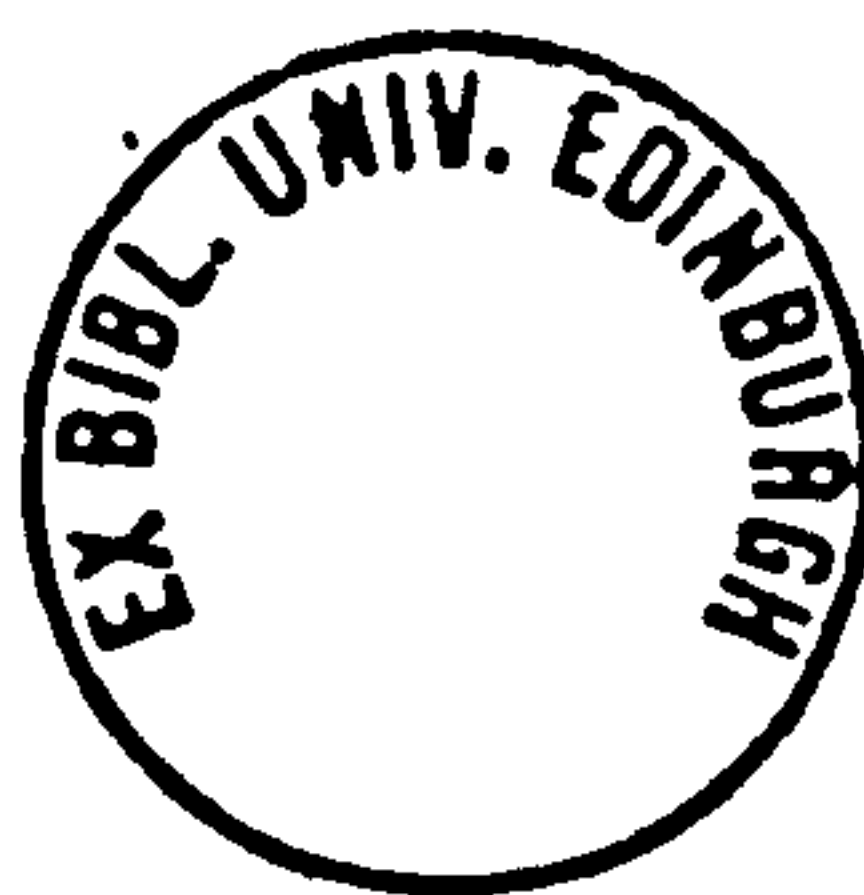


The Circulation of Cypriot Pottery in the Middle Bronze Age

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**Doctor of Philosophy
University of Edinburgh
1990**

VOLUME I

To my family,
Mum, Dad
Robert,
Maureen,
Kathleen,
Frank
Eileen,
Maria

"I hereby declare that the work contained within this thesis was entirely composed by myself."

Louise C. Maguire

Abstract

In any historical perspective of the Bronze Ages of Cyprus the complexity of development in the Middle Bronze Age has been overshadowed by presuming that the origins of Late Bronze Age internationalism lie within the Middle Bronze Age. This thesis, therefore, is an attempt to assess the *circulation* of Cypriot pottery abroad within the Middle Bronze Age without recourse to extrapolation from the situation in the Late Bronze Age. Circulation has been adopted as a neutral descriptive term for the 'export' of Cypriot pottery abroad.

The thesis comprises two parts. *Volume II* is a catalogue of over 800 pieces of Cypriot pottery from over 40 sites in the East Mediterranean. The catalogue provides information on ware type, context and distribution, from which an assessment of Cypriot pottery abroad has been attempted in *Volume I*.

Volume I, Chapter II reviews the literature pertaining to Cypriot pottery abroad in the Middle Bronze Age and demonstrates how the 'export' of Cypriot pottery has been assumed to be synonymous with Cypriot foreign relations.

The classification of the Cypriot pottery is reassessed in Chapter III in attempt to gauge the chronological and cultural implications of the distribution of Cypriot pottery within Cyprus. The problems of recognising and interpreting ceramic variability have been tackled and illustrated through a case study of individual stylistic variation in White Painted V Fine Line Style.

The significance of Cypriot pottery abroad for chronology was realised at an early stage. In Chapter IV the ramifications for Cypriot relative and absolute chronology are systematically dealt with. There has been a tendency to use the 'export' of Cypriot pottery in the Middle Bronze Age to establish fixed points in the absolute sequence in Cyprus. The limitations of such an exercise are discussed and a cautious approach to the absolute chronology of Cyprus is advocated.

Chapter V analyses the pottery in its geographical, chronological and cultural context. This involved a survey of other types of small, narrow-necked juglets from Syria, Palestine and Egypt. The patterns suggested a diversified exchange network in the Middle Bronze Age, consisting of a complex circulation of Cypriot, Red Burnished, Red Polished and Tell el Yahudiyyeh wares; the Late Bronze Age circulation of Cypriot and Red Lustrous Wheelmade, however, suggested a simplification in the exchange.

Chapter VI presents the results of Neutron Activation Analysis on a number of Cypriot sherds from Tell el Dab'a. The analysis successfully identified the existence of Cypriot, Palestinian and Egyptian clay sources which satisfied questions on the origin of Bichrome Ware at Tell el Dab'a, and also the existence of imitations of Cypriot pottery.

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ABBREVIATIONS

Pottery

<i>BICH</i>	Bichrome
<i>BR</i>	Base Ring
<i>BS</i>	Black Slip
<i>BS/RS</i>	Black Slip/Reserve Slip
<i>LoD</i>	Light on Dark
<i>PWS</i>	Proto White Slip
<i>RB</i>	Red Burnished
<i>RLWM</i>	Red Lustrous Wheelmade
<i>RoB</i>	Red on Black
<i>RoR</i>	Red on Red
<i>RP</i>	Red Polished (Cypriot)
<i>RP</i>	Red Polished (Palestinian)
<i>RS</i>	Red Slip
<i>TYH</i>	Tell el Yahudiyeh
<i>WP</i>	White Painted
<i>WP ABBWLS</i>	White Painted Alternating Broad Band and Wavy Line Style
<i>WP CLS</i>	White Painted Cross Line Style
<i>WP Comp</i>	White Painted Composite
<i>WP IND</i>	White Painted Indeterminate
<i>WP PLS</i>	White Painted Pendent Line Style
<i>WP STS</i>	White Painted Soft Triglyphic Style
<i>WP V BB</i>	White Painted V Broad Band
<i>WP V FLS</i>	White Painted V Fine Line Style

W P V T L S	White Painted V Tangent Line Style
W S	White Slip

References

CAH	Cambridge Ancient History
CMC	Myres, J.L. and Ohnefalsch-Richter (1899) <i>Catalogue of the Cyprus Museum</i>
SCE	Gjerstad, E. <i>et al</i> (1934-1972) <i>The Swedish Cyprus Expedition</i> (Vols I-IV) Uppsala and Lund.
SPC	Gjerstad, E. (1926) <i>Studies in Prehistoric Cyprus</i> Uppsala

Periods

EC	Early Cypriot
LB	Late Bronze
LBA	Late Bronze Age
LC	Late Cypriot
LM	Late Minoan
MB	Middle Bronze
MBA	Middle Bronze Age
MC	Middle Cypriot
MM	Middle Minoan

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CHAPTER I

Introduction

The distribution of Cypriot pottery abroad in the Middle Bronze Age has to some extent been overshadowed by the growing internationalism of the Late Bronze Age and there has been a tendency in the literature to lump, for example, Middle Cypriot (MC) III with Late Cypriot I; any events in the MC period being precursory to the Late Bronze Age (Merrillees 1968; Knapp and Portugali 1985; Knapp 1988, 1990). This retrospective analysis of events in these periods restricts our appreciation of "individual situations that in their specific detail are unique" (Trigger 1989, 27).

With this in mind, this thesis is an attempt to study the distribution of Cypriot pottery in the Middle Bronze Age in its entirety as well as in its singularity in order a) to enhance our knowledge of the extent and volume of pottery found abroad, an unprecedented export horizon in all of Cypriot prehistory and b) to accumulate information on the background or setting of the distribution, in geographical, cultural and chronological terms. This essentially is the basis of a composite approach which will be employed to assess the circulation of Cypriot pottery in the Middle Bronze Age. As will be explained in fuller detail later, the term *circulation* expresses neutrality in description as well as interpretation and has been adopted here to avoid connotative terms such as "export" and "distribution" from which restrictive trade theories, for example, tend to emanate. In this thesis where "export" and "import" are used, they imply only that an item, originally Cypriot was found abroad; and vice versa for those non-Cypriot items found in Cyprus.

The core of this research comprises a catalogue of over 800 pottery pieces, compiled as far as possible from first-hand examination of the material. The topicality of this research was enhanced moreover because of a substantial corpus of Cypriot pottery from Tell el Dab'a (Avaris), Egypt, which was made available for study. Merrillees (1968) had documented the Cypriot Bronze Age pottery in Egypt, the total number of Middle Bronze Age pieces amounting to no more than a handful. The presentation, therefore, of over 300 pieces of Cypriot pottery from Avaris, capital of the Hyksos in the Second Intermediate period, is of paramount importance. Likewise Johnson (1982) collated the Middle Bronze Age Cypriot pottery found in Palestine, amounting to 17 sites; the catalogue comprised information accumulated from publications. The compilation of a catalogue of Cypriot pottery found in Syria, Turkey, Palestine, Egypt and Crete is an invaluable record of Cypriot exports in the Middle Bronze Age.

The catalogue is located in Volume II. The details of its organisation and layout are presented in the preface to the catalogue (Vol II, 53-8). Volume II also comprises any text illustrations (Vol II, 1-48), and illustrations to the catalogue (figures - 175-237; plates - 238-286).

The focus in Chapter II is to demonstrate the bias in terminology and idealised approaches to the interpretation of Cypriot pottery abroad. In reviewing the literature it is quite clear that Cypriot pottery abroad has come to be equated with Cypriot foreign relations. It can be stressed here that this thesis deals foremost with the pottery, and from this perspective highlights in Chapter II the ways in which pottery has become synonymous with goods and exports.

The catalogue essentially adopts the classification system set up by Åström in 1957. There appeared to be certain reservations in the literature about the very nature of the system and these are investigated in Chapter III. The reason for doing so was to pinpoint

exactly where in Cyprus the exported Cypriot pottery had originated from. This information would be best obtained from the classification system. However, it is very evident that the classification sequence is primarily constructed with a relative chronological bias. Accordingly, Chapter III attempts to address the chronological imbalance by presenting a case study of White Painted V Fine Line Style to illustrate that through an analysis of stylistic variation, it may be possible to pinpoint specific production locales or workshops.

A similar imbalance is encountered in aspects of absolute chronology both inside and outside the island. Since Cyprus relies on absolute dates from the Levantine mainland and/or Egypt, Cypriot pottery abroad has been instrumental as a chronological export horizon. Dates from mainland contexts are readily associated and attached to a somewhat tentative relative sequence within Cyprus. The material from Tell el Dab'a is thought to be particularly illuminating in this regard since the deposits at the site comprise evidence of a local Egyptian cultural sequence alongside a Syro-Palestinian Middle Bronze Age culture. The links in the chronological chain therefore extend from Cyprus to Palestine, and Egypt. Chapter IV attempts to outline these assumptions and advocates caution in our advances towards establishing an absolute chronological framework for Cyprus, especially when using small samples and insecure dating material.

Since Chapters III and IV cover the classification and chronological considerations of the Cypriot pottery, the discussion in Chapter V can draw on the very many facets of the circulation of Cypriot pottery. Essentially, this chapter adopts a composite approach by assessing the background geographical, archaeological, cultural and historical contexts of the Cypriot pottery. In mapping the circulation of other small commodity containers, not unlike Cypriot pottery in terms of form and time span, a very interesting complex picture emerges, and the very essence of an exchange network begins to take form.

¹ For a general historical background of the Middle East in the Middle Bronze Age, reference can be made to the *CAH*³ (1973) Vol II part 1.

As a compliment to the macroscopic description of the Cypriot pottery, chemical analysis was undertaken. In Chapter VI this pilot Neutron Activation Analysis study sets out to confirm the origins of the Cypriot pottery, identify imitations, and verify the presence of Bichrome Ware of Cypriot, and Palestinian origin. The sample is restricted to comparative source material from Cyprus and the Cypriot material from Tell el Dab'a, Egypt.

The approach adopted throughout the thesis is ultimately traditional in that it presents a corpus of material and sets out to interpret it in its relative contexts. However, it is able to substitute simplistic assumptions with an appreciation of the complexity of 'interaction spheres', which suggests communication at various levels.

"This growing awareness of the interrelations between neighboring societies and of the complexity of internal cultural change has promoted increasing concern with the complexity of the archaeological record....What is known in the way of generalizations about human behavior and cultural change must be used, as far as possible, to try to explain individual situations that in their specific detail are unique" (Trigger 1989, 27).

CHAPTER II

Foreign Relations

The export of Cypriot pottery

The evidence of Cypriot pottery abroad in the Middle Bronze Age has been used as a medium for interpreting, on a broad as well as specific scale, the nature of Cypriot foreign relations. The literature is beset throughout with theories of wide-ranging contact from a specialised trade in luxury goods, such as perfume or unguents, to the peaceful migration of ethnic groups. These theories are somewhat restricted by a strong tendency to label the contact in succinct terminology *i.e.* the copper trade, the opium trade, the perfume trade, whilst the bulk of the evidence as such is pottery. A review of this literature will be appropriate in order to help outline the current theories and notions of exported Cypriot pottery in the Middle Bronze Age. As far as possible these theories and opinions are dealt with in chronological order.

In coming to terms with the material remains of the indigenous population of Cyprus, Myres, in his fruitful excavations in the 1890's identified pottery fabrics which did not resemble the 'native pottery' and were, therefore, classed as foreign wares. While his studies encompassed every period of prehistoric human occupation in Cyprus, only his Middle Bronze Age excavations and studies are re-examined here.

Of primary concern was the significance of "foreign importations, and native imitations of Egyptian ornaments, which ultimately provided the crucial link with the historical

sequences established for Egypt" (CMC, 138). At Kalopsidha, "black-punctured ware"¹ recognised as a non-Cypriot fabric (CMC, 138, 145) was an obvious candidate for evidence of *foreign contact*; and while its place of origin was not certain (CMC, 38) a Southern-Palestinian origin was thought likely (CMC, 146). The main objective, however, was to deduce the chronological ramifications of the occurrence of Tell el Yahudiyeh Ware. The pottery suggested a XIIth Dynasty date for the associated local Cypriot pottery and, consequently, the Bronze Age necropolis at Kalopsidha (CMC, 146). Similarly "porcelain beads" found in conjunction with "black-punctured ware" were paralleled to "a characteristic XII.Dynasty type of Egyptian bead..frequently found in Cyprus associated with many types characteristic of the XII.Dynasty." A XIIth Dynasty date for the *Bronze Age of Cyprus* was arrived at, with little discussion of the nature of the contact apart from when it happened

"This certainly points to intercourse between Cyprus and Egypt under the XII.Dynasty, for though many of the Cypriote specimens may be native imitations made in Cyprus at a later date, the types themselves can hardly have been introduced, inmixed with later forms, except under or immediately after the XII.Dynasty" (CMC, 146).

The date of the necropolis was also arrived at through a deductive process of a presence/absence forecast of known early or late native pottery forms, but foremost through foreign imports. An appreciation of the nature of these vessels in their local contexts was not undertaken at this stage.

Myres and Ohnefalsch-Richter, in compiling the catalogue of the Cyprus Museum, saw any evidence of foreign contact against a background of copper trading. The "main cause of this early advance was certainly the fact that Cyprus contains the only large deposits of copper ore in the Levant" (CMC, 17). With equal certitude, the origins and development of the indigenous Cypriot culture were paralleled with civilizations in Libya, Anatolia, Central Europe, the Aegean, North Syria and Egypt! (CMC, 16-18). Cypriot type

¹ Otherwise known as Tell el Yahudiyeh Ware

artifacts (*i. e.* those displaying characteristics of Cypriot workmanship) found in foreign contexts, proved that certain areas were in communication, and their absence that they were not. It appeared to Myres and Ohnefalsch-Richter that Phoenicia was not in contact with Cyprus until the later Bronze Age (*CMC*, 19).

In contrast to this approach, Gjerstad coherently outlined the question of foreign relations, adequately defining the limitations and restrictions imposed on our interpretations by the nature of the evidence (*SPC*, 291-4). He formed a working hypothesis to interpret foreign relations in which he saw a development from cultures which are initially separate, to separate cultures in communication, leading to cultures which become assimilated (*SPC*, 293-4). He collates the Middle Bronze Age evidence for foreign relations in a circuit of the neighbouring countries. Increasingly, from the EC the evidence for contact is more substantial and the exchange in articles more numerous, while pertaining to pottery as opposed to other materials. Hence an increase in numbers marks an increase in communication. In Syro-Palestine in particular the picture was one of reciprocal exchange, "The importation began slowly in Middle Cypriote I and increased in Middle Cypriote II to become an actual invasion in Middle Cypriot III" (*SPC*, 306). Much Cypriot pottery was found in Syro-Palestine and lesser amounts were found in Egypt (*SPC*, 303).

Despite consideration of war, raids and colonisation between Cyprus, Syria, Palestine and Egypt, the general consensus arrived at was that relations were "chiefly commercial" (*SPC*, 307). What must be emphasised at this point, however, is the limited evidence used to interpret such relations.

"So far as can be judged at present the Syrian Ware is found on Cyprus in greater quantity than the Cyprian ware in Syria: the Cyprian ware in Gezer is an ebb in comparison with the flood of Syrian imported ware in Kalopsidha" (*SPC*, 308)

This flood of Syrian imported ware from the Kalopsidha excavations is somewhat incompletely catalogued and its chronological and "cultural" parallels have not been outlined in the diligent fashion exercised previously for all other wares. Whilst the foreign ware included Red Polished juglets of Palestinian or Syrian manufacture (*SPC*, 269) and probable Tell el Yahudiyeh wares (*SPC*, 270), and after reclassification to a Syrian origin, very little remains of the other foreign categories - including pithoi, painted jars, cups and Syrian bottles (*SPC*, 306). The "Syrian Black Lustrous ("Hyksos") ware" and some other "Syrian ("Hyksos") Red Lustrous II bottles" found by Myres are mentioned but their relation to the "Syrian Ware" which *is* discussed (*SPC*, 200-9), is not clear. It is, consequently, acknowledged that Gjerstad may have included in his "Foreign Ware" category all wheelmade wares, which were considered non-Cypriot on the basis that all native Cypriot fabrics were handmade. Hence wheelmade wares which were in fact Cypriot may have been lumped into this group (*cf* Barlow 1985, 51 *n.* 28). Gjerstad's tally for Cypro-Aegean contacts amounts to a Kamares Ware fragment found at Episkopi but he feels that such little evidence warrants no comment; the lack of evidence highlights the sparse commercial contacts between the Aegean and Cyprus. It suffices to state that the excavations of Kalopsidha alone could not possibly be representative of island-wide commercial activities on an international scale and while it is obvious that contact was made, its extent and objectives are poorly understood.

Åström (1957) devoted a substantial amount of time to the study of foreign relations (*SCE* IV.1B)². Like Gjerstad before him, however, his chapter remained in essence an extensive catalogue objects imported into Cyprus, during the Middle Bronze Age, and a comprehensive survey of the distribution of material exported. Åström felt the need to find parallels for the indigenous Cypriot types. This is all the more evident because of

² Åström's doctoral dissertation was published in 1957. Subsequently, in 1972 the Swedish Cyprus Expedition published the same manuscript, with very little changes, in *SCE* IV.1B. Within this thesis this latter version is referenced.

the heavy influence of typological categories created and used by Åström, and moreover because of the apparent obsession with tying down particular types to specific time spans. The corpus of exported material is extensive and at the time of writing was exhaustive. It stands as a solid foundation for the interpretative stage which must surely follow.

The conclusions formulated on the position of Cyprus in the realm of international contact within the Mediterranean are understandably restricted, in view of the amount of time employed to compile such extensive corpora. Åström ideally surveyed the mainland for parallels with the *types* of Cypriot bronzes, pottery and architecture which he had identified in the local material culture. This exercise ultimately mapped the chronological and cultural links of the artifact types. Within the Middle Cypriot period, the extent of contact is measured by the quantities of Cypriot *pottery* abroad. In MC I contacts "with the Aegean and Syro-Palestinian areas were only sporadic" (SCE IV.1B, 276). The evidence of MC I 'contacts' is limited to possible Aegean influence, identified through the similarities of Aegean wares to MC I White Painted II Ware (SCE IV.1B, 207); and likewise the apparent characteristic Syro-Palestinian elements in White Painted II Ware (SCE IV.1B, 208), indicate limited contact with the Syro-Palestinian mainland. In MC II "the relative isolation of the preceding period is now over and definite contacts are established with Egypt, Palestine and Syria" (SCE IV.1B, 277). This is based on specific Cypriot MC II types found in Syro-Palestine and Kahun, Egypt. The equation of Alasia with Cyprus to which Åström alludes, indicates that Cyprus exported copper to Mari at this time (SCE IV.1B, 277). In MC III contacts "with neighbouring countries are also stronger in this period." Cypriot wares were exported in abundance.

"The amount of Cypriote wares abroad is so great that one is tempted to assume Cypriote trading factories at sites such as Ras Shamra" (SCE IV.1B, 278).

It is at this time that Syro-Palestinian fabrics are also found in Cypriot contexts. A popular theory to arise from these observations of Cypriot involvement in international

dealings was that since Cyprus possesses naturally occurring copper resources, copper was a marketable commodity and was, therefore, traded in antiquity.

"Copper was exported from Cyprus, probably mainly as ore or ingots, exports of tools or weapons being rare" (*SCE IV.1B*, 278).

There is no evidence of this export unless the equation of Cyprus with Alashiya is accepted; or if the more substantial evidence of the LC period trading activities are projected backwards into the Middle Bronze Age.

In 1966, Catling presented a brief historical reconstruction of the Middle Bronze Age. In it he draws particular attention to the differences in culture between the east and the west of the island, delving briefly into the apparent economic superiority of the east (*CAH*, 40, 45) as a result of trading activity outwith the island, in which the role of copper is given some consideration (*CAH*, 43, 45). The sites in the east and south east were founded in this "phase of expansion", but not at the expense of the inhabitants of the North (*CAH*, 45). The amount of *pottery* exchanged is large, and to Catling represents "exports" and "goods", of which we have little evidence.

"What in MC II had been a mere trickle of exports to the eastern markets became a flood in MC III; at the same time there was a reciprocal flow of foreign goods into Cyprus" (Catling *CAH*, 44).

Catling proposes that this lively import/export trade resulted in a change of settlement pattern and ultimately contributed to a more rapid urbanisation process (*CAH*, 45), proposals which Merrillees (1971) takes one step further (see below). Catling is responsible for introducing into the discussion the effect of Cypriot international trading on Cyprus and draws attention to any econo-political aspects of the trade, including the possibility of Cypriot domination and control of the contact to Cyprus' advantage. Merrillees (1968) catalogued the Cypriot Bronze Age pottery found in Egypt. He recorded details of BS II, WP Pendent Line Style and WP Cross Line Style which were the only items from the MCIII period exported to Egypt (1968, 145-6). Throughout

MCIII-LCII, Cyprus experienced constant trade with Egypt, and to what extent the Cypriots, Egyptians or even Syrians involved themselves in its operation, is discussed (Merrillees 1968, 190-1). Ras Shamra is to be seen as playing an integral role in the transport of goods to Egypt: this conclusion was reached on the basis of the abundance of Cypriot pottery and Cypro-Minoan tablets found there, testifying to the probable existence of a Cypriot colony (Merrillees 1968, 190). Perhaps this is a position which can be best placed in the LC IA period and onwards and not in MC III, since Merrillees is referring no doubt to the LC Wares such as WS and BR. In this review we are attempting to assess the interpretations of the nature of contact in the Middle Bronze Age, as opposed to the Late Bronze Age, and there is a tendency in the literature to deal with both periods as one.

While the Cypriots might have used the Syrians as middlemen, the use of Egyptian or Syrian *and* Egyptian middlemen, for example, is just as "integral" to the enterprise, and is equally tenable. A number of possibilities exist, including the participation of merchantmen, who were engaged in either state-controlled activities or free trade enterprises, of which Merrillees is well aware (1968, 192).

"If the pottery was being carried in ships manned by foreigners, it implies that the Egyptian's naval activity during this transitional phase did not seriously hamper Levantine merchants cruising south to sell their goods in the Nile Valley" (Merrillees 1968, 193).

"Goods" being the operative word; it is all too often taken for granted that since pottery remains one of the most abundant forms of tangible evidence, that pottery was traded for itself and not the goods it contained, nor is it emphasised that the cargo of a ship was unlikely to have contained empty jars, jugs and little else.

Merrillees (1971) advocates a "gradual transition" from MCIII-LCI, demonstrated through the introduction, continuity or diminution of pottery styles all over the island (1971, 56). The crux of the debate lies in the appearance of BR, WS and Monochrome Wares in the west of the island, whereas in the east, "culturally retarded", the WP

tradition persisted (1971, 72). The absence of BR, WS and Monochrome Wares at the eastern sites of Enkomi and Kalopsidha, as well as Proto-WS and Proto-BR, suggested that while "the ceramic hall-marks of the L.C. period were evolving in the west, the culture of the east resisted these new elements" (1971, 70). Where foreign relations are concerned, the apparent dichotomy existing within the island is reflected in the distribution of pottery styles abroad. WP Pendent Line Style, Cross Line Style and V Styles, for example, are traditionally considered to be from the east and southeast of the island; Red on Black has a predominantly eastern distribution with moderate extensions in the west. These styles are found in large quantities at sites in the Levant and Egypt at the end of the Middle Bronze Age.³ Therefore, prior to the introduction of BR, WS and Monochrome styles there would appear to have been no export from the west of the island. Merrillees uses the absence of Proto-WS and Proto-BR in Egypt in LCIA and the appearance of BR and WS there in LCIB to emphasise the situation prevalent in Cyprus (1971, 74). Proto WS, WS and BR, however, have been found at Tell el Dab'a in deposits which show a continuum of trade through the arrival of WP Pendent Line Style, Cross Line Style, WP V and Cypriot Bichrome throughout the Second Intermediate period. In this respect, an amount of rethinking about the tenure of economic or regional supremacy in Cyprus is necessary. In demonstrating chronological contemporaneity between the late WP and BR, WS and Monochrome wares in LCIA, he surmises that the west at some stage in LCIA deliberately gained supremacy in the trading enterprise(s) already established in the east from the MC III period onwards, and exported BR, WS and Monochrome in LCIB (1971, 74, 77). The issue here, for the moment, is not entirely chronological. The equation of cultural units with pottery styles lacks essential objectivity. Descriptions such as the "W.P. culture of the eastern Mesaoria" and the "R.-on-B. and allied culture of the Karpas" (1971, 70) are misleading and reflect a restricted, myopic perspective. While it is expected that certain groups would produce certain styles

³ As yet only one sherd from a bowl of the MBA White Painted pottery, belonging to a uniquely western distribution has been found outside Cyprus: Cat ref DAB 609.

of pottery in preference to others, it cannot be demonstrated satisfactorily that the replacement of one pottery style by that from another area marks the 'takeover' of one culture by another.

"For if the purveyors of the west's ceramic inventions wished to assert their burgeoning cultural ascendancy with a view to loosening the east's hold over the Levantine market and sharing the profits of this trade, but encountered internal and external resistance in its attempts to make some advancement, then it is not difficult to imagine that rivalry between the protagonists of the two regions could have led to animosity and even aggression" (Merrillees 1971, 77).

The 'easterners' might just as easily have commissioned the export of a commercially more viable product which the west were making and adapted their activities accordingly. The situation is obviously much more complex than Merrillees would believe (*cf* Baurain 1984, 49 *n.* 135).

In the first instance, the evidence comprises mainly pottery vessels, although the appearance of fortresses and mass burials at the end of the MC III suggests to Merrillees that the period was far from peaceful and the cause of the turmoil was no more than a contest between east and west to gain control of the export market (Merrillees 1971, 77-8). Secondly, how can it be ascertained that the Cypriots themselves are responsible for the export of this material? The dependency of Cypriot markets on Levantine merchants operating in the major towns in Cyprus is one alternative consideration. Profit gained by the Cypriots from such commercial activities would no doubt be injected into the local Cypriot economy at some stage via commercial entrepreneurs. As such the market would be controlled by consistency in demand from the overseas market and the ability to transport the goods there.

It is suprisingly easy to suggest interpretations of cultural development within an island-population from the manifestations of cultural individuality observed in pottery types and styles. The evidence in this respect, however, is too limited; the complexities of pottery

industries and pottery trade are ill-understood. With what certainty do interpretations of the limited evidence reflect wholly events as they happened? Or are they only a very restricted, one-sided view of life in the Middle and Late Bronze Age?

One further consideration which Merrillees does not discuss should be mentioned. In the majority of cases, LC wares (WS, BR and Monochrome) are consistently found at those sites in the Levant and Egypt to which WP and RoB wares are exported in abundance.

Any significant gap in the chronological succession of any of these wares, let alone a gap between BR and WP has yet to be demonstrated. It may be suggested that the disruptions in the internal makeup of commercial power did not have equally disturbing repercussions in the export market. Where Merrillees is concerned the market lay in the hands of the Cypriots but this has yet to be conclusively proven.

A very different approach taken by E. Masson (1976) argues extensively for the recognition of an ethnic influx of Hurrians in the MC III-LCI archaeological record. The appearance mainly of Bichrome Wheelmade Ware, evidence for the introduction of the horse, as well as the socketed axe, are attributed to the presence of communities or artisans resident in the east of the island, who originated from the mainland (Masson 1976, 146, 153, 155) and who were most likely Hurrians (Masson 1976, 144, 159, 160.) For the elements considered characteristically Hurrian, however, there exist either Cypriot or Syro-Palestinian parallels (Knapp 1979). Masson's work serves primarily as a collation of the 'foreign' elements in the Cypriot material and draws attention to the considerable amount of interaction between Cyprus and the mainland. It is impossible to identify from these specific elements alone the ethnic groups who may have used or introduced into Cyprus Bichrome ware, the horse and the socketed axe, without at least more pertinent evidence.

Pat Johnson (1982) produced a catalogue of the Cypriot exports to Palestine in the Middle Bronze Age. A chronological bias and a quantitative approach to the proportional occurrence of the White Painted Wares precluded any comprehensive discussion on the nature of the contact. Johnson suggested that the lack of 'geometric' White Painted styles abroad could be attributed to the fact that 'geometric' styles were earlier than 'linear' styles; the linear styles were those exclusively found abroad. In using the classification sequence set up by Åström, Johnson inherited the innate typological bias to the pottery which has restricted the interpretations of the pottery within Cyprus. The White Painted II ware is characterised by predominantly geometric motifs; yet although the WP V ware is dominated by those south eastern styles using mainly linear decoration, there exist those styles which draw on geometric motifs such as White Painted V styles using chequered patterns and WP V Fine Line Style. These styles are contemporaneous with the linear styles exported. It becomes obvious that the classification system requires reappraisal since their "absence" abroad cannot be interpreted in light of their absence in Cyprus.

Johnson briefly mentions the mechanisms of exchange against a background of copper trading.

"If Cyprus was exporting copper at this time, the pottery may only have been of secondary importance in the east-west trade" (1982, 70).

The paucity of foreign objects in Cyprus in comparison to the amount of Cypriot pottery exported, suggested that Cyprus may have been an intermediate stop in a long-distance market, and as such was not necessarily engaged in reciprocal trade, whereby Near Eastern goods were exchanged (Johnson 1982, 71).

Baurain (1984) undertakes a thorough historical and archaeological review of the transition period between the Middle and Late Bronze Ages. His systematic survey of

the material reveals that the Hittite activities in N. Syria had little to do with Cyprus at this time, but that the heightened commercial activity on the Syrian coast, at sites such as Ugarit and Byblos, had a substantial influence on Cypriot society (1984, 94, 101). The situation was not one of invasion or mass immigration but rather exploitation by foreigners of the resources which Cyprus had to offer (1984, 102). The evidence of the foreigners' "installations" is poor, since they were not permanent but convenient interaction points (1984, 103). In total, Baurain views the cause of the change in the transition period to be the result of external influence.

"La réponse cypriote à ce *stimulus* extérieur est malaisée à préciser, mais il est indéniable: des établissements furent créés pour y répondre et des copies de vases importés y furent *tournés*" (Baurain 1984, 102)

The supremacy of the eastern markets in Cyprus is not denied; rather the "*explorateurs*" from the mainland did not exploit the west in the same way as they did the east (1984, 102). Baurain disagrees with Merrillees' idea of a western 'takeover'.

"Mais, plutôt que de supposer une portion Ouest conquérant l'Est, nous nous demandons s'il ne faut pas davantage imaginer qu'à un moment donné, les centres orientaux, une fois mis sur la voie de la prospérité, n'ont pas fait basculer l'Ouest de l'île dans ce processus d'ouverture sur l'extérieur, amenant dans leur zone les céramiques de l'Ouest" (Baurain 1984, 102-3).

He avoids referring to the "*explorateurs*" as anything but Syro-Palestinian. The attempts to match ethnic populations in the facets of material culture are recognised as very tentative and "*par trop délicats à interpréter*" (1984, 101) especially the identification of a Hurrian population in Cyprus by E. Masson (1984, 43 n. 89; 101).

One aspect of Baurain's analysis, demands particular attention. The absence of Middle Bronze Age Cypriot pottery at Alalakh VII, for which Baurain establishes contemporaneity with the MCIII period, suggests to him that

"Chypre paraît avoir suivi son propre destin insulaire. En fait, tout donne à penser qu'un *écran* s'interposait entre l'île et la côte voisine" (1984, 51).

Further he would advocate a sudden crescendo in Cypriot contact with the rest of the Levant.

"Il n'est évidemment pas question pour nous de soutenir une absence d'exportation cypriote au CM III jusqu'à l'absurde en niant que Chypre ait jamais exporté quoi que ce soit au cours de ces années. Toutefois, il nous semble possible de prétendre que l'ouverture de l'île sur l'extérieur fut rapide, en tout cas plus *brutale* que ce que d'aucuns ont écrit" (Baurain 1984, 53).

Baurain has failed to come to terms with the amount of pottery exported from Cyprus in the Middle Bronze Age. If he has, he prefers to take the latest date for their manufacture *i.e.* LCIA (1984, 53 and *n.* 159). The argument is circular: the stratigraphic evidence for BR, WS and Monochrome indicates a succession in the pottery sequence from WP Wares to BR, WS and Monochrome, both within Cyprus and outside Cyprus. Both Merrillees and Baurain believe that the BR, WS and Monochrome wares were produced in the West of the island while the late WP wares prevailed in the south. Therefore, the late WP wares such as WP V are in fact LC. It is of no consequence to which period the material is allocated *i.e.* MC III or LC IA. In relative terms, a significant horizon for each ware exists to suggest that BR, WS and Monochrome become the predominant wares in use in the Late Bronze Age, and superseded the WP tradition. Merrillees and Baurain argue for contemporaneity to support their theories: Merrillees for his 'takeover' of the east by the west; and Baurain for his rapid "ouverture" of the island in the LCIA period.

Rather, it can be demonstrated that Cyprus was *drawn* into interaction with her Levantine neighbours over several years, before the "flood" of Late Cypriot pottery reached the extensive mainland market. The internal situation in Cyprus is poorly understood in view of the reliance on pottery to determine chronologically the economic and political situation, and the adaptation of the evidence, such as fortification and mass burial, to match the theories.

Portugali & Knapp (1985) in their review of Cypro-Aegean contact in the MCIII-LCI period have automatically placed Cypriot pottery abroad in close connection with copper. The steadfast adherence to Alashiya = Cyprus is quite presumptuous and overshadows MCIII-LCI foreign relations which they review since Amarna letter 35 is LC IIB in date.

"Mining activities are best documented by Amarna letter no. 35 sent from the king of *Alashiya* (i.e. Cyprus) to the king of Egypt. The Alashiyan ruler apologizes to Pharaoh for sending only 50 talents of copper; a plague had struck Cyprus and "there is nobody who can mine [literally "make"] copper" (*ēpiš erî jānu*) (Portugali & Knapp 1985, 44).

Merrillees (1987) in an exhaustive review of the literature concerning the identity of Alashiya has called for caution and redirection (1987, 65; 72). The major proponents, by complete polarisation in their views, are faced with the dilemma that until further evidence is forthcoming neither position will be conclusively accepted. The equation serves to verify, through textual evidence, the association of Cyprus with copper, as well as the export of ivory and wood, which may find substantiation eventually from the archaeological evidence. It will be important to establish any evidence to support the general assumption (even where Alashiya does not equate with Cyprus) that in the 16th and 15th centuries BC Cyprus *was* a supplier of copper and hence such statements as the following will be acceptable.

"Cyprus' role as a producer of copper, in conjunction with the large quantities of Aegean artifacts found in Cyprus and the small quantity of Cypriot objects found in the Aegean, has led to the virtually orthodox theory that Cypriote copper was exchanged for Minoan and Mycenaean ceramics and/or their contents." (Portugali & Knapp 1985, 45).

The evidence for Aegean/Cypriot contact in MC III amounts to three objects -- one seal (MM III) found at Ayia Paraskevi, one definitive WP Pendent Line Style (MC II-III) sherd, and one Red on Black bowl sherd from Mallia (Portugali & Knapp 1985, 71, 77).

Since the first signs of substantial interaction between Cyprus and her Aegean, Levantine and Egyptian neighbours were in MC III, it will be important to demonstrate at that stage

the extent of trade, the objects traded and their contextual implications. It does not suffice to extrapolate, from the LC I period and beyond, indications of foreign contact which are then used in retrospect to substantiate the beginnings of foreign trade in the MC III with one-sided theories of copper production and export from Cyprus, as Knapp and Portugali purport (MCIII-LCI 1985, 44-5; see also Knapp where he combines both periods into MCIII-LCI which subsequently is termed the *Protohistoric Bronze Age* 18/1700-15/1400 BC Knapp 1990).

Copper production and trading, from an Aegean perspective, as with trade with the Levant and Egypt, has to be thoroughly explored archaeologically without recourse to the textual evidence pertaining to Alashiya and dependence on the Alashiya = Cyprus equation to explain the arrival of Cypriot objects in the Aegean in the MC III period.

The importance of studying the Middle Bronze Age in separation from the Late Bronze Age can be understood in the following ways. Firstly, the Middle Bronze Age is the first time we have substantial evidence that Cyprus was in commercial contact with its neighbours; the reasons why Cyprus should become involved, and to what degree Cypriot involvement is registered archaeologically must, therefore, be explored in as much detail as possible. Secondly, it should not be assumed that the Late Bronze Age copper trading activities in the East Mediterranean apply automatically to the outset of any trading exploits at the end of the Middle Bronze Age. Nor need it be taken as dogma that if copper was traded from the very beginning that copper *alone* was responsible for the development of Cypriot trading on an international scale.

The preceding observations on the major works undertaken to study the export/import trade between Cyprus, Syria, Palestine, Egypt and the Aegean have outlined considerable bias in the interpretation of the material which can be summarised as follows:-

1. Initially, scholars attempted an evaluation of foreign imports or exports in terms of their chronological implications. The explicit mechanisms of the trade were rarely explored.

2. Contact was understood by the quantities of material imported and exported; and since pottery is the most extant, the interpretations are somewhat broad, especially since the contextual data and the association of related artifacts were not considered.

3. The equation of Alashiya/Cyprus has accentuated the role of copper as an exported commodity. Similarly the *reasons* for any type of trading activities may have been unnecessarily overshadowed by the predominance of copper as an export.

4. The tendency to superimpose Late Bronze Age interpretations of trade in the latter part of the Middle Bronze Age pervades the literature, whereas ideally the MC III period, as the first stage of international relations, should be studied initially in its singularity, and only then justified as an immediate precursor to the Late Bronze Age.

5. In classifying any Cypriot Middle Bronze Age pottery found abroad, the current classification sequence set up by P. Åström has been consistently adopted. However, there are unforeseen problems with this typological series which have come to the fore, especially in incorporating new material into the established system, both within and outwith Cyprus.

In light of the preceding review it is quite apparent that the concept of Cypriot exports and foreign imports in the Middle Bronze Age preempts to a large extent an appreciation of pottery circulation within its own distributive and contextual parameters. The inevitable is to extrapolate from ceramic production and distribution to the economic

endeavours of an international socio-political entity, and it is evident that the connection between these is less than clear.

Essentially, the interpretations of Cyprus as a socio-political entity are impressions gained from the Late Bronze Age, when Cyprus is considered a major copper producer and exporter, as well as an Alashiyan state (Knapp 1979; 1990). Otherwise we have very little to demonstrate that Cyprus had achieved status in an international sphere, let alone a recognised political status within its own boundaries. The following chapters will isolate the information we can obtain from the pottery evidence alone as it is exported, by assessing its temporal, spatial and contextual variability.

"Testimony, which at first sight appears to be of fact, may prove to be actually of belief or opinion" (Walker and Walker 1964, 431)

CHAPTER III

Classification

Introduction

"It is probably safe to say that the archaeologists' chief concern with pottery at the present time centers about the problems of classification" (Shephard 1985, 306).

Classification of Cypriot pottery in the Middle Bronze Age is an important step to understanding the recurrence of types of pottery in terms of their temporal and spatial distributions. Therefore, an appraisal of the classification of Cypriot pottery as currently used must be undertaken in order to assess the validity of the ceramic descriptions, and their chronological and cultural implications. Indeed many 'new' classifications are reworkings of antique systems. Previously (see above p.20) it has been mentioned that within the classification system already in use, certain restrictions have been encountered, and these are in need of revision.

The first attempts to classify the prehistoric pottery of Cyprus were undertaken by Thomas Sandwith in 1871 (Sandwith 1880, 127-142).

"The pottery excavated comprises an immense variety of styles, moreover, being so distinct as to make it easy to separate the cemeteries into different classes, a careful examination of which leads to the conclusion that the various kinds of pottery are characteristic of distinct races" (Sandwith 1880, 128).

The cemeteries excavated by Sandwith were divided into discrete classes (I-IV) on the basis of their pottery content, leading to an isolation in a relative time scale of "red vases" (*i.e.* Red Polished) in Class I cemetery. Class II cemeteries contained the Egyptian *lecythi*, (*i.e.* Base Ring Ware); and bowls decorated in black paint (*i.e.* White Slip Ware). Following in this tradition, archaeologists classified Cypriot pottery mainly by

observing the most prominent characteristic feature of the vessels and coined the appropriate label. Myres and Ohnefalsch-Richter (1899), for example, divided the catalogue of the Bronze Age pottery in the Cyprus Museum into two classes *Unpainted* and *Painted Pottery* (CMC 36-8; 38-40) subdivided into discrete Wares; the labels conjuring up the most distinguishing features *eg Red Polished Ware, White Ware, White Slip Ware*. These subdivisions were further divided into shape categories such as *Bowls* and *Bottles*.

Gjerstad (1926) modified these arrangements and amalgamated certain classes of pottery (SPC, 88). Notably, he combined the "Painted Pottery" category with the ware types within it to produce, for example, "White Painted Ware" which ideally should have been "Painted White Ware". Red Polished Ware and Black Slip Ware lost their initial "Unpainted Pottery" label. Gjerstad consciously adapted the classification sequence set out by Myres and Ohnefalsch-Richter to function as a typological series. In recognising recurring types among the pottery wares, he assigned each type a numerical division (SPC, 88).

Sandwith was aware in his initial categorisation that the ware types represented very different classes of material, which he preferred to associate with different ethnic groups. Myres and Ohnefalsch-Richter recognised the *general development* in ware types through the Bronze Age. Gjerstad, however, from his excavations at Alambra and Kalopsidha, indicated (in retrospect of the results of his excavations, or purely from his recognition of types?) that within each ware there existed a chronological development. This resulted in the creation of the numerical divisions I-IV attached to Red Polished Ware, and I-V White Painted Ware (SPC, 264; 269).

"At the same time the White Painted V ware becomes the most important painted ware, forcing the White Painted IV ware and still more the White Painted III ware into a position of minority, while the White Painted II ware is entirely lacking" (SPC, 271 and cf 269 Figure, 273 Figure).

The classic picture is one of evolving pottery wares superceded or outlived by other ware types. The implicit chronological denotation of these Roman numerals is not defined in the presentation of the typology. However, although the pottery from Gjerstad's excavations at Kalopsidha has never been fully published, a 'chronological development' of the pottery wares is outlined in summary in tabulated form (*SPC*, 269) and discussed in more detail in a summary chapter on the relative chronology of the Bronze Age of Cyprus (*SPC*, 268-277). The sherds used in the seriation table are from separate architectural phases excavated to different depths and extended over different sized areas.

"Thus only the two uppermost strata were removed in the rooms 1, 2, 3, 4, 6, 10 and 11, while 4 strata were removed in the rooms 5, 7, 8 and 9, and finally in the area limited by room 7 the débris was removed down to the rock, revealing 7 strata" (*SPC*, 268; Barlow 1985, 49 Fig 1).

Only in Room 7 do the excavations reach bed-rock and the continuum of pottery development through the EC and MC periods has been based on this sounding. Barlow has suggested that the increase of White Painted pottery in stratum 4 may be the result of a) functional differentiation between the rooms in the different houses at separate levels and b) the extension of the excavations in stratum 4 may have added weight to the pottery numbers (Barlow 1985, 50).

Even accounting for the extended area there remains a remarkable increase in White Painted Wares from the 4th stratum onwards. This shift cannot be denied, though its magnitude might be difficult to gauge. The primary concern, however, with reference to the White Painted typological series is the lack of evidence for the internal chronological succession, as well as the lack of criteria for isolating types into their respective categories of White Painted I, II, III and IV wares. Barlow has indicated that there is little evidence in the lowest strata at Kalopsidha for the precedence of each type (1985, 50). The situation is not eased by the apparent inconsistency in classifying White Painted

III and White Painted IV sherds (Barlow 1985, 51 and *n* 36). The numbers of White Painted II and IV in stratum 4 do not give a clear indication of the dominance of each ware.

The crux of the problem lies in the dependence on such limited data. It becomes apparent from Gjerstad's work that, in the first instance the types which he classed in his numeral divisions are often ill-defined; and that their chronological and cultural attributes can be interpreted only from reference to the ware types set up. There is a large amount of subjectivity involved, and for that reason it is difficult to replicate certain types, especially in classifying sherds (Merrillees 1978, 18). The introduction of the numerical divisions along with this paradigm of chronological succession has been condemned by Merrillees, who envisages the contribution as "one of the only services that Gjerstad did not render of lasting value" (1978, 18).

Åström (1957) classified the Middle Bronze Age pottery according to the system devised by Gjerstad (1926); and for the latter part of the Bronze Age according to Sjöqvist (*SCE* I). Åström, in the same vein, failed to identify systematically the particulars of each pottery type.

"The classification is based on criteria of technique, form and decoration, sometimes on one of these criteria (when other criteria are indecisive), sometimes on two, sometimes on all" (*SCE* IV.1B, 11).

In incorporating new material in this classification sequence, the increase in corpus size for each type has conveniently allowed for comparisons, and if a piece is similar in several characteristics it can be incorporated into a type. However, Coleman (1985, 139) illustrates the problem of replicating types, firstly, between those scholars who devised the systems and, secondly, difficulties are encountered by archaeologists trying to incorporate new material (*c.f.* Barlow 1985, 51). A crucial development in the classification system was introduced by Åström (1957). He identified individual styles

from the standard wares, and isolated these styles into discrete classes each with their own temporal and spatial distributions (Åström *SCE* IV.1B, 11; Merrillees 1978, 20-1). These include, for example, White Painted III-IV Lattice Diamond Style (*SCE* IV.1B, 32-4) White Painted III-IV Pendent Line Style and IV-VI Cross Line Style (*SCE* IV.1B, 27-30; 63-6), White Painted V Framed Broad Band Style and White Painted VI Soft Triglyphic Style (Åström 1966, 90, 92-3). The combination of certain distinctive motifs repeated on various vessels warranted the creation of these particular stylistic groupings. Merrillees (1978) has correctly pointed out that while Åström isolated individual styles from the standard sequence, by applying the numerical divisions outlined for the classic sequence of the styles, it is not acknowledged in the terminology that these "styles" have their own geographical and chronological dimensions within the development of pottery in Cyprus (1978, 20-1). Likewise Barlow has drawn attention to the fact that

"the chronological and geographic dimensions are combined on the assumption that development of pottery styles will be revealed to be more or less uniform throughout the island" (Barlow 1982, 22).

Åström himself admitted that the White Painted II-V Wares were mainly types represented at Lapithos and in the centre of the island. Merrillees' suggestion that the numerical divisions II-V of the White Painted sequence (and the Red Polished sequence I-IV) be left aside in the case of each style, therefore, is very appropriate.

In White Painted III-IV Pendent Line Style or IV-VI Cross Line Style, it is felt that the numerical divisions III-IV and IV-VI are invalidated because geographically both styles are peculiar to the south and eastern parts of the island. Since the II-V (and more specifically types II, III, IV) standard types are generally to be found in the north of the island, if the sequence is to be consistent White Painted III-IV Pendent Line Style and IV-VI Cross Line Style should have been given "new" numbers to denote different types. Åström has restricted the Pendent Line Style to III-IV, but there are examples which would warrant the extension into White Painted V category.¹ Frankel has also drawn

¹ Unpublished Cyprus Museum A777 Kythrea Tomb 1.

attention to the fact that the Style categories are essentially Ware categories as defined originally by Åström for the rest of the White Painted II-V series (Frankel forthcoming). Therefore, it would seem appropriate in the case of these styles to drop the numerical divisions.

White Painted III-V String Hole Style is perhaps an exception to the stylistic groupings defined above. Rather than being isolated from the Ware categories on the basis of a distinctive decorative attribute, *i. e.* design content, the application of a functional or stylistic knob or more commonly a "stringhole" on the body, neck or handle, in any number, has been isolated into a discrete type. This is unnecessary since the stringhole examples become separated from their group *eg* White Painted V which is grouped also stylistically and technologically. In this instance the "stringhole" category is particularly inconsistent with the previous stylistic groups since it uses an attribute of shape rather than of design content or fabric analysis.

Coleman (1985, 136 *n.* 7) demonstrates the confusion between White Painted II, III and IV, where Åström has moved Gjerstad's types from II to III, for example, on the dating of Lapithos and A. Iakovos. Coleman emphasises the considerable chronological bias placed on the numerical types and how Åström alters the classification of some pieces because he considers them to be later.

"In consequence of the view held here that the Lapithos sequence comes down later, and the Ayios Iakovos sequence starts earlier, than hereto thought, some alterations in the previous classification have been made. Gjerstad, Sjöqvist and J.R. Stewart had already seen that White Painted III Ware comprised two distinct groups; the later of these groups has been classified as White Painted IV and part of the former White Painted III Ware has also been included in White Painted V Ware" (Åström *SCE* IV.1B, 11).

Is this not evidence that the types devised *i. e.* I, II, III, IV and V have limited value as indicators of pottery production over the whole of the island, when they are used as tools

of relative chronology rather than representative products of potters? In the words of Shepard, the reality of typologies is more poignantly assessed; a 'type' is

"artificial in so far as it is selected to serve as a means of outlining relative chronologies, a purpose that has no relation to the conditions of production or original functions of pottery" (Shepard 1985, 307).

This subjectivity and inconsistency in creating or reallocating pottery types is outlined, to a greater extent below.

Gjerstad and Åström

It has been possible to correlate Gjerstad's² (1926) and Åström's (*SCE* IV.1B) type series (Appendix I). There are several observations to be made from this exercise. In the first instance, and by far the most obvious, is the *lack* of correlation between Åström's typology and that devised by Gjerstad. The same vessels have been classified under different Ware categories. Where Åström has moved a vessel into another Ware type, the new type is indicated in the listing (Appendix I, 156-9) by bold characters. Where there is no entry under Åström for Gjerstad's class, no entry has been found within Åström's corpus. The listings have been graphically summarised in Figs 2-5. Each graph displays the reclassification of Gjerstad's illustrated examples by Åström. The "Missing" category denotes those entries which are not referred to by Åström in his corpus.

In view of these inconsistencies and in the light of Åström's widely accepted classification, it is difficult to agree with the chronological underpinnings of Gjerstad's typology (see above p.23-25), and especially with the stratigraphic associations of each ware as observed at Kalopsidha. Åström has, like Gjerstad before him, introduced into the catalogue, and consequently the White Painted sequence, the belief that each type is either earlier or later than another on an island-wide footing. He uses such terms as

² It has not been possible to identify with certainty those pieces which Gjerstad catalogued without illustrations. In many cases only brief descriptions exist without any museum or context numbers. For these reasons the cross correlation with Åström's catalogue uses only those vessels which have been illustrated.

"transitional White Painted II-III" and "late White Painted III" which introduce a chronological content into the classification.

A further difficulty lies in the layout of the typology devised by Åström for shape. In each numerical division (*ie* type) a different Roman numeral is given for each shape category. The confusion arises when in White Painted IV a jug is Type IX (*SCE* IV.1B, 52) whereas in White Painted V the jug category is Type V (*SCE* IV.1B, 69). Similarly, the subdivisions of shape are inconsistently applied. In White Painted IV-VI Cross Line Style Type I A (Type I = jug), 'A' denotes "Handle from rim to shoulder" (*SCE* IV.1B, 64) and in White Painted V Type V A (Type V = jug) 'A' represents "High handle from rim to shoulder" (*SCE* IV.1B, 69). This extensive catalogue functions as a thorough reference for Middle Bronze Age pottery but it is restrictive in its use as a comprehensive typology because of lengthy corpus descriptions and terminology.

The crux of this typological disarray is that Gjerstad's stratigraphic seriation of the pottery types, which occurred at Kalopsidha, is unworkable (Barlow 1982, 180-1), and that there is no evidence to support the division, chronological or technical, between the White Painted Wares III and IV.

Jane Barlow and John Coleman have experienced inconsistencies in the classification system while attempting to incorporate White Painted pottery from the Alambra settlement, pottery which appeared on the same floors (Barlow 1982, 106), into the standard White Painted types. In this instance the Roman numerals were set aside and replaced by White Painted A and White Painted B, akin but not identical to Åström's White Painted II and White Painted IV types respectively.

Barlow and Idziak's work on clay selection suggests that the White Painted A group consistently used calcareous clay for pastes and non-calcareous clay for slips or paint, a selection also identified for Red Polished A pottery found at Alambra (1989). This similarity suggests that the White Painted pottery, traditionally considered early in the sequence and referred to as White Painted II, has a close association with Red Polished pottery. The White Painted II and White Painted A categories are decorated with a lustrous red paint, heavily applied in geometric designs and a light brown or pinkish fabric, as in Red Polished A. White Painted B on the other hand differed stylistically and in technical characteristics from A. In White Painted B the higher firing temperatures consistently achieved might represent more controlled firing conditions unavailable at Alambra and, hence, White Painted B might possibly have been imported from elsewhere (Barlow and Idziak 1989, 74-5). Specific imports, in particular to the North from the south of the island and vice versa, are documented by Ellen Herscher (forthcoming). It is possible that through trade and further interaction the superior firing techniques advance throughout the island (Frankel 1981)

These results of Barlow and Idziak demonstrate the danger in accepting White Painted II and White Painted IV categories as chronologically successive wares on an island-wide sequence. Alternatively, the White Painted II and White Painted IV pottery may be representative of contemporary traditions of different potters located in different areas.

In contrast, Ellen Herscher (1978) readily accepts Åström's White Painted system in all its parameters, especially in her study of the Lapithos tombs.

"The White Painted Ware has been classified following Åström, within the main numerical divisions (II-V) determined principally on the basis of fabric. These fabric distinctions, for the most part consisting of differences in color, lustre and hardness can probably be attributed mainly to differences in firing temperature, although this has not yet been proven experimentally" (1978, 721).

Are these types, as defined by Herscher, equivalent to Åström's when the criterion used to define them is fabric, as opposed to "criteria of technique, form and decoration" (SCE IV:1B, 11) or dating (Coleman 1985, 139-140) as defined by Åström. It is more plausible that the White Painted *standard sequence* is representative of a tradition prevailing in the north of the island, eg a Lapithos sequence.

"the standard White Painted II-V Wares, *which are mainly of the types represented at Lapithos and in the centre of the island.*" (my italics SCE IV:1B, 11) and "The standard White Painted V Ware has also noticeable Eastern Cypriote elements" (SCE IV:1B, 11 n.1).

Lapithos in the Early and Middle Bronze Ages, according to Herscher (1978, 801), remained separate from the rest of the island. The majority of pottery fabrics and styles recorded at Lapithos appeared to be of local origin. Only a few pieces may have derived from other parts of the island³. In order to understand this regional distribution of styles, however, it will be important to establish the relationship of "Northern styles" such as White Painted II in terms of distribution and development with that of the south and east. This could be achieved by mapping on a localised scale the occurrence of specific styles, as opposed to the regional occurrence of popular motifs.

The concept of that a "northern coast sequence" which is made up of predominantly geometric styles, possibly White Painted II, III? and IV, whilst White Painted Pendent Line Style, Cross Line Style and the White Painted V are deemed "Eastern Mesaoria" styles (Merrillees 1974, 53) should, nevertheless, be treated with caution. This broad brush approach can be open to misinterpretation.

Johnson (1982) suggests that, while the North Coast styles from Lapithos, for example, are thought to be contemporary with the south eastern styles, very little evidence exists

³ "there are clear *regional* variations in these fabrics. Most of that found would seem to have originated at Lapithos, but 3 pieces (803A.18, 812A.32, 814.19) exhibit differences of fabric as well as slip which place their origin in eastern Cyprus" (1978, 721).

which demonstrates contemporaneity of these "geometric" and "linear" styles. This presumes that to demonstrate coexistence in pottery styles they should be found in association in the same deposit. This is a concept which does not appreciate the inner complexities of regionalism within the island most visible in pottery groupings, yet it is currently acknowledged (Barlow 1985, 53). It introduces a paradigm of chronological development between the 'geometric' and 'linear'.

It is generally agreed that the White Painted II and White Painted V (Broad Band) pottery groupings are separated both regionally and chronologically (Barlow, Frankel, Herscher pers. comms). White Painted II appears at the earlier stage of the Bronze Age, while White Painted V sees its floruit in MC III, the end of the Middle Bronze Age. Within the White Painted V Wares there exists, throughout the whole of the island, a common knowledge of high firing techniques while in contrast a great diversity in ceramic *styles* prevails in certain areas of the island *e.g.* White Painted Fine Line Style (see below) in the north and centre of the island, and White Painted V Broad Band styles in the south and east. The Fine Line and Broad Band (for example) have mutually exclusive distributions, though on one occasion they are found within the same tomb group, (Tomb 1 at Kythrea, Åström 1987, 60 Fig 1). There is no reason to doubt that in different areas of the island ceramic styles developed independently and contemporaneously to produce regionally diverse and unique styles, reflecting individuality as opposed to the 'innate conservatism' suggested by Merrillees (1965, 146).

Barlow (1985, 53) suggested, on the basis of 'geometric' versus 'linear', that the Alambra White Painted A and B pottery is chronologically different from pottery of the Lower House in Kalopsidha, which comprises White Painted III-IV Pendent Line Style as well as White Painted V (1985, 51), even though Gjerstad would place them together. White Painted II, for example, is very close technologically and morphologically to much Red

Polished, and is traditionally early in the sequence. White Painted IV, however, and its relationship with III-IV Pendent Line Style is poorly understood. Until the ceramic groups of the White Painted sequence are more rigorously studied on a regional if not local scale, the cultural and chronological implications of ceramic variability cannot be fully appreciated.

Regionalism

The concept of regionalism in Cyprus is for the most part based on pottery styles. The cultural division between the North-western coast and Eastern Cyprus, first recognised by Gjerstad, was made on the preponderance of geometric styles in the north and linear styles in the east (*SCE* IV.1B, 275 and *n* 7). Likewise, Catling argues that from "the beginning of MC III onwards for centuries to come Cyprus can be divided into two cultural zones, east and west;" (1973, 170) a position held by Merrillees with relation to the LC I period, where he sees the cultural retardation of the east against the economic supremacy of the West, in terms of the introduction of Base Ring, White Slip and Monochrome Wares (Merrillees 1977, 72). The ceramic evidence is contemporary with the appearance of fortified monuments, and burial deposits which show "unprecedented variations" especially in the east of the island (1977, 75). From his

"...survey of conjecture and conclusion emerge several vital historical leads. Firstly it must be accepted that the instability which seems to have reigned in the island owed its origins to internal pressures, which could themselves have been stimulated by external events, but not to those overseas developments as such."

Merrillees correctly draws attention to the heightened commercial activities and regional diversity of Kalopsidha, for example, and possibly the whole of the east of the island. It is difficult to accept from the evidence available, however, that these activities were disrupted by internal strife caused by the west's need to dominate the east, especially when the evidence for this difference lies in the pottery.

Frankel (1974) in his stylistic analysis of the Middle Cypriot White Painted Pottery, assessed the proportional occurrence of the designs in terms of the number of vessels between different groups. The isolation of these particular groups studied through time was not attempted. The results of this analysis showed that certain motifs were popular in certain locations and it demonstrated a degree of interregional contact over the whole of the island. Broadly speaking, the Karpass region was the most distinct with a high frequency of Wavy Line motif, and the linear motifs of the eastern sites. The centre of the island concentrated on more geometric motifs, such as double chequer rows alternating with cross-hatched zigzags, lozenges or triangles, and the North Coast using vertical cross-hatched panels and wavy lines.

Frankel's analysis concluded that ceramic diversity was very evident, although the island can be divided into a series of overlapping regions (1974, 47) as opposed to the East/West dichotomy advocated by Åström (*SCE* IV.1B, 27 and n 7), Catling (1973, 170) and Merrillees (1971, 72). Frankel suggested greater contact between neighbouring sites based on the similarity of motifs. He painted a picture of strong interaction between different villages, against a background of trade or inter-marriage in more peaceful conditions than those invoked by Merrillees (Frankel 1974, 48-51; Merrillees 1971, 77). Whatever the strength of these relations, it is very clear that the White Painted pottery repertoire is being used, in general, to reflect the cultural distinctions of different areas in Cyprus.

It becomes increasingly evident from the preceding discussions that the White Painted II-V sequence no longer satisfies the levels of archaeological inquiry which are being constantly reached. The classification sequence serves the purpose of putting the amassed pottery from excavated tomb groups and limited settlement into a cultural and

chronological framework. Possible historical correlations can then be surmised. As a tool of relative chronology, the classification sequence is significantly artificial in construction. **Classifications**

"should be judged heuristically for their ability to reorganise the material under study in a convenient form for further analysis. What seems spurious to the debate is the question of the 'reality' of types or designs assumed to operate on a privileged level, universal to ceramic analyses and observable in the ethnographic record" (Miller 1985, 10)

They serve as a convenient base line from which questions on pottery production and distribution can be directed.

Ceramic Variability

"Ceramic variability may be described statistically, may evoke differentially for different people and is not reducible to simple empiricist accounts of denotative 'meaning'. There is no 'true' typology or taxonomy but, equally, the producers cannot be disestablished as the creators of the order under study" (Miller 1985, 11)

The difficulties encountered with the White Painted sequence, as previously outlined, arise because of the specificity with which they were designed. First and foremost, the order imposed on the large amounts of Bronze Age pottery in the Cyprus Museum was devised, at least in part, to facilitate cataloguing and reference. Secondly, from this broad classification emerged a typology designed to show the chronological development of pottery wares through the Middle Bronze Age for the whole of Cyprus. Thirdly, the classification sequence as it now stands combines several aspects of shape, ware, decoration and style as well as temporal data to group specific types of pottery. The White Painted sequence, in effect, evolved as an inflexible typology limited by subjectivity.

The specific attributes of each vessel type and their variables were neither isolated nor clearly defined. Åström singled out specific attributes (technique, form and decoration *SCE* IV.1C, 11) but failed to define the aspects of scale of variability in each attribute. The classification sequence is operable only where independent attributes such as decoration or fabric are very distinctive. For example, White Painted IV-VI Cross Line Style and White Painted III-IV Pendent Line Style are easily classified because of the distinctive and repetitive style of decoration used in each class. White Painted V is easily recognised by an unusually high fired light brown fabric, and black matt friable paint. White Painted II, displays a characteristic red brown fabric, highly burnished red brown slip and lustrous red paint. The decoration very often comprises cross-hatched panels alternating with wavy lines on the main part of the body.

Yet, the number of attributes inherent within a pottery vessel are numerous (Table 1) and the information to be gained from them is extensive. Often their measurement is limited because of space requirement in catalogue cards or site processing sheets. More often, descriptions are confined to certain combinations of attributes when they are used to classify and type artefacts. Ultimately, when the diverse attributes are used systematically, one classification sequence ordinarily would not incorporate every variable of that attribute, nor cope with every level of variability (*eg* global, regional, local or individual).

For example, on a regional level the following attributes might be used in combination, shape (body), surface (content, paint) and fabric (all attributes) or independently, variation in fabric alone, or variation in decoration.

Table 1: The types of attributes, variability and scale recognisable from pottery

ATTRIBUTES	VARIABILITY	SCALE
SHAPE		
size	functional	global
body	stylistic	regional
spout	technological	local
handle		individual
neck		
base		
SURFACE TREATMENT		
eg decoration		
content	functional	global
incised	stylistic	regional
applied	technological	local
painted	symbolic	individual
execution		
application		
eg slip		
colour		
texture		
thickness		
FABRIC		
colour	funtional	global
texture	technological	regional
inclusions		local
porosity		individual

Frankel (1974) in carrying out an analytical study of the decoration of White Painted pottery, attempted to identify the variation of motif popularity on a regional scale within tomb group assemblages over the whole of the island.

Herscher (1978) identified through the analysis of fabric (macroscopically) that the pottery from the Lapithos *Vrysi tou Barba* tombs adhered to a regional group, separated from the fabrics of the south and east of the island. Similarly, variation in the

level of an individual potter's work has been studied on the basis of stylistic variation in decoration (Hennessey 1973; Frankel 1974; forthcoming) and fabric differentiation (Herscher 1972).

In this respect, the White Painted Ware sequence operates as a very general description of certain, but not necessarily specified, attributes. From this level, different aspects of ceramic variability can be tackled on different scales, as already exemplified.

Classifications as well as typologies cannot be considered as rigid constructs, into which each pot sherd or vessel should ideally fit. In light of recently excavated material, and scientific techniques, it may be necessary to reclassify.

Baird (forthcoming) advocates the need for thorough *descriptive* classifications

"in order that assessment of the nature of relationships or future analytical reclassification may be carried out to maximum effect"

Ideally then, classification should operate firstly on a descriptive basis, *i.e.* on a recognition level, from which 'studies' on specific variables can be attempted; this does not necessarily imply "reclassification" but rather further analyses using the information presented. The problem in previous research was that often certain information was extracted to formulate unique Classifications and Typologies which, once established, become difficult to alter and eradicate if necessary, because a dependency on their 'chronological' or 'cultural' function has evolved with them.

The problem for future research, however, lies in the enormity of the task of preparing such lengthy descriptions of attributes for publication and for essential cross reference in studying comparative data. In the case of whole pots this requires accurate descriptions and detailed drawings. The evolution of user-friendly computer facilities and programmes has by default much encouraged multivariate analyses which can

accommodate the large amount of information to be recorded from sherd material, especially from settlement contexts. The incorporation of such *descriptive* classifications in publications might rather be viewed in terms of archive material stored, for example, on IBM compatible software or on rather less popular microfiche.

The above discussion suggests that for the White Painted sequence, the study of limited and exclusive attributes produces an inflexible, subjective type series. The White Painted Ware sequence could function as an umbrella grouping for future analytical analyses. If this type of methodology is adopted then the system of classification for Middle Bronze Age Cypriot pottery will be more productive.

Case Study: White Painted V

The objective of presenting this case study is to demonstrate how stylistic analysis can aid our understanding of pottery production and distribution. The case study shows the value of moving away from chronological considerations and attempts to identify individual variation within the data. It also points out the ways in which regional, local and individual scales of variation have been recognised from the archaeological record. It has not been possible to adopt this approach with all the Wares exported abroad, but it is nevertheless an indicator of the potential of stylistic analyses.

White Painted V comprises several Styles, for example, White Painted V Tangent Line Style, Broad Band Style and Eyelet Style. As argued above, however, (and Frankel forthcoming) these are equivalent to the numerical categories already devised, and while they are distinctive stylistic groupings, they remain Ware categories on par with the II-V subdivisions.

White Painted V forms one of the most cohesive groupings of the White Painted Ware sequence in terms of technical characteristics as well as use of decorative motifs. It is easily recognised by a pale light brown fabric, few inclusions in a mostly hard fabric, an often unslipped, matt surface and dark brown to black matt paint. In the south of the island this group is characterised by the application of the paint in broad linear bands on jugs, juglets and tankards, as exemplified in Tangent Line Style and Framed Broad Band Style (Åström 1966, 89, 90). In the north and central parts of the island on similar well fired fabrics, the motifs are highly geometric using chequers, and cross hatching (*eg SCE IV.1B Figs XVII.2, 10, 11*).

Through the varying classification sequences of prehistoric pottery, the tendency to dehumanise decorated pottery via the terminology of artificial type series inadvertently masks the very identity of a potter or artist, and the concept of a potter's *workshop*. Classification essentially facilitates the sorting of large amounts of pottery, allowing interpretations of a chronological/cultural order to be made. Yet increasingly within the scope of this type of research the rift between potter and pottery artifact is very great. If the preliminary definitions of Style are expanded to include peculiarities and similarities in the execution of various elements such as decoration, shape and form by individual potters, artists or workshops, rather than identifying regional groups from motif popularity (Frankel 1974), it may be possible to identify the mechanics of pottery circulation and distribution on a specific level (Frankel forthcoming).

These humanising terms of 'potter', 'artist' and 'workshop', however, are loaded with archaeological as well as social implications. Their use rests on the supposition that individual stylistic variability is manifest in the artifacts created and as such is identifiable from the archaeological record. The familiar means by which individual artists or workshops have been recognised are predominantly subjective, when they rely strongly on the 'educated eye' or 'sensory feel' of the researcher. They should not be

ignored, however, because of their subjectivity, but should be welcomed in view of the crucial amount of intuition required to identify stylistic variability convincingly. The difficulty in consistently identifying the work of individuals is exemplified by the adoption of such terms as "analytical individuals" (Muller 1977, 25) and "smallest interaction groups" (Redman 1977, 44) or "microstyle" (Muller 1977, 25-30) where the similarity in styles is great but may be the work of closely related persons, rather than one individual. In the vocabulary of the art historian, the terms 'schools' or 'workshops' are more frequently used to encompass degrees of similarity and difference. The unifying element between recognising individual and workshop is the amount of 'similarity' between the objects concerned. The objective in using the term workshop is to collate what would appear to be a closely related body of material, which has been identified by similarity in intent, design and distribution (Adelman 1976, 2). The label 'workshop' does not hold connotations of specialised potters or specialised trade nor does it assume a purely household or domestic mode of production (Frankel 1988, 28-32).

The importance of identifying individual workmanship or the collective traits of a particular workshop lies in the potential to map specific artifact distributions on a definitive, localised scale, rather than solely as part of an all encompassing regional style. In mapping the distribution of the Red on Black Ware, Merrillees successfully defined a regional grouping in the Karpass Peninsula and in the south east of the island, as well as a more confined distribution to the West (Merrillees 1979a, 115-34). He also suggested the extent of specialised trading activity in that ware over the whole of the island. The distribution, however, is solely of a Ware type. It would be profitable to reexamine this material to identify style and microstyle (Muller 1977, 25-30) through which the complexities of pottery production could be more adequately gauged.

The criteria for identifying individual variation

amounts to a degree of uniformity in

1) vessel form and shape, by the potter

2) design content or

3) design execution, by the artist

combined with the identification of peculiar traits which display distinctive similarities or differences, indicative of individual hands or the same character of workmanship.

Similar constructs have been outlined by M. Hardin (1977, 111, 113). In analysing the characteristics of "personal graphic style" she identified the work of each individual artist.

In several instances, individual artists, or potters operating as individuals or within workshops can be isolated from the record. Frankel recognised from the pottery in Lapithos Tbs 316, 2 and 702 individual artists within the White Painted pottery repertoire (1974, 50 and *n* 29; forthcoming). He mentions other instances of individual potters from Livadhia, Ayia Paraskevi and Politiko (1974, 50, 52 *n*. 30). Ellen Herscher identified a so-called "Spongy group", found especially in examples from Lapithos Tb 702 (1972, 23-4). The high porosity value in some pieces was suggested to be the product of one potter or workshop. The aim, therefore, is to build on these associations to form core reference groups, and ultimately map a distribution of either individual artists work, or repertoires of a 'school' or 'workshop'. Frankel illustrates the restrictions of working at this level of identifying individual stylistic variability (forthcoming). The work of individual artists can be confidently recognised (Frankel forthcoming Fig Lapithos Tb 316) but the identification of constituent artists within the core reference groups is less certain when the identification procedure extends beyond *identical* sets of ceramic material.

In cataloguing the more northern distribution of White Painted V, Åström applied the term White Painted V Fine Line Style to a

"whole group of bowls, juglets and jars decorated with similar thin lines in purplish red paint which may originate from the same workshop" (1979, 17)

In collating this 'Fine Line Style' material the very notion of a pottery workshop begins to take form.

Firstly, in the overall repertoire of shapes in the White Painted V sequence, an obvious predilection for individual forms by the potter is self-evident. White Painted V Fine Line Style draws on one particular shape of jug; the body is globular, the neck is short and cut away to form a spout which is sometimes sliced.

The consistency in vessel shape and size is noticeable if the measurements for White Painted Fine Line Style (especially those pertaining to the main part of the body) are compared with those of another Style, for example, White Painted Cross Line Style. The graphs in Figures 6 and 7 express the ratio of the maximum diameter to the maximum height of the vessel. Table 1, Appendix III is a list of the measurements⁴ of the FLS and CLS pots used. Since elongated spouts are common in White Painted Fine Line Style, and therefore show more potential for variability, the ratio of maximum diameter to the height of the maximum diameter is also plotted. In both cases White Painted Fine Line Style jugs cluster tightly. The Cross Line Style also displays a clustering towards smaller vessels, overlapping with the Fine Line Style but the figures reflect equally the preference for larger bodied jugs.

There is a preference for a small handle at the neck base, often square topped (*CVA* Pologne 1 Pl. 3.5; *CVA* Österreich 4 Tafel 24.4; *SCE* IV.1B Fig XVII.3) String-holes, both functional and decorative appear mainly on the upper body, neck and handle, some fairly elaborate (*CVA* Österreich 4 Tafel 24.1,2; Villa 1969, Pl XIV.63; Villa 1969, Pl XIV.62). The delightful feature of this group is the creation of zoomorphic and anthropomorphic terminals on bottles and flasks and the fashioning of complete animal

⁴ I am grateful to Dr Frankel for allowing me access to his data.

vessels (Tatton Brown 1987 Pl 36 second left; *CVA* France 5 Pl 4.4; Tatton Brown 1987 Pl 36 left; Åström 1969, 72 no 85). Standard bowls and uniform small jars are complemented by innovative designs in baskets and cups (Frankel 1983 Pl 14.169; *SCE* IV.1B Fig XVI.13) both of which display particular elements most likely characteristic of one artist *ie* compare handle, protrusions, design content and positioning, especially on handle and neck; Unpublished Cyprus Museum 1952 III-13.3 Dhenia Kafkalla; *SCE* IV.1B Fig XVI.1; *CVA* GB 1 Pl 5.22; *SCE* IV.1B Fig XVI.8). In contrast to the highly uniform jugs of the White Painted V "Eastern Mesaoria Styles" (Merrillees 1974, 53), the complexities of vessel shape and decoration may well reflect the difference between minimal production at one workshop where the time and effort involved is at its maximum, and those workshops where mass production is evident and minimum time and effort expended (Frankel 1988, 35).

Secondly the clay, well-levigated, is fired to a constantly high temperature, is often unslipped and matt, and decorated in even, solid matt paint which is fired black, red brown or purplish red.

Finally, the field of decoration and in particular the finely executed motifs are by far the most unifying elements in this workshop. The major factor which determines the orientation or field of decoration for the artist, is the consistent demarcation of zonal areas, using horizontal friezes or registers. These registers in themselves are marked out by divider motifs such as framed wavy lines or double parallel horizontal lines (Pls 1-4; Figs 8.1-4). The maximum number of registers is three, for the main body of the vessel (Pls 3-4). The neck is decorated with horizontal lines, interrupted by vertical lines, rather than continuous encircling bands (Figs 8.3-4) and the base is filled primarily with oblique lines (Figs 8.2,4).

The most predominant motifs are the hatched triangles (Pls 3-4; Figs 8.1-4), cross-hatched panels (Pl 2) and reserved zigzags; many of the same motifs are found on alternate vessel forms, within the classic repertoire. A rather individualistic touch is created by intermittent elements such as squiggles, dotted circles and dashes (Figs 8.3-4; *CVA Great Britain 1* Pl 6.15; *SCE IV.1B* Fig XVI.2; Frankel 1983, Pl 14.169).

Probably the most distinctive feature of this Style is the execution of the decorative elements by the artist, using an exceptionally steady hand and fine brush. The intricate and complicated mesh of cross lattice elements are smoothly and evenly applied without blemish.

The distribution of this workshop's product lies mainly in the central and northern sites (Fig 9). The number of examples of this Fine Line Style group as collated amount to well over a hundred. The pottery of this workshop, from whatever source, was being redistributed over a wide area, found for the most part in tomb groups; more than one example from the same workshop have been found in the same tomb. One implication of defining styles to the extent of recognising workshops is realised if the distribution of White Painted pottery outside Cyprus is examined. Of the White Painted tradition, Pendent Line Style, Cross Line Style and White Painted V Styles, which are predominantly SE Coast in origin, form the largest component of exported pottery to over 30 sites in the Levant and to Tell el Dab'a, Egypt (Maguire 1986). However, despite the quantities of White Painted Ware exported to several sites in the Levant and to Tell el Dab'a, only one small rim fragment from a small jar of the *White Painted V Fine Line workshop* was found at Tell el Dab'a; there are at present no other known examples of this Fine Line Style from sites in the Levant or elsewhere in Egypt. There are parallels in shape which are illustrated in Åström (*SCE IV.1B*, Figs XVI.7,8) and decoration (*SCE IV.1B*, Fig XVI.13 hatched triangle). While the popular contemporary styles of the White

Painted V series exported to the Levant and Egypt are of the 'broad band' tradition, it is striking that one example from the Fine Line workshop has been found.

Within the sphere of ceramic production it may well be that channels of exchange were specific and controlled in different localities. It is almost impossible to identify those responsible for conducting the redistribution, since three groups could be involved -- the workshop itself; middlemen, responsible for the commodity contained within the pots, who communicated both with the workshop and trader; or an independent trader altogether. Similarly, the traded pottery might simply be the offshoot of bulk produce being exchanged, either within the island or abroad. What is evident is that in the first instance *separate* distributions in contemporary styles exist on the island, and secondly that proportionally in the distribution of their numbers abroad, a dichotomy is also noticeable.

This case study shows that by assessing the relationship between distinct attributes (in particular shape and surface treatment), it is possible to identify stylistic variants and attribute pots to an individual's style with confidence (Table 1).

It is true that ceramic assemblages can be manipulated to act as chronological indicators. Classifications, however, should not be created solely for this purpose. Clearly defined descriptive classifications can provide the foundation for future analytical research on pottery production and distribution.

Åström's classification system for MBA Cypriot pottery, therefore, has been used in moderation. It functions primarily at a descriptive level allowing for further analytical classification, such as that devised for WP V FLS. Within the catalogue and throughout the text the author has chosen not to use the numerical divisions III-IV for WP PLS and

CLS. WP II and WP V, it is recognised, do have chronological significance, and have been retained. Further analysis into the WP classification is essential, however, in order to advance our knowledge of production locales, distribution and dating.

"A presumption has been said to be an inference as to the existence of another fact, drawn solely by virtue of previous experience of the ordinary connection between the known and inferred facts, and independent of any process of reasoning in the particular case" (Walker and Walker 1964, 50)

CHAPTER IV

Chronology

Introduction

A dependence on pottery as a chronological indicator, particularly in the Middle Bronze Age, has already been hinted at in the above chapter. It will be pursued here in some detail in relation to the use of pottery to establish the Cypriot, Palestinian and Egyptian relative and absolute chronologies. It has long been held that scholars of Cypriot prehistory turn to synchronisms with historically dated sequences such as Mesopotamia or Egypt to determine an absolute chronology for the Cypriot Middle Bronze Age. Those sequences are founded on detailed observations of astronomical data and calculations therefrom of successive kinglists or dynasties. In recent years the service of C¹⁴ dating has provided pertinent dates for discussion from sites in Cyprus and outside Cyprus, with far-reaching implications. The evolving sequences for the East Mediterranean are networks based on cross correlations of material found in viably historical contexts, or deposits dated through radio-carbon methods. In cutting across geographical and cultural boundaries, the distribution of Cypriot Middle Bronze Age pottery is considered, therefore, an important chronological horizon.

Cypriot internal chronology: the relative framework

For the relative internal framework, we have to look back as far as Myres (1899) and Gjerstad (1926) who were preoccupied to some extent with links, defined through typological parallels, with the Levantine and Egyptian dating sequences. This procedure is also a major component in Schaeffer's study of the comparative stratigraphies of the Middle East (1948). It is important to note how Schaeffer presents Gjerstad's

chronological succession of Wares in types I-IV (Red Polished) and I-V (White Painted) where the ultimate succession of each type is illustrated (1948, Planche LII).

Åström (1957) surveyed the stratigraphic occurrence of pottery types within the Cypriot Bronze Age, thereby establishing a relative chronological sequence for Cyprus, even though the classification sequence has itself proved problematic (see above 23-32). The relative dating was often established through typological assessment where little stratigraphic evidence, both in tomb and settlement, was available. Through the occurrence of White Painted Wares abroad, the associated contexts in Cyprus could be dated.

"Six burials had probably taken place in L.315A¹, but as it lacks stratigraphical evidence we must use typological criteria to date the tomb. The presence of White Painted II and III Wares suggests that the initial date for the tomb is not later than the beginning of Middle Cypriot II, but the advanced White Painted IV Ware and comparisons with L.702 and Stephania Tombs 10 and 13, argue that the tomb was closed in MC III" (Åström *SCE* IV.1B, 181).

Indeed, the internal discrepancies are often poorly studied and inevitably a false sense of security has permeated the work of those scholars outwith the mainstream of Cypriot archaeology.

"In contrast, a few classes of imported wares commonly found in the Levant during the second millennium B.C. do permit very precise chronological tabulations. These include a variety of Cypriote wares of unmistakable appearance and relatively short duration. Their occurrence in burials and settlements on Cyprus has been observed and recorded with care, such as these wares act as excellent chronological indices when found in other areas" (Gates 1981, 18).

This reveals the apparent confusion in dating the Egyptian sequence according to Cypriot pottery (Long 1976) or the Syrian sequence (Thrane 1978, 47). In Fig 15 the dependency of one chronological system on another of more historical relevance, for example, is schematically illustrated. Essentially Mesopotamia and Egypt, and the Aegean to some degree, are those systems which need not look any further than the calculations made

available through astronomical data, deductive reasoning on the length of regnal years and occasional cross-dating.¹

Coastal Syria looks to parallels in development with Palestine, while inland Syria, east of the Orontes, has closer connections with historical happenings in Mesopotamia. Palestine, itself, relies on a limited occurrence of Egyptian objects in Palestinian contexts. More recently (Bietak 1984, 1989) has called for a reappraisal of the Palestinian absolute chronology in accordance with the dates compiled at Tell el Dab'a. Bietak has identified a Second Intermediate cultural sequence juxtaposed with a Palestinian MBA development.

This brief survey in Fig 10 highlights the difficulties in using Cypriot evidence to date contexts in Syria and Egypt, as mentioned above, when Cyprus itself depends on dates from Palestine in particular. Cypriot pottery found at Tell el Dab'a therefore, adds a further link in the chain.

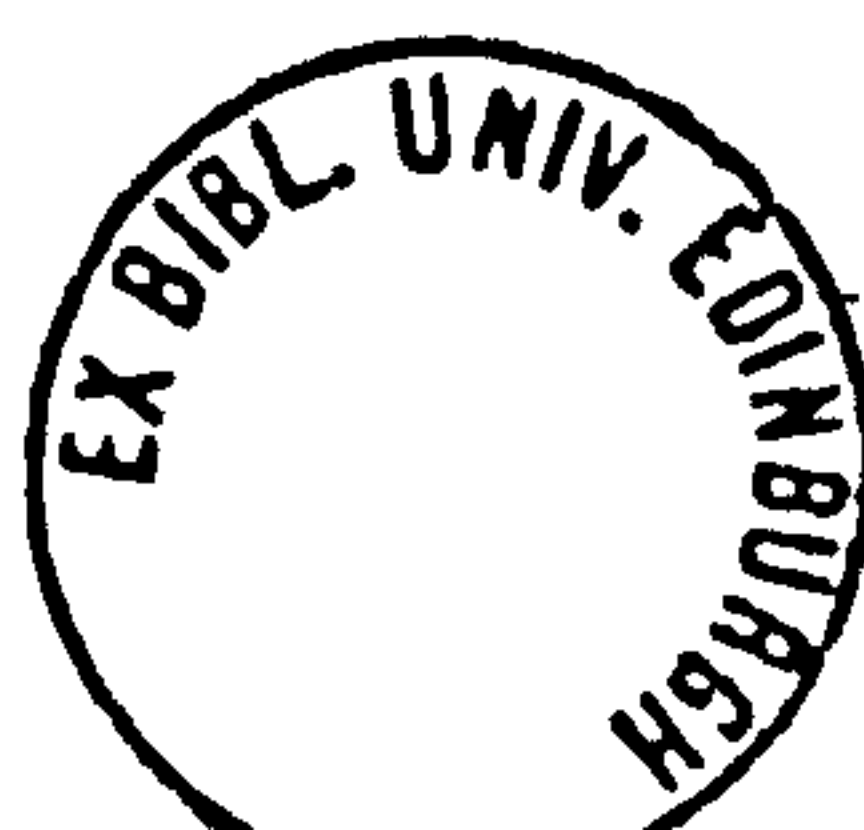
If we focus more closely on this pattern of cross correlations, a further discrepancy exists in the nature of the contact between Cyprus and the Levant. The types of pottery which were exported from Cyprus in the Middle Bronze Age are those styles which are manufactured in the south east of the island, and are contained within a south-eastern distribution on the island. Herscher (1978, 721) has drawn attention to the very few imports from the south of the island to Lapithos *Vrysi tou Barba* in the Middle Bronze Age. Therefore, there exists a very obvious contradiction in that the exported White

¹The Aegean is not well integrated into this system; generally, chronology in the Aegean relies on contact with Egypt. Most recently the controversies behind the dating of the Bronze Age eruption of Thera have been tackled by the application of tephra techniques, which scientists have used to attempt to pinpoint the exact dating of this catastrophe (Manning 1988, 1990; Betancourt 1990). If the higher date for the eruption of Thera were accepted, and it remains to be confirmed, the repercussions and implications for the chronology of the Mediterranean zone would be enormous. We cannot, therefore, enter into this discussion here.

Painted Wares, "datable" by their contexts abroad, are then used to date other White Painted Ware styles, when the only associations occur in tomb chambers which were used over long periods eg Lapithos Tomb 316^I, 316^{II}. These contain substantial collections of White Painted Wares representative of a very different style of pottery production which exists in the north of the island. In Chapter III, the general characteristics of the White Painted Ware classification sequence were summarised. The numerical divisions implied chronological succession as well as uniformity in either fabric, shape or style over a range of several pottery types. White Painted III and IV are related to White Painted Pendent Line Style or White Painted Cross Line Style, through the III-IV or IV-VI suffix which is usually found with WP PLS and WP CLS, respectively. These similar numerical divisions suggest parallel development in the northern styles WP *III* and WP *IV*, with the south eastern styles, WP *III-IV* PLS, and WP *IV-VI* CLS, as opposed to stylistic variation between the north and south east. The relative occurrence of the south eastern styles in the North can be compared (Åström *SCE* IV.1B Table (second) 189), but it will also be necessary to identify the association at south east coast sites of WP III and IV (*i.e.* those sites marked SE coast in Fig 11) with the WP PLS and WP CLS styles, in order that a valid chronological link be made. Similarly the export of WP PLS, in particular, to the Lapithos sites must be examined in the light of any contextual data to establish a further connection. Equally problematic is the lack of temporal and spatial analysis on the stylistic attributes of WP PLS and WP CLS.

In conjunction with the information extracted from Åström (tabulated this volume Appendix III, Tables A-C) and the condensed data displayed graphically Figs 11 and 12², the following can be demonstrated. Fig 11 displays the preponderance of WP III and WP IV in the north and central sites and the lack of WP III and WP IV at sites in the south

² The abbreviations used for the sites in the graphs are taken from the first letters of the site names, which are fully written in Table 2, where T. = Tomb.



east. While it is true that excavations in the north have been more plentiful and the finds more fruitful, even the excavations at Kalopsidha have produced only one WP III fragment of a jug (Åström 1966, 80-1 Fig 102 left) and no classic WP IV. In contrast Figure 12, although dealing with a far smaller sample, demonstrates that the WP PLS and CLS (Appendix III, Table C) are represented by individual examples at tombs in Lapithos. The majority of them are small bottles (Table 2) as opposed to the globular jugs with cylindrical necks, the most common shape in this Ware. WP CLS on the other hand is represented by one vessel at Lapithos 18A which itself has been reassigned from T.1 at Lambertis by Gjerstad (Åström *SCE* IV.1B, 64). Table 2 records contexts and vessel types of WP PLS and WP CLS.

Where the contexts of WP III and WP IV have been noted (Appendix III Tables A and B), there exists no correlation in well stratified contexts of WP III and/or WP IV and WP PLS and/or WP CLS (Appendix III Table C). For example, at Lambertis T.38, WP IV (2 examples) occurs with one WP CLS jug. The tomb was excavated by Ohnefalsch-Richter at the end of the nineteenth century (Frankel 1974, 75-6). The contextual data from the tomb is severely limited and it would be inappropriate to suggest that WP CLS could offer a date to the WP IV jugs when the tomb was thought to have originally contained 300 vases (*SCE* IV.1B, 196 *n* 11) and no doubt several successive interments. Dhenia Tomb G contains WP PLS and WP IV but the tombs have been looted (Åström & Wright 1962, 227-8).

In each of the Lapithos tombs (Appendix III Table C) which contain WP PLS bottles and one WP CLS jug (Lapithos T.18A), an analysis of the contextual data reveals that in every case the burials are multiple (eg L.316 contained at least 6 burials and flooding had also contributed to the redistribution of the finds (*SCE* I, 115-18)). The burials in Lapithos T.316 are divided into two groups and the excavator suggests that the central group within the tomb is the later, the "evidence, however, is not sufficient for an exact relative

J = Jug B = Bottle
A = Animal vase

WP CLS WP PLS SITE Context (where known)

Northern Sites

	B	Lapithos T.316I
	B	Lapithos T.316II
J	BB	Lapithos T.18A
	B	Lapithos T.8
	B	Lapithos T.29
	B	Lapithos T.50
	B	Lapithos T.28
	B	Lapithos T.49
	A	Lapithos T.21
	J	Dhlorios

NE and southern sites

	J	Gallinoporni
J	JJJ	Nitovikla T.1
	sherds	Paleoskoutella (surface)
	J	Lambertis T.38
	J	Lambertis T.21
	B	Dhenia Tb G
	J	A. Paraskevi T.2
	JB	A. Paraskevi
JJJ	JJ	Kythrea T.1
	JJB	Yeri
	J	Alambra
B		Dhali
J		Arpera Tb 203
J		Enkomi FT.11
B		Enkomi GB T.10
J		Enkomi T.5
J		Enkomi 19.60
BJ		Milia T.10
J		Milia T.11
	?	Kalopsidha
JJJJJJJJB	BJ	Kalopsidha T.11
J		Kalopsidha T.25
J		Kalopsidha T.27
		?Paphos

Table 2: Types of WP PLS and WP CLS vessels and their contexts in Cyprus

chronology" (SCE I, 115). Owing to the variety of pottery styles and accumulated deposits the tombs are thought to have been in use over a long period of time.

Similarly, Lapithos T.18A containing a WP CLS jug and two WP PLS *bottles*, in the same general context as WP III (13 examples) and WP IV (25 examples) vessels "had at least 7 burials, and Gjerstad lists 140 vases in the tomb" (SCE IV.1B, 184). The WP IV bottle in Milia T.10 (86/5), classed as WP V by Westholm (1939, 6) is associated (*i.e.* in the same tomb group) with one WP CLS (T.10 (73/8)) jug and one WP CLS (T.10 (72/38)) bottle (both 1939, 6), but unfortunately the tomb was destroyed by tomb-robbers and the "attribution of the finds to the respective burials is uncertain or impossible to ascertain" (Westholm 1939, 1).

Åström has attempted to identify chronological contemporaneity in some cases. A WP PLS Ware jug (SCE IV.1B, 28 Type I B 1 a)

"is of White Painted II or III fabric and its shape is fairly well attested in central Cyprus and on the North coast. The best parallel is a bigger jug of White Painted II or III fabric in L.47, datable to M.C. II. *This confirms the M.C.II origin of the Pendent Line Style*" (SCE IV.1B, 190 n 3, *my italics*).

The picture is very patchy. There is little to demonstrate chronological contemporaneity, which is imperative if we are to establish a relative chronology over the *whole* of the island.

On this subject of contemporaneity Johnson argues that the WP III and WP IV which she terms 'geometric' styles "preceded and overlapped with the 'linear' style, which gained ascendancy (as did the area of its origin) during MC III" (1982, 68). Furthermore, *ex ilentio*, it is postulated that because these earlier geometric styles are not found abroad, and the 'linear' *i.e.* WP PLS, WP CLS, WP V styles are, it cannot be assumed that the north of the island was isolated from foreign contact because it was in contact with the east and west earlier in the MC period (1982, 68). As I have mentioned above, while it

may be difficult to demonstrate contemporaneity through contextual data, it cannot be concluded that because there *is* little association, styles were not contemporary.

Polarisation of ceramic styles such as the WP III and IV of the North and the WP PLS, WP CLS of the south, does not necessarily illustrate isolation between the groups of people identifying with each style. Although the analysis of the contextual data of the Lapithos tombs (above 51-54) does not contribute to our understanding of the relative chronology over the whole of the island, it does demonstrate that WP PLS *bottles* were deposited in the Lapithos tombs (Table 2). These are imports, of a style known from the south east coastal sites. Specifically, there are several WP PLS bottles at Lapithos, while in the south east jugs are more commonly found; there exists only one WP PLS jug (Herschler 1978, 96) and one WP CLS jug at Lapithos (Table 2).

Johnson's reappraisal of the "geometric" styles in contrast to the "linear" styles, a classic evolutionary sequence, does not take on board the controversies posed by the classification of WP Wares by Gjerstad, and the lack of agreement in Åström's groups. Equally invalid is a discussion by Johnson using the evidence from Lapithos 804A, Lapithos 702 and Kythrea Tomb 1 to demonstrate that the 'geometric' and 'linear' styles are chronologically successive. In the first instance, the WP PLS jug found at L.804A should, if anything, support the import model for the WP PLS bottles in other Lapithos tombs rather than mark "a moment early in the transitional period between the two styles". Johnson fails to acknowledge that L.702 does *not* contain "several of the WP V types found in Palestine" and therefore, south eastern styles. Of the WP V styles found in Lapithos Tb 702, L.702.69 (SCE IV.1B, 69 Fig XVI, 13), L.702.178 (SCE IV.1B, 69 Fig XVI, 14) and L.702.55 (SCE IV.1B, 70 Fig XVI.18) which Johnson mentions, none have parallels abroad. L.702.178 has affinities with WP V 'Eyelet' style in shape and with WP V Broad Band styles of the south east, but L.702.178 is an uncommon example. What is interesting about the WP V Wares from L.702, is that they represent yet another

manifestation of diversity in ceramic styles. The WP V vessels of L.702 are representations of the Fine Line Style workshop, which has already been outlined (above 42-46). Its distribution is central and northern and only one sherd has been found abroad. Kythrea Tomb 1 contains WP V styles also related to the WP V Fine Line Style workshop, styles which are "geometric" but not directly related to either WP III or WP IV; the tomb group also contains WP CLS and WP PLS where the PLS, for example, shows characteristics in shape usually reserved to the jugs of the Red on Black Ware. WP PLS is also combined with the WP V Tangent Line Style motifs on the same vessel.

It is surely evident that we are not sufficiently informed to decide the contemporaneity or non-contemporaneity of the WP III and/or WP IV with WP PLS and/or WP CLS, nor discuss the trajectory of evolution between them, since we are only coming to terms with the apparent independence, as opposed to isolation, of ceramic styles. These broader chronological conflicts do little to advance our knowledge of the complex question of ceramic production in localised groups, let alone problems of regionalism or cultural identity, represented in a limited body of data.

Despite these inconsistencies, how much the south eastern styles (WP PLS, WP CLS) *are* contemporaneous with the very different WP III and IV groups typical of the North will have to be ascertained before the refinement of the relative chronological sequence can take place and before the dates attached to the south eastern styles abroad can be sufficiently well implemented.

The difficulties with the Northern (*i.e.* Lapithos) evidence are echoed in current literature.

"There is general agreement that the chronology of the earlier part of the Bronze Age in Cyprus is in a state of flux. Because of the paucity of settlement material, it has been necessary to depend almost entirely upon artefactual types, especially the sequence of pottery, to define the relative chronology" (Barlow 1985, 47).

Barlow has attempted to "anchor" the tomb material to what little settlement evidence exists, and particularly to the excavations at Alambra (Barlow 1985; Barlow & Coleman 1982, 31-3). The Alambra pottery, however, dates to an early stage of the Middle Cypriot and while it sheds light on the possible contemporaneity of WP II and IV (above 00 13-14), the stratification sequence at Alambra cannot yet provide secure anchor points for the latter stages of the Middle Bronze Age over the whole of the island.

In light of the difficulties posed by the evidence and its previous treatment, especially the typology, the outcome is necessarily negative. Refinements of the existing terminology and chronologies are not entirely satisfying nor wholly constructive. The fact remains that Cyprus lacks a series of overlapping settlement stratigraphies for the Middle Bronze Age and it seems that an entirely positive contribution would be future settlement excavations with a view to emulating those settlement sequences already arrived at in the Chalcolithic period (Bolger 1987; Peltenburg 1987). Perhaps it is apt at this point to repeat Gjerstad's statement made in 1926,

"I therefore aimed both to control and complete the chronological scheme yielded by the tomb-finds, and in this way it has been possible to trace the development of the Cypriot Bronze Age in 9 successive periods, grouped in 3 main periods, Early, Middle, and Late Cypriote, each divided into 3 sub-periods numbered I.II.II. It must, however, be claimed that this chronological scheme *is not definitely* fixed - which would be very unscientific! Above all, until more stratified sites are excavated, it is uncertain how far the stratigraphic results on a single site may be representative for the whole island" (263).

As yet there exists little if any correlation between WP III and WP IV in the North and the exported styles WP III-IV PLS, WP IV-VI CLS characteristic of the south.

Cypriot internal chronology: the absolute framework

It would be expected that once the relative sequence had been established, the refinement of the dating could be undertaken and external or absolute dates applied (Gjerstad 1926, 334-5). Åström communicated just this in his chapter on absolute chronology (*SCE* IV.1B, 257-273). In effect Åström tied down the earlier stage of the northern sequence of WP and monochrome wares to MM1a (*i.e.* c. 1800 BC), since a Cretan jar of this period was found at Lapithos in an EC III context (*SCE* IV.1B, 274). A polychrome Kamares Ware cup was found at Karmi in an EC III context. Those who do accept its importance as a "star piece of evidence for MC I chronology" (Saltz 1977, 53) however, date it mid-late MC I, MB IIA (c 2000/1950 to c 1800 "middle" chronology; c. 1900-c.1750 "low chronology") (Saltz 1977, 66).

Some importance, therefore, has been given to very isolated occurrences of Minoan pottery to date the beginnings of the Middle Bronze Age. This methodology is not entirely satisfactory when caution is not expressed, even less so when there is little to suggest that the dates and typological assessments of the Cretan wares are reliable (Merrillees 1977, 36-8). A chronological horizon has been set up between Cyprus and Crete using these star pieces, but in effect the dates are not precise since the Cretan pots can only offer a *terminus post quem* for the Cypriot deposits.

Åström is able to tie down MC II to 1750 to 1700 BC (*SCE* IV.1B, 277) since "exports from Cyprus to Syria and Palestine provide better synchronisms for Middle Cypriote II and III" (*SCE* IV.1B, 277). At some stage Åström separated the northern sequence from the sequence in eastern Cyprus, though he does not define explicitly perhaps that the numerical divisions of the north and east may not always be synchronous. The northern

sequence, therefore, requires an equivalent refinement to the one which he attaches to the east.

"In many cases the finds from Ugarit Moyen 2 and the beginning of 3 run parallel with the *M.C.II-M.C.III sequence in Eastern Cyprus*, which indicates that M.C.II begins about 1750B.C." (my italics *SCE* IV.1B, 264).

MC II and the date of 1750 BC can surely be applied only to those sites where those types of pottery which are exported abroad occur.

More recently, Åström (1987, 57-66) re-surveyed the evidence for the absolute dates for the MC period through the occurrence of WP PLS and WP CLS abroad. The dates are still notably insecure, even if we take the WP PLS and WP CLS evidence to be relevant only for the south-east of Cyprus, or those contexts where WP PLS and WP CLS occur in secure and chronologically compact contexts. Åström himself is aware that these dates need a certain amount of consideration (1987, 62). However, the evidence is stretched where reference is made to an MBIC (MBIIA) date for WP PLS in Palestine, even though the evidence is uncorroborative (see below 59-60). This is more confusing since Gerstenblith (1983, 106) correlates MBIC with Kültepe Ib by which Åström then dates the WP PLS (1987, 62). Perhaps a link with the Anatolian chronology is possible, in light of the WP PLS jug found in Kültepe Ib (1987, 62 & Fig 2) dependent, of course, on the dating of the reign of Shamshi-Adad I but, more importantly, I think, on the discovery of more examples of this type within the level, to substantiate extrapolation of a date from Anatolia to Cyprus³.

It is quite evident that it is a gross misinterpretation of the nature of society in each area of Cyprus to suppose that in antiquity a uniform development took place *without* first examining the contextual data to establish contemporaneity. When sufficient data does

³ This relates to an underlying archaeological theory which is more explicitly and succinctly dealt with in a paper presented at the 1990 2nd International colloquium on *High, Middle or Low?* held in Langenlois, Austria *A cautious approach to the Middle Bronze Age of Cyprus* (Appendix VII).

not exist the complexities of assessing stylistic and technical similarities to determine relative associations in the different ware groups, over the whole of the island, must be appreciated.

At this stage the regional and chronological variation within Cyprus of those types of pottery exported has not been sufficiently surveyed. As suggested, the results of future inquiries dealing with such questions will no doubt assist our understanding of ceramic production as well as provide answers to the increasingly complex question of ceramic typology as a means of relative, and absolute dating. Perhaps another avenue away from this apparent chronological disarray, ever increasing because of the absence of reliable contextual data, is to follow Frankel's suggestion,

"Certainly we may need the simple structures - basic types and spatial/chronological entities to give an initial insight into this complex field; but it is then important to leave them behind, and to address ourselves directly to the more difficult task of asking appropriate questions of appropriate data, and of learning to read the archaeological record in different ways" (Frankel forthcoming).

Cyprus: the use of Levantine chronology

Saltz (1977) used the evidence for foreign relations to refine the synchronisms posed for Cyprus with Syria and Palestine. In very many instances Saltz shows a tendency when determining relative, and by default absolute chronology, to place too much importance on single artefacts in insecure deposits.

For example:

"A Composite ware sherd (RS/BS = WP III-IV) was recorded from Stratum XII at Megiddo. This is the earliest Cypriote import to that site. Stratum XIII...belongs to MBIIA. The Composite ware sherd was not found in a burial, *but its location in the stratum is not precisely fixed*. However, there is every reason to date this sherd to MB IIA, especially in light of the discovery of the same ware at Tell Akko, along with about 200 other Middle Cypriote sherds, *in deposits of MBIIA*

pottery in secondary use as construction fill for the MB IIB glacis" (Saltz 1977, 57, my italics).

Despite Saltz's argument we are still dealing with *one* sherd whose relationship to stratum XII is not explicit. Further, with reference to the Akko material Johnson (1982) is prepared to accept the MB IIB date given to the glacis, while the glacis is constructed from the debris of the settlement site of the MB IIA period (Dothan 1976, 8). It is highly suspect to give the Cypriot pottery such a date and the excavator's words sound appropriate caution.

"A thorough discussion of the White Painted Ware in Akko must be delayed until we find the settlement strata on the tell from which the ware found in the glacis came" (Dothan 1976, 9).

Thus Saltz's parallels for the Megiddo sherd cannot be considered entirely valid. It is this type of cross-dating is detrimental to the construction of a valid chronological framework. I would argue that the attribution of all the Cypriot material to an MBIIA date at Akko cannot be made, pending the final publication of the Akko material. The Tell Beit Mirsim G-F, WP IV-VI Cross Line Style sherd is again *one* sherd attributed to MB IIA, and even though the details of its context are poorly understood, Saltz uses the Akko model -

"Sherds of this ware unearthed in the MB IIA deposits at Akko confirm the Tell Beit Mirsim find" (Saltz 1977, 58)

deposits which are unsatisfactorily dated, as mentioned above. Åström's comment is very appropriate - "The Cross Line Style fragment found in Stratum G at Tell Beit Mirsim calls for some consideration, but a stray sherd has little value." (Åström *SCE* IV.1B, 264).

These synchronisms based on small samples and incompletely recorded contextual data are potentially misleading and insecure. One accepts the need to be constructive when dealing with the inadequacies of residual archaeological data, such as pottery sherds.

However, this positivism should not undermine the subtle processes of artefact deposition which themselves are poorly understood, often inadequately recorded, and frequently ignored in the secondary literature.

If we resurvey the deposits in which Cypriot pottery found abroad arrives, we are faced with two major fields of evidence, each with several considerations to be resolved, before an interpretation of their significance can begin.

A: Tomb material

i) successive interments

ii) redistribution of finds through disturbances caused by natural events eg flooding; looting or intrusion from upper levels.

B: Settlement evidence

i) Tell sites: successive layers of occupation which produce residual material, through intensive pit, grave or building construction.

ii) inevitably sherdage is often debris of occupation and there is no guarantee that it will be found in its original stratum of use.

iii) it is very difficult to examine the microstratigraphic relationships of settlement features in a complex development of occupation levels within tell sites.

In view of these external restraints, in order to assess the reliability of mainland contexts to date the Cypriot pottery, a sufficiently secure context and/or a plentiful sample of Cypriot pottery in the case of settlement material must exist. In dealing with tomb material, where no secure deposits exist, only a *terminus ante quem* for the pottery can be given.

This preliminary caution is nothing new to archaeology but it tends to be overshadowed by an enthusiasm to produce definitive, conclusive results for the dating of 'exotic' material such as the Cypriot pottery in a foreign context.

"One or two sherds found in a critical position may be given a significance out of proportion to their real value, unless it can be shown that they were positively sealed and could not have arrived in their position by the action of burrowing animals, rainwash, or other misleading effects. The opposite also holds. A single sherd, positively stratified, which gives an inconveniently late *terminus post quem* for its layer or structure, must not be discarded by the excavator because he cannot bring himself to face the fact that his preconceived theories are wrong" (Barker 1977, 174-5).

It will be pertinent to review now the individual sites where sufficiently reliable contexts have been recorded with a sample number larger than three. In doing this the limitations of the excavated material are very evident. The information in the graphs is compiled from the contextual data presented in the Catalogue. For the stratified deposits at Hazor (Fig 13) some material is not assigned to a specific stratum or phase and is given a broader stratigraphic unit defined as MBII or given a date somewhere between MB-LBII. Nevertheless, this material contributes to the general picture, which at the moment seems to be the most promising in determining the continuum of Cypriot exports to Palestine. The excavator has been able to assign the tombs from Megiddo to specific periods and these have been included in the count of pieces displayed in Fig 14. In examining these strata as divided by the excavators, it appears that the trend of Cypriot imports in the cases of Hazor, Megiddo, Tell Mevorakh (Fig 15) and Tell Jerishe⁴ (Fig 16) seems to be consistent, firstly, in terms of the types of pottery being exported and secondly, those types exported through time. WP PLS and WP CLS overlap and occur earlier in general than WP V. Red on Black and Red on Red (where it has been defined) cannot be conclusively shown in these four examples to be consistently later or earlier than any of the more popular styles. Taking another look at Megiddo, it should be made clear that, while the data appears to shed some light on the stratigraphic occurrence of the pottery, the majority of pieces are from tombs. Where Dever (1976) has assigned

⁴ While Jerishe had a sample number greater than 3 it became evident that it did not represent a well stratified sequence (Geva 1982).

tomb groups to strata on the basis of typological and comparative data from other sites, these have been clearly marked.

It is obvious that we are working within certain limitations. The overall perspective of the proportional occurrence of types for each site shows nothing more than that Cypriot pottery is present in MBIIB levels through to MBIIC and that WP V likewise is found in MBIIB, but more strongly in MBIIC, *i.e.* Megiddo Str XI to X.

The overall preponderance in the popular wares throughout the Levant and Egypt can be seen in Figure 17. Any patterns in the distribution are difficult to gauge, and these are dealt with in Chapter V. The graph does highlight the disparity, firstly in the geographical distribution of the material, and secondly in the sample numbers at each site, with three notable exceptions. A horizon of Cypriot pottery exists which is poorly assessed in view of the lack of concentration of Cypriot pottery at each site. The site of most interest in this distribution, therefore, is ultimately Tell el Dab'a, where intensive excavation since 1966 has produced a representative sample of Cypriot pottery, over 300 pieces; approximately 60 of which have been assigned specific stratum. It will be possible to look at them in the same relative and absolute perspective as that attempted in using Levantine material to date the Cypriot material.

Cyprus: the use of Egyptian chronology

Ideally, Cyprus relies on synchronisms with Egypt to determine the absolute dating of the Bronze Age.

"..it seems best to work backwards through the Island's prehistory, starting with the Late Cypriot period, when multiple interconnections with the outside world, particularly Egypt, existed, and advancing through the Middle into the Early Bronze Ages, when cross contacts are more sporadic and less chronologically sure" (Merrillees 1977, 41).

Merrillees (1977) uses a Proto-White Slip bowl found at Tell el Dab'a, Egypt, found in stratum D/2 of the main tell area of the excavation. This Merrillees uses as a *terminus ante quem* date (1575/1550 BC) for the end of the LCIA period in Cyprus ($\pm$ 1560-1530 BC Bietak 1989, Fig 6). I have already outlined the difficulties in using isolated examples to date major periods in Cyprus. The bowl is securely sealed in a grave of D/2 and, while it is assured an exact date it is surprising that it should be used to mark the end of the LCIA period rather than as an indicator for the extent of the period (Knapp 1979, 37-8). While there exist at Tell el Dab'a several other examples of PWS ware in D/2, none have been found in secure contexts. Åström (1987, 57) draws attention to other individual examples of Egyptian objects of MCIII to LCIA date found in Cyprus which suggest a transitional (MCIII-LC) date of 1600/1575, and a terminus date for LC IA at 1525/1500.

The Egyptian chronology, therefore, is playing a crucial role in determining absolute dates for the periods within Cyprus but due to a paucity of evidence on both sides the dates have been far from agreement. Bietak (1989) calls for a reappraisal of the Syro-Palestinian dating sequences, which are indirectly based on Egypt, since his excavation at Tell el Dab'a has produced a well defined sequence, whereby the Syro-Palestinian culture (MBIIA-C) could be surveyed in contexts which showed a connection to the Second Intermediate Period in Egypt.

"..it is high time to adjust the MB-chronology again according to Egyptian relative and absolute chronology in order to improve the historical understanding of the archaeological contexts" (Bietak 1989, 99).

This suggestion has been previously repelled by those archaeologists working with the Palestinian material.

"Part of the difficulty lies in Bietak's low chronology, which if accepted would make proper synchronisms with Palestine difficult...In my opinion, Bietak has erred by failing to give priority in dating to the *Palestinian*, rather than the Egyptian, material" (Dever 1985, 76).

The disagreement in accepting historically viable dates is not detrimental to the study of chronology since the field itself is beset with alternate systems, dependent on several assumptions and presumptions on the length or date of specific historical dynasties or reigns, and the exact dates will inevitably fluctuate as new material is excavated and deciphered. However, the relative appearance and cross-cultural association of material over geographical boundaries, and within specific sites or localities is vital to our understanding of communication and development in each area.

It will be informative, therefore, in light of the foregoing discussions on Cypriot pottery in Palestine to review the Cypriot material which has been found at Tell el Dab'a. It will be pertinent to view this in relative perspective, before the implications of the dating from Palestine or Egypt of Cypriot material, and the ramifications of these synchronisms can be taken on board.

A cautious approach to the Middle Bronze Age chronology

A model to determine an absolute chronology for the Middle Bronze Age of Cyprus has only been hinted at in previous studies, yet unanimously and inadvertently adhered to. It is in need of reappraisal since it is a model which has never been systematically expounded. Therefore, before we take into consideration the Cypriot pottery from Tell el Dab'a, where more conclusive evidence for dating is *expected* to lie, it may be more profitable in the long term to approach this venture with some caution (Maguire forthcoming b, Appendix VII).

In previous literature dealing with absolute chronology, one prevailing tendency is to use the export of Cypriot material abroad to establish an absolute chronology for the Middle Bronze Age of Cyprus (Gjerstad 1926, 330; Åström *SCE* IV.1B, 257-73; Merrillees 1977, 33-50; Saltz 1977, 51; Johnson 1982, 49; Åström 1987, 57). In the previous sections, on

the use of Levantine and Egyptian chronology, several of these synchronisms have been discussed and their limitations aired. It is beyond argument to suggest that individual artefacts be used as intrinsic indicators of absolute dates. Equally contestable is insufficient sampling from poorly excavated or incompletely recorded sequences. Yet still it is accepted that cross-cultural relations be taken as synchronic and they are subsequently used, without extensive precaution, to establish "fixed points" in the relative chronology of Cyprus (Merrillees 1977, 42-5). In using methods of external absolute dating, synchronisms are the least reliable form of evidence. The expected sequence for absolute dating begins with consideration of the following aspects:

- i) dating finds from their context
- ii) dating contexts from their finds
- iii) dating finds from other finds in the same context (Orton 1980, 97).

Ideally, the above three aspects of dating would be derived from evidence accumulated from sites in Cyprus and used to date interdependent contexts within the island.

However, we are immediately at a disadvantage since we turn to dating Cypriot finds from contexts abroad, themselves dated from associated finds which in Palestine for example, are derived from "synchronisms" with Egypt.

How much synchronism exists between the following?

- i) the production of a pot
- ii) its distribution within Cyprus and export abroad
- iii) its use and subsequent deposition abroad
- iv) and possible redeposition.

The export of Cypriot pottery abroad provides only a horizon in terms of an estimated span for the period of export to the period of deposition, unless it could be suggested that the pottery was specifically designed for mortuary deposition. In specific case studies it can be estimated that the average life of Samian ware, for example, from Highgate, North London (England) is 29 years and that 20% of the Samian *sherds* from Highgate were

over fifty years old at their time of deposition (Orton 1980, 101 *my italics*). The possibility of such a lengthy time scale for the span of life, use and deposition of pottery cannot be ignored.

The object, therefore, should be to minimise the distance, geographically and chronologically between sets of evidence used in constructing absolute frameworks. This means that certain criteria would have to be satisfied for every occasion where a find requires a specific date. The ideal criteria for reconstructing absolute time scales, to be satisfied by contexts and their contents, are as follows:

MODEL A

Absolute "fixed point" in any one deposit, ideally in the country of origin

Contexts	Sample No.	Dating evidence
feature of architectural significance	> 10	scarab inscription c14 series
secure/sealed deposit		
within a well defined relative cultural sequence		

MODEL B

Absolute "estimates" within several deposits, outwith country of origin

Contexts	Sample No.	Dating evidence
feature or settlement sequence	> 10	comparison with datable sequences
secure		associated finds of datable sequences
relative sequence		

In the case of Model A it is evident that these conditions do not exist, especially within Cyprus, and may appear unrealistic. It should be advocated that rather than look to

synchronisms with Egypt and Mesopotamia to establish the absolute chronology for Cyprus, it would certainly be more profitable to use synchronisms to *confirm* a sequence within Cyprus. Unfortunately there exists little absolute data within sites in Cyprus although radiocarbon dates from sites, though not sufficient in sample number to promote a series of dates, are gradually appearing. Neither situation is ideal but it is more rewarding to grapple with more secure or conclusive corroborative evidence, than with insecure, distant synchronisms of associated datable data.

It will be proposed, however that where Cypriot pottery occurs abroad, and satisfies the conditions of Model B, we are in a position to attach span dates, between production, export and deposition for the material. For example, the dates calculated from Syria, Palestine or Egypt for WP PLS, WP CLS and WP V, can only imply that before a certain date the pottery must have been made in Cyprus, because at that date its export horizon, or date of deposition occurs. Further to this caution in assigning absolute dates to Cypriot material abroad, if on the absolute "estimates" level, Model B, dates can be extrapolated from the relevant contexts, their assignment to the Cypriot relative sequence poses specific, and insurmountable obstacles. These dates cannot be fixed to the relative sequence to establish the Bronze Age chronology, especially where pottery is concerned (and for the most part the evidence pertains to pottery). They can be used only to offer a *terminus ante quem* for the date of manufacture of the pottery within Cyprus and the span of its export abroad. Therefore, bearing in mind these precautions, we can turn to the evidence from Tell el Dab'a and examine the ramifications of Cypriot pottery at the site.

Tell el Dab'a

For dating purposes the relative distribution of Cypriot pottery at Tell el Dab'a is displayed in Figure 18. PLS and CLS and WP V are those types which are well represented and about which some conclusive remarks on the extent of their existence at Tell el Dab'a can be made. This situation is similar to the distribution of Cypriot styles in Syria and Palestine. PLS and CLS appear in early levels at Dab'a but not in sufficient numbers to date their floruit, whereas their preponderance in E/1 may indicate the most major influx. WP V, on the other hand, does not appear in the early levels, and while there are contemporary occurrences from its appearance in later levels in Area V, it generally succeeds the popularity of the PLS and CLS. With one isolated occurrence of RoB in E/1, the later MC and LC wares appear at the end of the sequence D/3 to D/2. This picture is confirmed by the late Hyksos deposits in Area V, the suburb of the tell. Figure 19 is an overall perspective of the Cypriot wares in stratum D/2, where the PLS and CLS are in the minority with WP V in the majority. The later MC and LC wares are marginally present.

In Area AV Square p19 the distribution is illustrated in Figure 20, since the sounding reached deeper levels and these subsequent strata are illustrated. PLS and CLS are few in number; WP V and one sherd of WP VI are already present in E/1. Although earlier strata are only recorded in one area of the suburb, the evidence would seem to confirm the trend in the main tell area, AII. PLS and CLS therefore occur in culturally MBIIB levels and WP V and MCIII-LC wares in levels assigned to MBIIC? (Bietak 1989, Fig 7). It must be emphasised that at Tell el Dab'a we are dealing in the majority of cases with sherd material and that an exact, precise date for one sherd in one level cannot be taken as the absolute date, for example, of the first occurrence of the ware.

Figure 21, therefore, presents a critical overview of the occurrence of each ware in Area AII and Area V. The more dense lines mark the "floruit" of the styles. The most distinctive observation which can be made is the position of WP V and the LC wares in the sequence. The sequence suggests that PLS and CLS are earlier than WP V and the later MC III and LC wares, for example PWS, WP VI, BR and Bichrome Ware. However, the relationship between WP V and these LC wares is more difficult to gauge. The absolute dating system used by Bietak has been constructed using a fixed point for the start of the 18th Dynasty (Bietak 1989, 91) and therefrom dates for the preceding Hyksos rule have been calculated. Therefore, parameters for both the end of the 12th Dynasty and beginning of the 18th Dynasty have been confidently placed, but the exact lengths of the cultural strata can only be taken as approximate. Each stratum at Tell el Dab'a has been allotted a ± 20 years duration (Bietak 1979, 236).

The implications of the Tell el Dab'a sequence for the Cypriot Middle Bronze Age

The relative sequence for the Cypriot Middle Bronze Age has been previously outlined (see above pp. 48-56). Essentially, its construction was based superficially on the proposed development of pottery styles from WP II through to WP V: WP II being the earliest in the sequence and WP V, the later. This information has been compiled from tomb groups and stratified deposits to confirm the sequence are lacking. Kalopsidha is the only excavation where a sequence of White Painted wares exists, and to which the stratified deposits at Tell el Dab'a can be compared. However, Trench 9 contained no distinctive settlement features and was interpreted as a dump outside the settlement (Åström 1966, 48). Many of the upper levels were disturbed and the depth of deposit to sterile soil was approximately 90cm. In Trench 3 the remains of 3 walls of probably the same building were found, comprising two rooms. It has been assigned a construction

period towards the middle of MC III, and destroyed before its terminus. In this instance there is

little evidence for a succession of pottery styles in this one phase and it offers little comparison with the sequence found at Tell el Dab'a.

Trench 9 poses problems since it is not associated with architectural features, for example, through which a relative succession of wares would be controlled. It is difficult, therefore, to assess the nature of the Trench 9 deposition and the validity of a statistical count of sherds in each superimposed level.

The statistical data from the sherds is, however, summarised in Figs 22-24. There appear to be some trends in the distribution of types through the layers. In Fig 22 the layers are arranged from the deepest level to the surface, left to right. The juxtaposition of WP PLS, WP CLS and WP V against Late Cypriot wares are compared. While WP PLS shows a decreasing trend, WP CLS remains dominant; the Late Cypriot wares are present in the deepest levels and subsequent levels but the figures show no real significant trend.

The data in Fig 23 is arranged as in Fig 22 and implies a similar trend of distribution to the North pit in Trench 9; a decline in numbers of WP PLS and increase or consistency in WP CLS. WP V, few in number, however, appears to decrease, and the LC Wares are present in small numbers in each layer. The overall situation for the Southern part of Trench 9, Fig 24, shows significantly a decline in WP CLS after Layer 64C, the deepest level, and increase from then on of LC wares; WP PLS and WP V are insignificantly represented. The only general observations which compare to the situation at Tell el Dab'a, are the position of the LC wares, which appear to be later than WP PLS and WP CLS, and the decline of WP PLS as the LC wares appear. The relationship between the export of WP PLS, WP CLS and V at Tell el Dab'a cannot be further elucidated by the material at Kalopsidha.

Other information which may shed light on the relationship between WP PLS, WP CLS and WP V may be gathered from certain tomb groups within Cyprus (Stephania, Lapithos, Enkomi, A. Iakovos, Kalopsidha (Åström *SCE* IV.1B, 190-99)) but in general WP V from the excavations at Kalopsidha (Gjerstad 1926,) has been accepted as being a MC III fabric (Åström *SCE* IV.1B 190). Traditionally, WP CLS is thought to have developed from WP PLS, but this has been disputed (see above pp. 25-26). WP CLS is thought not to have occurred earlier than MC III (Åström *SCE* IV.1B, 197).

In effect, it has been assumed that WP V is chronologically later than WP PLS and some WP CLS, and different technically from these wares, but its exact position in a Cypriot sequence has not been confirmed. The WP wares at Tell el Dab'a may indicate a chronological succession which is visible in the export of the different wares, but this picture cannot be confidently applied to the manufacture of the wares in Cyprus. The other sites which may suggest a similar pattern of export are Megiddo Fig 14, and Hazor Fig 24 where it could be suggested that WP V does not occur as early as WP PLS and WP CLS, and generally appears in later MB II C levels.

Conclusions

The purpose of this chapter has been to assess the chronological implications of Cypriot pottery of the Middle Bronze Age found abroad. These implications are important since traditionally the absolute sequence of the Bronze Age of Cyprus is based to a large extent on synchronisms with dated sequences in the Levant and Egypt.

Through a survey of the use of Cypriot, Levantine and Egyptian relative and absolute chronologies to establish a framework for the Cypriot cultural sequence, certain limitations of the evidence have been outlined. Notably, for Cyprus, the sequence is

based almost entirely on the relative dating of pottery types which itself is an artificial concept and therefore problematic, and secondly, that synchronisms where used for absolute dating can offer only estimated dates for a *terminus ante quem* for the manufacture of Cypriot pottery within the island. Even where certain patterns of export or deposition occur at sites abroad such as Tell el Dab'a, it is difficult to apply these span dates to developments in Cyprus, since the relative stratified deposits and tomb evidence supply no specific details of the chronological positions of certain wares eg WP PLS, WP CLS and WP V. It would appear that the traditional view that WP V is later than WP PLS and some WP CLS is difficult to illustrate conclusively from the evidence in Cyprus, either from occupation deposits or mortuary contexts.

Equally limiting is the lack of evidence for chronological contemporaneity between the styles which are exported (and possibly dated) and the WP III and WP IV pottery which occurs in the north of the island.

In the light of this survey some general observations can be made on the ramifications of Cypriot pottery found abroad, specifically at Tell el Dab'a, which affords a well-stratified, well-sampled and dated sequence of Cypriot.

WP PLS and WP CLS show a roughly contemporary export horizon at sites in Palestine and Egypt. WP V would seem to overlap with, but is generally later than the floruit of these two styles, and this trend would appear to be consistent with the picture in neighbouring Palestine. Exact dates for the first occurrence and floruits of exports can not be established but the estimated span of exports remains as illustrated in Fig 10.

These styles were obviously manufactured prior to their date of deposition at Tell el Dab'a but it is not certain how long before that date they were manufactured. WP V may have been manufactured slightly later than PLS, and/or WP CLS, but this is not confirmed since the data pertaining to the exact chronological position of WP V is not well documented in Cyprus.

In conclusion, the relative sequence of pottery distribution within Cyprus needs to be bolstered by material from excavated settlement sequences within Cyprus itself, before data from sites such as Tell el Dab'a can be properly assimilated.

"Men talk of a chain of facts. The comparison is inept. The chain is weakened by the increasing number of its links.. The cable gains increased strength by each added strand. The failure of proof as to one circumstance is but one strand from the cable"
(Walker and Walker 1964, 9)

CHAPTER V

The circulation of Cypriot pottery

Introduction

The chronological parameters of the previous chapter allow us to examine the distribution of Cypriot pottery within its relative historical, archaeological and geographical context. The Cypriot pottery which crosses cultural and geographical boundaries forms an important export horizon. That Cypriot pottery was exported to over 40 sites in the Levant and Egypt in the Middle Bronze Age would be a simple observation from an overall distribution map. In this vein previous commentators, as we note in Chapter II, have attempted this sort of summary. Cypriot pottery is found abroad, therefore, Cyprus (as a complete socio-political entity) exported pottery (interchangeable with goods). The overtones of trade (via export) and socio-political relations (via Cyprus or Cypriot foreign relations) are pronounced and the connotations of reciprocal trade or exchange (imports and exports) are only too evident in the literature. In order to appreciate the complexity of the real picture which we are ultimately trying to piece together, we should adopt a *composite* approach in our interpretation of the distribution of Cypriot pottery.

Circulation

In looking at the distribution maps of Cypriot pottery from mainland contexts (Figs 25-30) and pottery from abroad which reached Cyprus, certain unfounded conclusions materialise. Cypriot pottery from A (Cyprus) arriving in B (eg the Levant) and C (Egypt) versus "foreign" pottery from B (the Levant) and C (Egypt) arriving in Cyprus provide the perfect data for defining a trading pattern. The diagrams in Figs 31-32 suggest that there is reciprocity of "contact", where AB denotes Cyprus is in contact with B because objects of A

are found at B and vice versa; and ABC denotes Cyprus (A) is in contact with Palestine (B) and Egypt (C), because Cypriot objects are found at B and C, and so on.. Is A in contact with both individually? An operative conclusion would be *Cyprus traded with Syria and Palestine*. Reciprocity may exist because objects of C and B are found at A; Realistically the situation is more complex and can be made up of one or more of the combinations displayed in Figs 31-32.

The *terminology*, therefore, used to describe the distribution in Figs 31 and 32 is pregnant with allusions of foreign relations, import, export and trade. The picture of foreign relations has been surmised or imagined rather than composed. The optimal diagram (Fig 33) (not necessarily model) which could describe the distribution without recourse to restrictive terminology is that where the arrows are continuous. This implies that objects were circulated, not necessarily distributed by A, B, or C in either case of "export" or "import". Cyprus, Syria, Palestine and Egypt have no need to be viewed as the distributors and hence socio-political discussions *at this stage* need not, and cannot, be entered into.

The composite picture will consist of an overall presentation of material associated with or related to the Cypriot pottery, allowing for all the evidence to be observed before any patterns in the distribution can be interpreted.

Contexts

Primarily the contexts of Cypriot pottery are funerary, but by far the largest samples are from settlement material (Ras Shamra >100, Akko >200 Tell el Dab'a >300). The nature of findspots, where known - tomb (multiple, or single interments) or settlement are indicated in Appendix IV.

The background picture for Middle Bronze Age Palestine, where intensive survey has been undertaken, is illustrated by Broshi and Gophna (1986), where the totality of Middle Bronze Age settlement can be seen in some perspective. For the MB II (A&B)

"A sharp increase in the settlements of the Coastal Plain, a sharp decline in the Middle and Lower Jordan Valley and a certain decline in the hill regions." (1986, 87).

The Cypriot pottery reached those major coastal cities (Figs 55, 56: Figs 25-30), primarily fortified in the MB II period, Tell el 'Ajjul, Ashkelon, Gezer, Tell Nagila, Tell Mevorakh, Dor, Akko, Achzib, Kabri, as well as Hazor and Tell Dan which lie inland; Tell el Dab'a in the Eastern Nile Delta and the major coastal sites in N. Syria. The circulation of Cypriot pottery in these regions can, therefore, be considered restricted in the main to the Levantine coast, while it has a widespread distribution relative to the spatial distribution of sites in Middle Bronze Age Palestine: a Coastal Plain distribution is prevalent as is the concentration of settlement in Palestine in the MB IIA and B period. Likewise in N. Syria the distribution is primarily coastal; Ras Shamra, Tell Daruk, Tell Sukas and Kassabine. Only Red on Black reaches Alalakh and no Cypriot pottery reaches Hama and Qatna.

The sparsity of Cypriot pottery in coastal Syria, as well as at sites in the Nile Delta cannot yet be said to reflect the lack of circulation of Cypriot pottery there in antiquity. Tell el Dab'a (Avaris, while capital of the Hyksos) remains one of several sites in the Nile Delta which display characteristics of the Syro-Palestinian Middle Bronze Age culture. Tell el Yahudiyeh has produced imitations of WP VI Cypriot pottery, and of WP PLS in tomb contexts. Other sites of this period (Tell el-Sahaba, Tell el-Maskhuta, Bubastis, Inshas and Ghita) if extensively excavated, would undoubtedly shed further light on the distribution of Cypriot pottery. The Pelusiac branch of the Nile facilitated ease of access to Tell el Dab'a, and it is equally likely that other MB II sites, all situated on the east bank of the Pelusiac branch (Bietak 1975, 165 Abb 35) received items that were circulated from Syro-Palestine and elsewhere.

While the coast of N. Syria is well represented, southern Syria is sparsely populated by later MC wares (RoB, WP VI) at sites such as Sarepta and Tyre. Byblos is sharply isolated from the mainstream influx of popular Cypriot pottery (WP PLS, WP CLS and WP V; Figs 17, 25-27). This may be through the accident of incomplete reports from Byblos, where in EB/MB tomb contexts, pottery is inadequately recorded, or not interred. Similarly, the lack of substantially excavated sites in coastal Syria of the MB II cultural phase (*i.e.* other than Ras Shamra) may have a bearing on this sparse distribution. Equally, the distribution may be biased by increased archaeological activity in Israel since the 1940's. The outlying distributions at Kültepe (Turkey) (Fig 25) Komnos and Zakro (Crete) (Figs 25, 26) may be far from isolated or sporadic examples since they are only recently documented (Åström 1987; Russell 1985).

From what little stratigraphic evidence there is available from settlement and tomb material throughout the Levant we can deduce that the Cypriot pottery enters the cultural horizon of MBIIB-C and continues to some extent, but in a different mode, into the Late Bronze Age.

The funerary evidence indicates that Cypriot pottery was used in multiple and single interments. At Dhahrat el Humraiya (Ory 1948) over 60 tombs were recorded, each containing one or two interments. Dever (1985) has assigned this group to MB IIA, but without full publication of the remains, it is difficult to accept this date as conclusive. There are tombs which contain material of LB date, and the pottery assemblage has parallels in MBIIA and MBIIB contexts. A similar cemetery, Tel Aviv Harbour (Kaplan 1955, 1-18) was used for individual and double interments in the MB II period but to date has not produced any Cypriot pottery.

Tell el Far'ah (S) Cemetery 500 has produced burials with individual or double interments (Petrie 1932; Price-Williams 1977); generally the method of grave construction is more elaborate, in stone carved chambers rather than in shallow pits or earth chambers as at Tel Aviv Harbour or Dhahrat el Humraiya. The date of Cemetery 500 is placed in the later Middle Bronze Age. Individual interments are common at Tell el Dab'a where Cypriot pottery is plentiful. The number in tomb groups, however, is minimal; it is yet to be ascertained from where the bulk of sherds, especially from tell occupation, derives; Tell el Yahudiyeh Ware, for example, at Tell el Dab'a was only

"found in tombs or in mortuary temples and, with a single exception, not in residential areas, apart from scattered sherds, which may have been brought to the surface by the destruction of older tombs" (Bietak 1979, 288).

This is equally plausible at Tell el Dab'a for Cypriot pottery, but in numbers the Cypriot material amounts to more than just a few scattered sherds. At other sites, for example, Ginosar, Gezer, Beth Shemesh, Lachish and Ras Shamra, tombs were reused over lengthy periods, or skeletal remains were poor and it is difficult to estimate the number of bodies. At Tell Sukas (Syria) in one multiple burial, 40 skeletons are recorded, and the confusion in interpreting the relative position or association of skeletons and artefacts is acknowledged.

" - in some cases sherds of the same pot were found in all levels of the grave. It is natural that sherds were transported to a higher level than the original when earlier burials were disturbed in order to make room for new interments..." (Thrane 1978, 3-4).

At Tell Nagila (Palestine), 45 skeletons were found in a three-chambered tomb with 150 pottery vessels (Amiran & Eitan 1965, 123), but only 10% of them, a representative sample, has been published (1965, 119 Fig 13).

The difficulty in interpreting sherds from settlement sites has been touched upon briefly in Chapter IV and in more detail in Appendix VII. Without a thorough examination

through micro-stratigraphic observations, it is impossible to report conclusively the original contexts of sherd material. Obviously there may be subtle exceptions where sherds are found in *in situ* deposits. However, it remains to be ascertained when the material became sherdage, and how it came to be deposited in its context. Within a large reference sample it would be possible to deal in presence/absence of sherdage in the spatial organisation of occupation. This is unrealistic, however, in analysing minimal numbers of Cypriot pottery on large tell sites.

At Tell Akko, for example, a large body (some 200 sherds) of Cypriot material was excavated from the MB IIB glacis, derived, it is thought, from MBIIA occupation levels on the tell itself. At Hazor and Megiddo, single sherds were found within settlement deposits, though whether derived from occupation or funerary contexts, it is impossible to know. At Tell el Dab'a numerous sherds were found close to the temple complex of str E/1 to E/2. Do these sherds have any significance because of their association with deposits pertaining to a temple and mortuary complex? Area AV at Tell el Dab'a is a suburb of the main core occupation of the tell, where houses and house complexes with courtyards and grain silos have been excavated. Cypriot pottery has been found within these houses, where it was common to inter single or multiple burials within the structures. Does the pottery derive from the houses and did it, therefore, have a utilitarian purpose? Or from the tombs and from funerary contexts? These are simple observations but in understanding the nature of Cypriot pottery abroad their implications must be dismissed or used accordingly.

It is sufficient to state that where pottery occurs within a feature, which is securely contained by its construction or destruction, its context can be offered as reliable evidence for the function or use at some stage in the history of the pot. Not unexpectedly, burial deposits form the most recurrent type of closed, contained contexts, and provide a window through which we might gauge the nature of the associated assemblage, which was

deliberately deposited with the body(ies). However, it is not a clear vision since our perceptions of the weight of deliberation or intent, sentimental or functional, communal or individual, which was bestowed upon these objects, is a tentative and complex concept to detect from material remains. At this stage, we are not attempting to assess social stratification from the assembled tomb evidence, but rather assess the geographical and contextual distribution of Cypriot pottery.

Where Cypriot pottery is contained within a tomb context, despite the inconsistency in its recurrence in either single or multiple interments, it should be possible to identify systematically the objects with which it is associated. This survey may display differential patterns within the distribution of associated tomb contexts throughout the Levant, or equally highlight any similarity. It may be possible to simplify this exercise by identifying the tomb "package", a name which despite its connotations, can be satisfactorily used here in a general sense: *i.e.* any objects which were purposefully and intentionally deposited by individual or communal request, as a recurrent phenomenon. This gives us the scope to identify the package in use in Syria, Palestine and the Nile Delta. It is not my aim to standardise the tomb assemblages into a uniform set of objects which are or are not represented in a package, but rather to describe those types of objects placed in tombs in the Middle Bronze Age, which may have a bearing on the presence of Cypriot pottery.

In a survey of the artefacts placed in single and multiple burials throughout the Levant (Appendix IV) the following objects have been recognised, and constitute a tomb package.

POTTERY

bowls

storage jars

dipper juglets

Red Polished variants

Red Burnished variants

Tell el Yahudiyeh variants

Cypriot variants

Jugs

Lamps

SCARABS:variants

IVORY:inlay, objects

FAIENCE:vessels, jewellery

METAL

weaponry (variants)

jewellery

togglepins

BEADS: amulets

BONE: objects

SHELL: ostrich

ALABASTER

The ceramic variants have been isolated since they at the moment present the most *common* indicator in all the tombs of regional diversity or uniformity within the assemblage and they can be further categorised as follows (Appendix IV, 00-00, Fig 1):

BOWLS

flaring carination/squat

flaring carination/deep

shallow bowls/platters

other

STORAGE JARS

ovoid handleless

ovoid handles

JUGS

high handle

trefoil

one handled

ear shaped

other

RED POLISHED WARE

piriform

cylindrical

cylindrical

RED BURNISHED WARE

collared

trefoil

BICHROME WARE

Cypriot

Palestinian

TELLEL YAHUDIYEH WARE

piriform

globular

cylindrical

biconical

The background of regional and parallel development

The types of objects tabled above are interred throughout the Syro-Palestinian coast with only slight variations in overall design. For example, in Syria Red Burnished juglets are paralleled with Red Polished juglets in function but vary typologically. At Ras Shamra in Tomb LII, dippers and bowls display similar characteristics to those of MB II deposits in Palestine; functionally they appear identical, stylistically and technologically they differ marginally. The objects in caveaux LVI and LVII are similar to deposits throughout Palestine, including Lachish, Gezer, Tell el Far'ah and Dhahrat el Humraiya.

Within Palestine the assemblages show a remarkable degree of typological homogeneity, with ultimate chronological and stylistic permeations throughout the different sites. This regional diversity should not overshadow the general cultural milieu which prevails. At

Tell el Dab'a there is, however, a development parallel with that of Palestine in pottery styles in the MBIIA and MBIIIB periods. There are some difficulties¹ in assessing this sequence, since as yet there is not a comparative seriation of pottery wares (as developed at Tell el Dab'a) in excavated records in Palestine. The equivalent MBIIIB-C strata from Tell el Dab'a display more individualistic tendencies peculiar to the site. The origins of the Tell el Dab'a MBIIA and B culture are difficult to pinpoint, while it has been noted that the early pottery is characteristic of Syria, rather than Palestine. Although a full report of the excavations is underway, some indications of Syrian contact can already be gleaned. Tomb m/10 no 8 str F or E/3 has produced pottery of Syrian character. Some juglets (Bietak 1979, Fig 6 A no 200; Pl XXXI.d; Fig 14 tomb 1/2 no 1 (no 25)) have parallels at Ras Shamra (*Ugaritica* I Fig 41). These oval juglets with collared rim and pedestal base are classic forerunners to the Red Burnished collared juglets with carinated shoulder, common to Ras Shamra in the so-called 'Hyksos tombs' of the lower acropolis; these 'early' oval juglets also have parallels at Tell Sukas (Thrane 1978, eg Figs 57, 73-4, 89-90, 102-4). An early Syrian element may also be reflected in the circulation of Tell el Yahudiyeh (Fig 37); the Syro-Egyptian type cluster around south coastal Syria and Tell el Dab'a, while the Early Palestinian group is unique to Palestine, which illustrates "intensive Handels- und Kulturbeziehungen zwischen dem Ostdelta und Phönikien" (Bietak 1985, 338). It is certainly an indicator of interchange in specific types of objects at whatever level, between Syria and the Eastern Nile Delta. Some amphora clays of str G/4 (Bietak 1989, 88) match those analysed (by NAA) from Ras Shamra and other areas.

There is little that can be concluded without an exhaustive, systematic survey of the pottery types, but it can be agreed that between Palestine and the Eastern Nile Delta an intensive interchange took place, since the character of MBIIA and MBIIIB in Palestine is reflected in the cultural strata of Tell el Dab'a. There would appear to be parallel development in

¹ Some of these difficulties were dealt with in a discussion session at the second symposium on *High, Middle or Low?* Aug 1990, Langenlois, Austria.

architecture, burial custom and religious practice as well as in pottery production (Bietak 1979, 1989). Equally prevalent in this regard is the production and circulation of MBIIA Levantine Painted Ware in Syria, Palestine and the Eastern Delta. Notably MBIIA types, such as Monochrome bandpainted jugs found at Ras Shamra, Tel Apeck and Gezer (Bagh 1988), display similar uniform characteristics, as do MBIIA painted juglets with concentric circles from Ras Shamra, Majdalouna and Tell el Dab'a (Bagh 1988, Fig 46, Fig 62c; Fig 74a). There are other parallels at Amrith and Byblos but so, too, in other types of MBIIA painted wares which have an extensive distribution throughout the Syro-Palestinian coast and the Eastern Nile Delta (Bagh 1988, Fig I).

Philip (1989, 207) believes Palestine to be

"a peripheral though by no means isolated region...in addition to metalwork, there is further evidence for wider Palestinian contacts at this time... The actual pattern of contacts seems complex and varied."

but Palestinian material is "virtually identical with that of coastal Syria" (Philip 1989, 209) in the MB I (MBIIA) period. Beck (1985) alongside Tubb (1983) and Gerstenblith (1983) have surveyed the Syro-Palestinian material and would advocate that communications between the two areas exist

"As borne out by the pottery evidence, there clearly were on-going contacts between Canaan and Syria. The problem lies in our ability to understand the mechanism of these contacts" (Beck 1985, 200).

The pattern and mechanisms of contact and the impetus for the settlement at Tell el Dab'a, for example, is indeed complex. The MBIIA Levantine Painted Ware found at Tell el Dab'a is found with jugs of Syrian type, with examples matching material from Qatna and Byblos (Bietak 1989, 90). Syrian imports as well as Syrian type architecture are present in the earliest levels of Tell el Dab'a but become overshadowed by str F (MBIIA/B), while MBIIA (Palestinian) types also occur alongside a primarily Egyptian ceramic corpus. In str G, MBIIA imports from Palestine increase, with all amphorae, for example, being

imported. Though equally "the influence on the highly developed MB-culture of the Nile Delta extended to the borders of Palestine" (Bietak 1979, 272).

The exact nature of these levels of relations between Syria, Palestine and the Nile Delta sites (or rather between the different facets of the Syro-Palestinian culture: we should not necessarily apply the geographical parameters which apply today to those same areas in antiquity) is integral to understanding the channels and networks of communication which existed throughout the MBIIA and MBIIIB phases. However, these relationships are less easily defined, without recourse to a systematic study of the cultural development, whether paralleled or regional, for the whole of the coastal Levant and the Nile Delta. This is beyond the scope of this present research.

However, we may be content with some general observations namely - material from coastal Syria in the MBIIA period found at Tell el Dab'a indicates that in the initial stages of settlement at Tell el Dab'a, there was an intensity of communication, through trade or cultural affiliation, between Syria and Egypt. There exists in the MBIIA and MBIIIB a certain degree of homogeneity between the sites of coastal Syria and Palestine, though regional variation in stylistic and typological attributes of pottery is prevalent. An equivalent degree of intensity in communication existed between Palestine and the Delta sites alongside/or independent of the Syrian elements, but in MBIIA and B there is sufficient evidence to conclude that extensive interchange existed between these two southern areas.

A comparative analysis of the circulation of small narrow-necked juglets:

Red Polished, Red Burnished, Tell el Yahudiyeh Wares and their variants.

As a starting point in analysing the position of Cypriot pottery against this background of parallel and regional development in the Syro-Palestinian culture, the evidence of the

distribution of pottery types similar to the Cypriot material may begin to indicate to us the density of objects in circulation at this time.

These objects, which are associated with Cypriot pottery in terms of context, function and design, are similar types of small, narrow-necked juglets, which it might be assumed were used to contain a liquid intended to be used in small quantities, for example oils or perfumes. They may for convenience be called Precious Commodity Containers (PCCs). 'Precious' is not to be immediately associated with value, but rather used in the sense of the commodity being limited or rare.

These juglets occur from MBIIA onwards. Those which are of concern here are those which are found in conjunction with Cypriot pottery, therefore, in chronological terms MBIIIB. A basic descriptive classification has been compiled (Fig 34) for easy reference and a general distribution is present in Figs 35 and 36. In MBIIA both the north Syrian Burnished wares and the Red Polished piriform juglets are more oval in shape (*Ugaritica* II Fig 41; Amiran 1969, 109 Pl 33.11) and reflect the general preference throughout Syro-Palestine for this shape. It is visible in MBIIA Levantine Painted Wares (Bagh 1988 Fig 74a Majdalouna; Fig 78 a, s, g, h Ruweisé; Fig 71 a, b Sin el Fil, Fig 88a-e Ginosar). In MBIIIB, however, the tradition holds more towards a carinated shoulder in the case of the Red Burnished Ware, and a piriform body in the case of Red Polished Ware. Kenyon used the Red Polished cylindrical juglets as indicators of a later phase of the MBII period (MBIIIB Kenyon 1960, 264). Bienkowski draws attention to the absence of a well-stratified sequence to confirm this position (1986, 6). There may be an equivalent cylindrical juglet of Syrian manufacture found at Ras Shamra (*Ugaritica* I, Fig 72.H, Fig 62.M) but this association has not been fully investigated.

The other ware and its variants, chronological and stylistic, associated in similar contexts with Cypriot pottery and the Red Polished/Red Burnished variants is Tell el Yahudiyeh

(TYH) Ware. These juglets have been surveyed (Kaplan 1980) and resurveyed (Bietak 1985) to produce a composite distribution of the varying classes of Tell el Yahudiyeh (Figs 37-40).

In effect the Red Polished/Red Burnished circulation shows polarisation (Fig 35), the Red Polished in the south and the Red Burnished in the north. There are only two examples of Red Burnished in the south and as yet no Red Polished in the north. Red Polished cylindrical vessels are further restricted to the south. This Red Burnished/Red Polished polarisation suggests that each type satisfied the functional and stylistic requirements in each region.

The circulation of Tell el Yahudiyeh Ware is separated into a Syro-Egyptian group (Fig 37), which reaches Cyprus, and an early Palestinian group restricted to Palestine (Fig 38). In both early and late distributions in Syro-Palestine (Figs 38 and 40), the circulation seems to be centred at Jericho, with a north/south distribution parallel to the coast but not actually visible at sites on the coast such as Tell Ridan, Tell el 'Ajjul, Tell Mor, Dhahrat el-Humraiya, Tell Jerishe, Tell Mevorakh, Tell Dor, Akko and Achzib. However, examples of TYH (early Syro-Egyptian) have recently been documented at Kabri, which lies inland near to the Lebanese border (Kempinski forthcoming). These are exactly the sites to which Cypriot pottery arrives. There is evidently an overlap in circulation of Cypriot and late Palestinian Tell el Yahudiyeh pottery at Lachish, Beth Shemesh, Gezer, Megiddo and Hazor. The late Egyptian Tell el Yahudiyeh (Fig 39) group is significantly different from Cypriot wares, implying a specific circulation of this type of pottery. It would be unreasonable at this stage to equate these types of pottery one with the other, but as a suggestion, it does not seem unlikely from the distribution that Cypriot pottery circulated between Syria, Palestine and Egypt; Red Polished from Palestine to Egypt; Tell el

Yahudiyeh from Egypt to south Palestine, and to Ras Shamra and Cyprus, where Syrian Red Burnished is found.

One other type of pottery which deserves mention at this stage is WP V 'eyelet' style (Fig 28 and 41). This type of pottery is found in limited numbers at Ras Shamra (<10), Megiddo (2) and Yiftahel (1) (Fig 28). The clay and technique are typically Cypriot as are elements in the decoration, application, colour and motif content, but it lends itself more to Syrian attributes in shape and motifs (Seton-Williams 1953, 56-68). There is a remarkable exchange, therefore, in terms of pottery manufacturing techniques. What is even more remarkable is that this pottery fashioned in Cyprus using Syrian and Cypriot attributes is "re-exported" in limited numbers to Syria and Palestine.

If for one moment we could suggest that these four types of small, narrow-necked juglets are closely related chronologically and functionally, as containers for commodities such as perfumes, oils and unguents, the implications of their respective circulations can be more adequately gauged. From the outset, it would appear that the pattern of communication as perceived through the circulation of PCCs is complex. The circulation of Cypriot pottery prior to the end of the Middle Bronze Age, and essentially prior to the expulsion of the 'Hyksos' from Egypt, encompasses Crete (Komnos, Zakro), Turkey (Kultepe), Syria-Palestine and Egypt. The sample numbers of each type are to date fairly limited (Figs 25-30; Figs 42-46). In the case of any individual type of Cypriot pottery at any one site the number never exceeds thirty (whether pots or sherds). Amalgamated, however, over style and period, the largest sample of Cypriot pottery comes from Tell el Dab'a, where over 300 pieces have so far been documented. However, it is important to note that while the sample numbers are certainly not excessive, the distribution is nevertheless extensive and appears to intrude on the circulation of those related PCCs Red Burnished in Syria and Cyprus (and Palestine (2)), Red Polished in Palestine and Egypt, and Tell el Yahudiyeh Ware in Syro-Palestine and Cyprus. The Red Polished piriform juglets are peculiar to

Palestine and the Nile Delta. Jericho has produced by far the largest number of both Red Polished piriform and Red Polished cylindrical vessels for the whole of Palestine; upwards of 200 vessels have been recorded from numerous Middle Bronze Age tombs (*Jericho I; II*). In comparison to the settlement sites of Tell el 'Ajjul, Lachish and Gezer, however, Jericho is comparatively small in the MB II period; the former sites range between 50 to 200 dunams, while Jericho is no more than 50 dunams (Gonen 1984, 63-65). There is at present no evidence for the source of production of either Red Polished piriform or Red Polished cylindrical, which is represented at coastal sites as well as sites such as Lachish, Beth Shemesh and Jericho in central Palestine. The northern Palestinian inland sites of Megiddo, Hazor and Tell Dan are less well represented. Tell el Dab'a and the Delta, in view of the parallel development between Palestine and the Delta, is the only area outside Palestine where Red Polished and its variants are known.

Red Burnished, on the other hand (Fig 35) is confined to north coastal Syria and to several sites in Cyprus, especially those on the eastern coast, though individually the numbers at each site amount to very few. At Ras Shamra the numbers are plentiful (>30) but this ware is scarcely represented in Palestine and Egypt.

The production centres of Tell el Yahudiyeh Ware appear to lie in Palestine and Egypt, with distributions centred in those areas (Bietak 1985), but equally the Syro-Egyptian group is circulated in very limited numbers to southern Palestine and north Syria, and in more substantial numbers to Cyprus. The findspots of Red Burnished Ware, WP V eyelet and Tell el Yahudiyeh Ware (late Syro-Egyptian) in Cyprus are equally matched, namely the south east coastal sites of Enkomi, Livadhia, Kalopsidha, Arpera and Milia. The Tell el Yahudiyeh Ware (late Palestinian) (Fig 40) matches to some extent the position already observed for Red Polished piriform (Fig 35) and Red Polished cylindrical (Fig 36) but differs in one aspect, namely, the late Palestinian group does not appear at Tell el Dab'a.

In this case it is not unlikely that the Syro-Egyptian Tell el Yahudiyeh group satisfied the circulation in the Delta and Upper Egypt. The late Palestinian Tell el Yahudiyeh Ware is not prominent on the south Palestinian coast. In contrast no Cypriot pottery has been found at Jericho while it penetrates several sites on the Coastal Plain.

Prior to the end of the Hyksos era, it may be postulated that there was a diversification in the number of related types of PCCs. Each represents a particular place of origin and suggests a specific form of circulation in terms of the requirements of a particular area. There appears to be an intensity in direct communication between Syria and Cyprus: a remarkable exchange of pottery production techniques took place, which may reflect a communication in functional, stylistic and possibly economic concepts (see above p 87).

The complex interaction which may be represented not only in the circulation of PCCs themselves, but also in their design and in their content, must be perceived as more than an indicator of regionalism within a common culture. Cypriot pottery is found throughout the whole of the Levantine coast, while Tell el Yahudiyeh (Syro-Egyptian) is found in south Palestine, north Syria and Cyprus.

Circulation, and the transition to the Late Bronze Age

It is, therefore, particularly illuminating to discover that during the early Late Bronze Age, the period which immediately succeeds the expulsion of the Hyksos from Egypt, this diversification in PCCs ceases. The circulation of Cypriot pottery continues *en force* to Syro-Palestine and Egypt, while the equivalent PCCs as discussed, with the possible exception of Red Burnished Ware, virtually disappear. Essentially in the transition to the Late Bronze Age the diversification in the circulation of PCCs which existed in the Middle Bronze Age is replaced by a simple circulation of Cypriot and Syrian wares.

At the same time the diversification in fine wares within Cyprus is reduced to such wares as Base Ring (BR) and White Slip (WS), which are in fact new products, epitomising the arrival of the Late Bronze Age in the ceramic sequence. BR Ware jugs and juglets circulated according to the Middle Bronze Age pattern, but reveal a more extensive distribution to the whole of the East Mediterranean, penetrating inland Syria, sites east of the Jordan Valley, as well as Upper Egypt (Merrillees 1968, Gittlen 1977). WS 'milk bowls' are found in conjunction with BR but are less common, especially in Egypt at this time, while Monochrome ware has not been found in Egypt (Merrillees 1968, 198). Red on Black (RoB) Ware and the remnants of the White Painted tradition (eg WP VI juglets and teapots) (Oren 1969), including new manifestations of WP Ware in the form of Bichrome Ware, are distributed. Gittlen's study of the Late Bronze Age trade has mapped the undulating influx into Palestine of BR, WS and Monochrome in the Late Bronze Age (1977, 1981).

"That the trade was ongoing from MBII, increases slightly with the arrival of new products during LBIA, surged during LBIB, and reached a climax during LBIIA is now certain" (1981, 55)

Likewise, Merrillees (1968; 1970) has monitored the trade in Egypt of all wares, where Cypriot and Syrian traders

"vied with each other to corner the Egyptian market in similar commodities. Indeed the comparisons between the Cypriote pottery from Ras Shamra and Egypt make it impossible to deny the integral position the Syrian city occupied in commercial intercourse between Cyprus and the Nile Valley" (1968, 187).

Merrillees in studying the circulation of BR and WS in Egypt, dealt with one other ware which seemed to be circulating alongside the popular BR: Red Lustrous Wheelmade (RLWM). The origins of this ware are still not conclusively perceived as either Cypriot or Syrian or both (Gjerstad 1926; Sjöqvist 1940; Merrillees 1963, 1968; Åström *SCE* IV.1C; Eriksson forthcoming).

It is not unreasonable to suggest that the ancestry of RLWM may be found in the Red Burnished Ware of north coastal Syria, due to the similarity in technique and form: the elongation of the RB shape into the RLWM bottle, the continuation of the pedestal base, high burnishing and colour. The interaction which took place in the Middle Bronze Age between Cyprus and Syria may have continued into the Late Bronze Age, reflected in the exchange of pottery style and technique in BR (I) (*SCE IV.1C* Figs LI. 10-14) and RLWM, especially in shape rather than technique, since BR remains consistently handmade while ultimately RL is a wheelmade product. The distinctive orange colour and burnishing of the Red Burnished Ware relates equally to the high burnishing to high lustre and orange colour of the RLWM Ware. A systematic analysis of the geological properties of the ware will undoubtedly help to identify the place of manufacture, but ultimately it cannot be demonstrated conclusively that the inspiration is likely to have been Red Burnished Ware.

In looking at the "wider perspective" of interaction in political, cultural or historical terms, there are some dramatic events which may have had an effect on this differential circulation of PCCs in the Middle and Late Bronze Age. The repercussions of the Hyksos expulsion from Egypt and subsequent Egyptian domination in Palestine are represented in the archaeological record through the destruction and abandonment of several major settlements in the Late Bronze Age period. Gonen (1984) has recorded the fluctuation in Late Bronze Age settlement and concludes that a limited number of sites show continuous occupation from the Middle to Late Bronze Age notably Lachish, Hazor, Megiddo and Tell Jerishe and sites where no Late Bronze Age settlement is recorded, for example, Gezer, Ashkelon, Jericho and Tell Beit Mirsim. Similarly the occupation at Tell el Dab'a draws to an end with the expulsion of the Hyksos from the capital, Avaris. With the loss of major production centres in Palestine and their direct beneficiaries including Tell el Dab'a, it is not surprising that the production of all small PCCs pertaining to these southern regions of

the Levant, Tell el Yahudiyeh Ware and the Red Polished variants ceases. Cypriot pottery in Syria, Palestine and Egypt, nevertheless continues.

However, this interpretation of a simultaneous termination of the Middle Bronze Age smacks of 19th century catastrophe theories, and requires some discussion. The paradigm that homogeneity demonstrates contemporaneity in the period of "Hyksos" occupation in the Levant has resulted in a poor understanding of a complex, diverse period of Egyptian and Levantine historical reconstruction. The parallel development which we have illustrated between Palestine and the Delta is in need of further reappraisal. This aspect of contemporaneity is advocated mostly through the relative terminology of MB II A-C. Cultural assemblages, therefore, displaying homogeneity are lumped into one phase of occupation. Hence Gophna & Broshni survey patterns of settlement and population in MB II Palestine namely, MBIIA and B, which we must realise are 200 and 300 years of duration. Our MB II labels cannot detect the subtle differences in 5 to 10 year spans of occupation. Only dramatic events can be readily identified in the archaeological record, and hence our indicators of change are gradual and appear contemporary.

Our perception of time elapsing is in need of reconsideration. Time in archaeological records is perceived through change and development. It is not surprising, therefore, that when we fail to detect any changes in the artefactual or architectural record, we do not see time progressing. The Cypriot pottery, if viewed in successive phases of export (see below), may be an indicator of time progressing within a cultural horizon, which through its homogeneity does not show change and therefore the passing of time.

The settlement of Tell el Dab'a would appear to represent successive occupation through the MBIIA and B periods, as well as an Egyptian presence. The levels indicate a culmination of various facets of the cultural development in the Syro-Palestine coast. This may reveal that settlement on the Levantine coast was continually expanding and

retracting at different rates. If we assume, for a moment that Cypriot pottery can be divided (chronologically) into two broad phases - Phase 1 (WP PLS, WP CLS) and Phase 2 (WP V, LC) - the following picture arises.

In MBIIA there exists, no, or very little, evidence for the circulation of Cypriot pottery. Cypriot Phase 1 wares are represented in the following areas (> 10): Ras Shamra, Akko, Dhahrat el Humraiya and Tell el Dab'a. Phase 2 wares are represented at Ras Shamra and Tell el Dab'a with a concentration of LC wares in southern Palestine. Tell el 'Ajjul and Tell el Far'ah have very little evidence of the popular WP PLS and WP CLS tradition though WP V as well as LC Wares such as PWS, RoB and WP VI are well represented. The settlement of 'Ajjul and the cemetery of Far'ah as well as the tombs at Jericho may represent a Hyksos phase, successive to the main domination in the Delta, at a time when they were consolidating power in Egypt. From these sites the Hyksos may have carried out their administration of Palestine, immediately prior to their fall and expulsion.

The ongoing debate on the termination of the MBA in the Levant (Bienkowski 1989; Hoffmeier 1989; 1990; Dever 1990) is based on the interpretation of how Egypt expelled the 'Hyksos'. While Dever believes in Egyptian destruction of Palestinian sites, as well as Tell el Dab'a, Hoffmeier advocates that within the texts referring to this tumultuous period, there is no evidence of military dominance through the sacking or destruction of Palestinian cities (1989, 1990),

"Those who attribute the end of MB Palestine solely to Egyptian military aggression are in fact holding mono-causal views, a view, which is increasingly becoming an outmoded way of accounting for the demise of complex societies" (1990, 87).

I am inclined to support such an approach. The domino effect in seizing, by whatever means, the centres of Hyksos power in Egypt, and subsequently the satellite sites of administrative importance in Palestine, would have repercussions throughout the Levant.

It is important, therefore, in our assessment of the events at the end of the Middle Bronze Age, to understand the nature and indeed existence of the Hyksos presence in Palestine. The excavations at Tell el Dab'a have vividly revealed the core of Hyksos power as it existed in the Delta. It has to be established through future research just how the Hyksos maintained a close relationship with the Palestinian centres. Where did the impetus for the economic prosperity of the Delta and Palestine originate ?

"The richness of the Delta lands in comparison with the settlements of southern Palestine and the long history of contact, suggest that this area should be ascribed a major role in the political and economic development of Palestine in the MBII period" (Philip 1989, 213).

It has yet to be demonstrated that sites such as 'Ajjul or Tell el Far'ah (S) anchored Hyksos control in Palestine towards the end of the MBA but we are beginning to alter our perspective on MBA Palestinian development.

"One might even suggest that the large centres of the Delta might have acted as the 'locomotive' for economic developments throughout the southern Levant" (Philip 1989, 214).

Tell el Dab'a to some extent was supported throughout its MBII existence by products from the region of Palestine. Bietak has illustrated the inordinate quantities of true MB ceramics, for example, which reach Tell el Dab'a from Palestine as early as G/4, as well as Syria (Bietak 1989, 88) and which continue to be imported throughout the sequence, whilst return traffic is less visible in the archaeological record. There are close connections also in terms of metalwork; perhaps an early bias towards Syria (Philip 1989, 209-10) and a more concentrated exchange in MBII with Palestine (1989, 213, 214). The Hyksos may have attempted to secure the increasing prosperity and independence of the Palestinian centres via sites like 'Ajjul: if the 'locomotive' screeched to a halt, the trailing carriages may have been subsequently derailed.

Therefore, in understanding the economic and political make-up of the Hyksos domination in the Delta, and the nature of their presence in Palestine, we would undoubtedly be able

to outline the forces behind the termination of the Hyksos control, and hence the termination of the Middle Bronze Age in Palestine.

In Cyprus there would appear to be production locales. In BR ware there at least five major sources of clay around the island, limited in the initial production stages to the central region (Vaughan 1985, 287-90; forthcoming). This contrasts with production in the Middle Bronze Age which is more localised in different pockets of the island, with a marked stylistic difference between the North and South reflected in the types of pottery exported. This impetus for the change from the White Painted tradition to the Base Ring and White Slip Wares is difficult to pinpoint and inevitably may be the result of several factors (Merrillees 1977). One or two of these factors may be detected in the nature of 'foreign' material which begins to enter Cyprus in several forms at the end of the Middle and beginning of the Late Bronze Age. The material has been amalgamated by Masson (1976) in the form of socketted axes and belts, Bichrome Ware, fortress construction, mass burials as well as the influx of Tell el Yahudiyeh Ware, Syrian Red Burnished Ware and Plain Wheelmade Wares (which appear to have been made outside Cyprus). Tell el Yahudiyeh imitations in BS III ware have also been excavated at Toumba tou Skourou (Vermeule 1974) and Kalavassos (Merrillees 1985), for example.

The increasing amount of foreign effects, material as well as conceptual, which enter Cyprus from the end of the Middle Bronze Age signify either an increasing intensity of contact with the outside world or an increasing degree of dependence on the mechanisms which delivered the foreign material to the island.

Imitations of Cypriot pottery

The above discussions centre around patterns of uniform types of juglets designated for the moment PCCs. There exist other types of evidence, in the form of imitations, which contribute to this overall complex picture of interaction, communication or exchange.

One interesting example which is present at Tell el Dab'a in the earliest levels, is the imitation of the plug handle (Fig 47). This is a classic feature in Cypriot pottery production - where the handle is inserted through the vessel wall. This technique is common in Cyprus from the Early Bronze Age and throughout the Middle Bronze Age. It is rarely used outside Cyprus but there are examples in local wares on Crete (eg Myrtos, Betancourt 1985, Fig 26.D). Likewise at Tell el Dab'a the technique is found on local Tell el Yahudiyeh pots (Figs 48-49) which in these cases are handmade and globular, while Tell el Yahudiyeh ware is generally wheel thrown and piriform. The globular form and handmade technique are implicitly though not exclusively Cypriot in technique. These globular, handmade, Tell el Yahudiyeh juglets are a phenomenon at Tell el Dab'a early on in the sequence (*i.e.* Stratum G through to E/3-2) 1790-1680 (Bietak's chronology), a time when Cypriot pottery first appears, and reaches its floruit just as these globular Tell el Yahudiyeh juglets end (Bietak 1989, Fig 4). The use of the plug handle on these vessels obviously cannot be taken to be exclusively Cypriot, but in all probability in view of the popularity of its use in Cyprus and sporadic use elsewhere, it is very likely that these small handmade, globular juglets are related in technique to the Red Polished and Black Polished juglets of the Cypriot Early Bronze Age.

Imitations of PLS for example, are not uncommon, where several attributes are adopted (Fig 50), namely, the oval to globular shape of the body, the background colour and the application of paint, but more visibly in the motifs used which very definitely resemble the

WP PLS alternating wavy and vertical lines. In an example from Tarkhan, once again shape and decoration are imitated (Merrillees 1968, Pl 1, 2) but also in just one aspect: in Fig 51 the PLS motif is applied to a standard Tell el Yahudiyeh juglet (from Tell el Dab'a). These imitations of PLS, and more usually of WP VI, are found more commonly in Egypt than elsewhere (Bagh 1988).

One further exchange in pottery styles is manifest in a small collection of ring vases. The majority of classic ring vases and the ring vase design are traditionally attributed to the Mycenaeans in the East Mediterranean in the Late Bronze Age. All the examples in Fig 52, however, are of Middle Bronze Age date and demonstrate its use in Syria and Cyprus prior to the Mycenaeans. Examples (Figs 52.3-6)², from Tell el Dab'a and Ras Shamra are monochrome, while Fig 52.1³, from Byblos shows some remnants of painted decoration, and Fig 52.2⁴, from Cyprus is vividly painted in red on a light red brown slip. In each example there are similarities in design and intent. The example from Byblos is fashioned using local characteristics, the bipartite handle and an accentuated bevelled outward lip; the Cypriot example is handmade, bears the motifs common to WP PLS and WP CLS and has a neck, handle and mouth common to all jugs and juglets of MC II to MC III. The combination of both motifs is an unusual phenomenon, known from Kythrea and Kalopsidha, where WP PLS and CLS are combined but also WP PLS and WP V TLS are used on the same vessel. The monochrome examples from Ras Shamra display a candlestick rim common to Red Burnished wares at this time and the Tell el Dab'a example may reflect either a Syrian or Palestinian technique. There are too few examples recorded to make substantial conclusions as to the nature of these vessels, yet they represent further evidence for the close interaction in pottery manufacturing techniques

² Fig 52.3 Tell el Dab'a, 5673, F/I 119 Grab 2 Z83/1986; Fig 52.4 Ras Shamra, Ugaritica VII 209, Fig 4.1; Fig 52.5 Ras Shamra Ugaritica I Fig 53 E (1); Ras Shamra Ugaritica I Fig 53 E (2), Fig 55 photo; Fig 52.6 Ras Shamra Ugaritica I, Fig 53.F.

³ Fig 52.1 Byblos, Byblos I Texte Fig 235.

⁴ Fig 52.2 Cyprus, probably A. Iakovos, Famagusta District. Morris 1985, 85 Pl 153. cf. Karageorghis 1976, 126 95 photo col.

and styles in different areas; in this case the Cypriot and Syrian examples are particularly close.

Commodities

There are no analyses to date of exported Middle Bronze Age pottery which could indicate to us the nature of the contents of the vases. Merrillees (1979b) has suggested that the classic Base Ring jugs and juglets of the Late Bronze Age were designed to carry opium. He bases his theory mainly on the resemblance of the BR shape to an inverted opium poppy seed and on the argument that the markings on the pots, in paint and relief decoration, are in fact representations of the scoring which would have been made to draw out the resin from the plant. A carrying agent of honey and water may have been used to prevent solidification. Although BR jugs and juglets have been analysed there remains no conclusive publication of the results.

Lucas (1948, 105) suggests, from "purely theoretical considerations" that fragrant substances were added to oils and fats; Cypriot juglets could likewise have carried essences as well as resins, such as opium. There is one relevant representation on a tomb wall in a Middle Kingdom tomb at Beni Hasan (Cailliaud 1831) Fig 53 where flowers (possibly) are being wrung out in a cloth.

"Oils and fats were employed in ancient Egypt for eating, cooking and illumination; for anointing both the living and the dead; for libations; as a base for perfumes; as medicines and vehicles for medicines and doubtless for many other purposes" (Lucas 1948, 390).

Unfortunately, our evidence for these practices in the Middle Bronze Age is non-existent and our information on the exact nature of the contents of the juglets is gathered through inference. As a generalisation it can be inferred that the contents were liquid, such as oils,

fats, or resins with carrying agent, perfumed perhaps to create essences used for a wide variety of purposes, and often interred with the dead.

The interpretation of the circulation of Cypriot pottery

The circulation of Cypriot pottery, it has been demonstrated is part of a widespread, international distribution of small narrow-necked juglets in the Middle Bronze Age. The classic models for distribution and exchange are often rather idealistically applied to our data. In an attempt to monitor socio-behavioural aspects of the human patterns that we observe.

"....the underlying regularities in the patterns observed are being sought, with the aim of understanding the mechanisms of exchange involved and hence of gaining an insight into economic and social processes at work in the society in question" (Renfrew 1977, 71-2).

So in effect we are not assessing the patterns of circulation, but rather the impetus behind the circulation of Cypriot pottery. Since our artefact databases, in this respect, rarely stretch to accommodate information on the complex interaction of social, political and economic 'regularities', it cannot be expected that our insight, deduced solely from the patterns in circulation, will be especially deep.

Our models for exchange are essentially incomplete and exhibit

"a tendency to focus research on one or a few key variables that are assumed to provide insights into organizational variation without either adequately arguing the relevance of key variables to the organizational phenomena or considering other nonorganizational, even noncultural causes for the variation in question" (Plog 1977a, 127).

Rather than ask key questions about the organization of the circulation of the material we have surveyed, which may only take note of one or two variables, Plog (1977, 127) suggests that an essentially descriptive model must be attempted and for this reason Plog's exchange model has been used here. Plog (1977a, 128) has suggested that in attempting to

model exchange networks (Irwin-Williams 1977), we identify a network as "a series of elements linked by specified exchanges of goods, behaviour, and information". In this case the elements are the sites, linked by the transfer of Cypriot pottery, or Red Burnished or Tell el Yahudiyeh wares. This, I hope, does not infer that one commodity is exchanged for the other but rather, more simply, that objects from one area are found in the other.

"Exchange is considered here to be a form of interaction that creates and reflects specific socioeconomic linkages between individuals, groups, societies, regions, states, etc., in short, biological and social systems over a wide range of size and complexity" (Irwin-Williams 1977, 142).

If we want to describe "the organization of exchange networks and...organizational variation" (Plog 1977a, 128), it is essential to pinpoint the variables in the network. These can be listed as follows (Plog 1977a, 129),

1. content of the network
2. magnitude
3. diversity
4. size
5. temporal duration
6. directionality of exchange
7. symmetry
8. centralization
9. complexity

The above characteristics can be observed in the circulation of small narrow-necked juglets.

1. The range of materials being exchanged, or rather that for which we have evidence of exchange, are upwards of 500 examples of small narrow-necked juglets which have conflicting as well as merging distribution patterns in the Levant in the MBA.
2. The magnitude amounts to substantial numbers of Cypriot, Tell el Yahudiyeh, Red Polished and Red Burnished wares. Individually, in the numbers of each ware as exported

from the source area are certainly not excessive, yet present a continuum of exchange in these types of pots.

3. The diversity in small juglets is great, while our evidence for other types of material is very limited, and indeed conjectural or deductive, since there is little specification as yet, in the circulation patterns of gold, tin or precious stones, for example, in this area.

4. The size of the network is extensive in relation to Cypriot pottery; it encompasses Anatolia, Crete, the Levantine coast and Egypt. The other examples are equally extensive (TYH to Cyprus and Ras Shamra; Red Burnished to Cyprus and Palestine) but are restricted to the East Mediterranean basin.

5. The temporal duration of this network lasts throughout the MBII period; early TYH ware in Cyprus and Syria; and early RP/RB in Syria, Palestine and Tell el Dab'a in MBIIA. Its floruit is in the MB IIB period perhaps, when the influx of Cypriot pottery to the Levantine coast is extensive; and similarly RB/RP. The circulation of all these PCCs would appear to be generally contemporary.

6. Directionality can be pinpointed in TYH (Egypt to Syria and Cyprus); Red Burnished to Cyprus and limited distribution in Palestine; and RP juglets from Palestine to Tell el Dab'a, Egypt. The flow of pottery from the MBII B period is outlined in Fig 54.

In the case of RP in Egypt, it is evident that Tell el Dab'a did not seek to imitate or replicate RP with Nile clays. They did manufacture a Nile equivalent to the Palestinian TYH. Likewise RP/RB satisfied the functional requirements in each area.

7. The symmetry of the exchange for small narrow-necked juglets can be viewed in Fig 54; the darker lines indicate substantial numbers of pottery in circulation. Cyprus, Ras Shamra and Dab'a are key pivots, while RP is restricted to Tell el Dab'a and Palestine; likewise there exists a Palestinian group of TYH whose circulation is limited to inland Palestine.

8. The centralization of the network may be observed in the case of Ras Shamra and Tell el Dab'a in the flow of goods; Palestine receives material but is restrained in export. Cyprus, on the other hand, shows widespread distribution at over 40 sites, with substantial quantities at Ras Shamra, Akko and Tell el Dab'a. We should also note the signs of centralization within Cyprus where several production locales for different wares have been indicated eg RoB, WP and PWS. RP would appear to be manufactured in several areas in Palestine, with Jericho an obvious contender for a major production locale; but RP nevertheless is redistributed to Dab'a, in the Delta, and may have originated from one of several locales.
9. The complexity of the network is evident in the variation of the above 8 characteristics. The patterns are varied, yet they are inextricably linked. This diversification in the circulation or exchange network is characteristic of the MBA but in the LBA it is replaced by a simplification in the circulation; *Cypriot* material and possibly RB ware (in the manufacture of Red Lustrous Wheelmade Ware) continued in circulation whilst there is a discontinuation in RP and TYH wares.

In describing the specific key variables of this network according to Plog, it is quite evident that an exchange network does exist and that because of the variability within each aspect, it is obviously very complex. The network, it must be emphasised, is only representative of the circulation of small narrow-necked juglets. It will not be suggested that this represents the exchange networks in operation in the MBII period for every type of material. It only serves to indicate the type of network in which Cypriot pottery circulated. These reconstructions are formed according to the availability or presentation of evidence at each site, and therefore are not conclusive. This exchange network can be considered as a segment of a larger undiscovered international trading network, which may have controlled the circulation of such items as copper, tin, precious stones, metals and agricultural produce. Their interconnection will no doubt be the focus of future research.

All the above evidence as used to describe the characteristics of this PCC exchange network, shows little promise of "insight into the economic and social processes at work in the society in question" (Renfrew 1977, 72). Ultimately we cannot hope to deduce from the network who was responsible for the impetus behind the circulation. Plog (1977a, 138) has argued for "limited inferences" from our evidence since our data cannot support, as yet, questions which delve into the vast realm of socio-behavioural patterns. In the many studies which do so (for example Renfrew 1977), their conclusions are essentially idealistic constructs.

- Kohl (1978) and Alden (1982) in labelling the exchange or trading networks in Mesopotamia, have adopted what would appear to be "simplistic formulations" to explain the process of interaction. In the case of Kohl the model, and it is essentially a model, amounts to the dependence of highland societies on food produced in the lowland, and an exchange of "socially needed commodities". Alden draws on an explanation of controlling elites manipulating and influencing economic activity in Proto-Elamite Iran. Likewise Knapp (1985) advocates hypotheses which should be tested and "discarded when accumulating data allow a refined model to be presented" (1985, 7). It is presumed in all three cases that in mapping exchange networks "glimpses of specific social differences, economic activities, cultural exchange, and political development" can be made (1985, 7).

In the exchange network mapped here, I feel it is necessary to stress the complexity of the variables or the 'mechanics' within the network. The data which has been presented indicates indirectly that multiple levels of communication and interaction may have been in operation. The specific levels of communication may vary between 'interaction sphere', e.g. between Cyprus, Syria and Egypt. While the final map may indicate interaction between A, B and C, the interaction between A and C may be negligible.

"If historians, after generations of intensive research, continue to debate the reasons for the disintegration of the Roman Empire, it is surely unrealistic for archaeologists to believe either that complex processes can be explained by simplistic formulations or that complexity necessarily precludes understanding" (Trigger 1989, 27)

It was important in analysing the characteristics of the exchange network to establish contemporaneity in the exchange of objects within the network. Any contemporary textual evidence which documents exchange networks or trade in this area would be of prime importance. However, many of our sources pertain to the Late Bronze Age and we have already demonstrated that the position in the Late Bronze Age does not reflect the diversification of the Middle Bronze Age and is, therefore, too far removed, therefore, in time.

There exist sporadic references to Alashiya in the Mari texts as well as mention of Hazor, however we are aware already of the complexities in interpreting Alashiya as Cyprus (see above p. 18). We also have evidence of a Cypriot WP PLS pot in Kültepe level 1B (Åström 1987), the period of Samsi-Addu and Hammurapi, as well as the Mari letters. The period immediately prior to this at Kültepe (level II) witnessed the lively Assyrian trading operations, between Anatolia and Assur (Leemans 1960, 117-18). Therefore, the exchange network which we have mapped was developing on the fringes, both temporally and spatially of intensive trading in Mesopotamia and Anatolia as far as we know from texts, but it is probable that the furthest limits of the trade were centres of transit trade (Leemans 1960, 137). Mari appears to have been a transit centre, with trading contact with Aleppo, Hazor and probably Ugarit (1960, 138). The interconnection of all these areas is important in understanding from the written records what might have been exchanged at this time in the PCC exchange of the late Middle Bronze Age.

"Objects of art and fine craftsmanship were obtained for the king of Mari from Kaneš, Harsamna and Hattusa.....Objects from Crete (Kaptara) came to Mari, perhaps via Ugarit, occasionally mentioned in the texts..." (Leemans 1960, 138).

Knapp (1979) has used the above correlation to link Cyprus in with the tin trade.

"It could be assumed that Cyprus received its tin from the Near East via ports such as Ugarit. Textual data from Mari demonstrates that Kaptaru received tin from an eastern source..." (1979, 132-3)

The extent of trade operating from Mari reached Telmun, which introduces "sea-faring merchants". We already have documentation from the Ur texts of the sea traders of Telmun, which operated as a market place for raw materials and precious goods. In contrast to the Old Assyrian independent merchants, the Telmun trade was subject to central government taxes (Oppenheim 1954, 6-17).

Leemans documents that in texts referring to the Old Babylonian period oils, essences or unguents were frequently mentioned. "They were in great demand, as they were needed for a number of different purposes" (1960, 127). Oils are also frequently referred to in the Mari texts, where essences were exported and imported over large distances alongside products such as copper, tin, gold, silver, textiles, precious stones, ivory, wine, woods, paint and slaves (Leemans 1960, 110-29). The traders themselves are referred to as merchants in the case of the Kaneš-Assur trade, where the merchants were independent; otherwise the traders are undesignated, and their role in the trading operation can only be inferred, though we know that the sea-trade from Tilmun to Ur was subject to governmental legislation.

We have no specific texts, therefore, referring to the network we have been discussing, yet we know that trade operated over very large distances and that certain centres were renowned for specific materials; copper, for example, was integral to the trade between Kaneš and Assur, and in turn tin was transported from Assur to Kaneš; Mari may have been an important transit centre for the tin trade. There is much to infer from these historical texts but it is sufficient to note that other exchange networks existed for the redistribution of materials as each society saw fit to use them or manipulate their distribution.

One further development in Cyprus at this time which is important in view of Cyprus' integration into the Eastern Mediterranean and Levantine world is the import of tin or bronze. It is significant in light of the production and circulation of PCCs. Balthazar (1986) has documented the introduction of bronze in Cyprus in the Early and Middle Bronze Age.

"It thus appears that by MCI bronze was being imported into Cyprus, at least occasionally in the form of finished objects. At about the same time, Cypriot smiths seem to have begun using bronze as well. Melted-down imports may well have been their only source of the alloy, although other possibilities -- that the Cypriots imported tin or bronze ingots, or tin ore -- cannot be ruled out.... By MCII or MCIII, about half of the objects produced were made of tin bronze or tin-arsenic-copper-alloys. The remainder continued to be made of arsenical copper or, more rarely, unalloyed copper" (Balthazar 1986, 284).

There is also a marked restriction in the selection of which types of objects should be made of bronze throughout the Middle Cypriot period. Even by the MCIII period bronze was never used in the production of hooked-tang weapons, scrapers, awls, tweezers or pins. Riveted knives, shaft-hole axes and mushroom headed toggle pins were manufactured using bronze (Balthazar 1986, 658). There is no restriction in the distribution of bronzes over the whole of the island. Bronzes, either tin bronze or mixed tin-arsenic-copper alloys, have been recorded at Lapithos, Kalopsidha, Ayios Iakovos, Galinoporni and Nitovikla.

This development within Cyprus, the introduction of bronze, cuts through all previous Chalcolithic and Early Bronze Age Cypriot conservatism in copper working. Cypriot metalsmiths "recognised differences between bronze and arsenical copper and did not consider the two interchangeable" (Muhly 1986, iv). Although it might be ambitious to suggest any correlation between the circulation of Cypriot pottery and the introduction of tin, their contemporaneity provokes discussion.

It has been suggested that the circulation of Cypriot pottery at this time reflects the export of Cypriot copper to the Levant (Knapp 1988, 140-1). This theory remains unfounded at

least for the Middle Cypriot period. What we may have evidence for in Cyprus and Syria is the foundation of an exchange network. Tin and/or bronze, as well as small, narrow-necked juglets were circulated, though not necessarily traded one for the other. In the future it may be possible to interlock other types of commodities such as precious stones or metals, and even copper, into this pattern of exchange in the Middle Bronze Age. It would appear to be a complex, diversified exchange network as an offshoot of a trading enterprise operated through Syrian contacts, as opposed to exclusively Cypriot entrepreneurs. It is impossible at this stage to suggest the hierarchy of control which may have existed in this exchange network. We have no evidence to suggest that it was state controlled in the Middle Bronze Age, rather the diversification of circulation suggests independent communication, and simplification of the exchange in the Late Bronze Age may suggest nothing more than monopolisation rather than indicate state-controlled exchange. These events in metal-working, in conjunction with the evidence not only for the circulation of Cypriot PCCs, but also the interchange which exists between the manufacture of Cypriot and Syrian pottery, for example, suggests an unprecedented appreciation and adoption of 'foreign' material within the Cypriot culture. This coincides with the circulation of Cypriot pottery throughout the Levant and Egypt, as well as Crete and Turkey, culminating in an intensity of 'foreign relations' at the end of the Middle Bronze Age, and ultimately the Late Bronze Age.

Conclusions

In this chapter I have attempted to move away from preconceived ideas of trade and distribution, export and import in the description and analysis of the patterns of Cypriot pottery abroad. A change in terminology afforded a more composite approach to the interpretation of the pottery. By studying aspects of circulation, such as content and incidence of objects in circulation, a more complex, complete picture has been uncovered.

Whether essence, perfume or unguent, it is difficult to say, but a very extensive, diverse exchange network in a precious commodity existed within the Middle Bronze Age. Closer interaction has been detected not only in the exchange of objects, but in the use of well-recognised foreign elements in style and technique in the production of certain types of pots. The mechanisms of exchange are difficult to pinpoint and I believe that our databases cannot yet satisfy the complex questions on socio-behaviour aspects of communication.

"Circumstantial evidence is indirect evidence of a fact in issue. It consists of circumstances, admitted or proved, from which the existence of the fact in issue is inferred. Each circumstance by itself may be of little significance. It may be consistent both with the existence of the fact in issue and with some other possibility. But if, despite the other individual possibilities, all the circumstances agree in supporting the existence of the fact in issue, it may be proper to regard the fact as proved" (Walker and Walker 1964, 8).

CHAPTER VI

Chemical Analysis

Provenance studies

Introduction

It is important to determine the point of origin of every archaeological artefact. The distribution of objects, as well as raw materials, are evidence of contact between different areas and countries, the implications of which are of fundamental concern. In cataloguing excavated material, and more specifically pottery, it is often possible to recognise objects which are not common in the local repertoire. The terms "imported", "foreign" or "exotic" are used for such pieces from abroad. To locate the place of origin of less exotic items on a localised scale can also be of important significance in determining, for example, the nature of pottery production and distribution (Shepard 1985, 338-40 & Table 11).

Pottery provenance studies are carried out at two levels. The first level is to adopt a qualitative approach through preliminary visual examination of the material. The second is to define quantitatively source areas through scientific analyses. Macroscopically, it is possible to identify 'foreign' styles, for which parallels can be found in excavated records. The parallels, on the basis of proportional occurrence and similarity, often establish the most likely origin. Microscopically and chemically, knowledge of the *natural* properties of clay can be applied to the analysis of *fired* clay.

Over the last thirty years scientific techniques, primarily used to determine the make-up of naturally occurring materials, have been employed in archaeology. Petrographic analysis, for example, originating from a geological field, is now frequently applied in pottery provenience studies. The aim of the petrographic analysis is to identify those minerals and rock fragments which characterise the clay, or characterise inclusions introduced to the clay during manufacture. In essence, the goal is to identify the source of the clay using a background of geological input from the geographical area, and thus narrow down the source to a specific outcrop. Chemical analysis, however, seeks to identify the elemental composition of the pottery, and through a quantitative analysis of the constituent elements, differentiate between sources, even when the source is not known (Rice 1987, 414). Therefore, provenance studies are fundamental to our understanding of the artefactual evidence presented to us. Origins, or more definitively *sources*, for ceramic material can be located through chemical and petrological analysis.

Research Design

It became obvious from the bulk of the Cypriot material exported to the Levant and Egypt in the Middle Bronze Age that the majority of pieces already classed stylistically as Cypriot were made in Cyprus and were not of local Egyptian imitation. Within the corpus from Tell el Dab'a, Egypt, several classes of pottery were tentatively assigned by the author to a Cypriot, or non-Cypriot (eg Levantine or Egyptian) source. A few were deemed as possible local imitations of Cypriot imports. These preliminary non-Cypriot classes were less than satisfactory. In nearly all cases the material was fragmentary and parallels were difficult to find.

Bichrome Ware¹ from Tell el Dab'a proved to be the largest of these groups. The basic criterion used to identify the ware was the juxtaposition on the vessel of two colours. Red and brown, or red and black with variations of a lighter or darker hue were applied on a brown or yellow slip. The fabric colour varied from light brown to red brown, and dark red to crimson or violet. The clay was either well levigated or porous. The decoration seemed to follow an adopted guideline, and in general the use of design elements appeared consistent, yet the fabric as well as the overall finish of the vessel produced such varying results as to warrant further analysis.

Several indeterminate sherds from Tell el Dab'a², and one jug from Megiddo [MEG 236] were imitations of Cypriot painted wares but could not be conclusively identified as such. The recognition of local imitations of Cypriot products could be considered as an important, contributory element to the understanding of the distribution of Cypriot wares at this time. The task at hand, therefore, was to adopt a form of analysis which could best identify Bichrome Ware and potential local imitations as either Cypriot or non-Cypriot products.

Method

Neutron Activation Analysis (NAA) is a well-established, and well-defined technique used in pottery provenience studies (Perlman & Asaro 1969; Topping 1985) and is favourably reviewed (Harbottle 1976, Wilson 1978). The pottery artefact, it is assumed, provides a specific chemical 'fingerprint': the clay, used in the pottery production, is created by geological and environmental processes, which combine to form constituent minerals within any clay bed. It is presumed that, geographically, the elemental

¹ A synonym for Bichrome Wheel Made Ware, Wheelmade Bichrome Ware and Palestinian Bichrome Ware.

² DAB 687 a 'fish piece' assigned a Cypriot provenance, but no parallels existed, and a Levantine origin was equally plausible. Similarly DAB 627, wheelmade of a porous, green fabric probably derived from either of these sources.

composition varies according to the background geology, and hence each source potentially holds an "identity kit", which the fired clay would match.

NAA is a powerful multi-element facilitated technique with a very low limit of detection for several elements. The sample required is very small (0.1-0.2gms); it is non-destructive and in practical terms provides an opportunity to analyse multiple samples. Equally advantageous is the small amount of preparation time required for each sample. This technique was chosen in preference to petrographic analysis, which involves the thin-sectioning of sherds and characterisation of the minerals under a microscope using polarised light. Petrographic analysis identifies the breakdown of minerals and can potentially locate sources where 'exotic' minerals are found. A detailed sample of the background geology in the surrounding source areas is required in order to match sources. NAA analyses the elemental composition of the fired clay and the results can suggest the likelihood of pottery belonging to different sources without identifying specifically the outcrop of that source. On a more practical note it was not possible to thin-section the relevant pieces: NAA facilitates the sampling of pieces which are otherwise inaccessible *eg* in museums, since vessels can be drilled and minimum damage is done. NAA appeared to be the most appropriate technique available for determining the nature of Bichrome Ware and local imitations on a Cypriot or non-Cypriot foundation.

Previous research

Bichrome Ware has been the centre of extensive studies by Heurtley (1938) and Epstein (1966). The term 'Palestinian Bichrome Ware', coined by Epstein, in general refers to all pottery of the 16th century, found in the Levant, Cyprus and Egypt with bichrome red and black painted decoration. Despite inherent stylistic differences in decoration, fabric

and shape, and a wide distribution, Palestine has been postulated as the production locale. Merrillees (1970), and among others (Birmingham 1968), have found this label unsatisfactory. It encompasses a broad sweep, regionally and chronologically, of wares which often subtly reflect their original provenance.

Heurtley could see a noticeable influence from Cypriot Painted Wares, on what he considered ultimately a Palestinian product (Heurtley 1938, 21-34). The assumption had also been made that the potter's wheel was introduced to Cyprus in the Late Bronze Age. The long use of the potter's wheel in Syro-Palestine, since the beginning of the Middle Bronze Age, precluded a Cypriot origin for the Bichrome Wheelmade Ware. Epstein traced the "cultural" origins of the Ware to North Syria where Hurrian influences were bestowed on certain elements (Epstein 1966,). and to Cyprus (1966, 83-7) whose influence is manifested, in particular, in the Cross Line Style. Ultimately, however, Epstein considered Bichrome Ware to have been produced in Palestine.

"Painted decoration was not, however, common on local pottery before the middle of the second millennium, although in Syria there had long been a predilection for painted wares, while in Cyprus the tradition was a long-standing one. Thus the introduction and widespread use of painted decoration in sixteenth-century Palestine constituted a new departure, not stemming from indigenous ceramic traditions, which can only be interpreted as the result of the impact of outside influences." (Epstein 1966, 3)

Artzy, Perlman and Asaro (1976) using NAA challenged the above observations. The large proportion of Bichrome Ware found in Cyprus led to the thesis that Bichrome Ware was possibly not solely a Palestinian product. In comparing handmade White Painted Ware samples from the south east of Cyprus with Palestinian Bichrome Ware from the Levantine coast, the results showed that with the exception of Megiddo, compositions of Bichrome Ware from the various sites were homogeneous and matched the Cypriot group, and in particular the site of Milea. The pieces analysed from Megiddo were of a Cypriot and local provenance.

Similarly analysis of the Tell Nagila krater (Amiran & Eitan 1969) was undertaken (Artzy, Perlman & Asaro 1975). The krater combines Cypriot and Palestinian elements in decoration and composition, and is unusually thin walled. Its origin could not be readily identified. NAA identified the krater as a Cypriot product though of a coarser fabric than usually found (1975). In archaeological terms, the interpretations and presentation of the NAA analyses and results have sparked off some controversial comments (Catling 1986, 588). Although the pottery clay originated in Cyprus, the thesis that the Bichrome Ware developed from the White Painted repertoire (Artzy) can only be tenuously held; ironically, a Palestinian influence on the Cypriot Bichrome Ware is equally plausible. The numbers of Bichrome Ware recorded suggest that 40% of the total were produced in Cyprus (Catling 1986, 588). However, the predominance of a ware is not conclusive evidence of its provenance. There is no doubt that a certain amount of interchange went on between Cyprus and the mainland, but to what extent *potters* exchanged their methods, traits and skills can only be hinted at through the archaeological record. The Artzy, Perlman and Asaro results, however, are scientifically sound and have been instrumental in establishing by NAA a Cypriot *and* Palestinian source for Bichrome Ware.

The existence of an Egyptian clay source used in the production of Bichrome Ware has yet to be explored. Merrillees (1970, 10-11) has drawn attention to an Egyptian group of Bichrome Ware. The Egyptian examples adhere to the distinctive decorative Bichrome Ware recognised by Heurtley as Palestinian, but in terms of fabric, shape and finish are possibly Egyptian in origin.

The confusion, therefore, which could arise in identifying incorrectly from a preliminary macroscopic examination, the place of origin of Bichrome Ware, or local imitations of

pottery exported from Cyprus, demonstrated clearly that chemical analysis should be undertaken.

Sample Selection

The results of the NAA serve only to indicate the likelihood of a sample originating from one source as opposed to another, where the source clay can not be identified. The best approach, therefore, appeared to be to work from a "known" Cypriot sample against which the indeterminate samples could be analysed. The "known" Cypriot pieces were from archaeological sites at a distance from each other, within the island. The possibility that the groups identified by analysis might reflect regional variation in the supply of Cypriot pottery abroad or at the same time different sources in the stylistic ceramic groups within the island, could not be ignored, despite the small number of samples. Although the exported Cypriot MBA material is likely to have come from the south east of the island, the sources of the clay could not be assumed to be from that area alone. Characteristic sherds of White Painted Ware were selected and presumed Cypriot due to their innumerable parallels in fabric, decoration and distribution within Cyprus. The use of wasters from particular workshops has been undertaken in provenance studies to identify unknown groups of pottery (**Archaeometry 1972 Poole). In Cyprus, however, these specific production sites have not been identified within the Middle Bronze Age. The limitations of analysing raw clay sources against archaeological fired clay material have been outlined (Price 1987, 421-4; Pollard 1986, 51-3)³. In this approach, systematic sampling, to gather material from potential archaeological sources would have to be undertaken. Similarly, it would be necessary to imitate the pottery production to match, for example, the tempering or levigation processes used by the potters. Within the limited scope of this study, therefore, it has not been possible to take such measures and

³ Perlman & Asaro 1969; Wilson 1978 have also drawn attention the use of modern clay sources in interpreting unknown archaeological sources.

those pieces which are categorically Cypriot are used as a background rather than a clay core reference group.

Tell el Dab'a

The Tell el Dab'a assemblage in particular presented a number of problematic White Painted, Bichrome and Levantine Painted Wares, including potential local imitations. In cataloguing the Cypriot pottery from the Tell el Dab'a excavations the opportunity to study all the material classed as "imports" was invaluable. In this way, an appreciation of the many varieties of "exotic" or "unusual" material ie pieces which could not be recognised as local, was obtained. Those pieces ordinarily classed as indeterminate or unknown could be studied alongside the core groups of Cypriot material, and hence the potential of local imitations and different strains of Bichrome ware were identified. As a contained unit the 'unknown' sherds were analysed against a background of Cypriot (archaeologically) provenanced White Painted Ware from Dhiorios, Krini, Kalopsidha, Arpera and Politiko (Table 3 ASH). The Cypriot background sample, it was presumed originated within a Cypriot geographical boundary, but the location given to each by their findspots, could not necessarily be considered as the source of the clay used in pottery production. Similarly, a background sample (Table 3) of a definite non-Cypriot boundary, as far as could be observed macroscopically, was selected, including two samples of pottery known to be of Nile Clay (IB); two samples of Tell el Yahudiyeh (incised) and two of Tell el Yahudiyeh Painted Ware. The complete list of samples used in the analysis and the concordance of their catalogue, museum or site numbers appears in Table 3⁴.

⁴ Thirteen of the original indeterminate samples from Tell el Dab'a produced incomprehensible results after computer analysis. These samples have been left out of the analysis. The data was supplanted with 14 samples, also from Tell el Dab'a, which had been previously analysed without a provenanced background sample (Maguire 1986, 62-71).

Sample No	Site	Mus/Site Accordance	Cat No/ Reference	Type
2	T.Dab'a	06	DAB 627	?WP
4	T.Dab'a	2879d	DAB 497	WP PLS
5	T.Dab'a	4769	DAB 629	WP
6	T.Dab'a	7057F	DAB 516	WP CLS
7	T.Dab'a	011	DAB 687	WP?fish'
8	T.Dab'a	5208G	DAB 725	Bichrome
9	T.Dab'a	4124	DAB 519	WP CLS
10	T.Dab'a	4108F	DAB	TYH
11	T.Dab'a	4937D	DAB	Levantine
12	T.Dab'a	2891C	DAB 730	Bichrome
13	T.Dab'a	3415A	DAB	TYH
14	T.Dab'a	4506B	DAB 741	Bichrome
15	T.Dab'a	2530G	DAB 717	Bichrome
20	Kriai	1970.883	ASH	WPIV
21	Kriai	1970.884	ASH	WPIV
22	Kriai	1970.886a	ASH	WPIV
23	Kalopsidha	1953.1071(d)	ASH	WPIV
24	Kalopsidha	1953.1070(b)	ASH	WPIV
25	Kalopsidha	1953.1070(e)	ASH	WPIV
26	Dhiorios	1953.1124(h)	ASH	WPII
27	Dhiorios	1953.1124(i)	ASH	WPII
28	Dhiorios	1953.1124(e)	ASH	WPII
29	Politiko	1953.1034(l)	ASH	WPIV
30	Politiko	1953.1034(m)	ASH	WPIV
31	Arpera	1953.1187(b)	ASH	WPIII
32	Arpera	1953.1187(e)	ASH	WPIV
34	T.Dab'a	6038	DAB 508	WP PLS
35	T.Dab'a	Fl-o21 Gr3	DAB	TYH
36	T.Dab'a	Fl-o21 Gr3	DAB	TYH
37	T.Dab'a	4812A	DAB 679	WP 'V' TL
38	T.Dab'a	5208F	DAB 726	Bichrome
39	T.Dab'a	2010b	DAB 721	Bichrome
40	T.Dab'a	5208G	DAB 725	Bichrome
41	T.Dab'a	4223B	DAB	Levantine
42	T.Dab'a	4634A	DAB 628	Bichrome
43	T.Dab'a	6460L	DAB 612	WP 'V' BB
44	T.Dab'a	3432c	DAB 602	WP 'V' BB
45	T.Dab'a		DAB	Nile Clay
46	T.Dab'a		DAB	?WP
47	T.Dab'a		DAB	Nile Clay

ASH Ashmolean Museum, Oxford

Table 3: Concordance of NAA sample and catalogue numbers

Sample Preparation

Samples 20-32 were supplied by the Ashmolean Museum, Oxford. The sherds were drilled using 1/16th square section tungsten carbide drill bits. The bits were swabbed with acetone before each sample was taken. Samples 34-47, 2, 4-15, were obtained from a c 1-2cm² fragment which was broken off each sherd. Any post-depositional contamination was scraped off using a spatula. The fragment was then crushed to powder using a glass pestle and mortar. The work area, spatula, pestle and mortar were rinsed with distilled water and ultrasonically cleaned before proceeding with the next sample. This minimised the possibility of contamination between samples during preparation. A standard reference clay was included with each batch of samples. The standard used to calculate the concentrations of elements in the sample was the Scottish Universities' Research and Reactor Centre's (SURRC) 'in house' Edinburgh Standard Reference Clay. The properties of the reference clay have been compared with those standards used by the Brookhaven National Laboratory, Perlman and Asaro and Handcock. (Topping 1985, 35 & Fig 4 and Appendix V Table 1).

Each sample was contained in a pre-weighed snap-top polypropylene ampoule. The ampoule was heat-sealed with a spatula to ensure that it was securely closed. The ampoule was wrapped in a strip of aluminium foil with a 2cm length of Fe wire. The wire monitors the flux of the neutrons in relation to the position of each sample within the reactor. The aluminium foil prevented the samples from sticking together, and acted as a convenient label for each sample, the sample number being written on the inside of the foil with indelible ink.

Sample Irradiation

The samples were irradiated and analysed at the SURRC, East Kilbride. Each batch of samples was introduced into the Central Vertical Stringer of the reactor and irradiated for 6 hours at a neutron flux of $c.3 \times 10^{12}$ neutrons $\text{cm}^{-2} \text{sec}^{-1}$. The number of samples per irradiation was limited to twenty, due to the irradiation volume and the total induced activity. The polyvials have a standard radiation tolerance: too many samples could result in the vials melting. If counting short-lived activities, counting time is limited since certain elements have half-lives of 40 hours.

Radioactive decay is a spontaneous process in which an unstable nucleus undergoes a transition from an original state of defined energy to a new state of lower energy. The excess energy is emitted as irradiation. One such transition is called a disintegration, and the number of disintegrations per unit time is called the Activity, calculated thus $A = A_0 e^{-\lambda t}$ where $(e^{-\lambda t})$ are the decay factors.

Radiation Detection

Radiation detection is carried out using a high resolution Lithium Drifted Germanium Detector (Ge(Li)). The detectors are controlled by an EGG-ORTEC 7032 Data Acquisition and Analysis System associated with a microprocessor unit which has the capability of four independent 4096 channel analysers. The signals received by the detector are amplified and converted to digital format. The energy of a gamma photon, recorded in computer memory locations, is displayed on a oscilloscope. The high capacity multi-channel analysers resolve the many photopeaks in gamma-ray spectra, and the whole analysis is carried out by microprocessors.

Sample counting took place after an initial four days, during which short lived radioactivity could be recorded using a 25cc or 80cc GeLi Detector. The samples were counted for 15 mins in which time the nuclides ^{24}Na , ^{140}La , and ^{153}Sm were detected. Approximately two weeks after irradiation, the counting time was increased to one hour per sample, to detect long lived radioactivity. The nuclides ^{46}Sc , ^{51}Cr , ^{60}Co , ^{134}Cs , ^{141}Ce , ^{152}Eu , ^{177}Lu , ^{181}Hf , ^{182}Ta , and ^{232}Th were detected using an 80cc GeLi Detector. The complex peaks in the gamma-ray spectra were stored and analysed using GAMMA 2 programme. The data was then processed through the NAAF programme set up by Dr. Ian Harris (SURRC). This programme facilitates the incorporation of systematic corrections (the flux variation) and any known a priori errors (the geometry of the sample to the detector), as well as information on the elements, weights, decay and counting time. In each case the calculated errors are taken into account and a % error for each sample is allocated.

The elements, or variables, used in the statistical analysis were deliberately selected. Those which produced a high % total error were not used in the analysis. Rb and Sb were rejected on this basis. Ta produced a high error, but from the numerical data appeared to act as a discriminating factor between several samples and was therefore included in the analysis. Fe, K and Na are recorded as those elements most likely to have been affected by post-depositional alteration through soil leaching or enrichment (Topping 1986, 40) and could not be used in the analysis. In total 12 elements were used as variables - La, Sm, Sc, Cr, Co, Cs, Ce, Lu, Eu, Hf, Ta, Th.

Cluster Analysis

"Birds of a feather, yuppies, and many other animate and inanimate objects that share similar characteristics are found together. By studying such clusters one can determine the characteristics the objects share, as well as those in which they differ." (Norusis 1988 B-71)

In this respect the raw data collated from the NAA was further examined using cluster analysis to search for relatively homogeneous groups. The cluster analysis was carried out via SPSS/PC+ Version 3.0. Firstly, in preparing the data, the raw elemental values were normalised against the values for Sc. Secondly, the variables were standardised, since those variables (elements) with larger numbers will contribute more to the distance between cases than those with smaller numbers (SPSS 1988 B-72). The results of the agglomerative hierarchical clustering are displayed in a dendrogram (Fig 1a). In sample 47 the count for Eu is missing. In Fig 1b Eu is not used as a variable. The difference is marginal: all the core groups remain unaffected. The method used for cluster formation was Ward's method.

It is important to determine within cluster analysis, whether or not the clusters illustrated present real groups which exist in the data, rather than groups which have been produced purely through the method of analysis (Shennan 1988, 228-9). Discriminant analysis serves to maximise the separation between the clusters, and thereby reduce the possibility of incorrect grouping. The results are shown in Fig II.

Dendrogram using Ward Method with Eu

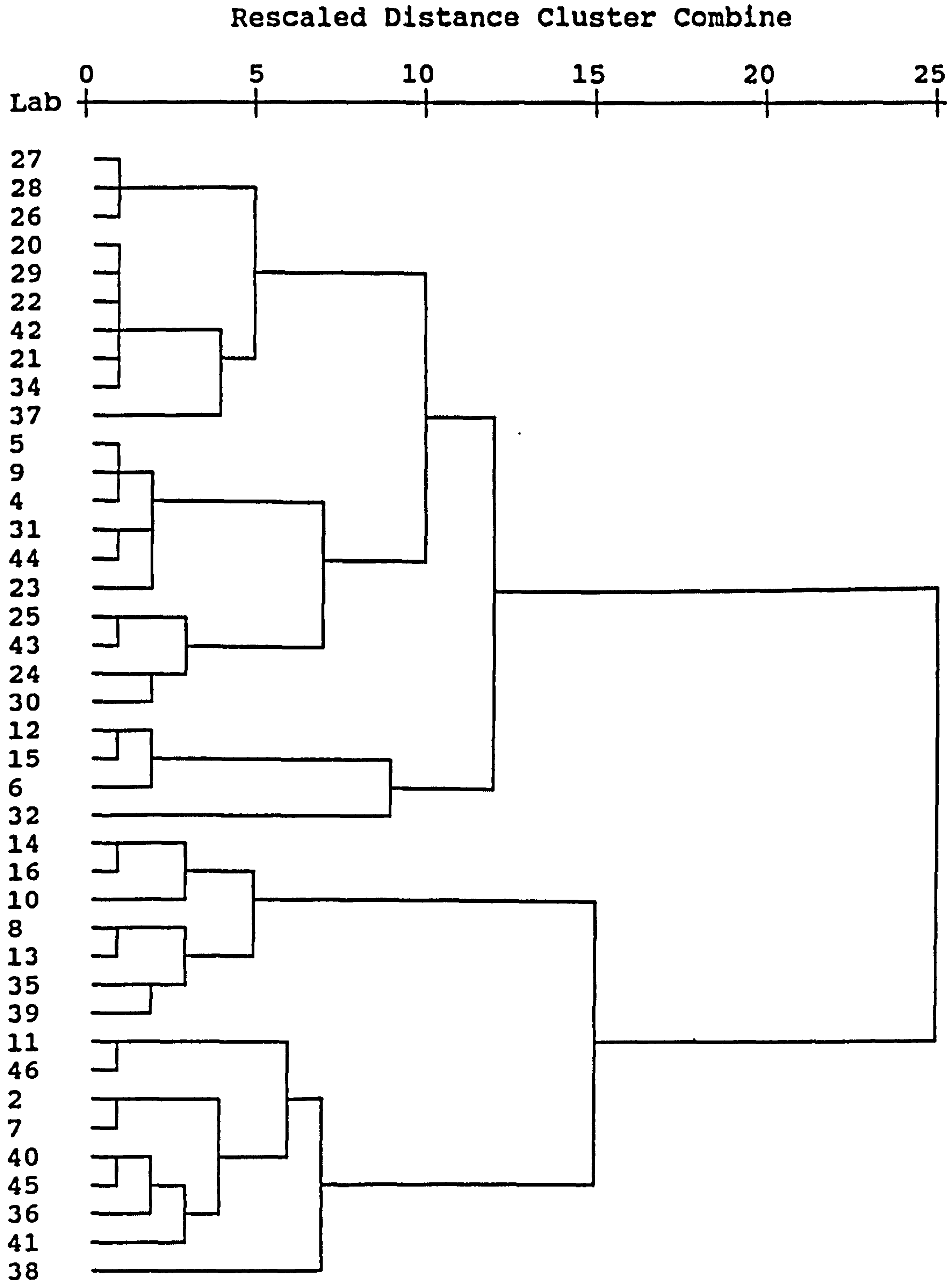
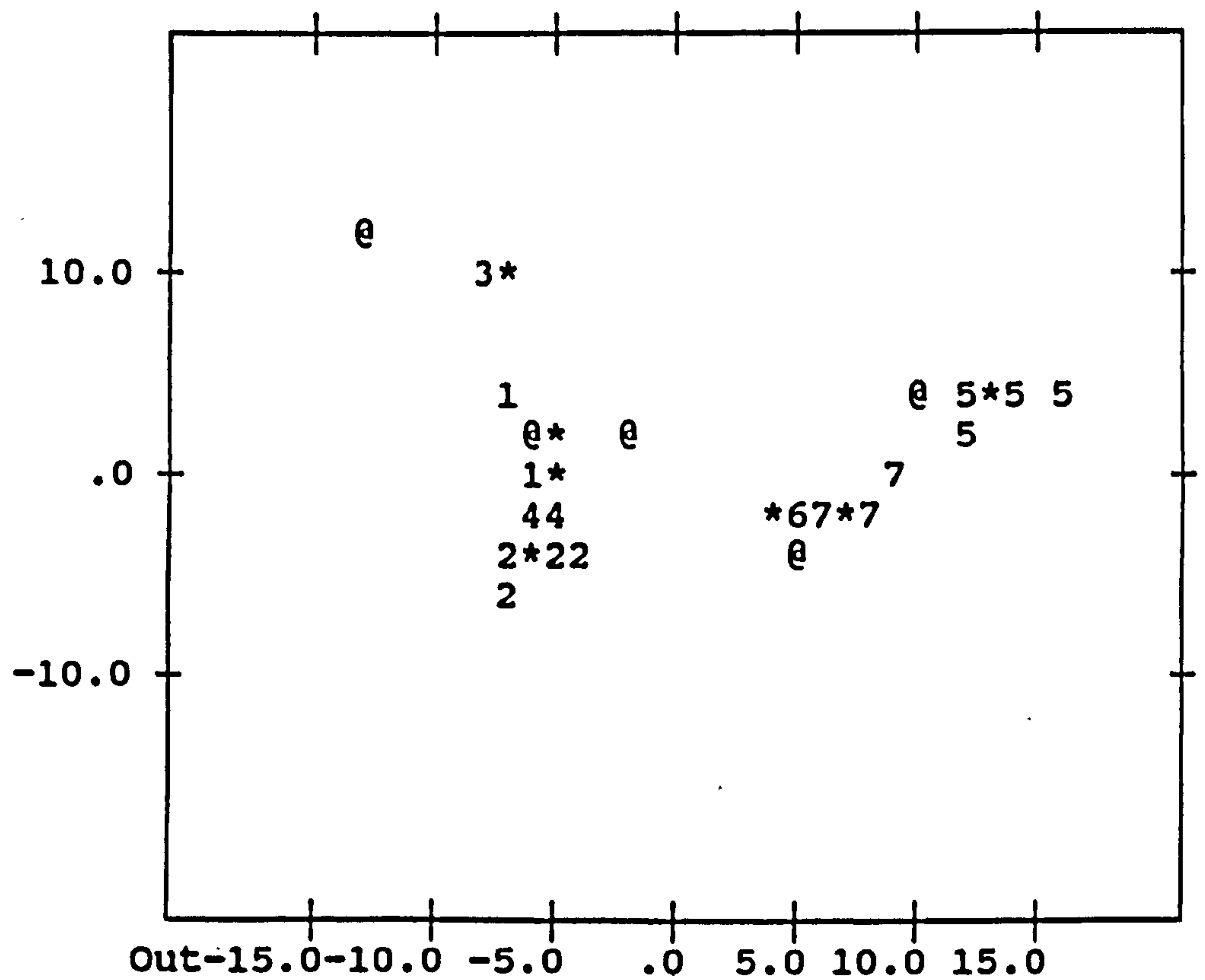


Fig Ia



* indicates a group centroid
 @ outlier

Fig II Discriminant scores of Groups 1-7 plotted against Function 1 and 2.

Results

The groups defined in Fig Ia and b, and Fig II, favour the division of the data into a Cypriot group (Groups 1-4) and a non-Cypriot group (Groups 5-7) Table 4. Samples 37, 24, 32 and 41 were not delegated a Group initially, though their position following Discriminant Analysis falls securely within either of the respective groups; only one sample remains a notable outlier. Group 5 is particularly interesting: sample 39, it was noted, had been previously analysed at the Brookhaven National Laboratory: sample no. MB0022 (Bagh 1988, Appendix A/1-2; Bagh pers comm). This sample belonged to a large homogenous group of Levantine Painted ware found at Tell el Dab'a. This Levantine group was analysed alongside the Bieber/Brooks 'Palestinian Red Field Clay' group. This characteristic local material from a large part of southern Palestine (P. McGovern pers. comm). The tightness of the cluster comprising samples 7, 11 and 39 and BNL MB0022 suggests a very close relationship.

Their separation from Group 6 and 7, especially 6 which contains, originally 2, Nile Clay samples, indicates a likely Southern Palestinian for Group 5 and a tentative Egyptian grouping for Groups 6 and 7. Groups 6 and 7 are closely positioned in Fig II. The proximity of the group centroids point to a common origin. In view of the small number of samples within Groups 6 and 7, however, further details on the clay sources are not available.

The Cypriot group (Groups 1-4) forms a more comprehensive unit. The clusters created using Ward's method, however, are not explicitly defined in terms of Group relationship. This is evident in the apparent separation (Fig I) of Group 1 from Group 4. The discriminant analysis independently calculates the probability of each case belonging to any one Group, and maximises the differences between each Group.

GROUP 1	GROUP 2
12 Bichrome Dab'a	4 WP PLS Dab'a
15 Bichrome Dab'a	31 WP III Arpera
22 WP IV Krini	43 WP V BB Dab'a
34 WP PLS Dab'a	44 WP V BB Dab'a
42 Bichrome Dab'a	5 WP ? Dab'a
21 WP IV Krini	6 WP CLS Dab'a
29 WP IV Politiko	9 WP CLS Dab'a
- - - - -	
37 WP V TLS Dab'a	
GROUP 3	GROUP 4
27 WP II Dhiorios	20 WP IV Krini
28 WP II Dhiorios	25 WP IV Kalopsidha
26 WP II Dhiorios	23 WP IV Kalopsidha
	30 WP IV Politiko
GROUP 5	GROUP 6
7 ?WP'fish piece' Dab'a	14 Bichrome Dab'a
11 Levantine Dab'a	40 Bichrome Dab'a
39 Bichrome Dab'a	45 Nile Clay Dab'a
2 ?WP (wheelmade) Dab'a	- - - - -
	47 Nile Clay Dab'a
GROUP 7	41 Levantine Dab'a
8=40	
13 Painted TYH Dab'a	
10 Painted TYH Dab'a	
46 ?WP(wheelmade) Dab'a	
35 TYH Dab'a	
36 TYH Dab'a	
38 Bichrome Dab'a	

Table 4: Summary of Groups 1-7 as defined by Cluster and Discriminant Analyses

The group centroids of Groups 1 and 4 are closely positioned (Fig II) reflecting similar compositions. Group 3 is significantly isolated from Groups 1, 2, and 4, perhaps indicating a separate clay source.

This background of potential Cypriot, Southern Palestine and Egyptian sources provides a base from which the Tell el Dab'a samples can be viewed. Bichrome Ware has produced by far the most encouraging results. Group 1 (Cypriot) comprises two Bichrome pieces, Group 5 (?Southern Palestine) one Bichrome piece, and Groups 6 and 7 (?Egyptian) comprise five pieces. Those ?WP or possible imitations have been assigned a non-Cypriot source. Samples 34, 4, 37, 38, 3, 4, 7 from Tell el Dab'a are traditionally considered south-eastern Cypriot styles. They appear in the groupings as conclusively Cypriot but further regional implications are indiscernible from the data, other than that the homogeneity of Groups 1, 2, 4 may indicate a common geological clay source.«©

Discussion

The limitations of this study are self-evident, yet the potential of Neutron Activation Analysis in identifying provenances is vast. The preliminary aims of the study have been fully satisfied. Bichrome Ware is derived from a definite Cypriot source and a non-Cypriot source. Samples 39, 45 and 47, and their respective clusters are positive indicators of a South Palestine and Egyptian sources.

The present study reinforces the thesis that Bichrome Ware comprises two, if not three separate types, each derived from three different sources. In this respect the Cypriot group warrants reappraisal in view of its distribution abroad and its relationship to the Palestinian and Egyptian group. Artzy, Perlman & Asaro have already advocated an early Cypriot origin for the Cypriot Bichrome Ware. The origins of this ware are to be found in the development of the White Painted V styles of the south east of the island.

The adoption of the wheel and the bichrome technique are two major innovations into a tradition which has adhered to handmade goods and monochrome black or red painted decoration. In the same instance, the introduction of certain design elements, such as "spoked wheels" and bird motifs, contrasts with the strong linear tradition which had remained in vogue for the larger part of the Middle Bronze Age. Tankards, kraters and large jugs are the predominant shapes in the Cypriot Bichrome tradition. The tankard is well established in the Middle Bronze Age White Painted and Black Slip series but *wheelmade* jugs and kraters afford different dimensions. It is hard to see a completely internal development within the White Painted ceramic sequence for Bichrome Ware. The influences from abroad are particularly prevalent and a major degree of interaction between a Cypriot potter or workshop and a similar agent on or from the mainland can be assumed for the transference of otherwise alien techniques. The combination of a long standing handmade, painted tradition with a predominantly wheelmade, monochrome and bichrome tradition has resulted in Bichrome Ware. Cypriot Bichrome was exported alongside other late Middle Bronze and Late Bronze Age wares to sites in the Levant and to Tell el Dab'a Egypt. It signifies the continuance of South Palestinian contact with Egypt in the transport of goods from Cyprus to Egypt. Against this background we see a similar distribution of Palestinian Bichrome ware, indicating similar interaction. Both wares are possibly imitated in Egyptian locations. This is not surprising, in view of the large Asiatic population established in the late Hyksos period in the Delta, and the occurrence of imitations of other Wares, for example at Tell el Dab'a, and Tarkhan.

The WP PLS, CLS and WP 'V' examples from Tell el Dab'a belong to a homogeneous group, and it is tempting to assign a south eastern origin to Groups 1, 2 and 4.

Regionalism in ceramic provenance studies, however, should be cautiously approached and it is necessary to outline current concern here.

Frankel (1974) identified different regional groupings on the basis of the proportional occurrence of various motifs within tomb assemblages over the whole island. An attempt to validate these regional groupings further through an analysis of the elemental composition of the wares was carried out as an initial pilot study (Frankel 1976). The samples were selected regardless of existing regional allocations and respective findspots, since it was estimated that the analysis would identify independently the production locales.

The samples were analysed using optical emission spectrography and the raw data using Cluster and Principal Components Analysis. Clay source controls were included in the analysis yet very little information could be gained from the results (Frankel 1976, 40). The indistinguishable groups were thought to be the result of the apparent homogeneity of the sedimentary geological make-up of the island. Only three samples from Galinoporni formed a uniform, independent and tight cluster (Frankel 1976, Fig 1). Jones (1986, 525-6) outlines possible factors which could have affected the results in the Frankel, Hedges, and Hatcher data. In view of the scope of the study, he asserted that too few samples were analysed; and the limitations of small sample numbers have already been indicated in the present study. The choice of technique for this type of analysis is also questioned.

Nonetheless, the problems of dealing with regional groupings within preconceived stylistic entities are manifold; their existence is undeniable (see above: Dhiorios Group 3 in contrast with Groups 1, 2, 4 as viable source differentiation on a regional scale; and Galinoporni and Dhiorios: (Frankel 1976, Fig 1) but their interpretation is subjective. Jones (1986, 526) has commented that even when groupings are recognised from the analytical data, their position can be contradictory to those stylistic groups conventionally identified (Frankel 1974, WP PLS). The Dhiorios cluster (Frankel 1976, Fig 1), which includes PLS, is comparable in composition to a Lapithos mediaeval source

(ie *north coast*), yet the PLS is traditionally a south eastern style, with presumed production locales in the same area. Therefore, further analysis might identify substantially different sources within a complex distribution of individual styles.

In order to extrapolate sources from the archaeological record successfully, new approaches following the designs expressed admirably by Catling (1986, 574) should be adhered to.

"The original neglect of basic essentials in Cypriot pottery analysis work is perhaps explicable...; its continuance is now quite indefensible. It is fervently to be hoped that publication of this book will stimulate the design and execution of a comprehensive programme of pottery analysis within Cyprus itself, a principal objective of which must be the establishment of adequate controls; for safety these must be both regional and diachronic;"

The need for systematic sampling on a localised scale (eg intra-site comparison with immediate source areas) is required before perspectives on a global scale (eg regionalism within the MBA Cypriot ceramic sequence) can be achieved.

"Cypriot archaeology is passing through a particularly creative phase, the most important feature of which has been the recognition of regional variation in both prehistoric and later periods. Much of the evidence on which these new insights are based is ceramic; pottery analysis could have an important role in giving greater precision to the regional groupings already arrived at by conventional study." (Catling 1986, 575).

The success of large scale NAA carried out by the national laboratories is encouraging (BNL; RLAHA). The major concern for individuals carrying out NAA is sample quantity. The advantages of manipulating a large pool of data, collated from multiple analyses on related material, would overcome the disadvantages of operating in isolation from universal Standards and comparative data.

Barlow and Idziak (1989) have successfully undertaken an operation to identify the composition of characteristic wares found on the early Middle Cypriot site of Alambra. Their research has established the existence of two clay sources used in pottery

production on one site. The two different clay groups were identified by petrological and chemical analyses, and further exemplified using a HCl acid test on sherds visually recognisable as calcareous or non-calcareous. The choice of either clay was instrumental in the fashioning of Red Polished Ware and White Painted Ware. These two types of clay sources are situated at close proximity to the site. The White Painted A category is akin to White Painted II and White Painted B is a subvariety of White Painted IV in the conventional classification system (Åström *SCE* IV.1B). Within the Red Polished ware two different clay sources were identified; RP A is calcareous and RP B non-calcareous and WP A is calcareous. WP B was indicative of the use of clay at high firing temperatures, adopted most likely from potters in other areas (Barlow and Idziak 1989, 74).

These preliminary investigations are crucial to our interpretation of clay sources on an intra-site and intra-island perspective. It may be possible to construct core reference groups using NAA, on a similar foundation as the Barlow and Idziak research. Gradually we may be able to use core reference groups of definitive local sources within each site catchment, which will offer a solid basis on which regional groupings can be built.

Conclusions

The chemical analysis of Cypriot pottery at Tell el Dab'a has demonstrated the potential, and ultimate necessity for definitive provenance studies. The identification of Cypriot, Palestinian and Egyptian Bichrome, and the clarification of consistent sources for White Painted pottery, have been possible. Nonetheless, in its application to the particularly

complex aspect of Cypriot regionalism in the Middle Bronze Age, NAA demands multi-sample selection within a coherent, strategic research programme.

"Since the opinion [evidence] is based on a certain state of facts, it is valueless unless the facts are proved" (Walker and Walker 1964, 432)

CHAPTER VII

Conclusions

At the outset of this thesis, it was intimated that Cypriot foreign relations were appreciated primarily through the distribution of Cypriot pottery abroad, and the appearance of foreign pottery and other items within Cyprus. A review of the literature pertaining to Cypriot foreign relations shows that the majority of theories were restricted by the terminology, as well as basic concepts of 'export' and 'import', 'trade', 'distribution', 'contact' and 'relations'. This amounted to the "belief" or "opinion" that Cyprus exported pottery to the Levant and Egypt in particular and, therefore, that Cyprus as a socio-political entity was involved in the political and economic affairs of similar entities in the Levant and Egypt, hence the existence in the Middle Bronze Age of foreign relations, and talk of *trade* in pottery, tin and copper.

Concealed within this restrictive terminology and idealised trade constructs, there existed a wealth of information which, when accumulated and deciphered, offered a more composite, direct picture of 'international contact' in the Middle Bronze Age. A new terminology which allowed for description, as opposed to interpretation, of the evidence was adopted. *Circulation* reduced the onus and immediacy of understanding the patterns of distribution of Cypriot pottery.

The best approach to accumulating this data appeared to be an assessment of the types of Cypriot pottery in circulation at this time. The Catalogue, therefore, offers a fully representative sample of the pottery in circulation throughout the East Mediterranean in

the Middle Bronze Age. Much of the material is hitherto undocumented, especially in the corpora from Tell el Dab'a, Tell el 'Ajjul and Ras Shamra. An overall catalogue has not been compiled since 1957. It provides a descriptive and visual presentation of the distributions of Cypriot pottery abroad as well as an indication of the amount of available material. Provenance studies using Neutron Activation Analysis confirm the stylistic classification of the Cypriot pottery, as well as the existence of imitations, and pinpoint production locales for Bichrome Ware in Palestine as well as Cyprus. The NAA was unable to specify production locales within Cyprus itself and realistically a thin-section programme in conjunction with NAA should be undertaken at a local level, in order to obtain results along the line of Barlow and Idziak in locating clay sources.

This assessment of the types of Cypriot pottery abroad, however, was extended to a review of the classification system in operation in Cyprus since chronological and cultural factors appeared to be intermingled with pottery production and distribution. In essence the Ware typologies created order amidst a catalogue of inordinate amounts of Middle Bronze Age pottery, but did little to enhance our knowledge of the specifics of regional as well as individual production and distribution. This was particularly evident in the case of White Painted III and IV and White Painted Pendent Line and Cross Line Style in the North and South of the island. A case study of the White Painted V Ware demonstrated that stylistic analyses could identify workshops as opposed to production locales. In observing the distribution within Cyprus and abroad of the White Painted V Fine Line Style workshop, it was quite evident that very diverse, though contemporary, distributions of Cypriot pottery existed. This contributes to the diversification of the exchange network in operation, whereby specific types of Cypriot pottery produced in specific areas are being redistributed abroad. These results demonstrate quite clearly that there is a need for descriptive classifications to sort data and for further analytical classification to help us observe and assess the patterns within the data.

The present classification serves its descriptive purpose but deserves more analytical work, in accordance with current studies (Frankel forthcoming; Barlow & Idziak 1989; Barlow forthcoming; Maguire forthcoming a). Essentially the system is chronologically biased and lacks confirmation through securely excavated settlement sequences, which would conveniently act as a complement to the amassed cemetery data available in particular from the north of the island.

Likewise Cypriot Middle Bronze Age pottery is enmeshed in the turmoils of absolute as well as relative chronology. The attempt to give the Cypriot pottery a chronological and, therefore, implicitly historical perspective, made it obvious that certain preconceived ideas on the creation of sequences for Cyprus, in particular based on Cypriot pottery found in Palestine and Egypt have distorted the overall picture.

A positive contribution, therefore, was to establish how the network of Near Eastern chronologies operated and how best the evidence for Cypriot absolute dating could be managed. The approach adopted was inevitably cautious and outlined the pitfalls of using stratigraphically insecure material, especially individual pottery items, as well as accumulated sherds, from potentially churned up occupation deposits. The best plan was to utilise ceramic seriation in the case of sherds with the realisation that a date proposed from the contexts in which the Cypriot pottery occurred offered only an approximate date for deposition, in amalgamation possibly with a date of export, and conditionally a *terminus ante quem* for production in Cyprus. In any event the dates were not fixed but rather spanned and ranged several episodes. This seriation was most evident and most poignant in the case of tomb and settlement material from Tell el Dab'a. Relatively speaking Cypriot pottery occurs consistently in MB II B-C deposits, and absolute dates derive from the Palestinian and Egyptian chronologies according to the high, middle or low or ultra-low preferences. However, we are in any case nowhere

near appreciating the length of time Cypriot pottery was in circulation. The difficulty remains in gauging when in, a 300 year (MBA) span, Cypriot pottery arrived; whether it was over a period of 5 or 50 years cannot be ascertained.

An analysis of the contextual data of the Cypriot pottery in foreign contexts led to the conclusion that Cypriot pottery was integrated as part of a 'tomb package' which could be identified throughout the Syro-Palestinian coast. In effect, while there existed regional and paralleled development throughout the Levant, Cypriot pottery cut across geographical boundaries and highlights the plausibility of a common cultural milieu which may have prevailed in the Middle Bronze Age.

Certainly the historical situation facilitated ease of circulation in several items. It was possible to map the respective distributions of what have been termed precious commodity containers: Cypriot jugs and juglets, red Polished Ware, Red Burnished Ware, and Tell el Yahudiyeh Ware and all their recognised variants including imitations. These demonstrate conclusively that there existed a highly diversified exchange network in probably oils, fats or essences in the Middle Bronze Age in varying degrees of intensity between sites in Cyprus, Syria, Palestine and Egypt, as well as Crete and Anatolia. The importance of identifying this diversification in circulation can be realised if we project our exchange network into the Late Bronze Age. The picture emerging is very different from that of the Middle Bronze Age. Very many PCCs disappear, *i.e.* Tell el Yahudiyeh, Red Polished and Red Burnished Wares. Only Cypriot pottery and a probable manifestation of Red Burnished Ware in Red Lustrous Wheelmade Ware persisted. With the apparent demise of Palestinian and Delta centres at the time of the expulsion of the Hyksos, it may be that a forced redirection in the circulation of PCCs took place. If Cyprus and Syria, more specifically sites like Kalopsidha and Ras Shamra, were closely linked and remained in more intense communication than their Palestinian and Hyksos

neighbours, it is not surprising that Cypriot and Syrian pottery types survived the disruption in the circulation of PCCs, if we presumed that Cyprus and Syria remained less affected by political and economic events in southern Palestine and Egypt with the expulsion of the Hyksos, possibly linked to the demise of major centres.

Admittedly the representations of Cypriot pottery in terms of Ware and distribution within Cyprus are markedly different *eg* Base Ring, White Slip and Monochrome Wares. Typologically (with BR at least) and functionally a parallel can, however, be drawn between the jugs and juglets of the Middle Bronze Age, and the vast repertoire of jugs and juglets of the BR ware. Yet the MBA/LBA would appear to be an actual transition phase, at least in terms of pottery production. The particulars of change are impossible to recount, but to a surprising degree, foreign elements pervade Cypriot culture including metals, pottery and probably tin. The transition signifies a culmination of factors which contributed to the incursion of Cypriot items into an international circuit of communication, primarily on an economic level. The exchange network of the Middle Bronze Age is essentially transformed to accommodate a mass of pottery export, and equally to receive an ever-increasing amount of foreign items as well as foreign influences. Our understanding of Cyprus' socio-political state at this stage is little furthered basically because we lack essential records of well-stratified sites which might, for example, indicate economic and political development manifested in architectural display. The production and distribution of pottery is the only extant indicator.

Within this exchange network it has not been possible to identify those responsible for the circulation or, indeed, the 'organisers' or 'entrepreneurs'. It is even presumptuous to talk of a rigid trade construct based on the evidence we have. Any alternative or more detailed interpretations of the circulation would be factoids as opposed to facts inferred from the available evidence; there is not enough evidence to discuss gift-exchange or

specialised trading. The inferred facts are that Cypriot pottery was being circulated over vast distances amidst a diversified exchange network in other PCCs which carried liquids, probably in the nature of perfumes or unguents.

While this research has achieved certain goals, the limitations as well as expectations of current and future research must be discussed. To some extent the second half of the Middle Bronze Age in Cyprus is something of an enigma. The cultural development of the MBA is heavily obscured by a mountain of pottery derived primarily from tomb contexts. The settlement evidence is fairly limited and rarely provides a well stratified architectural sequence. Where extensive research has been undertaken, the overt regionalism of the area denies us a link with other sites especially on the eastern and northern coast. There is a desperate need for further excavation of Middle to Late Bronze Age sites in Cyprus to contribute to our knowledge of cultural development already obtained through ceramic data. Until a systematic excavation programme can be carried out the classification sequence is also in need of full reappraisal, both stylistically and chronologically.

There is also a lack in our knowledge, or perhaps a gap in our publication record, of the nature of parallel development in Syria, Palestine and the Delta in the so-called Hyksos period. A systematic analysis of the cross-cultural development in Palestine and Tell el Dab'a, will be forthcoming in the publication of the Tell el Dab'a excavations. We lack, however, a comprehensive, detailed survey of the specific regional and chronological development of the material culture in Palestine and the Delta in the latter half of the Middle Bronze Age. It is a period pregnant with internationalism on a far grander scale than specific relations with Syria and Egypt, for example, as witnessed in the Middle Kingdom. The evidence for intensive interaction over large distances, and participation by several communities is rapidly growing. By the Late Bronze Age the archaeological

record is swamped with specific items which represent international contact on an economic and personal level.

It must be expected that where Cypriot pottery abroad is used to establish the absolute chronology for the Middle Bronze Age of Cyprus, certain precautions must be taken. Pottery cannot be taken to infer specific fixed points in chronological systems; it was never fashioned for this purpose. It is a tool to help archaeologists broaden their perspectives on historical development, and when used for the purpose of dating it must be used conditionally. In our present day environment of analytical and scientific research it should be possible to design programmes which amalgamate pottery and radiocarbon dating techniques, for example, to build a series of interlocking dating controls from occupation as well as tomb deposits.

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APPENDIX I

White Painted Ware

The following listings are the result of cross correlating Gjerstad's and Åström's type series. There are several observations to be made from this exercise. In the first instance, and by far the most obvious, is the *lack* of correlation between Åström's typology and that devised by Gjerstad. The same vessels have been classified under different Ware categories. Where Åström has moved a vessel into another Wares type the new type is indicated in the listing by bold characters. Where there is no entry under Åström for Gjerstad's class, no entry has been found within Åström's corpus. In view of these inconsistencies it is difficult, in the light of Åström's widely accepted classification, to agree with the chronological underpinnings of Gjerstad's typology especially the stratigraphic associations of each ware as observed at Kalopsidha. Åström has, like Gjerstad before him, introduced into the catalogue, and consequently the White Painted sequence, the belief that each type is either earlier or later than another. He uses such terms as transitional "White Painted II-III" and "late White Painted III" which indicate a chronological bias to the classification.

A further difficulty lies in the impracticality of the typology devised by Åström for shape. In each numerical division (i.e type) a different Roman numeral is given for each shape category. the confusion arises when in White Painted IV a jug is Type IX (*SCE* IV.1B, 52) whereas in White Painted V the jug category is Type V (*SCE* IV.1B, 69). Similarly the subdivisions of shape are inconsistently applied. In White Painted IV-VI Cross Line Style Type I A (Type I = jug), A denotes "Handle from rim to shoulder" (*SCE* IV.1B, 64) and in White Painted V Type V A (Type V = jug), A represents "High handle from rim to shoulder".

The abbreviations used in the listings are given below on p.158. Full bibliographic and pottery term abbreviations are given above (pp.vii-viii).

GJERSTAD SPC 1926	CONTEXT	ÅSTRÖM SCE IV.1B (1957) 1972 ¹	
p152 bowl 1 WP II		p13 I.A.b	<i>trs WP II-III?</i>
p152 jug 1 WP II		p14 III.D.1.c	WP II
p152 jug 2 WP II	L.47	p14 III.D.1.d	WP II
p152 jug 3 WP II	L.9	p15 IV.C.1.a	WP II
p152 jug 4 WP II	L.203B	p13 III.B.2.a	WP II
p152 jug 5 WP II?	A.Paras	p15 V.A.1.a	<i>trs WP II-III</i>
p152 flask 1 WP II		p42 X.A.2.a	<i>WP III-V SHS</i>
p152 amph 1 WP II	L.46A	p16 VI.f	WP II
p152 amph 2 WP II		p25 VIII.B.e	<i>WP III</i>
p152 amph 3 WP II		p15 VI.a	WP II
p152 vase WP II	A.Paras	p16 VIII.a	WP II
p152 vase 1 WP II	A.Paras	p25 IX.a	<i>WP III</i>
p157 bowl 1 WP III		p51 V.a	<i>WP IV</i>
p157 bowl 2 WP III		p125 III.a	<i>BS/WP III-IV</i>
p157 bowl 3 [a] WP III		p19 I.a	WP III
p157 bowl 3 [b] WP III		p49 I.A.c	<i>WP IV</i>
p157 bowl 4 WP III		p51 VI.a	<i>WP IV</i>
p157 bowl 5 WP III	L.138	p50 I.C.a	<i>WP IV</i>
p157 bowl 6 WP III		p49 I.B.a	<i>WP IV</i>
p157 bowl 7 WP III			
p157 bowl 8 WP III		p68 IV.a	<i>WP V</i>
p157 bowl 9 WP III	L.50	p19 II.b	WP III
p157 bowl 10 WP III		p32 I.b	<i>WP III-IV LDS</i>
p157 bowl 11 WP III		p34 I.a	<i>WP III-V SHS</i>

¹ Some vessels notably WP V (Gjerstad) are catalogued by Åström in SCE IV.1C as WP VI. These entries are marked with an asterisk.

p157 bowl 12 WP III		p19 II.a	<i>late WP III</i>
p157 bowl 13 WP III	Yeri	p32 I.a	<i>WP III-IV LDS</i>
p157 bowl 14 WP III	L.21	p51 IV.a	<i>WP IV</i>
p157 bowl 15 WP III	L.21	p34 II.a	<i>WP III-V SHS</i>
p157 bowl 16 WP III		p51 VII.a	<i>WP IV</i>
p157 bowl 17 WP III		p68 III.a	<i>WP V</i>
p157 jug 1 WP III	L.4	p54 IX.C.1.b	<i>WP IV</i>
p157 jug 2 WP III		*p57 V.D.1.d	<i>WP V-VI?</i>
p157 jug 3 WP III	L.29	p24 IV.D.1.c	<i>WP III</i>
p157 jug 4 WP III	Chom Tb 3	p36 IV.C.1.b	<i>WP III-V SHS</i>
p157 jug 5 WP III	L.18A	p53 IX.B.5.b	<i>WP IV</i>
p158 jug 5 WP III	?Lamb T.9 or 28	p35 V.B.1.a	<i>WP III-V SHS</i>
p158 jug 6 WP III		p52 IX.A.1.a	<i>WP IV</i>
p158 jug 7 WP III		=p39 VI.A.1.a ²	<i>WP III-V SHS</i>
p158 jug 8 WP III		p72 VI.A.1.a	<i>WP V</i>
p158 jug 9 WP III		p53 IX.A.5.a	<i>WP IV</i>
p158 jug 10 WP III		p20 IV.A.3.c	<i>WP III</i>
p158 jug 11 WP III		p20 IV.A.4.b	
p158 jug 12 WP III	L.8	p20 IV.A.2.a	<i>WP III</i>
p158 jug 13 WP III		p36 V.B.2.a	<i>WP III-V SHS</i>
p158 jug 14 WP III	L.29	p54 IX.7.a	<i>WP IV</i>
p158 jug 15 WP III	Kyth Tb 1	p70 V.D.2.a	<i>WP V</i>
p158 jug 16 WP III		p23.IV.C.3.c	<i>WP III</i>
p158 jug 17 WP III		p36 IV.C.2.e	<i>WP III-V SHS</i>
p158 jug 18 WP III	39 VII.A.1.a		<i>WP III-V SHS</i>
p158 jug 19 WP III		p46 XV.c	<i>WP III-V SHS</i>

² Åström does not give a reference here to Gjerstad but it is most likely the same vessel.

p158 jug 20 WP III	L.50	p57 XII.A.1.b	<i>WP IV</i>
p158 jug 21 WP III	L.47	p57 XII.A.2.A	<i>WP IV</i>
p158 jug 22 WP III		p69 V.A.1.a	<i>WP V</i>
p158 jug 23 WP III		p73 VIII.A.1.a	<i>WP V</i>
p159 bottle 1 WP III		p29 II.C.a	<i>WP III-IV PLS</i>
p159 bottle 2 [a] WP III		p29 II.C.d	<i>WP III-IV PLS</i>
p159 bottle 2 [b] WP III		p29 II.B.c	<i>WP III-IV PLS</i>
p159 bottle 2 [c] WP III		p73 IX.A.1.b	<i>WP V³</i>
p159 bottle 3 WP III		p74 X.C.1.d	<i>WP V</i>
p159 flask 1 WP III	L.47	p42 X.B.1.d	<i>WP III-V SHS</i>
p159 flask 2 WP III		p59 XIV.B.3.a	<i>WP IV</i>
p159 flask 3 WP III	L.49	p42 X.B.2.a	<i>WP III-V SHS</i>
p159 flask 4 WP III	L.51	p44 X.C.3.a	<i>WP III-V SHS</i>
p159 flask 4 WP III			
p159 flask 5 WP III	Klavdhia Tb A.12	p43 X.B.3.h ⁴	<i>WP III-V SHS</i>
p159 flask 6 WP III		p75 X.E.1.a	<i>WP V</i>
p159 amph 1 WP III			
p159 amph 2 WP III	L.189	p61 XV.A.e	<i>WP IV</i>
p159 amph 3 WP III	L.49	p61 XV.B.c	<i>WP IV</i>
p159 amph 4 WP III		p75 XII.A.a	<i>WP V</i>
p160 jar 1 WP III	Lamb Tb 18	p62 XV.B.c	<i>WP IV</i>
p160 vase 1 WP III	L.50	p46 XIV.A.3b	<i>WP III-V SHS</i>
p160 vase 2 WP III		p46 XIV.A.3b	<i>WP III-V SHS</i>
p160 vase 1 WP III	L.21	p47 XVI.d	<i>WP III-V SHS</i>
p160 comp vase 2 WP III		p63 XIX.a	<i>WP IV</i>

³ Åström SCE IV.1B n.1 "Partly White Painted IV-V Ware, mainly distinguishable from White Painted IV Ware by the decoration."

⁴ see n 2.

p160-comp vase 3 WP III		p63 XIX.b	WP IV
p160 comp vase 4 WP III		p47 XVI.e	WP III-V SHS
p169 jug 1 WP IV		p64 I.I.3.d	WP IV-VI CLS
p169 jug 2 WP IV	Kalop Tb 11	p65 I.A.3.f	WP IV-VI CLS
p169 jug 3 WP IV		p28 I.A.3.A	WP III-IV PLS
p169 bottle 1			
p172 bowl 1 WP V	Kalop Tb 11	p67 I.C.b	WP V
p172 bowl 2 WP V	Kalop Tb 17	p67 I.C.a	WP V
p172 jug 1 WP V		*p58 V.D.2.D	WP VI
p172 jug 2 WP V		*p69 V.B.1.b	WP V
p172 jug 3 WP V		*p57 V.D.2.a	WP VI
p172 jug 4[a] WP V		*p58 V.D.2.c.	WP VI
p172 jug 4[b] WP V		*p59 V.D.2.f	WP VI
p172 jug 4[c] WP V		*p58 V.D.2.c	WP VI
p172 jug 5[a] WP V		*p58 V.D.2.e	WP VI
p172 jug 5[b] WP V		*p58 V.D.2.e	WP VI
p172 jug 6 WP V		*p56 V.B.3.a	WP VI
p172 jug 7 WP V		*p56 V.B.3.a	WP VI
p172 jug 8 WP V		*p61 VII.A.a	WP VI
p172 jug 9 WP V		*p60 VI.B.b	WP VI
p172 flask 1 WP V		p73 X.A.1.a	WP V
p172 flask 2 WP V		*p62 X.a	WP VI
p172 flask 3 WP V	A.Paras	*p62 IX.B.a	WP VI
p172 flask 4 WP V		*p59 V.F.1.a	WP VI
p173 amph 1 WP V		p68 IV.f	WP V-VI
p173 amph 2 WP V			
p173 amph 3 WP V		p76 XII.D.a	WP V
p173 amph 4 WP V		p76 XII.E.a	WP V

p173 rattle 1 WP V	*p64 XIV.a	WP VI
p176 animal vase 1	p29 III.a	WP III-IV PLS
p176 animal vase 2	p77 XIII.e	WP V
p176 animal vase 3	p76 XIII.c	WP V
p176 animal vase 4	p76 XIII.d	WP V
p176 animal vase 5	p76 XIII.a	WP V
p176 animal vase 6		
p176 animal vase 7	p25 XI.c	WP III
p176 animal vase 8	p77 XIII.e	WP V
p177 animal vase 9		
p177 animal vase 10		

Abbreviations

L.	Lapithos
Lamb	Lambertis
Kalops	Kalopsidha
Kyth	Kythrea
Tb	Tomb
A.Paras	A. Paraskevi
Chom	Chomazoudhia
trs	transitional
amph	amphora
comp	composite

APPENDIX II

Measurements in cm of WP FLS and WP CLS juglets used in Figs 6-7 (Chapter III)

White Painted Fine Line Style

JUGS	MX DIAM	HT	HtMxD
176	6.7	11.2	
177	8.3	12.5	
178	9.6	15.9	4
180	9.1	17.7	
185	9.7	10.8	3
763	7.5	12.6	2.5
1264	8	11.8	
1266	7.6	12.7	2.5
1267	7.9	12.8	2.5
1268	9.2	11.8	4
1269	7.4	6.6	3
742	9.5	18.5	4
718	8	13.5	4
732	6.5	11.5	6.5
730	8	13.5	4
727	8.5	14	4
729	8.5	15	4
745	7.5	12	2.5
741	10	16.5	4
1955	9	15.5	4
84	7	10.7	2
282	8	13	3
4.131	15	26.3	5.5
4.143	8.3	13.4	3
736	8.5	14.5	3.5
740	9.4	12.5	4
1968	10.6	16	4
1968	10	15	5
710	21	16.5	6.5

White Painted Cross Line Style

JUGS	MxDiam	MxHt	HtMxDiam
798	13	20	5
1970	10.4	13	6
38	6.5	10.4	3
18	17.3	22	7
787	6.5	11.5	3
1933	10	14.5	4
1937	8.5	15	8.5
1942	8.5	12.5	3
1956	23	31	9
1963	18	27.1	8.5
1950	12	19	5.5
1939	7.5	11	3.5
1956	17.5	27	10
782	15.5	23	7.5
799	13	19	7
783	14	21	7
786	6.8	11	4
784	9	13.5	4
804	6.5	10.5	4
789	6.5	11.5	3
785	8	12	4

APPENDIX III

Table A: White Painted III

This table has been compiled with information extracted from *SCE* IV.1C 18-27. It should be used in conjunction with Chapter IV, Figs 11 and 12. The format is as follows: the numbers in superscript represent each vessel. Where there is no known context, the museum/collection location has been inserted for easy reference, the third column from the left is a list of page references for each item. The abbreviations peculiar to the following three tables can be found on p.162.

Site	WP III Contexts	Åström <i>SCE</i> IV.1B Page ref
Kouklia	1	1 25
Kalopsidha	1 T.2,1894	1 24
Alambra	1 HCC ² HCC ³ Atlas II	1 21 ² 25 ³ 26
Yeri	1 GB	1 19
Ayia Paraskevi	1 MELB ² MELB ³ Kypros ⁴ Kypros ⁵ Kypros ⁶ MELB ⁷ Kypros ⁸ GB ⁹ Kypros	1 19 ² 19 ³ 19 ⁴ 19 ⁵ 20 ⁶ 20 ⁷ 23 ⁸ 25 ⁹ 25
Dhenia (looted)	1 Tb C ² Tb F ³ HNM ⁴ HNM ⁵ Tb C ⁶ Tb C ⁷ Tb H	19 ² 21 ³ 22 ⁴ 22 ⁵ 26 ⁶ 25 ⁷ 26
Leon. Vouno	1 GB ² GB	1 19 ² 19
Ayios Iakovos	1 Tb 6I?	1 22
Katydhata	1 Tb 85II* ² Tb 85II	1 20 ² 22
Vounous	1 Tb 40.7 ² Tb 50 ³ Tb 50 ⁴ Tb 37.96	1 19 ² 23 ³ 24 ⁴ 25
Lapithos 315A	5 Tb 40 ⁶ Tb 57	5 25 ⁶ 25
315B-C ^I	1 2 3 4	1 18 ² 19 ³ 22 ⁴ 22
315B-C ^{II}	1-2 3 4-5	1-2 22 ³ 25 ⁴⁻⁵ 26
315Cup1	1	1 22
316 ^I	1-3 4-5 6-8	1 20
	9-12 13-16 17-18	1-3 18 ⁴⁻⁵ 19 ⁶⁻⁸ 21
316 ^{II}	1 2 3 4	9-12 22 13-16 23 17-18 24
316Cup1	1	1 19 ² 20 ³ 23 ⁴ 25
320	1-2 3-4 5 6	1 19
	7-8	1-2 18 ³⁻⁴ 19 ⁵ 20 ⁶ 22
322D	1	7-8 23
14E	1 2-3 4 5-6	1 18
18A	1-8 9 10 11 12-13	1 18 2-3 20 4 21 5-6 23
29	1-4 5 6 7-8	1-8 18 9 19 10 20 11 22
	9	12-13 23
13B	1 2	1-4 18 ⁵ 21 ⁶ 22 ⁷⁻⁸ 23
47	1 2	9 24
		1 22 ² 25
		1 18 ² 23

Site	WP III Context	Åström SCE IV.1B Page ref
Lapithos 49	1-10 11-12 13	1-10 18-19 11-2 19 13 22
315 Cup3	14	14 23
6A	1	1 24
50	1-5 6 7-8 9	1-5 19 6 21 7-8 22
8	1 2	1 20 2 23
311A	1-2 3-4 5	1-2 19 3-4 21 5 22
303B	1	1 23
319B	1	1 19
21	1 2	1 21 2 22
51	1-2 3 4-5	1-2 19 3 20 4-5 22
44	1	1 23
45	1	1 19
9	1	1 24
203A	1 2-4	1 19 2-4 22
203B	1	1 19
203C*	1	1 22

Table B: White Painted IV

This table uses the information from SCE IV.1B, 48-63. It can be used in conjunction with Chapter IV, Fig 11. The format is as for Table A above.

Site	WP IV Contexts	Åström SCE IV.1B Page ref
Kalopsidha	1 Str 1 or 2	1 51
Yeri	1 GB 2 GB 3 GB 4 GB 5 GB	1 49 2 49 3 49 4 52 5 58
	6 GB 7 GB	6 59 7 62
Ayia Paraskevi	1 Theoph St 2 Tb 12 3 Tb 13 4	1-4 49
	5 Tb 13 6 MELB 7 Theoph St 8 MELB 9	5-6 50 7-8 51 9 54
	10 MELB	10 55
Dhenia	1 TbG 2 TbA 3 TbF 4 TbE 5 TbH	1 49 2 51 3 51 4 54 5 55
Leon. Vouno	1 2	1 52 2 58
Ayios Iakovos	1 Tb 6 ^I 2 Tb 6 ^I	1 49 2 51
Katydhata	1 Tb 85 ^{II} * 2 Tb 85 ^{II} 3 Tb 85 ^{II}	1 52 2 55 3 55
Vounous	1 Tb 50	1 61
Lambertis	1 Tb 38 2 MELB 3 4 MELB 5 MELB	1 49 2 49 3 50 4 51 5 52
	6 Tb 38 7 MELB 8 Tb 18	6 55 7 58 8 62
Stephania	1 Tb 13 2 Tb 13 3 Tb 10	1 49 2 55 3 57
Klavdhia	1 2 Tb 15	1 52 2 55
Arpera	1 Tb 103	1 52
Laxia tou Riou	1 Tb 1	1 55
Enkomi	1 Tb 20	1 57
Dhali	1 GB 2	1 58 2 59
Milia	1 Tb 10 2	1 59 2 62
Lapithos 315A	1 2-6 7 8	1 48 2-6 49 7 50 8 51
	9 10-12 13-14	9 52 10-12 58 13-14 59
	15-16 17-18	15-16 60 17-18 61
315B-C ^I	1-3 4	1-3 49 4 50
315 Cup2	1	1 50

* L 320.37 is marked in the index (SCE IV.1B, 297) as an entry on page 52. However, no such entry has been located.

Site	WPIV Contexts	Åström SCE IV.1B Page ref
Lapithos --		
315 Cup3	1	1 49
316 ^I	1-5 6-9 10	1-5 48 6-9 49 10 50
	11-12 13 14	11-12 52 13 54 14 59
	15 16 17	15 58 16 59 17 61
316 ^{II}	1-3 4 5 6	1-3 48 4 57 5 58 6 59
316Cup2	1	1 49
320	1-2 3-7 8	1-2 48 3-7 49 8 50
	9-11 12-13 14	9-11 52(1*) 12-13 53
	15-16	14-15 59 16 60 17 61
320Cup 2	1 2	1 49 2 50
320Cup 3	1	1 48
322D	1 2	1 49 2 54
18A	1-13 14 15-16	1-13 48 14 49 15-16 50
	17 18 19-20	17 51 18 52 19-20 53
	21-22 23-24 25	21-2 54 23-4 55 25 56
29	26-27 28 29-30	26-7 58 28 59 29-30 61
	31 32	31 56 32 57
13B	1 2-4	1 49 2-4 50
47	1	1 47
49	1-3 4 5-6 7-8	1-3 48 4 53 5-6 54 7-8 57
	9 10-11	9 58 10-11 61
50	1-9 10 11	1-9 48 10 50 11 51
	12-13 14-17	12-13 53 14-17 55
	18-20 21 22	18-20 57 21 58 22 60
	23 24-25 26	23 61 24-5 61 26 62
8	1-2 3 4 5	1-2 48 3 53 4 54 5 57
	6-7 8	6-7 58 8 61
21	1 2-4 5-6 7	1 48 2-4 50 5-6 51 7 54
	8 9 10 11	8 55 9 57 10 58 11 59
	12 13-15	12 60 13-15 61
51	1 2-3 4	1 48 2-3 49 4 50
203A	1 2-3 4-5	1 48 2-3 50 4-5 56
203B	1 2	1 53 2 61
10A	1	1 48
42	1	1 48
204	1 2 3	1 48 2 49 3 57
4	1 2-3 4 5	1 49 2-3 50 4 51 5 52
	6 7 8 9	6 53 7 54 8 57 9 60
	10-14 15	10-14 61 15 62
52	1	1 50
47	1-2 3 4 5-6	1-2 50 3 54 4 57 5-6 58
15	1 2 3	1 50 2 57 3 59
702	1 2	1 53 2 57
28	1 2	1 54 2 61
44	1	1 54
201B	1	1 57
35	1 2 3	1-2 58 3 61
51	1 2	1 58 2 61
14D	1	1 61
323D	1	1 61
46B	1	1 61

1* L.320.37 is marked in the index (SCE IV.1B, 297) as an entry on page 52. However, no such entry has been located.

Table C: White Painted Pendent Line Style; White Painted Cross Line Style

The information used in this table is from SCE IV.1B, 27-30, 63-66 for each ware respectively. It is graphically summarised in Chapter IV, Fig 12.

Site	WP PLS	WP CLS	Åström SCE IV.1B Page ref
Nitovikla I	1	1	1 27 1 66
2II	1		1 28
3	1		1 27
Kalposidha		1	1 65
	1		1 28
T.11	1 2 3	1-8	1-2 27 3 29 1-3 64 4-8 65
		9-10	9-10 65
T.25		1	1 65
T.27		1	1 64 Ayia Paraskevi?
	1 Kypros 2 CVA		1 27 2 29
A.Paraskevi- (Theoph.St)	1 Tb2		1 28
Yeri	1-5 GB		1 27 2-4 28
			5 29
Dhioros	1 NM		1 27
Alambra	1 Atlas		1 28
Kythrea T.1	1 2	1 2 3	1-2 28 1-3 64
Lambertis T.21?	1		1 28
T.38		1	1 65
T.25 Sect V		1	1 66
Paleoskoutella	1		1 28
Lapithos T.18A	1 2	1	1 28 2 29 1 64
316I	1		1 29
316II	1		1 29
8	1		1 29
21	1		1 29
28	1		1 29
29	1		1 29
49	1		1 29
50	1		1 29
"Paphos" Region	1		1 29
Dhali	1		1 29
Dhenia Tb G	1 HNM		1 29
Milia Tb 11		1	1 64
Milia Tb 10		1 2	1 64 2 65
Enkomi		1-2 NM	1-2 66
Enkomi T.5		1	1 64
Enkomi T.7		1	1 66
Enkomi T.10 Eng		1 GB	1 65
T.11		1	1 64
T.19		1	1 64
T.21		1	1 65
Arpera T.203		1	1 64

APPENDIX IV

The following tabulations are a summary of a database designed to accommodate the contextual data pertaining to Cypriot pottery found in Syro-Palestine and Egypt. The tables comprise the following information and layout.

Tables A-D Site Information

Tables A-D Associated Pottery 'utilitarian'

Bowls, Storage Jars, Dippers, Jugs and Bichrome Ware

Tables A-D Associated Pottery 'small narrow-necked juglets'

Red Polished Ware, Cypriot Wares, Tell el Yahudiyeh Ware

The control key to the types of pottery (as indicated in Chapter V) can be conveniently divided for ease of recognition into the following numerical categories (specifically designed for computation), illustrated Fig 1.

BOWLS

- 01 flaring carination/squat
- 02 flaring carination/deep
- 03 shallow bowls/ platters
- 04 other

DIPPERS

STORAGE JARS

- 01 ovoid handleless
- 02 ovoid handles
- 03 one handled
- 04 ear shaped
- 05 other

JUGS

- 01 high handle
- 02 trefoil
- 03 other

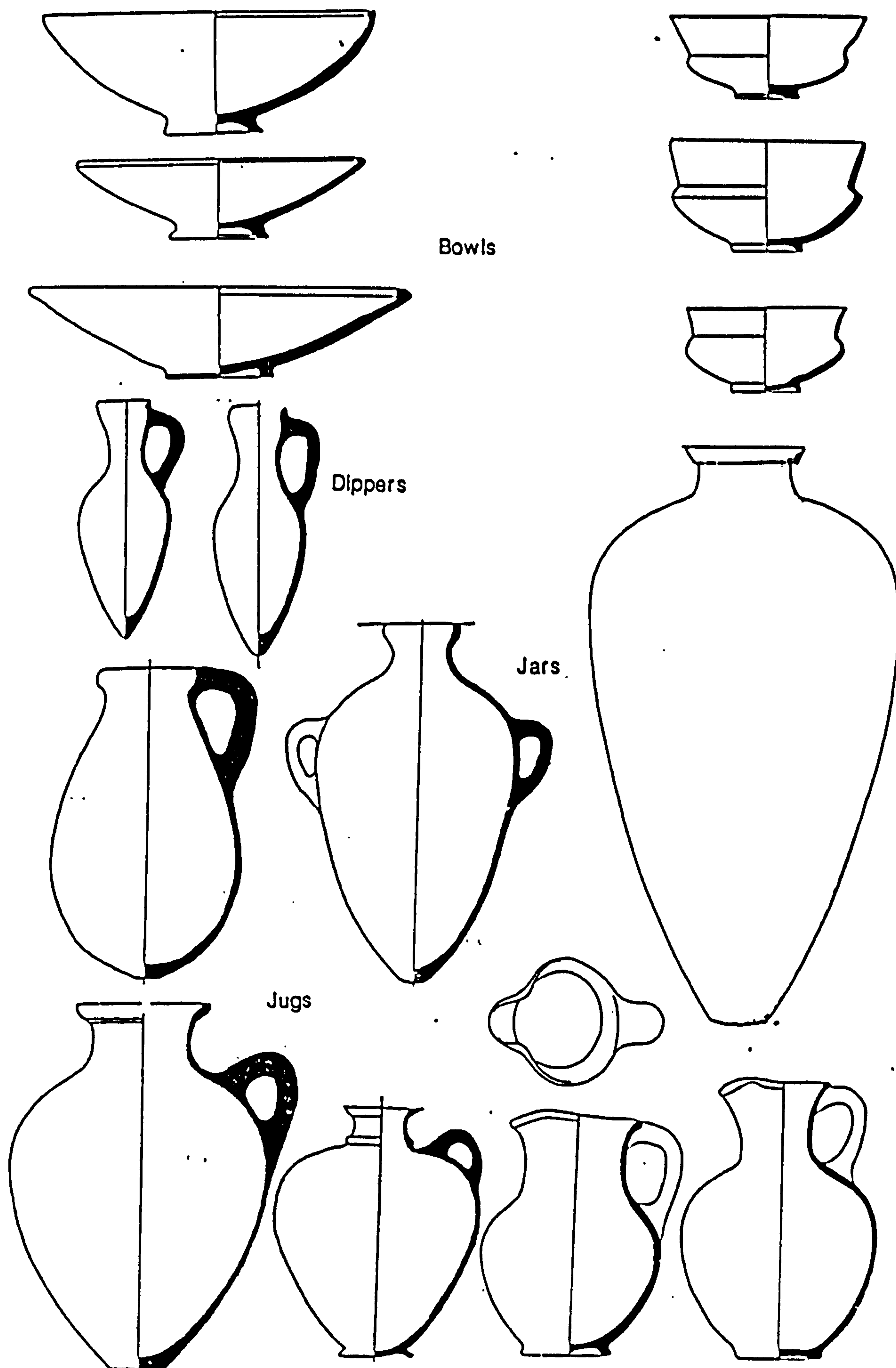


Figure 1: Standard types of pottery associated with Cypriot pottery

RED POLISHED

- 01 piriform
- 02 cylindrical
- 03 other
- 04 Red Burnished Wares (collared, trefoil, cylindrical)

CYPRIOT

- 01 WP CLS
- 02 WP PLS
- 03 WP V
- 04 WP IND
- 05 RoB
- 06 PWS
- 07 other

TELLELYAHUDIYEHWARE

- 01 piriform
- 02 globular
- 03 cylindrical
- 04 biconical
- 05 other

BICHROME

- Palestinian
- Cypriot

The 'other' category is generally those instances where the types cannot be readily identified, for example, sherd material or incomplete records or photographs. In the case of the cemetery site at Dhahrat el-Humraiya there were several cases where Ory (1948) had recorded occasions where there were "dipper juglets"; button-base juglets" or "a number of button-base juglets". It was assumed, therefore, that the number was greater than 3 but probably no more than 5, hence 5 was taken to be the amount. Where "a group of juglets" was mentioned the maximum number assumed to have existed is 10. In view of the limited amount of information from all the tomb groups no statistical analysis has been carried out.

The majority of the contexts from Tell el Dab'a are unpublished. Where possible any relevant information has been inserted but until final publication the analysis is temporary.

Site Information (A)

Ref No	Site Name	Tomb No	Settlement	Tomb type	Publication	Notes
3001	Gezer	1		chamber & shaft	Macalister 1912 I, III	
3002	Gezer	3		chamber & shaft	Macalister 1912 I	
3003	Gezer	4		step shaft, chamber	Macalister 1912	
3004	Tell Nagila	DT2		chamber 3 adjoining	Amiran & Eitan 1965	45 skeletons
3005	Tell Nagila		Area A StrVIII, VII		Amiran & Eitan 1965	
3006	Tell Mevorakh		Str XII, Fig 26		Stern 1984	
3007	Ginosar	2/3		shallow pit/chamber	Epstein	
3008	Ginosar	4		chamber & cave	Epstein	
3009	Lachish	129		chamber & shaft	Tufnell 1953, 1958	
3010	Lachish	157		disturbed	Lachish IV.231	
3011	Lachish	Cave 1546		cave	Lachish IV.270-2	
3012	Lachish	Cave 1547		cave	Lachish IV.270-2	
3013	Lachish	Cave 1552		cave	Lachish IV.270-2	
3014	Lachish		Locus outwith settl		Lachish IV.225	
3015	Lachish	115		chamber & shaft	Lachish IV.228	
3016	Lachish	Cave 1542	reused EB cave		Lachish IV.270	
3017	Lachish	173		oval pit?	Lachish IV.232	
3018	Lachish	145		oval? disturbed	Lachish IV.230	body missing disturb
3019	Lachish		4008 hole in SqU.2		Lachish IV.285	
3020	Lachish	1502		chamber & shaft	Lachish IV.254	
3021	Lachish	119		oval chamber/shaft	Lachish IV.228-9	no bodies recorded
3022	Lachish		cave 6028 in SqV.4		Lachish IV.302c.	6-7 burials
3023	Lachish	Cave 6027	cave 6027 in SqV.4		Lachish IV.301	13 adults 1 child *
3024	Lachish	153		Bilobate chamber	Lachish IV.230-1	bodies dist. fem?
3025	Dhahrat el Humraiya		1	Sq d/5 Fig 2	Ory 1948	
3026	Dhahrat el Humraiya		2(£3)	Sq d/5 Fig 2	Ory 1948	
3027	Dhahrat el Humraiya		5			
3028	Dhahrat el Humraiya		4	Sq d/2 Fig 2	Ory 1948	

(B) Ref No	Site Name	Tomb No.	Settlement	Tomb type	Publication	Notes
3029	Dahrat el Humraiya	6		Sq e/6 Fig 2	Ory 1948, 80	no grave plan
3030	Dahrat el Humraiya	7		Sq e/4 Fig 2	Ory 1948, 80	no grave plan
3031	Dahrat el Humraiya	8		Sq e/4 Fig 2	Ory 1948, 80	no grave plan
3032	Dahrat el Humraiya	9		Sq d/3 Fig 2	Ory 1948, 81	PLXXIX.4 gr. of goats
3033	Dahrat el Humraiya	11		Sq d/4 Fig 2	Ory 1948, 81	PLXXIX.5; XXX.1
3034	Dahrat el Humraiya	12		Sq d/5 Fig 2	Ory 1948, 81	no grave plan
3035	Dahrat el Humraiya	13		Sq e/5 Fig 2	Ory 1948, 81	no grave plan
3036	Dahrat el Humraiya	15		Sq e/5 Fig 2	Ory 1948, 82	no grave plan
3037	Dahrat el Humraiya	18		Sq d/5 Fig 2	Ory 1948, 82	no skeletal remains
3038	Dahrat el Humraiya	19		Sq e/5 Fig 2	Ory 1948, 82	contracted body
3039	Dahrat el Humraiya	20		Sq e/5 Fig 2	Ory 1948, 82	below Grave 19
3040	Dahrat el Humraiya	21		Sq c-d/3-4 Fig 2	Ory 1948, 82-3	disturbed
3041	Dahrat el Humraiya	22		Sq e/5 Fig 2	Ory 1948, 83	no grave plan
3042	Dahrat el Humraiya	25		Sq e-d/6 Fig 2	Ory 1948, 83	contracted & animal
3043	Dahrat el Humraiya	27		Sq d/6 Fig 2	Ory 1948, 83	Extended body
3044	Dahrat el Humraiya	28		Sq d/6 Fig 2	Ory 1948, 83	Extended body
3045	Dahrat el Humraiya	29		Sq c/4 Fig 2	Ory 1948, 83	disturbed
3046	Dahrat el Humraiya	30		Sq d/5 Fig 2	Ory 1948, 83	no skeletal remains
3047	Dahrat el Humraiya	31		Sq d/5 Fig 2	Ory 1948, 83	no skeletal remains
3048	Dahrat el Humraiya	32		Sq d/5 Fig 2	Ory 1948, 83	human & animal dist.
3095	Dahrat el Humraiya	34		Sq d/6 Fig 2	Ory 1948, 84	no grave plan
3096	Dahrat el Humraiya	35			Ory 1948, 84	crushed pottery
3097	Dahrat el Humraiya	36			Ory 1948, 84	dist remains body
3098	Dahrat el Humraiya	37		Sq d/6	Ory 1948, 84	no bones
3099	Dahrat el Humraiya	38		Sq d/5	Ory 1948, 84	slightly contracted
3100	Dahrat el Humraiya	39		Sq d/6 Pl XXX, 4	Ory 1948, 84	Contracted burial
3101	Dahrat el Humraiya	40		Sq d/5 Pl XXX, 5	Ory 1948, 84	Frag bones
3102	Dahrat el Humraiya	41		Sq d/5 Pl XXX, 6	Ory 1948, 84	Crushed skull

(C) Ref	Site Name	Tomb No	Settlement	Tomb type	Publication	Notes
3103	Dahrat el Humraiya	42		Sq d/5	Ory 1948, 84	Few bones
3104	Dahrat el Humraiya	43		Sq c/4	Ory 1948, 84	No remains of body
3105	Dahrat el Humraiya	44		Sq d/6 Pl XXI, 1	Ory 1948, 84-5	Animal. Contracted.
3106	Dahrat el Humraiya	45		Sq c/d	Ory 1948, 85	Skull remains
3107	Dahrat el Humraiya	46			Ory 1948, 85	No bones
3108	Dahrat el Humraiya	47		Sq c/5	Ory 1948, 85	No bones
3109	Dahrat el Humraiya	48		Sq c/5	Ory 1948, 85	Disturbed body
3110	Dahrat el Humraiya	49		Sq b-c/4	Ory 1948, 85	Animal bones. Body
3049	Dahrat el Humraiya	50		Sq c-d/6 Fig 2	Ory 1948, 86	no skeletal remains
3050	Dahrat el Humraiya	51, 52		Sq c/5 Fig 2	Ory 1948, 86	two burials PLXXI.2
3051	Dahrat el Humraiya	53		Sq c/5 Fig 2	Ory 1948, 86	poss of 48 PLXXI.4
3052	Dahrat el Humraiya	54		Sq c/6 Fig 2	Ory 1948, 86	p'haps with 56?
3053	Dahrat el Humraiya	55		Sq c/5 Fig 2	Ory 1948, 86	
3054	Dahrat el Humraiya	57		Sq c/6 Fig 2	Ory 1948, 87	cist LB 3 bodies
3055	Dahrat el Humraiya	58		Sq b/5 Fig 2	Ory 1948, 87	scattered remains
3056	Dahrat el Humraiya	59		Sq c/6 Fig 2	Ory 1948, 87	few scattered remain
3057	Dahrat el Humraiya	60		Sq b/4 Fig 2	Ory 1948, 87	contracted burial
3058	Dahrat el Humraiya	61		Sq a/1-2 Fig 2	Ory 1948, 87	partly disturbed
3059	Dahrat el Humraiya	62 (61)		Sq a-b/1 Fig 2	Ory 1948, 88	dist. close to 61
3060	Dahrat el Humraiya	63		Sq b/5	Ory 1948, 88	contracted burial
3061	Beth Shemesh	T.3		shaft & chamber	Grant 1929, 26	T3-WBA oem PIs115-36
3062	Tell Dan	4663		passage & chamber	Biran 1986, 168-87	
3063	Tell Sukas	T.IV		Fig 4 Plan 3	Thrane 1978	17 bodies iii-ix
3064	Beth Pelet	550		bilobate	Petrie 1930Pl VIII (full plan)	
3065	Beth Pelet	551		bilobate	Petrie 1930Pl XVII (full plan)	
3066	Beth Pelet	554		bilobate	Petrie 1930Pl XVIII	
3067	Beth Pelet	563		?	Petrie 1930Pl XVIII	
3068	Beth Pelet	569		bilobate	Petrie 1930Pl XVIII	
3069	Beth Pelet	565		bilobate	Petrie 1930Pl XVIII	
3070	Beth Pelet	566		bilobate	Petrie 1930Pl XVIII	

(D) Site Name Ref No	Tomb No Settlement	Tomb type	Publication	Notes
3071 Beth Pelet	556	bilobate	Petrie 1930Pl XVIII	
3072 Beth Pelet	568	bilobate?	Petrie 1930Pl XVIII	
3073 Beth Pelet	545	chamber & shaft	Petrie 1930Pl XVIII	
3074 Beth Pelet	570	chamber & shaft	Petrie 1930Pl XVIII	
3075 Beth Pelet	555	bilobate	Petrie 1930Pl XVIII, Pl VIII	
3076 Beth Pelet	559	bilobate	Petrie 1930Pl XVII	
3077 Hazor	Area D3 L. 9039 Str2		Yadin et al 1958Pl CLXXXIII.6	
3078 Hazor	Area D2 L.R15		Yadin et al 1958Pl CLXXXII Pl XCVIII	
3079 Hazor	Area D3 L.9009 Str 3		Yadin et al 1958Pl C	
3080 Hazor	Area D3 L.9010 Str 4		Yadin et al 1958Pl C Pl CLXXXIII	
3081 Hazor	Area D5 Q14		Yadin et al 1958, 126	
3082 Hazor	Area D2 Q16		Yadin et al 1958Pl CLXXXII Pl XCVIII	
3083 Hazor	Area D1 Str 4			
3084 Hazor	Area D1 Cave Str 3		Yadin et al 1958Pl XCIV	
3085 Tell Mevorakh	Str XIII, Fig 27		Stern 1984	
3086 Ras Shamra	LIV	built, step, rectang.	Syria XIX, 213-222 Fig17,18	upper/lower
3087 Ras Shamra	XXXVI shaft and 'chamber'	Ugaritica I, 54	reused 15-14th cent	
3088 Ras Shamra	LIII	built, under house	Ugaritica I, 72 Figs69-71	Syria Fig 2
3089 Ras Shamra	LVI	built, under house	Ugaritica I, 54 Figs49,50	Syria XIX,227 Fig 16
3090 Ras Shamra	LVII	built, under house	Ugaritica I, 67-73 Fig 60	Figs 60,61 Fig 49
3091 Ras Shamra	LV	built, under house	Syria XIX 222-6 Figs 24-5	Fig 16, Fig 26
3092 Ras Shamra	LXXV		Syria XX 276-95 Fig 3-5	check Figs
3093 Kafer ed-Djarra?		Fig 31, oval/circ.	Syria I, 127 Contenau, G.	
3094 Tall Daruk	Layer 24,25 Fig 8		Oldenburg & Rohweder 1981 Bronze Age strata	
3112 Tell Mevorakh	Str XII, Fig 26		Stern 1984	
3113 Ras Shamra	LXXV Fig 108	Ugaritica II		
3114 Ras Shamra	LXXXIII		Ugaritica II	
3115 Ras Shamra	XXXV	Fig 98 (pot)	Ugaritica II	
3116 Tell el Dab'a	AI-g4 Gr 3	built mudbrick	unpublishedl interment	
3118 Tell el Dab'a	AIJ-k17-117 Gr 13	built mudbrick	unpublished unknown	

(E)

Ref No	Site Name	Jars, Dippers, etc.	Tomb No	Settlement	Publication	Notes
3119	Tell el Dab'a		AII-k9 Gr 35	built mudbrick	unpublished	unclear
3120	Tell el Dab'a		AII-l17 Gr 5	built vault mudbrick	unpublished	1 interment
3121	Tell el Dab'a		AII-m-n/11 Gr 1	jar burial	Bietak 1979	infant
3122	Tell el Dab'a		AII-m11 Gr 7	pit grave	cf van den Brink (1982)	1 interment
3123	Tell el Dab'a		AII-n10 Pl 2/3	Gr 1	built vault mudbrick	cf van den Brink (1982)
3124	Tell el Dab'a		AII-n19 Pl 1/2	Gr 1 str D/2	no type cf van den Brink (1982)	unclear
3125	Tell el Dab'a		AII-p20 Gr3	built vault mudbrick	unpublished	unclear
3127	Tell el Dab'a		AV-p19 Gr 28	built mudbrick	unpublished	unclear
3129	Tell el Dab'a		FI-122 Gr 29	pit	unpublished	unclear
3135	Tell el Dab'a		FI-o20 Gr 10	built mudbrick	unpublished	
3136	Tell el Dab'a		FI-o20 Gr 12	built mudbrick	unpublished	
3137	Tell el Dab'a		FI-o20 Gr 14	built mudbrick	unpublished	robber's pit
3139	Tell el Dab'a		FI-o21 Gr 5	built mudbrick	unpublished	
3140	Tell el Dab'a		opfergrube 9	pit	unpublished	

Bowls, Storage Jars, Dippers, Jugs, Bichrome

(A)

Ref No	ABBREV	B01	B02	B03	B04	SJ01	SJ02	SJ03	SJ04	SJ05	DIPPER	JUGS 01	JUGS 02	JUGS 03	BICH
3001	GEZ	8		12	9	1	2					3	5	2	1
3002	GEZ					2	2								
3003	GEZ														
3004	NAG	4			5	1	3				2			1	
3005	NAG	2	2	3		1	4				5				1
3006	MEV	5			6			1		4					
3085	MEV				32					25		7			
3112	MEV	3			29			1		7			7		
3007	GIN	25		2	18						5		6		
3008	GIN	9	2	3			1	3	1		2		2	3	
3009	LACH	10			1	1			2		8		1		
3010	LACH	1			2										
3011	LACH	11					1				2		1	1	
3012	LACH	2									3				
3013	LACH	12		2	1		1				4			1	
3014	LACH	2			1						1				
3015	LACH	3					1						1	4	
3016	LACH	4					2				1			1	
3017	LACH	2												2	
3018	LACH														
3019	LACH	2									4				
3020	LACH	6				1	1				2				
3021	LACH	12				4	5				6		1	1	
3022	LACH	4									2				
3023	LACH	11		2							4			2	
3024	LACH	2	1	1	1		3		1		3				
3025	DHAH			3	1					5					

(B) Ref No	ABBREV	B01	B02	B03	B04	SJ01	SJ02	SJ03	SJ04	SJ 05	DIPPER	JUGS 01	JUGS 02	JUGS03	BICH
3026	DHAH		5				7				5				
3027	DHAH		5		1					5					
3028	DHAH				10	2	3				5				
3029	DHAH										1				
3030	DHAH									5					
3031	DHAH						2								
3032	DHAH									2					
3033	DHAH	5		5						5		5			
3034	DHAH	2								5		1			
3035	DHAH			5				1		5					
3035	DHAH	1		2							1				
3036	DHAH	2		3		1		1		3		5			
3037	DHAH				5										
3038	DHAH				5					2					
3039	DHAH									2					
3040	DHAH			1						3					
3041	DHAH									1			1		
3042	DHAH									2					
3043	DHAH														
3044	DHAH														
3045	DHAH									5					
3046	DHAH								1						
3047	DHAH			2						2					
3048	DHAH									1					
3095	DHAH			1			1			1					
3097	DHAH									1					
3098	DHAH			5				1		1					
3099	DHAH				1		2			1		1			
3100	DHAH									2		1			

(C)

Ref	ABBREV	B01	B02	B03	B04	SJ01	SJ02	SJ03	SJ04	SJ05	DIPPER	JUGS 01	JUGS 02	JUGS 03	BICH
No															
3101	DHAH			2						1	1				
3102	DHAH				5					2					
3103	DHAH			3						1					
3104	DHAH									1					
3105	DHAH			2	2		1		1		2				
3106	DHAH	1		1	2			1							
3108	DHAH	1		1	3		1	1			1		1		
3109	DHAH									1	1				
3110	DHAH	1		1	2		1				1		1		
3049	DHAH			2		1		1			1		1		
3050	DHAH	1			1		1			1	1				
3051	DHAH														
3052	DHAH														
3053	DHAH	1			1					1					
3054	DHAH														
3055	DHAH						3								
3056	DHAH						2	1		1	2				
3057	DHAH						1			1	3				
3058	DHAH				1		1								
3059	DHAH							1					3		
3060	DHAH	2								2	1				
3061	SHEM	24		28	11		3	6	2		7	1	3		
3062	DAN	3			2			2							
3063	SUK														
3064	PEL	6		2		2	3	1			5		2		
3065	PEL	5					5	1			2		2		
3066	PEL						1				1				
3067	PEL	1					1				1				
3068	PEL	3					1				3		1		
3069	PEL	7						1							
3070	PEL	1									2				

(D)

Ref	ABBREV	B01	B02	B03	B04	SJ01	SJ02	SJ03	SJ04	SJ05	DIPPER	JUGS 01	JUGS 02	JUGS 03	BICH
NO															
3071	PEL	3					3				2				
3072	PEL	1	1	1	3	1	1			1					
3073	PEL						1				1				
3074	PEL	2					2				2				
3075	PEL	2					3	1			3				
3076	PEL	6	1	2		1	4	1			5				
3077	HAZ			4	1					5					
3078	HAZ				1					4					
3079	HAZ			1						5					
3080	HAZ	1	4							2					
3081	HAZ														
3082	HAZ				1					3					
3083	HAZ		2		2					4					
3084	HAZ				1					1					
3086	RAS		2	3						1	1	2	1		
3087	RAS														
3088	RAS														
3089	RAS														
3090	RAS	1			3		2				3				
3091	RAS	1	1	4	3						4	2	1		
3092	RAS			1	1										
3093	KAER														
3094	DAR														

Red Polished, Cypriot, Tell el Yahudiyeh Ware

Ref	ABV	RP01	RP02	RP03	RP04	CYP01	CYP02	CYP03	CYP04	CYP05	CYP06	CYP07	OTH	TYH01	TYH02	TYH03	TYH04	TY05
No																		
3001	GEZ	3		1			1				1			1	1			
3002	GEZ			3														1
3003	GEZ																	
3004	NAG		1	1					1							1		
3005	NAG																	
3006	MEV							1	1	1								
3085	MEV			4		1		2		1						1		
3112	MEV		1	4			1			1		2						5
3007	GIN		11	11														
3008	GIN		4	2			1											
3009	LACH	8																
3010	LACH	4	2	1														
3011	LACH		8															
3012	LACH		11															
3013	LACH	2	5											1			1	1
3014	LACH	3	2	2														
3015	LACH	1																
3016	LACH																	
3017	LACH	1																
3018	LACH	1										1						
3019	LACH	2	1															
3020	LACH		1															
3021	LACH		2															
3022	LACH		4															

(B)	Ref	ABBV	RP01	RP02	RP03	RP04	CYP01	CYP02	CYP03	CYP04	CYP05	CYP06	CYP07	OTHER	TYH01	TYH02	TYH03	TYH04	TYH05
No																			
3023	LACH	3	14																
3024	LACH	2	2	2															
3025	DHAH			5				1											
3026	DHAH	1	1	5	5			2											
3027	DHAH			5															
3028	DHAH	1																	
3029	DHAH																		
3030	DHAH			1															
3031	DHAH	1										1							2
3032	DHAH																		
3033	DHAH	5																	
3034	DHAH							2											
3035	DHAH	6																	
3035	DHAH	10					1												
3036	DHAH	10						1											
3037	DHAH																		
3038	DHAH	1																	
3039	DHAH																		
3040	DHAH	2																	
3041	DHAH	2																	
3042	DHAH																		
3043	DHAH																		
3044	DHAH		2									2							
3045	DHAH											2							
3046	DHAH																		1
3047	DHAH	1																	
3048	DHAH		2																
3095	DHAH				2														
3097	DHAH																		
3098	DHAH																		
3099	DHAH		4																

(C)	Ref	ABBV	RP01	RP02	RP03	RP04	CYP01	CYP02	CYP03	CYP04	CYP05	CYP06	CYP07	OTHER	TYH01	TYH02	TYH03	TYH04	TYH05
No																			
3100		DHAA	1																
3101		DHAA			1														
3102		DHAA			1														
3103		DHAA			1														
3104		DHAA																	
3105		DHAA	10		2														
3106		DHAA			1														
3108		DHAA	1																
3109		DHAA																	
3110		DHAA	6																
3049		DHAA	1					1											
3050		DHAA																	
3051		DHAA																	
3052		DHAA																	
3053		DHAA	5					3											
3054		DHAA																	
3055		DHAA																	
3056		DHAA	1																
3057		DHAA																	
3058		DHAA	3																
3059		DHAA																	
3060		DHAA			2					2									
3061		SHEM	14	2	5			1							1				1
3062		DAN						2											
3063		SUK																	
3064		PEL		2															
3065		PEL		2							1								1
3066		PEL		1															
3067		PEL		1															
3068		PEL		2															
3069		PEL		4															

(D)	Ref	ABV	RP01	RP02	RP03	RP04	CYP01	CYP02	CYP03	CYP04	CYP05	CYP06	CYP07	OTHER	TYH01	TYH02	TYH03	TYH04	TYH05
No	3070	PEL		2															
	3071	PEL		3															
	3072	PEL		2															
	3073	PEL		2															
	3074	PEL		2															
	3075	PEL		4															
	3076	PEL		2															
	3077	HAZ						1	1		1								4
	3078	HAZ	2					2											
	3079	HAZ							1										2
	3080	HAZ						2											
	3081	HAZ										1							
	3082	HAZ			1					1									
	3083	HAZ								1									
	3084	HAZ									1								
	3086	RAS				7							1						
	3087	RAS			1								1						1
	3088	RAS																	
	3089	RAS									2								
	3090	RAS			9								1						2
	3091	RAS	6	1			2												
	3092	RAS		1		6													
	3093	KAFR																	
	3094	DAR																	

APPENDIX V

	BMi cal v		BMi cal v
	Brookhaven	ESRC ppm	Perlman & Asaro
Isotope			
Ce	77.9	77.7	77.5
Tb	1.11	1.17	1.23
Th	14.5	14.7	14.9
Cr	108*	114	119*
Hf	5.52*	6.04	6.55*
Ba	438		411
Cs	7.22	7.61	7.99
Rb	64.6	69.9	75.1
Sc	26.2	26.0	25.8
Ta	1.59	1.35	1.10
Fe%	5.10	5.06	5.02
Ca			
Co	17.9	18.4	18.8
Eu	1.96	1.87	1.78
Lu	0.636	0.564	0.491
U	3.24	3.44	3.63
Yb	3.53	3.57	3.61
As	8.10		8.10
Sb	0.710	0.740	0.769
Na%	0.056	0.058	0.059
K%	0.793	0.808	0.823
La	43.4	40.1	37.7
Sm	8.69	7.75	6.81

Table 1 Properties of the reference clay standard as compared to other laboratories (after Topping 1985, 35)

Sample No.	Elements													
	La	Sm	Sc	Cr	Co	Cs	Ce	Eu	Lu	Hf	Ta	Th		
21	32.408	6.1386	13.266	120.57	15.47	2.2472	75.508	1.6545	0.33671	8.875	1.442	8.8982		
22	13.716	3.0414	26.42	337.12	34.48	3.0896	37.794	1.0124	0.28813	2.8663	0.75808	4.6865		
4	16.865	3.9813	29.301	395.03	25.714	2.7189	42.402	1.2555	0.31774	3.6117	0.78716	5.0398		
5	22.204	4.8987	35.535	415.97	34.372	3.3622	55.941	1.8029	0.43701	3.4095	0.9826	7.0838		
6	36.359	7.027	16.717	135.74	19.8	2.843	83.687	1.8055	0.39656	9.2301	1.7666	8.971		
8	43.938	8.938	29.496	243.85	37.128	3.5611	103.85	2.6674	0.54729	8.7948	2.1269	10.084		
9	15.216	3.6368	27.692	343.08	31.601	2.1113	39.039	1.4095	0.31154	2.8076	0.86701	4.8641		
10	37.613	7.6894	22.341	171.21	26.274	1.2937	86.762	2.2893	0.45461	7.0582	1.7724	9.7636		
11	22.768	4.4718	11.864	131.04	11.772	1.5301	52.768	1.3183	0.36508	6.6899	1.176	7.1396		
12	24.416	4.868	29.764	409.28	33.315	5.7979	61.673	1.5583	0.42815	4.3063	1.2031	9.1245		
13	39.831	7.9707	25.854	199.25	34.561	2.3365	92.164	2.5919	0.54858	8.7126	2.0123	10.354		
14	32.005	7.2009	26.047	203.95	33.01	1.7783	76.999	2.1736	0.49763	9.2493	1.8312	8.1558		
15	24.718	4.6864	29.422	423.81	35.633	5.0975	57.53	1.5011	0.34101	4.4777	1.0164	8.8522		
16	27.22	6.7744	28.08	268.16	39.893	2.5687	87.623	2.1003	0.48954	11.175	1.9948	8.9744		
20	18.018	3.421	21.553	296.95	34.551	4.4605	45.695	0.98773	0.3036	2.6304	0.82751	7.5908		

No.	La	Sm	Sc	Cr	Co	Cs	Ce	Eu	Lu	Hf	Ta	Th
21	18.275	3.4788	18.678	338.06	26.103	3.5403	37.363	1.1192	0.27109	2.9007	0.62734	7.1938
22	18.682	3.5411	19.882	309.28	23.737	4.466	41.03	1.068	0.36243	2.9341	0.73206	7.6165
23	12.694	2.8358	26.946	283.15	45.283	3.2877	42.122	1.2433	0.3733	3.1018	1.1198	5.6760
24	13.555	2.6699	17.604	341.52	41.1201	2.1072	32.283	0.79256	0.23041	3.4245	0.95231	4.1171
25	13.262	2.8501	17.856	223.14	29.308	2.7977	32.537	0.85604	0.2876	2.08	0.50536	4.6526
26	17.635	2.8038	13.973	277.58	24.577	4.5361	37.134	0.87199	0.19406	2.094	0.56847	7.7580
27	20.016	3.1072	14.63	263.48	23.563	4.7894	42.479	0.9776	0.21898	3.0841	0.73064	10.39
28	27.702	3.4852	14.825	266.60	24.926	4.9075	43.455	0.89507	0.223	2.5333	0.79705	10.68
29	21.755	3.9339	23.669	361.49	32.966	4.1235	44.266	1.2329	0.31747	3.3288	0.81817	6.8469
30	11.8116	4.1461	19.277	155.65	35.089	1.3511	27.616	0.79181	0.23321	1.7014	0.74645	3.6242
31	11.1986	2.3023	27.318	399.71	37.374	2.6287	43.764	1.424	0.41071	3.5194	0.62802	6.0068
32	17.379	3.7813	21.211	594.19	59.613	2.2600	59.347	1.1354	0.34798	4.7242	1.2984	16.249
34	17.421	4.1691	23.672	430.53	25.013	3.8266	45.928	1.16	0.40235	3.3903	0.62349	6.3217
35	35.303	7.2933	27.08	200.16	36.424	2.2055	106.41	2.6115	0.68008	11.306	2.9204	12.187
36	25.873	4.8964	18.002	134.47	24.112	1.1639	70.579	1.6594	0.52715	6.7571	2.2745	8.4268
37	34.382	6.8055	22.052	411.85	18.923	2.7398	40.225	0.86801	0.35776	2.6194	0.61424	5.5566

THE CLASSIFICATION OF MIDDLE BRONZE AGE PAINTED POTTERY:

WARES, STYLES, WORKSHOPS

No.	La	Sm	Sc	Cr	Co	Cs	Ce	Eu	Lu	Hf	Ta	Th
38	13.07	2.7709	18.969	146.77	23.878	3.1861	95.607	1.9006	0.63758	5.2759	2.5179	12.119
39	42.512	7.9295	21.07	179.23	24.932	3.3326	97.809	2.0803	0.64603	9.1868	2.4699	12.757
40	31.696	6.7752	23.295	188.54	33.929	1.8930	77.244	1.3797	0.49924	6.6838	1.7473	8.7189
41	32.045	5.9513	15.777	220.50	20.539	2.1402	63.859	0.91319	0.56195	5.5729	1.3437	8.7643
42	15.992	3.1907	21.539	309.69	27.465	3.7021	43.952	0.9651	0.34749	2.7148	1.1325	6.626
43	12.221	2.9007	19.51	279.93	21.068	1.8033	37.094	1.1051	0.38682	1.9944	0.41904	5.2432
44	19.258	3.4332	26.475	403.10	30.372	2.7074	47.642	1.7467	0.44951	2.221	0.61668	6.8821
45	25.601	5.7271	22.952	168.45	29.034	1.7775	69.227	1.3054	0.48647	6.8157	1.8493	7.3966
46	19.025	3.678	13.212	142.09	13.562	0.92142	57.281	1.4912	0.39177	2.88264	1.0355	7.4355
47	25.379	5.2741	20.908	169.35	25.186	1.742	62.118		0.49416	8.0509	1.4303	7.0548

(Maguire forthcoming a)

**THE CLASSIFICATION OF MIDDLE BRONZE AGE PAINTED POTTERY:
WARES, STYLES... WORKSHOPS?**

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The ultimate concern of this paper is to acknowledge that while discrepancies exist within the current classification sequence of the Middle Bronze Age pottery, there is scope for review and refinement, without totally demolishing that classification. With particular reference to White Painted V Ware (*SCE* IV.1B 66-78; Åström 1966, 87-90), it is possible to extract from the study of stylistic variation, indications of the mode of pottery production, and the pattern of pottery distribution within Cyprus. This information is essential before the ramifications of Cypriot pottery found outside Cyprus can be tackled.

The standard White Painted sequence is entrenched in a paradigm of chronological succession, crystallised in the numerical divisions I-VI. It is a sequence which draws on material biased by the very nature of the evidence. The paucity of settlement material

coupled with the abundance of looted, disturbed and reused tombs, particularly in the North of the island has led to inconsistencies in the analysis of artefactual data. Gjerstad in 1926, working essentially from the broad framework of Myres and Ohnefalsch-Richter (1899), introduced through a *type* series an inherent chronological denotation. He "tried typologically to arrange the material in each vase-class, and...indicated the various types with Roman numerals." (Gjerstad, 1926, 88).

The *definitive* meaning of these numerical divisions, however, as chronological indicators was not attempted. While an overall development can be traced from White Painted I to V, outlined in his excavations at Alambra and Kalopsidha (1926, 268-73), the evidence for the chronological succession of each type over the whole of the island is lacking (Barlow 1985, 50-1; Coleman 1985, 138-40).

Coleman (1985, 136 n 7) further demonstrates the confusion and lack of correlation between Åström and Gjerstad in identifying WP II, III and IV; especially where Åström has moved Gjerstad's types from WP II to III, for example, on the dating of Lapithos and A. Iakovos.

"In consequence of the view held here that the Lapithos sequence comes down later, and the Ayios Iakovos sequence starts earlier, some alterations in the previous classification have been made. the later of these groups has been classified as White Painted IV and part of the former White Painted III Ware has also been included in White Painted V Ware" (Åström SCE IV.1B, 11).

The lack of cross correlation between Åström and Gjerstad (Coleman 1985, 138-40) highlights especially the amount of subjectivity involved in the structure of the classification sequence, and the dependence on typologies when they are used as tools of relative chronologies.

A major contribution to the study of the White Painted Wares, therefore, was the identification of individual styles from the standard types, and the isolation of these

styles into discrete classes White Painted III-IV Pendent Line Style, IV-VI Cross Line Style and similarly WP V Framed Broad Band Style and WP VI Soft Triglyphic Style (Åström 1966, 90, 92-3). In creating these styles Paul Åström acknowledged that the standard White Painted sequence set up by Gjerstad was representative of the pottery in the North and centre of the island, although he continued to place increasing importance on the chronological succession of each ware. It is recognised that these styles have their own temporal and spatial distributions (Åström *SCE* IV.1B, 11; Merrillees 1978, 20-1). These Styles can be studied virtually independently of the White Painted II-V type series, especially since the type series has proved incapable of absorbing satisfactorily new material from excavations within Cyprus as well as exported Cypriot pottery. The pottery type is frequently identified by recognising uniform groups. Though realistically, as Shepard states the 'type' is

"artificial in so far as it is selected to serve as a means of outlining relative chronologies, a purpose that has no relation to the conditions of production or original functions of pottery." (Shepard 1985, 307)

Through the varying classification sequences of prehistoric pottery the tendency to dehumanise decorated pottery via the terminology of artificial type series, inadvertently masks the very identity of a potter or artist, and the concept of a potter's workshop. Classification essentially facilitates the sorting of large amounts of pottery, allowing interpretations of a chronological and cultural order to be made, yet increasingly we are aware as ceramicists that the rift between potter and pottery artifact is very great.

In his stylistic analysis of the Middle Cypriot White Painted Pottery, Frankel (1974) assessed the proportional occurrence of the designs in terms of the number of vessels between different groups. The isolation of these particular groups studied through time was not attempted. The results of this analysis, which showed that certain motifs were popular in certain locations, demonstrated a degree of interregional contact over the whole of the island. Broadly speaking, the Karpass region is the most distinct with a high

frequency of Wavy Line motif, and the linear motifs of the Eastern sites. In the centre of the island geometric motifs are more popular, such as double chequer rows alternating with cross-hatched zigzags, lozenges or triangles, and towards the North Coast vertical cross-hatched panels and wavy lines are more common.

Frankel's analysis concludes that ceramic diversity is very evident, although the island can be divided into a series of overlapping regions (1974, 47) as opposed to the East/West dichotomy advocated by Åström (*SCE* IV.1B, 275 and n 7), Catling (1973, 170) and Merrillees (1971, 72). He suggests greater contact between neighbouring sites based on the similarity of motifs and paints a picture of strong interaction between different villages, against a background of trade or inter-marriage with more peaceful conditions than those invoked by Merrillees (Frankel 1974, 48-51; Merrillees 1971, 77). Whatever the intensity of these relations, it is very clear that the White Painted pottery repertoire is being used to reflect the cultural distinctions of different areas in Cyprus.

That these results could be produced using only decoration as a varying element, as opposed to equal consideration of other technological factors in the pottery, suggests that an appreciation of the relative popularity of combinations of motifs on individual pots within assemblages, together with technique, should be made.

If we expand these preliminary definitions of Style, to include peculiarities and similarities in the execution of various elements such as decoration, shape and form by individual potters, artists or workshops, rather than identifying regional groups from motif popularity (Frankel 1974) it may be possible to identify the mechanics of pottery circulation and distribution on a specific level (Frankel this volume 00-00).

These humanising terms of 'potter', 'artist' and 'workshop', however, are loaded with archaeological as well as social implications. Their use rests on the supposition that

individual stylistic variability is manifest in the artifacts created and as such is identifiable from the archaeological record. The familiar means by which individual artists or workshops have been recognised are predominantly subjective, when they rely strongly on the 'educated eye' or 'sensory feel' of the researcher. They should not be ignored, however, because of their subjectivity, but should be welcomed in view of the crucial amount of intuition required to convincingly identify stylistic variability (Spaulding 1960, 62 quoted in Redman 1978, 163).

The difficulty in consistently identifying the work of individuals is exemplified by the adoption of such terms as "analytical individuals" (Muller 1977, 25) and "smallest interaction groups" (Redman 1977, 44) where the similarity in styles is great but may be the work of closely related persons, rather than one individual. In the vocabulary of the art historian, the terms 'schools' or 'workshops' are more frequently used to encompass degrees of similarity and difference. The unifying element between recognising individual and workshop is the amount of 'similarity' between the objects concerned. The objective in using the term workshop is to collate what would appear to be a closely related body of material, which has been identified by similarity in intent, design and distribution (Adelman 1976, 2). For the moment, the label 'workshop' does not hold connotations of specialised potters or specialised trade nor does it assume a purely household or domestic mode of production (Frankel 1988, 28-32).

The importance of identifying individual workmanship or the collective traits of a particular workshop lies in the potential to map specific artifact distributions on a definitive localised scale, rather than solely as part of an all encompassing regional style. In mapping the distribution of the Red on Black Ware Merrillees successfully defined a regional grouping in the Karpass Peninsula and in the south east of the island, as well as a more confined distribution to the West (Merrillees 1979 115-34). He also suggested the extent of specialised trading activity in that ware over the whole of the island. The

distribution, however, is solely of a Ware type. It would be profitable to reexamine this material to identify style and microstyle (Muller 1977, 25-30) through which the complexities of pottery production could be more adequately gauged.

The criteria for identifying individual variation amounts to a degree of uniformity in

1) vessel form and shape, by the potter

2) design content or

3) design execution, by the artist

combined with the identification of peculiar traits which display distinctive similarities or differences, indicative of individual hands or the same character of workmanship.

Similar constructs have been outlined by M.Hardin (1977, 111, 113). In analysing the characteristics of "personal graphic style" she identified the work of each individual artist.

We are assured, in several instances, that individual artists, or potters operating as individuals or within workshops can be isolated from the record. Frankel recognised from the pottery in Lapithos Tbs 316, 2 and 702 individual artists within the White Painted pottery repertoire (1974, 50 and n 29; and this volume 00-00). He mentions other instances of individual potters from Livadhia, Ayia Paraskevi and Politico (1974, 50, 52 n 30). Ellen Herscher identified a so-called "Spongy group", found especially in examples from Lapithos Tb 702 (1972, 23-4). The high porosity value in some pieces was suggested to be the product of one potter or workshop. The aim, therefore, is to build on these types of associations to form core reference groups, and ultimately map a distribution of either individual artists work, or repertoires of a 'school' or workshop. Frankel illustrates the restrictions of working at this level of identifying individual stylistic variability (this volume 00-00). We can identify with some degree of confidence the work

of individual artists (Frankel this volume Fig 3 Lapithos Tb 316) but we can be less certain of constituent artists within the core reference groups when our identification procedure extends beyond *identical* sets of ceramic material.

White Painted V forms one of the most cohesive groupings of the White Painted Ware sequence in terms of technical characteristics as well as use of decorative motifs. It is easily recognised by a pale light brown fabric; few inclusions in a mostly hard fabric, an often unslipped, matt surface and dark brown to black matt paint.

In the south of the island this group is characterised by the application of the paint in broad linear bands on jugs, juglets and tankards, as exemplified in Tangent Line Style and Framed Broad Band Style (Åström 1966, 89, 90). In the north and central parts of the island on similar well fired fabrics, the motifs are highly geometric using chequers, and cross hatching (eg *SCE* IV.1B Figs XVII.2, 10, 11).

In cataloguing the more northern distribution of WP V, Åström applied the term White Painted V Fine Line Style to a

"whole group of bowls, juglets and jars decorated with similar thin lines in purplish red paint which may originate from the same workshop" (1979, 17)

In collating this 'Fine Line Style' material the very notion of a pottery workshop begins to take form.

Firstly, in the overall repertoire of shapes in the White Painted V sequence, an obvious predilection for individual forms by the potter is self-evident. White Painted V Fine Line Style draws on one particular shape of jug; the body is globular, the neck is short and cut away to form a spout which is sometimes sliced. There is a preference for a small handle at the neck base, often square topped (*CV A* Pologne 1 Pl. 3.5; *CV A* Österreich 4 Tafel

24.4; SCE IV.1B Fig XVII.3) String-holes, both functional and decorative appear mainly on the upper body, neck and handle, some fairly elaborate (*CVA Österreich* 4 Tafel 24.1,2; Villa 1969, Pl XIV.63; Villa 1969, Pl XIV.62). The delightful feature of this group is the creation of zoomorphic and anthropomorphic terminals on bottles and flasks and the fashioning of complete animal vessels (Tatton Brown 1987 Pl 36 second left; *CVA France* 5 Pl 4.4; Tatton Brown 1987 Pl 36 left; Åström 1969, 72 no 85). Standard bowls and uniform small jars are complemented by innovative designs in baskets and cups (Frankel 1983 Pl 14.169; SCE IV.1B Fig XVI.13 both of which display particular elements most likely characteristic of one artist *i.e* compare handle, protrusions, design content and positioning especially on handle and neck; Unpublished Cyprus Museum 1952 III-13.3 Dhenia Kafkalla; SCE.IV.1B Fig XVI.1; *CVA GB* 1 Pl 5.22; SCE IV.1B Fig XVI.8). In contrast to the highly uniform jugs of the WP V "Eastern Mesaoria Styles" (Merrillees 1974, 53), the complexities of vessel shape and decoration may well reflect the difference between minimum production at one workshop where the time and effort involved is at its maximum, and those workshops where mass production is evident and minimum time and effort expended (Frankel 1988, 35).

Secondly the clay, well levigated, is fired to a constantly high temperature, is often unslipped and matt, and decorated in even, solid matt paint which is fired black, red brown or purplish red.

Finally, the field of decoration and in particular the finely executed motifs are by far the most unifying elements in this workshop. The major factor which determines the orientation or field of decoration for the artist, is the consistent demarcation of zonal areas, using horizontal friezes or registers. These registers in themselves are marked out by divider motifs such as framed wavy lines or double parallel horizontal lines (Pls 1-4; Fig 1.1-4). The maximum number of registers is three, for the main body of the vessel (Pl

3-4). The neck is decorated with horizontal lines, interrupted by vertical lines, rather than continuous encircling bands (Fig 1.3-4) and the base is filled primarily with oblique lines (Fig 1.2,4).

The most predominant motifs are the hatched triangles (Pls 3-4; Fig 1.1-4), cross-hatched panels (Pl 2) and reserved zigzags, many of the same motifs are found on alternate vessel forms, within the classic repertoire. A rather individualistic touch is created by intermittent elements such as squiggles, dotted circles and dashes (Fig 1.3-4; *CVA Great Britain* 1 Pl 6.15; *SCE IV.1B* Fig XVI.2; Frankel 1983, Pl 14.169).

Probably the most distinctive feature of this style is the execution of the decorative elements by the artist, using an exceptionally steady hand and fine brush. The intricate and complicated mesh of cross lattice elements are smoothly and evenly applied without blemish.

The distribution of this workshop's product lies mainly in the central and northern sites (Fig 2). The pottery of this workshop, from whatever source, is being redistributed over a wide area, found for the most part in tomb groups; more than one example from the same workshop have been found in the same tomb.

One implication of defining styles to the extent of recognising workshops is realised if we examine the distribution of White Painted pottery outside Cyprus. Of the White Painted tradition, Pendent Line Style, Cross Line Style and White Painted V Styles form the largest component of exported pottery to over 30 sites in the Levant and to Tell el Dab'a, Egypt (Maguire 1986) predominantly south eastern styles. However, of these White Painted V styles exported to several sites in the Levant and to Tell el Dab'a in substantial quantities, only one small rim fragment from a small jar of the White Painted V Fine Line workshop was found at Tell el Dab'a; there are at present no other known examples of this Fine Line Style from sites in the Levant or elsewhere in Egypt. There are parallels in

shape which are illustrated in Åström (*SCE* IV.1B, Figs XVI.7,8) and decoration (*ibid.*, Fig XVI.13 hatched triangle). While the popular contemporary styles of the WP V series exported to the Levant and Egypt are of the 'broad band' tradition, it is striking that one example from the workshop defined, reached Egypt alone.

Within the sphere of ceramic production, it may well be that channels of exchange were specific and controlled in different localities. It is almost impossible to identify those responsible for conducting the trade, since three groups could be involved -- the workshop itself; middlemen, responsible for the commodity contained within the pots, who communicated both with the workshop and trader; or an independent trader altogether. Similarly the traded pottery might simply be the offshoot of bulk produce being exchanged, either within the island or abroad. What is evident, is that in the first instance *separate* distributions in contemporary styles exist on the island, and secondly that proportionally in the distribution of their numbers abroad, a dichotomy is also noticeable.

The overall impression which this research ultimately gives is that inevitably very many workshops exist within each style. Yet if we persevere with the refinement of our existing classification sequence to include the possibility that individual workshops or styles are recognisable from the record, then we will be one step closer to accepting the complexities of interpreting ceramic material, rather than adhering to restricted chronological and typological angles posed by the existing ceramic classification sequence.

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The pottery photographs and drawings are reproduced here with permission from Professor Paul Åström and Dr David Frankel.

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APPENDIX VII

(Maguire forthcoming b)
(Conference Paper as presented)

A CAUTIOUS APPROACH TO THE MIDDLE BRONZE AGE CHRONOLOGY OF CYPRUS

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If I can begin with a quote, made by Wolf Randolph in a review of the proceedings of the first symposium of High Middle or Low -

"The ambiguity, that ceramic sequences impart(s) to the pursuit of absolute chronology constitutes a common thread running through the contributions of Åström, Waldberg, Hankey and Gates. In fact a recurring argument is that pottery may have been overvalued by earlier excavators such as Evans and a new caution seems to prevail"

Pottery has certainly been overvalued in calculating absolute parameters, and the "new caution" which is prevailing may be an attempt to advertise the limitations in using pottery or ceramic sequences to construct precise chronological frameworks.

Scholars of Cypriot prehistory turn to synchronisms with historically dated sequences such as Mesopotamia or Egypt, to construct the absolute chronology of the Middle Bronze Age of Cyprus: synchronisms which are more often than not based on the circulation of pottery, especially White Painted Wares eg PLS, or CLS, which are exported to sites in the East

Mediterranean, but more specifically to the Syro-Palestinian coast. A synchronism would be where a style, dated by its export abroad, dated the Cypriot ceramic sequence. The presence of a large amount of Cypriot pottery in the Middle Bronze Age levels at Tell el Dab'a, Egypt, therefore, is expected to have important ramifications for the absolute chronology of the Middle Bronze Age of Cyprus.

However, the logistics of such an exercise are overwhelming and while Cyprus has little else available to define an absolute sequence for the Middle Bronze Age cultural development in Cyprus, the limitations of these synchronisms must be addressed. Only then can the implications of what may be considered more accurate dating evidence from Tell el Dab'a be digested.

In sum, therefore, this paper is an attempt to define the limitations of using synchronisms from pottery evidence, and to outline the implications for the use of Cypriot pottery found at Tell el Dab'a, as dating evidence.

Those synchronisms, as we are no doubt well aware, based on small samples and incompletely recorded contextual data are highly misleading and insecure. It can be expected that it is necessary to be constructive when dealing with the inadequacies of residual archaeological data, such as pottery sherds. However, this positivism should not undermine the subtle processes of artefact deposition which themselves are poorly understood and often inadequately recorded.

With tomb material we are often faced with successive interments, redistribution of finds through disturbances caused by natural events eg flooding, looting or intrusion from upper levels. With settlement evidence, tell sites reveal successive layers of occupation which produce residual material, through intensive pit, grave or building construction.

Inevitably sheritage is often debris of occupation and there is no guarantee that it will be found in its original level of use. Only an examination of the microstratigraphic relationships of settlement features in a complex development of occupation levels within tell sites could clarify the processes of deposition.

In view of these external restraints, in order to assess the reliability of mainland contexts to date the Cypriot pottery, a sufficiently secure context and/or a plentiful sample of Cypriot pottery in the case of settlement material especially must exist. This preliminary caution is nothing new to archaeology but it tends to be overshadowed by an enthusiasm to produce definitive, conclusive results for the dating of 'exotic' material such as the Cypriot pottery in a foreign context.

Individual artefacts cannot be satisfactorily used as intrinsic indicators of absolute dates, likewise insufficient sampling from poorly excavated or incompletely recorded sequences should not be encouraged. Yet still it is accepted that cross-cultural relations be taken as synchronic and they are subsequently used, without extensive precaution, to establish "fixed points" in the relative chronology of Cyprus.

Warren and Hankey have taken a positive approach, as opposed to a cautious approach, in the use of synchronisms. MCIII, through the occurrence of a CLS pot in a MMII to III context "provides grounds for linking MM III to the first half, roughly, of the Hyksos period". This is calculated through Cypriot pottery in Palestine and the equivalence of MB II levels at Tell el Dab'a. But how much *synchronism* exists between the manufacture of this particular pot let alone the style in Cyprus, its export to Crete, and its deposition in MM levels, an export to Tell el Dab'a and deposition in MBII levels *and* the length of MM III or MCIII?

In all events, the export of Cypriot pottery abroad can only provide a horizon in terms of an estimated span for the period of export to the period of deposition, unless it could be suggested that the pottery was specifically designed for mortuary deposition.

At Tell el Dab'a intensive excavation since 1966 has produced a representative sample of Cypriot pottery, over 300 pieces, and approximately 60 of them have been assigned specific strata. The synchronisms between Cyprus and Tell el Dab'a on a relative scale will be more reliable than those from Palestine or Syria since there is a direct correlation of Cypriot pottery with historically dated deposits.

Here we have the relative distribution of Cypriot pottery at Tell el Dab'a. PLS and CLS and WP V are those types which are well represented and about which some conclusive remarks on the extent of their existence at Tell el Dab'a can be made. This situation is similar to the distribution of Cypriot styles in Syria and Palestine. PLS and CLS appear in early levels at Dab'a but not in sufficient numbers to date their floruit, whereas their preponderance in E/1 may indicate the most major influx, or equally a concentration in deposition. WP V on the other hand does not appear in the early levels, and while there are contemporary occurrences from its appearance in later levels in Area V, it generally succeeds the popularity of the PLS and CLS. This picture is confirmed by the late Hyksos deposits in Area V, the suburb of the tell. This is an overall perspective of the Cypriot wares in stratum D/2, where the PLS and CLS are in the minority with WP V in the majority. The later MC and LC wares are marginally present.

PLS and CLS therefore occur in culturally MBIIB levels and WP V and MCIII-LC wares in levels assigned to MBIIC. It must be emphasised that at Tell el Dab'a we are dealing in the majority of cases with sherd material and that an exact, precise date for one sherd in one level cannot be taken as the absolute date, for example, of the first occurrence of the ware.

This therefore, presents a realistic overview of the occurrence of each ware in Area All and Area V. The more dense lines mark the "floruit" of the styles. All in all these span dates reflect an estimation for the time of export but more importantly the time of deposition in archaeological contexts and reflect only a *terminus ante quem* for their use abroad. In Cyprus they reflect a *terminus ante quem* for the date of manufacture but not a date for their manufacture. When dealing with dating archaeological deposits our perception of time elapsing is restricted by the rate of deposition, and while the rate of deposition could be 5 or 50 years, our conclusions are still along the lines of prolonged spans of manufacture, use, export and deposition because as yet we cannot deduce real time from archaeological time.

There are several examples at Tell el Dab'a where whole pots are found in securely dated individual burials, and thus as whole pots and not sherd material, provide more reliable contexts. Their contexts still only proved a likely date of export and a *terminus ante quem* for their manufacture in Cyprus. Merrillees uses a Proto-White Slip bowl found at Tell el Dab'a as a *terminus ante quem* date (1575/1550 BC) for the end of the LCIA period in Cyprus ($\pm$ 1560-1530 BC Bietak 1989, Fig 6). The bowl is securely sealed in a grave of D/2 and while it is assured an exact date it is surprising that it should be used to mark the end of the LCIA period rather than an indicator for the extent of the period. While there exist at Tell el Dab'a several other examples of PWS ware in D/2, none have been found in secure contexts.

The dates calculated from Palestine or Egypt for White Painted Wares or even Proto White Slip can only imply that before a certain date the pottery must have been made in Cyprus, because at that date its export horizon, or date of deposition occurs: how long before that date and how long after that date the pottery was manufactured has to be calculated using a matrix of span dates rather than a fixed point.

For example, PLS has a span of deposition from 1770 to 1530, with a concentration between 1620 and 1560, Bietak's chronology, and WP V 1620-1530 for a span of deposition, 1560-1530 or a concentration. The interesting aspect in these span dates is the relative late position of WP V and the LC wares, appearing with the floruit of PLS and CLS but continuing to the end of MBII period, 1530.

The second difficulty with pottery synchronisms of this nature, is the assessment of their implications on the internal chronological framework in Cyprus. The types of pottery which are being exported from Cyprus in the Middle Bronze Age are those styles which are manufactured in the south east of the island, and are contained within a south-eastern distribution on the island. There are very few imports from the south of the island to Lapithos in the North in the Middle Bronze Age. Therefore, there exists a very obvious problem when the White Painted Wares, purportedly "dated" by their contexts abroad, are used to date deposits where they rarely occur eg in Lapithos Tombs, which contain substantial collections of White Painted Wares representative of a very different style of pottery production which exists in the north of the island. The proportional occurrence of the south eastern styles in the North can be compared. In this Figure the distributions of the northern styles are plotted across the island. In contrast this Figure, although dealing with a far smaller sample, demonstrates that the southern styles are represented by individual examples at tombs in Lapithos. Where the contexts of the northern styles have been noted there exists no correlation in *secure* contexts with the southern styles. Despite these inconsistencies, how much the south eastern styles (PLS, CLS) *are* contemporaneous with the very different WP III and IV groups typical of the North will have to be ascertained before the refinement, not only of the relative chronological sequence can take place, but also before the dates attached to the south eastern styles abroad can be sufficiently well implemented.

These occurrences of Cypriot pottery abroad and the dates used to calculate the length of the relative periods in Cyprus are not synchronic and secondly, the stratigraphic position of the White Painted Wares in any context in Cyprus is far from indicative of a relative date for the pottery let alone for the absolute chronology of Cyprus.

Kalopsidha is the only excavation where a sequence of White Painted wares exists, and to which the stratified deposits at Tell el Dab'a can be compared. However, Trench 9 contained no distinctive settlement features and was interpreted as a dump outside the settlement. Many of the upper levels were disturbed and the depth of deposit to sterile soil was approximately 90cm. In Trench 3 the remains of 3 walls of probably the same building were found, comprising two rooms. It has been assigned a construction period towards the middle of MC III, and destroyed before its terminus. In this instance there is little evidence for a succession of pottery styles in this one phase and offers little comparison with the sequence found at Tell el Dab'a.

There appear to be some trends in the distribution of types through the layers. While PLS shows a decreasing trend, CLS remains dominant; the Late Cypriot wares are present in the deepest levels and subsequent levels but the figures show no real significant trend. The only general observations which compares to the situation at Tell el Dab'a, are the position of the LC wares, which appear to be later than PLS and CLS, and the decline of PLS as the LC wares appear. The relationship between the export of PLS, CLS and V at Tell el Dab'a cannot be further elucidated by the material at Kalopsidha.

In effect it has been assumed that WP V is chronologically later than PLS and some CLS, and different technically from these wares, but its exact position in a Cypriot sequence has not been confirmed. The WP wares at Tell el Dab'a may indicate a chronological

succession which is visible in the export of the different wares, but this picture cannot be confidently applied to the manufacture of the wares in Cyprus.

"Synchronisms" where used for absolute dating can offer only estimated dates for a *terminus ante quem* for the manufacture of Cypriot pottery within the island. Even where certain patterns of export or deposition occur at sites abroad such as Tell el Dab'a, it is difficult to apply these span dates to developments in Cyprus since the relative stratified deposits and tomb evidence supply no specific details of the chronological positions of certain wares eg PLS, CLS and WP V and in any case we are well aware now that these links are not synchronic with the production of Cypriot pottery in Cyprus, rather they indicate that before a certain date Cypriot pottery was manufactured and exported but how long before or after its export cannot be gauged. It would appear that the traditional view that WP V is later than PLS and some CLS is difficult to illustrate conclusively from the evidence in Cyprus, either from occupation deposits or mortuary contexts.

Equally limiting is the lack of evidence for chronological contemporaneity between the styles which are exported (and possibly dated) and the WP III and WP IV pottery which occurs in the North of the island.

In the light of this survey some general observations on the ramifications of Cypriot pottery found abroad, specifically at Tell el Dab'a, which affords a well stratified, well sampled and date sequence of Cypriot imports can be made.

PLS and CLS show a roughly contemporary export horizon at sites in Palestine and Egypt. WP V would seem to overlap with, but is generally later than the floruit of these two styles, and this trend would appear to be consistent with the picture in neighbouring Palestine. Exact dates for the first occurrence and floruits of exports cannot be established but the estimated span of exports remains as illustrated. These styles were obviously manufactured prior to their date of deposition at Tell el Dab'a but it is not certain how long before that date they were manufactured. WP V may have been manufactured slightly

later than PLS, and/or CLS, but this is not confirmed since the data pertaining to the exact chronological position of WP V is not well documented in Cyprus.

In conclusion, the relative sequence of pottery distribution within Cyprus needs to be bolstered by material from excavated settlement sequences within Cyprus itself. The data from Tell el Dab'a as well as other sites in Palestine only reflect at best the date of export of Cypriot pottery, before which date Cypriot pottery was made, and therefore, the export horizon of Cypriot pottery cannot be used to precisely fix the absolute chronological parameters of the Cypriot Middle Bronze Age. In essence the circulation of Cypriot pottery abroad does not provide a precise method of dating the MBA of Cyprus, and by its very nature cannot.