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**LA THÈSE A ÉTÉ
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THE EMERGENCE AND SIGNIFICANCE
OF THE PORTABLE POTTERY CONTAINER
IN THE NEAR EAST, ANATOLIA AND THE AEGEAN

by

HILARY HOWARD

Thesis presented to the School of Graduate Studies
of the University of Ottawa as partial fulfillment
of the requirements for the M.A. in Ancient History
and Civilization with specialization in Classical
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Ottawa, Canada

1977



H. Howard, Ottawa, Canada, 1977.

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KEY TO CERAMIC TECHNOLOGY SUMMARY CHARTS

X : technique demonstrated in non-pottery contexts.

P : technique demonstrated in pottery container
manufacture.

ABBREVIATIONS

A.A.A.S.	American Association for the Advancement of Science
Acta Archaeol.....	Acta Archaeologia
Acta Bot. Neerl.....	Acta Botanica Neerlandica
A. Dept. Antiqu. Jordan ...	Annals of the Department of Antiquities, Jordan
A.S.	Anatolian Studies
A.J.A.	American Journal of Archaeology
Adv.Sci.....	The Advancement of Science
B.S.A.	Annual of British School at Athens
Bull.Am.Sch.Orien.Res. ...	Bulletin of the American School of B.A.S.O.R. Oriental Research
Bull.Inst.Arch.London Univ. ...	Bulletin of the Institute of Archaeology of the University of London
I.L.N.	Illustrated London News
I.E.J.	Israel Exploration Journal
J.N.E.S.	Journal of New Eastern Studies
Journ.Roy.Anthrop.Inst. ...	Journal of the Royal Anthropological Institute
J.F.A.	Journal of Field Archaeology
P.E.Q.	Palestine Exploration Quarterly
Proc.Soc.Ant.Scotland	Proceedings of the Society of Antiquaries, Scotland
P.P.S.	Proceedings of the Prehistoric Society
Proc.Nat.Acad.Science	Proceedings of the National Academy of Science
T.A.D.	Türk Arkeologi Dergisi

INTRODUCTION

During the latter years of the nineteenth century and the early part of the twentieth, archaeologists regarded the use of pottery as one of the most significant distinguishing marks of the Neolithic era, thereby implying that ceramic manufacture constituted a major step in the progress of mankind. In more recent years, advances in excavation and analytical techniques, particularly those associated with the natural sciences, have brought about considerable change in archaeological thought. A technological distinction between Neolithic and earlier stone-using cultures is no longer regarded as valid, and has been generally abandoned in favour of distinction according to economic criteria. Emphasis is now on entire subsistence patterns rather than on isolated artifact categories. "The association of the primary economic and cultural Neolithic period with the polished stone axe and handmade pottery industries is of secondary importance. These are merely additional characteristics of an age essentially based on agriculture, stock-breeding, and the settled community".¹

Consequent upon the shift from a technical to an economic model, artifact analyses have begun to involve a consideration of the economic situation which gave rise to their production, instead of being subject only to painstaking typological studies as has been the case in the past.

The first aim of this study is to present in logical and convincing fashion a major aspect of the evidence which has led scholars to dispense with the technological definition of the term 'Neolithic', and to consider the broader economic and cultural picture. This evidence is intended to illustrate that all techniques required for the manufacture of pottery were developed prior to its emergence, and that container types of which pottery can logically be considered simply as another example, had long been in use.

The second aim of the study is to attempt to assess the significance of pottery vessels within the cultural assemblage of each ceramic site included for study. It is only by seeing the emerging artefact within the cultural setting which produced it, that we may try to observe those factors which influenced its adoption, its nature and its use. "Ceramic ecology may be considered as one facet of cultural ecology, that which attempts to relate the raw materials and technologies that the local potter has available to the functions in his culture of the products he fashions".²

Deposits of clay, the raw material of pottery, cover much of the earth's surface, with the exception of desert areas and coral islands. Primary clays are formed by the decomposition of the rock-forming minerals, the feldspars. The minerals resulting from this decomposition are hydrated aluminum silicates, with subordinate amounts of alkalis, iron oxides and trace elements. However, simply because they are more readily available, the vast majority of clays

used for structural purposes, for modelling and for pottery, are secondary clays, transported from their primary source by water or erosion, acquiring impurities during the transportation. Of these impurities, the commonest are iron compounds, which, subject to certain firing conditions, have resulted in the various types of red pottery common throughout the ages.

Secondary clays are readily available in inexhaustible supply in all areas included in this study, although the quality of the deposits, and the amount of impurities vary from area to area. Generally speaking, the clay found on stream and river banks has a high sand content, often so high as to render it useless for large scale work such as house building. Alluvial plains and mountain plateaux usually provide fine textured clays, which are suitable for most purposes with and without the addition of a temper or filler.

As a raw material, clay has numerous advantages, many of which were realised and exploited long before pottery was made. When mixed with water, clay is a plastic material, that is, it can be formed into any shape, yielding under pressure without cracking and retaining the resulting shape when pressure is released. Unlike stone and wood (also used for Neolithic vessel manufacture) clay can be modelled without any tools save the bare hand. It is hard and water resistant when dried, and acts as an excellent insulator against heat and cold, thus rendering it extremely suitable for architecture. In the areas included in this study, houses with

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floors, walls and roofs of clay, have continued since pre-historic times to afford excellent protection against the elements. As a fireproof material clay is still widely used for a variety of refractory facilities. Hearths and ovens have been formed from clay since the building of the earliest settlements found to date in the Near East and Mediterranean areas. Clay was, and still is used for the provision of storage facilities. Hardened clay bins and jars protect perishable items against marauding insects and rodents, and against spoilage through dampness.

It is proposed to show, through the evidence set out in this thesis, that all these advantages of clay as a raw material; ease of moulding, water resistance, fireproofing and insulation properties, which are exploited by the manufacturers of pottery were appreciated in other contexts before pottery was made. Furthermore, it is also proposed to demonstrate through the following evidence, that all aspects of ceramic technology were developed in other contexts prior to the emergence of portable pottery containers.

The four basic stages involved in the making of a pot are preparation of the clay, forming, finishing (including decoration) and firing for permanence.³

Preparation of the clay

Although most pottery clay used today is subjected to complex levigation (cleaning) processes to eliminate all organic matter and coarser particles, it is unlikely that there was any concern with the need for a clean, uniform

clay before the introduction of the wheel. All pottery mentioned in this study was handmade, and other than the manual removal of stones and obvious lumps of organic matter, is unlikely to have been cleaned. No evidence of levigation pits or vats has been found in association with Old World pottery from the pre-wheel era.⁴ However, preparation of newly dug secondary clay usually requires the addition of a filler to reduce stickiness and increase tensile strength. Because of the method of formation, most alluvial secondary clays are composed of very small particles compared to primary clays. They are often extremely sticky and difficult to work. Furthermore, as moisture is driven off by the air and heat of the sun during the drying process, the excessive contraction which takes place in untempered secondary clay can cause the artifact to crack. The addition of some form of non-plastic material such as grit, ground potsherds, or chopped straw or reeds to a secondary clay, both reduces its stickiness and increases its porosity, thereby making it easier to work, and limiting its tendency to crack while drying. Tempering is as important in the building of walls, hearths, storage bins, and small artifacts as it is in pottery making, and there is ample evidence for the development of tempering in all these capacities prior to the emergence of ceramic vessels.

Forming (modelling and moulding).

In the light of presently available evidence we cannot tell when man first became aware of clay as a modelling

material. The earliest evidence of clay usage is dated to circa 17,000 BC., and comes from a repeatedly occupied cave site, Dolni Vestonice in Moravia, where a clay hearth and several small modelled animals were found.⁵ Clay may have been used for temporary structures or windbreaks in other areas during the food gathering stage, but there is no evidence of this to date. Generally speaking, because of their weight and fragility, clay objects would have been of little use to a nomadic people. Evidence for the consistent moulding and modelling of clay does not emerge until man began to adopt a more settled lifestyle.

The techniques of forming clay vary according to the object formed.⁶ Before pottery was made, mud bricks and pisé slabs were moulded in a variety of shapes for the construction of walls, and storage and refractory facilities, and figurines and small artefacts were modelled, often with a high degree of expertise. It may be assumed that through the use of clay for a variety of purposes its advantages and its limitations as a modelling medium were learnt, and knowledge of various possible ways of working the material acquired. This knowledge would subsequently be applied to the forming of pottery vessels. All modelling techniques, when known, will be noted in the course of examining the evidence.

Finishing

After the modelling process is complete, the pot or other artefact is air dried. Slow, even drying is a

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problem which had to be solved by the prehistoric clay craftsmen, just as it has by modern potters. Although there is no evidence, it is possible that clay objects were fashioned in the cool of the evening and set to dry to the stage normally known as leather-hard (so called because clay dried to this stage feels like soft leather) during the night. All finishing processes could then be completed in the early morning, and the item completely sun dried during the day.

When a pot has dried to the leather-hard stage it is frequently burnished. Burnishing both reduces porosity and provides the surface with a slightly shiny, decorative finish. The vessel is rubbed with a pebble or other smooth, hard implement (bones or potsherds may also have been used in the Neolithic era) to compact the surface particles. The smaller the particle size, the more efficient burnishing is likely to be; therefore in the case of coarse fabrics it is often found expedient to cover the surface with a slip or wash of finer clay prior to burnishing. Evidence of this practice can sometimes be detected in prehistoric contexts, and examples will be noted in connection with individual sites. "The elimination of porosity by burnishing is never complete, but it commonly sufficed to enable the pot to hold liquids, since the solids in milk, oil and the like assist in filling up the tiny pores".⁷

In a hot climate such as that of the Near East, some porosity is desirable in vessels which are to be used for water storage, as slow evaporation helps to keep the water cool. Burnishing

in non-pottery contexts may be both useful and decorative. As will be shown below, clay floors were often burnished for durability, prevention of dampness and probably ease of cleaning; also the inner surfaces of hearths and ovens were burnished to prevent crumbling. Burnishing techniques pre-dating the advent of pottery are evident throughout the area studied.

Whilst burnishing often constituted the only form of ceramic decoration, painting, incision, impression and application were also used to enhance the appearance of some examples of Neolithic pottery.⁸ Like burnishing, these techniques were developed in other contexts prior to the emergence of pottery.

Once all surface finishing and decoration is completed, the pot must be dried slowly until no surface moisture is apparent. Too rapid drying will cause the pot to crack, and insufficient drying before baking will have the same result when the vessel is placed in the kiln or fire. There is no evidence of how prehistoric pottery was dried. It may have been placed around the domestic hearth, or it may have been set out in the cooler hours of the morning and turned periodically to prevent too rapid drying on one side. A similar practice occurs in Iraq, Iran and Afghanistan today.⁹ A pre-pottery awareness of slow drying may be inferred from the successful firing of other artefact categories.

Firing

It will be demonstrated, by means of the evidence which follows, that man was aware of the effect of intense heat on clay long before pottery vessels were fired for permanence. Even during the Palaeolithic era, when a patch of clay was chosen for a hearth, the hardening effect of the fire built in that hearth is likely to have been observed. When man became more settled he chose clay as the raw material (perhaps an enforced choice in many instances, when no other materials were available in sufficient quantity) for his hearths and ovens, and thus became familiar with the fireproof properties of clay and its extreme hardness after exposure to heat.

We have no concrete evidence of how or where the earliest pottery was fired, or the fuels which were used. Possible kilns have been located at some of the sites studied, but generally it must be assumed that simple campfires were used to bake most Neolithic pottery, a practice continued by many primitive potters today. The type of fuel used may sometimes be deduced from an inspection of ceramic remains, analysis of fuel residue in domestic installations and a study of the environment of a site. If, for example, an area is known to have supported few trees, and no charcoal is found, the use of dung or straw as fuel may be supposed.

When pottery is fired to between 400° and 700°C (depending on composition of the fabric) all moisture

chemically combined with the clay particles is driven off and the product becomes permanent. Further firing to higher temperatures will cause change in crystal structure and eventually vitrification. However the necessary temperatures to vitrify a clay body were not achieved during the Neolithic era.¹⁰ It is impractical in the present context to examine all the possible effects of different firing procedures and different temperatures on various clay bodies. Such an examination would only be practical in conjunction with a scientific analysis of the sherds and other fired clay debris from the sites to be discussed. "Generally speaking there are too many factors determining colour to allow of conclusions being drawn without technical examination".¹¹ Let us take but one example to illustrate this problem. As will be seen from the evidence, dark cores are frequently observed in pottery of the Neolithic period. A dark core may signify a firing temperature insufficiently high to burn out all residual organic matter. Alternatively, if the temperature is high, but the duration of the firing too short, the outer surfaces of the vessel will be completely fired whilst the core particles will still retain moisture and organic material. Within the confines of the present discussion, without scientific analysis, a general assessment of the quality of the fired pottery must suffice. In accordance with the first stated aim of this study, it is hoped to show that an adequate level of pyrotechnology had been achieved prior to the appearance of fired pottery.

When pottery first emerged, it took its place alongside containers of other materials which had long been in use. Braidwood has suggested that the evolution of tool-making took place in three stages.

a) Simple utilisation of what was at hand.

b) Fashioning - the haphazard preparation of a substitute for, or improvement of natural materials when the need for an implement to perform a particular task arose.

c) Standardisation - making of tools according to set traditions established through experience, and based on which of the fashioned tools were the most efficient.¹²

Braidwood was referring to tools of stone, but it is not unreasonable to speculate that portable containers may have followed a similar pattern of development. It is likely that during the Palaeolithic era, when man is believed to have been largely nomadic, naturally occurring items such as gourds or perhaps roughly cleaned animal skins were observed to be of appropriate shape and adequate for such purposes as carrying water or collecting wild plant foods more efficiently. However, exactly what mental stages intervened between the use of a gourd or skin to carry water (it is likely that water was carried on hunting trips in a hot climate), and the manufacture of rough stone or basketry containers, we can probably never hope to know. We can only approach the development of the portable container pragmatically, that is, to note "the ultimate responses of the human brain and hand to the reactions of the inert materials involved."¹³

Once man began to lead a settled or semi-settled existence (that is, when durable open-air architecture is found, and when the assemblages from both open-air and cave sites became large, diverse, and contained a number of heavy, cumbersome artifacts, indicating occupation for considerable periods), durable container types are first found in quantity. In the early ninth millennium BC settlements in the Mount Carmel area of Palestine stone technology had reached the point where rudimentary vessels could be fashioned through the use of efficient hollowing tools.¹⁴ At Mugharet-el-Wad (terrace of level B), for example, hollowed stone cup-basins, stone mortars and clay and stone ovens are suggestive of a subsistence pattern which involved the grinding of grain.¹⁵

During the Neolithic era, as we shall see, containers of basketry, wood, and stone have been found in contexts antedating the appearance of pottery. Many of these containers show a high degree of skill in manufacture suggestive of a considerable period of development. When ceramic vessels were eventually produced, using tried and tested technology, they took their place among container types already in use.

SELECTION AND ARRANGEMENT OF THE MATERIAL

The body of this thesis consists of a compilation of available archaeological data from twenty-four sites with evidence of either repeated or permanent occupation. The twenty-four sites are located in areas of differing environmental resources throughout Anatolia, the Near East and the Aegean, and together cover some 3,500 years of man's history from about 8,600 BC (Zawi Chemi-Shanidar), to circa 5,000 BC (Anza and Knossos) according to C¹⁴ determinations.

The evidence is drawn exclusively from published data, and thus the selection was necessarily biased in favour of those sites which are well documented. Preliminary excavation reports, specialist studies, and final publications were used wherever available. As it would be extremely difficult, and necessarily arbitrary to prepare a uniform system of nomenclature for all evidence considered, the technical terminology and stratigraphic names used by individual excavators have been adopted throughout the study. Standard explanations of ceramic terminology are provided in the glossary.

As far as possible, the sites are arranged chronologically, that is according to presently available C¹⁴ determinations and occupation dates suggested by the excavators. Sites which have not yet been assigned dates are considered in proximity to those displaying the most closely comparable level of culture.

The evidence for each site has been divided into five sections (at sites with pottery, six) in order to illustrate as clearly as possible all aspects of clay technology, the various container types in use, and the probable relationships between clay and container usage and the culture as it is known from each assemblage.

The first section, 'The Environment' is intended to put each site into its natural setting. Information concerning climate, vegetation, food and water resources, and availability of raw materials is included here. Section two presents the entire cultural assemblage in tabular form. Section three, again in tabular form, describes the various uses of clay within the cultural assemblage, that is, in building, in refractory and storage facilities, and in figurine and small artifact modelling. These tables enable us to see at a glance the cultural needs which were met by clay at each site, and those ceramic techniques already known in contexts other than pottery manufacture. Non-pottery portable containers are next listed, and their known and possible uses noted. For sites in which pottery was discovered, section five presents the available evidence concerning quantity of pottery in use, shape variety and manufacturing data.

The final section begins with a discussion of clay usage and the level of clay technology attained at the individual site. This discussion is based upon the evidence presented in section three, and if applicable, five. This is followed by a consideration of container types,

including ceramic vessels if these were recovered, in relation to the cultural assemblage as a whole as presented in section two. Whilst it may be impossible in the light of presently available evidence to do more than speculate upon the precise economic role of containers including those of pottery during the early years of their production, or the cultural requirements which prompted their original adoption at any given site, it is important to view the container assemblage in the light of the culture which produced it.

It is worth remembering, when considering archaeological evidence from any site, that all artefacts recovered represent the ideas, beliefs and day to day lives of a single group of human beings. Just as social organisation, economy, and industries vary from community to community in modern times, so they must have varied in the prehistoric era. Each village or cave settlement was inhabited by individual people with individual ideas and feelings, and thus must have differed in some way from all other settlements, although the differences are not always apparent from the assemblages recovered. However, in order to relate the emergence of pottery to achievements in ceramic technology in the Neolithic as a whole, and to assess the significance of portable pottery containers within Neolithic culture, it is impossible to study each site in isolation. Therefore, after the evidence for the individual sites has been presented, comparative tables are included and discussed in the concluding

section to facilitate assessment of similar usages of clay, equivalent ceramic technology, and common container types used by the inhabitants of all the sites included in this study.

FOOTNOTES

1. Christopoulos and Bastias, 1970, 57.
2. Matson, 1965, 213.
3. Major works concerning the techniques of ancient pottery making include L. Franchet, Céramique primitive, Paris 1911; and A. Shepherd, 'Ceramics for the Archaeologist,' Chicago 1956. Some knowledge of ancient technique may be derived from comparison with techniques used by modern primitive potters. A definitive work on this subject is B. Leach, A Potter's Handbook, London 1945.
4. Matson, 1965, 211.
5. Klima, 1952, 193.
6. For forming techniques in general see Kenny 1949; Leach 1940; Rhodes 1958; and Rosenthal 1949.
7. Scott, 1954, 381.
8. See glossary for a precise definition of these terms as they apply to ceramics.
9. Matson, 1965, 211.
10. Scott 1954, 382. At present no examples of vitrified pottery of prehistoric date have been recovered. A single Karanova sherd examined by Kingery was found to have been partially vitrified, but its date falls outside the scope of this study.
11. Scott, 1954, 385.
12. Braidwood, 1975, 39-40.
13. Deetz, 1968, 31.
14. Clarke, 1969, 24. Frankfort 1956, 23.
15. Garrod and Bates, 1937, 10-13.

ZAWI CHEMI-SHANIDAR ¹

Shanidar Cave:

Site: limestone solution cave, 25m. long x 8m. high at entrance; maximum width 53m. 731.5m. above sea level.

Location: in Rowanduz district of Erbil Liwa in northern Iraq (Kurdistan), 365m. above Greater Zab river.

Years of Excavation: 1951, 1953, 1956-57, 1961.

Excavators: Ralph Solecki, under the auspices of the Director General of Antiquities of Iraq.

Area Excavated: 12m. (east-west) x 26m. (north-south).²

Depth of Deposit: 14m. to bedrock.

Stratigraphy: 5 main levels representing many thousands of years of interrupted occupation; termed Middle Palaeolithic (Mousterian), Upper Palaeolithic (Baradostian), Mesolithic, Proto-Neolithic, Neolithic to recent.³

Chronology

<u>level</u>	<u>C¹⁴ date</u>	<u>reference</u>
B1 (Protoneolithic)	8650 $\pm$ 300 BC	Solecki, 1957, 106

Zawi Chemi:

Site: low mound 215 x 275m.; today used as wheat field.
425m. above sea level.

Situated: 4km. from cave site on second terrace of Greater
Zab river.

Excavated in: 1956-1957 (test excavation); 1961.

Excavated by: Rose Solecki.

Depth of Deposit: 2m.

Stratigraphy: 2 distinct occupation horizons. 50cm. early
Christian debris overlying 1.5m. Protoneolithic
layer.⁴

Chronology

<u>level</u>	<u>C¹⁴ date</u>	<u>reference</u>
B= Protoneolithic	8920 [±] 300BC	Solecki and Meyer, 1958, 1446

ENVIRONMENT

The valley of Shanidar is formed by the Greater Zab and Rowanduz rivers. It is flanked on the north-east by Mt. Baradost, and on the south-west by the Berat Dag range, both over 1,800m. high.

Both Shanidar cave and Zawi Chemi are situated within the oak-pistachio belt which covered the lower Zagros slopes during the prehistoric era.⁵ They also fall within the primary habitat zone of wild wheat and barley.

Today the area is extremely fertile, enjoying an annual rainfall in excess of 50cm. which falls mainly in winter and early spring. A perennial spring situated some 125m. higher up the gorge from the cave site is believed to have supplied Shanidar B1 inhabitants with fresh water. The spring is still used by present-day cave-dwellers.⁶

The banks of the Greater Zab are rich in clay deposits, and an abundance of flint and coarse stone is locally available.

SHANIDAR CAVE, STRATUM B1 CULTURAL ASSEMBLAGE

Cultivation: -

Collecting: only hackberry identified, wild
grain gathering surmised⁷

Subsistence

Herding: -

Hunting: wild goat, wild pig, red deer, fallow
deer. Also wolf, jackal, fox, bear,
marten, gerbil. Goat predominant.
Snails, river clams, fish, tortoise.

Unlined pits, possibly for storage.

Architecture

Wall of loamy clay, set in boulders near cave mouth.
Traces of hearth.

Chipped

Mainly microlithic flint industry, with large

Stone

number of geometric forms.

Obsidian very rare.

Ground and

Querns, mortars, grinding slabs, millers,

polished

hammerstones, rubbing stones.

stone

Worked

Many awls.

Bone

Polished 'pins'.

1 bone haft with flints fixed with bitumen.

Stone: pendants

Bone: -

Ornaments

Shell: pendants

Clay: -

Other: 1 hammered native copper pendant.

Basketry and

Textiles

Wood

Figurines

-

Miscellaneous

Incised pebbles, use unknown.

Finds

Quantity of ochre.

Burial

Cemetery of 26 individuals, mostly children; depth 1m.

Customs

Stone platforms associated with burials, often in arc form as in architecture of Zawi Chemi.

Grave gifts: querns, grinding stones, ochre, tools⁸

Pottery

-

ZAWI CHEMI, STRATUM B, CULTURAL ASSEMBLAGE

	<u>Cultivation:</u> -
	<u>Collecting:</u> wild grains and acorns.
	<u>Herding:</u> dramatic increase in young sheep bones
<u>Subsistence</u>	in upper part of stratum suggests early domestication ⁹
	<u>Hunting:</u> 90% of bones = red deer, bezoar, sheep (which may have been herded as suggested above). Much snail consumed.
<u>Architecture</u>	Large pits for refuse or storage cut into sterile soil. Heaps of stones arranged into rough circles or arcs, 4m. diam. 3 successive rebuildings suggested.
<u>Chipped</u>	Microliths, including many geometric shapes.
<u>Stone</u>	Considerable debitage. Over 300 backed blades. Many choppers and spall tools, possibly for skin dressing. 1 piece of obsidian.
<u>Ground and polished stone</u>	U and V-shaped trough querns, combination quern-mortars, pestles, hammerstones, celts, grooved abrading stones, sandstone slabs.
<u>Worked bone</u>	More than 100 bone points, mainly awls, different sizes and shapes. Many polishers. Rubbers, flakers, chisels, hafts for blades. Occasional incised decoration ¹⁰
<u>Ornaments</u>	<u>Stone:</u> beads (marble and translucent blue stone), pendants (some incision). ¹¹ <u>Bone:</u> beads, tubular and flat elliptical. Bone beads predominant. Pendants. <u>Shell, clay:</u> no ornaments found.

<u>Basketry</u>	Fragments of matting or baskets indicating
<u>and textiles</u>	knowledge of twining.
<u>Wood</u>	-
<u>Figurines</u>	-
<u>Miscellaneous</u>	Fragment of unfired clay with grain impressions.
<u>Finds</u>	
<u>Burial</u>	-
<u>Customs</u>	
<u>Pottery</u>	-

USES OF CLAY IN THE ZAWI-CHEMI-SHANIDAR ASSEMBLAGE¹²

Architecture

Shanidar:

Loamy clay wall believed to have served as windbreak.¹³

Zawi Chemi:

No clay used.¹⁴

Refractory facilities

None found at either site.¹⁵

Storage facilities

Shanidar:

None found.

Zawi Chemi:

Storage or refuse pits cut into virgin soil.

Fragment of unbaked clay with grain impressions suggests possible clay lining.¹⁶

Figurines

None found of any material.

Miscellaneous clay finds

None.

NON-POTTERY CONTAINERS IN THE ZAWI CHEMI-SHANIDAR ASSEMBLAGE

Basketry

<u>quantity/</u> —	few fragmentary impressions at Zawi Chemi
<u>location</u>	
<u>materials</u> —	unknown
<u>technical</u> —	impressions too fragmentary to reconstruct
<u>data</u>	weave
<u>possible.</u> —	collecting wild food; temporary storage
<u>uses</u>	

Wooden Vessels

No direct or indirect evidence.

Stone Vessels

No direct or indirect evidence.

SUMMARY OF THE ZAWI CHEMI-SHANIDAR ASSEMBLAGE INSOFAR AS IT
RELATES TO THE EMERGENCE AND SIGNIFICANCE OF THE PORTABLE
POTTERY CONTAINER

Clay usage and Clay Technology

At Shanidar, the cave itself served as shelter, and the only architectural remains at Zawi Chemi, a rough circle of stones, suggest a temporary hut encampment, super-structures being built from grass and branches.

It is no surprise therefore, that clay was scarcely used at either site in a structural capacity. The properties of clay, however, were beginning to be appreciated by the apparently nomadic Zawi Chemi-Shanidar people. One wall of loamy clay near the mouth of the Shanidar cave is thought to have served as a windbreak. At Zawi Chemi, a pit was apparently lined with clay for the storage of grain. Clay therefore seems to have been respected as protection against the elements, and as a waterproofing material.

No modelled clay artefacts were recovered from Shanidar.

Containers

Although very few botanical remains were recovered from Zawi Chemi-Shanidar, some dependence on plant foods is attested by the large and varied ground stone assemblage. Several basket impressions were found at Zawi Chemi, and there is little doubt that these receptacles were used for the gathering and possibly temporary storage of grain and other vegetable foods.

If other containers were in use at the site, they must have been made from perishable materials such as gourds or skins. As the nearest fresh water supply was some considerable

distance from the sites, particularly Shanidar, some type of water carrying device was probably necessary, and it is thought that skins were used for this purpose, much as they are by Kurdish tribesmen today.¹⁷

Exactly what the people of Zawi Chemi-Shanidar used for eating vessels remains a problem. It is likely that the meal ground in the numerous querns and mortars was mixed with water to make a gruel, but no mixing vessels have been found. It may be suggested that the meal was mixed in and directly eaten from the grinding vessels themselves. Zawi Chemi-Shanidar represents, therefore, an early stage both in clay technology, and container usage.

NOTES

1. The close similarity between the cultural assemblages of Shanidar (stratum B1) and Zawi Chemi (stratum B), their physical proximity, and contemporaneity; led the excavators to conclude that the 2 sites were in fact the repeatedly occupied seasonal settlements of a single people. The tradition of wintering in caves and summering in the open is still continued today by some Kurdish tribes. Ralph Solecki, 1964a, 417. However, as no sheep bones were positively identified at Shanidar, and sheep were predominant at Zawi Chemi, and may even have been herded, the chances that both locations were inhabited by the same people seem slim. This is an economic problem which remains to be solved.
2. Ralph Solecki, 1964a, Fig. 2.
3. This discussion is confined to layer B1 (proto-neolithic) at Shanidar, and stratum 2 (proto-neolithic) at Zawi Chemi.
4. Rose L. Solecki, 1964; 405.
5. Ralph Solecki, 1957, 168.
6. Ralph Solecki, 1955, 402.
7. The vast assemblage of ground stone tools directly related to cereal food preparation indicates a measure of dependence on this form of subsistence. Wild wheat and barley were probably gathered, together with hackberry and the fruits of oak and pistachio. Helbaek 1969a, 368.
8. Luxury items were limited to a small collection of beads. ochre usage and incision indicates beginning of a desire to enrich appearance of everyday objects and possibly identify possessions. Rose L. Solecki, 1964, 408.
9. Zawi Chemi-Shanidar is generally considered to illustrate a shift away from the exclusive dependence on hunting and sporadic gathering of the Palaeolithic era, towards a heavier reliance on plant foods and the herding of animals. Perkins, 1964, 1565-1566; Perkins and Daly, 1971, 280-282; Bökönyi, 1969, 210-229.

10. Cf. note 8.
11. Cf. note 8.
12. Despite the proximity of the clay-rich banks of the Greater Zab, use of clay was extremely limited, and apparently unnecessary within the economy.
13. Ralph Solecki, 1957, 169.
14. Circles of rough stones were the only architectural remains found. They appear to have served as foundations for shelters of branches.
15. Fires for heating and the roasting of meat were no doubt lit on open ground cleared as necessary.
16. Rose L. Solecki, 1961, 124-125.
17. Ralph Solecki, 1955, 406.

KARIM SHAHIR

Site: Open occupation area 60 x 70m. Thin, 30cm. slope wash cover, heavily eroded. 860m. above sea level.

Location: On banks of Cham Gawra river, in intermontane valley of Chemchemal, west of Kani Shaitan, Hasan-Sagirma Dagħ ridge, Iraq. 3 km. from later site of Jarmo.

Years of Excavation: 1951.

Excavators: R.J. Braidwood and B. Howe.

Area excavated: 500 sq. m. in main excavation area and 7 exploratory trenches.

Depth of deposit: To 40cm. with pits extending a further 1.6m. into virgin soil.

Stratigraphy: Occupation represented by 1 thin layer, generally just below present surface.

Chronology: No C¹⁴ dates available. Excavator's suggested date, circa 8600 BC.¹

Environment: See Jarmo section, page 164.

CULTURAL ASSEMBLAGE

Cultivation: -

Subsistence Collecting: No plant remains found.²

Herding: potentially domesticable sheep/goat,
pig, cattle.³

Hunting: gazelle, wolf, marten, fox, dog, small mammals, birds, much turtle. Many snails, predominantly *Helix salomonica*.

No formal architecture, no discernable hut plans.

Architecture Occupation level strewn with erratic pebbles and river stones; pavement formations occasionally visible.

Several rock littered pits with traces of fire.

Chipped

More than 30,000 pieces, exclusively flint, many microliths.⁴ 70% notched blades and flakes.

Stone

Assemblage included scrapers, burins, few blades with sickle sheen. Many cores and flint knapping debris.

Ground and

3 dozen chipped celts with polished areas; few

Polished

boulder mortars grooved schist abrading pieces;

Stone

quern and pestle fragments.

Worked Bone

Few simple bone tools.

Ornaments .

Stone: Simple ground and polished pendants, beads; plain marble bracelet and ring fragments.

Bone: Simple beads.

Shell: Pierced beads and plaques.

Clay: -

Basketry -
and Textiles

Wood -

Figurines 2 poorly modelled examples, apparently lightly
baked. 1 found near circle of red ochre in a pit.

Miscellaneous -
finds

Burial No burials located.

Customs

Pottery -

USES OF CLAY IN THE KARIM SHAHIR ASSEMBLAGE

Architecture

No clay usage. Other than an erratic collection of stones which may possibly have served as foundations or enclosures for temporary huts, no architectural remains were found.

Refractory facilities

No clay usage. Refractory facilities restricted to blackened boulders and stone-filled pits.

Figurines⁵

Provenance — 1 of the 2 examples found near a circle of red ochre in a pit.

Material — Lightly baked untempered clay, possibly accidentally baked.

Technique — Very poorly modelled. Appear to be anthropomorphic.

NON-POTTERY CONTAINERS IN THE KARIM SHAHIR ASSEMBLAGE⁶

Basketry

No evidence.

Wooden Vessels

No evidence.

Stone Vessels

The beginning of the concept of stone as a raw material for container manufacture is indicated by mortar and quern fragments.

SUMMARY OF THE KARIM SHAHIR ASSEMBLAGE IN RELATION TO THE
EMERGENCE AND SIGNIFICANCE OF THE PORTABLE POTTERY CONTAINER

Clay Usage and Clay Technology

The thin deposit at Karim Shahir, and lack of architectural remains other than a few stones which may have served as hut enclosures suggest that the site was an occasionally occupied camp area.

As far as was ascertained during the excavations, clay usage was minimal at Karim Shahir. Two poorly modelled, anthropomorphic, clay figurines were found, one of which lay near a circle of red ochre in a pit. No other clay artefacts were recovered, but these two small figures are indicative of at least some knowledge of the plastic qualities of the raw material. Both figurines were lightly baked, and whilst it is uncertain whether this baking was deliberate or accidental, it is likely that the Karim Shahirans were aware of the hardening effect of fire on clay.

SUMMARY OF CERAMIC TECHNOLOGY.

AT KARIM SHAHIR

Vegetable temper.	
Mineral temper	
Modelling	X
Bonding	
Burnishing	
Decoration, painted.	
Decoration, other.	
Firing	? possibly figurines

CONTAINERS IN RELATION TO THE CULTURAL ASSEMBLAGE

Braidwood classifies the site of Karim Shahir as representative of the era of incipient cultivation. This classification is based upon the possibility that sheep or goat were herded, finds of blades with sickle sheen, and several fragments of ground stone equipment usually associated with plant food preparation.⁷ The large quantity of flint tools and waste flakes which constitute the major part of the material assemblage indicate that Karim Shahir probably served as a seasonal flint-knapping camp.

An early date (ca. 8,500 BC) is suggested for the site, the cultural level is low (few artefacts other than flint tools, and no permanent architecture), and it is likely that the people were semi-nomadic. No containers were found at Karim Shahir, but if any were used (for carrying water on hunting trips, for example), they were probably appropriately shaped natural items such as gourds, or perhaps roughly cleaned animal skins.

NOTES

1. Braidwood, 1974, 72. The date suggested is based upon Shanidar C¹⁴ determinations.
2. Despite a complete lack of vegetal remains; querns, pestles and mortars, and a few blades with 'sickle sheen' attest some measure of plant utilisation.
3. The high proportion of ovicaprids among the faunal remains suggest the beginnings of herding. This however is purely speculative. Oates, 1973, 149.
4. The enormous volume of flint artifacts, cores and waste flakes suggests that Karim Shahr may have served as a seasonal flint factory encampment. Braidwood and Howe, 1960, 53.
5. Braidwood and Howe, 1960, pl. 28, 3.
6. It seems reasonable to suppose that containers of anything other than light, perishable materials would have been too cumbersome for a people without a permanent abode.
7. Braidwood and Howe, 1960, 182.

TELL MUREYBIT

Site: Mound 75m. diameter, 6m. high; resting on platform
250m. long, 125m. wide, 4m. high. 297m. above
sea level.

Location: On the left bank of the Euphrates near Meskene,
86km. east of Aleppo in northern Syria.

Years of Excavation: (a) 1964 (preliminary sounding), 1965.
(b) 1971, 1972.

Excavators: (a) M. van Loon.
(b) J. Cauvin.

Area excavated: 240 sq. m. in first two excavation seasons.

Depth of deposit: 6.6m. (Neolithic) overlaid by 4m. of
Islamic and modern debris.

Stratigraphy:

<u>Soil level</u>	
Islamic and modern debris	4m.
Mureybit III: 'Rectangular phase' (levels x-xvii of van Loon excavations)	6.6m.
Mureybit II: 'Round house phase' (levels i-vii of van Loon excavations)	
Mureybit I: 4 levels of Natufian character. ¹	

Not to scale.

Chronology:

<u>Level</u>	<u>C¹⁴ date</u>	<u>reference</u>
Mureybit 1	8018 [±] 115 BC	
	8640 [±] 140 BC	Mellaart 1975

Chronology: (cont'd..)

<u>Level</u>	<u>C¹⁴ date</u>	<u>reference</u>
Mureybit II	8640 $\pm$ 170 BC	Mellaart, 1975
	8510 $\pm$ 200 BC	
	8265 $\pm$ 115 BC	
	8142 $\pm$ 118 BC	
	8056 $\pm$ 96 BC	
	7954 $\pm$ 114 BC	
	7780 $\pm$ 140 BC	
	7542 $\pm$ 122 BC	

ENVIRONMENT

The countryside which surrounds the ancient site of Mureybit is today virtually treeless and unsuitable for dry farming. Semi-arid, steppe-like terrain begins immediately to the south of Mureybit, and the Euphrates flood plain, lying almost 3m. above the minimum river level must be irrigated during the parched summer months.

Although the climate of south-west Asia appears to have undergone very slight changes during the last 10,000 years, it seems likely from the evidence, that within the prehistoric era, temperatures were sufficiently moderate and the humidity adequate in the Euphrates valley to support a measure of dry farming.

Charred wood samples recovered during the excavations have confirmed the presence of poplar, tamarisk and ash in the vicinity of the site during the occupation period.² Van Loon suggests that the quantity and variety of animal bones retrieved during the excavations may be explained by both this element of tree cover, and by a possible fortuitous topographical feature such as a ford or narrowing of the flood plain which funneled an abundance of game into the site area.³

CULTURAL ASSEMBLAGE

Subsistence Cultivation (phases II and III): strong possibility that morphologically wild einkorn and barley were cultivated.⁴

Collecting (all phases): pistachio, lentil, vetch, pea, foxtail grass, brome grass.

Herding: No positive evidence.

Hunting (all phases): 32% each Bos, onager, gazelle. 5% deer, boar, hare, wolf.⁵ Mussel shells and fish bones also found.

Architecture Mureybit I (campsite): Thin clay walls with vertical post holes. Stamped clay floors with hearths surrounded by clay horseshoe kerbs.

Mureybit II (permanent or semi-permanent village): Round pisé houses on stone.

Mureybit III: Rectangular houses appear with round houses. Clay plastered limestone bricks.

All phases: Pits containing burnt pebbles and ashes. Clay-lined in phase III.

Chipped Phase I: Entirely flint, microliths predominant.⁶

Stone Phases II and III: 70,000 artifacts in chert and flint with a little obsidian. Some microliths. Continuous tradition, predominantly hunting assemblage with many arrowheads. Sickles appear throughout.⁷

Ground and Phases II and III: Mortars, pestles, querns in large quantities; rubbing stones, pierced spheres (digging weights); limestone trays, pallettes, incised paving stones. Polished picks, axes (all phases).
Polished
Stone Polished stone bowls (phases II and III).

Worked Bone

Phase I: Awls

Phase II: Predominantly awls (well-made, highly polished) needles, 1 container.

Phase III: Awls, knives, needles, incised combs.

Ornaments

Stone (phases II and III): Rings, pendants, beads; of various stones including marble.

Bone (all phases): Beads; mostly cylindrical.

Shell: -

Clay: -

Basketry and

-

Textiles

Wood

Phase I: Wood used in architecture.

All phases: Carpentry assemblage attests some woodworking throughout.

Figurines

1 anthropomorphic limestone figurine found by van Loon (phase II).

4 limestone figurines and 1 of baked clay found in Cauvin excavations.

Miscellaneous

Phase II: 2 small clay bowls, 1 baked, 1 sun dried.

Finds

Extension of modelling rather than pottery.

Burial

Phase III: 3 instances of detached skulls set in angle between floor and wall, and clay plastered.

Customs

Few groups of bones buried beneath floors without skulls.

Pottery

-

USES OF CLAY IN THE MUREYBIT ASSEMBLAGE

Architecture

Mureybit I

Extent of Natufian settlement not determined.

Site plan —

Floors, round wall foundations and few wall remains.

Many pits with burnt pebbles and ashes.

Structures —

Circular huts, size not determined.

Construction —

Framework of thin wooden posts 7-12cm.

Materials

diameter. Clay infill.

and Techniques

Wall finish —

10cm. thick clay plaster.

Floor finish —

Stamped clay.

Roofs —

No evidence.

Mureybit II: Fig. Mureybit I

Entire plan not determined. Separate

Site plan— houses surrounded by gravel paths, perhaps
to catch run-off from roofs during rainy season.

Structures— Round or oval buildings 2.7-4m. diameter.

Construction— Foundations of limestone, frequently including

Materials and disused querns, set in clay.

Techniques Lower walls of pisé.
Limited height preserved.
Upper part of walls thought to have been made
of light materials such as reeds.

Wall finish— Sometimes covered with clay plaster the
consistency of mud-brick.

Floor— 3 distinct types.

Finish . a) Large limestone flagstones randomly embedded
in packed red clay. Quern fragments often
included.
b) Evenly laid, well shaped flagstones in clay,
with gravel in interstices.
c) Layer of hard-packed red clay over thin
layer of pebbles, all on limestone foundations.
Frequent refloorings, often in different
techniques.

Roofs— No evidence.

Mureybit III: Fig. Mureybit 2.

Site plan— Entire plan not determined. Paved courts separated houses.

Structures— Round structures continue from phase II, side by side with new, often multi-roomed rectangular houses. Doorways with stone pivots introduced.

Construction— Walls of loaf-shaped limestone bricks set in
Materials and straw-tempered clay mortar, often with pebble
Techniques admixture.⁸

Double course of bricks usual for exterior walls; interior walls single course.

Postholes suggest upper part of walls made of pisé on wooden framework.

Animal jaws and bulls' horns sometimes embedded in walls.

Wall finish— Rectangular houses: plastered on both interior and exterior faces with straw-tempered clay plaster. Many replasterings.

1 geometric wall painting found; black zig-zags on buff ground.⁹

Floor finish— Paving techniques as before. Clay plaster heavily straw-tempered.

Before replastering, floors levelled and covered with layer of fine sand.¹⁰

Roofs— Burnt clay with impressions of beams, posts and reeds suggested simple gable or flat roof of clay-covered reeds supported by wooden framework.

INTERIOR FITTINGS

Mureybit I

Bench

Location — Within house area, built against wall.
Size/shape — Not stated.
Construction — Clay without temper, built up over
materials and bucranium and 2 shoulder blades of equids.
methods

Refractory Facilities

Hearths

Mureybit I:

Hearths in house floors surrounded by clay
horseshoe kerbs.

Mureybit II, III:

Clay lined depressions in house floors.
Traces of burning.

Ovens

None found at any level.

Firepits: all levels.¹¹ Fig. Mureybit III.

Location — Outside house walls. Usually in groups
linked by stone slab pavements.

Size/shape — All perfectly circular, 70-80cm. diameter.

Construction — Lined and often relined with clay which
materials and had become hard baked as a result of
methods frequent fires.

Contents — Ash, charcoal and many black, fire-cracked
pebbles.

STORAGE FACILITIES

Storage bins: Mureybit III¹²

Location— Within houses, usually adjacent to walls of smaller rooms.

Size/shape— Oval, 2m. diameter x 78 cm. deep, with 11cm. high rim. Rare rectangular examples.

Construction— Sunk into floors and plastered with thick materials and layer of straw-tempered clay.

methods Some examples lined with flagstones set in clay plaster. 1 example separated from room by pisé screen wall.

Possible use— Believed to have been for grain and/or water storage.

Figurines: very rare

5 limestone and calcite anthropomorphic figurines found.

1 baked (probably accidentally) poorly worked clay head found in most recent excavations.¹³

Miscellaneous Clay Finds

2 Clay bowls:

Roughly modelled, 1 unbaked, 1 baked (probably accidentally).

Represent extension of modelling rather than true pottery.¹⁴

Clay plastered skulls; level III.

NON-POTTERY CONTAINERS IN THE TELL MUREYBIT ASSEMBLAGE

Basketry

No direct or indirect evidence.

Wooden Vessels

Direct evidence: none.

Indirect evidence: Much wood was used in architecture, and the large number of carpentry tools suggest wood-working, possibly vessels.

Stone Vessels: Fig. Mureybit 4

Materials— Limestone and marble.

Shapes— Oval and circular bowls and plates.

Technical— Roughly hewn, poorly finished.

data Some rudimentary incised decoration.

Possible— Preparation and consumption of grain food.

uses

Bone Container: Fig. Mureybit 4

1 unique example, well carved, and decorated.

SUMMARY OF THE MUREYBIT ASSEMBLAGE IN RELATION TO THE
EMERGENCE AND SIGNIFICANCE OF THE PORTABLE POTTERY CONTAINER.

Clay Usage and Clay Technology

Clay was readily available at Mureybit and knowledge of the material as protection against the elements and in a refractory capacity was familiar from the early camp settlement.

The circular huts of Mureybit I were framed with wooden posts and infilled with raw clay. Walls were finished with 10cm. thick clay plaster, and floors were of beaten raw clay. Stone foundations appeared in the more durable architecture of Mureybit II. The lower walls were built from pisé, and both foundations and walls were finished with a coat of tempered clay plaster. Considerable emphasis was placed on flooring at this stage. Three carefully designed floor types were exposed, all involving the use of clay. In Mureybit III, limestone superseded clay as the basic structural material, although clay continued to play a significant role as a bonding agent. Loaf-shaped limestone bricks were set in pebble and straw tempered clay mortar to form the lower walls.

Superstructures of these rectangular houses were made of pisé. Flooring techniques continued as in the previous phase and there was widespread use of tempered clay plaster for finishing walls and floors. One plastered wall was decorated with a geometric mural in black on a buff ground. Roofs are thought to have been made of reeds and waterproofed with clay.

Hearths and firepits in all levels were lined with clay, and camp-site level hearths were surrounded by raw clay 'horseshoe' kerbs. Storage facilities appear for the first time in Mureybit III, doubtless as a direct result of increasing reliance on agriculture, and possibly surplus production. Oval and rare rectangular bins were lined and rimmed with clay.

Only one example of clay artefact modelling was recovered from Mureybit, a crude, almost certainly accidentally fired head. Three clay plastered human skulls found in level III strongly suggest ritual, as do two equid shoulder blades and a bucranium embedded in a phase I clay bench; and further jaws and bulls' horns in level II house walls.

SUMMARY OF CERAMIC TECHNOLOGY.

AT TELL MUREYBIT.

Vegetable temper.	X
Mineral temper	
Modelling	X
Bonding	X
Burnishing	
Decoration, painted.	X
Decoration, other.	X incision (bone container, stone vessels)
Firing	X possibly figurine and miniature clay bowl.

CONTAINERS

No vessels were found at the Mureybit I, campsite level. Stone vessels appeared concurrently with durable architecture in phase II; and increased in quantity until the site was finally abandoned. One finely worked bone container from phase II may best be described as a prize possession.

Agriculture; beginning it would seem, in phase II engendered the need for a greater quantity and variety of containers for food collection, preparation and storage. Stone and rare bone vessels were probably supplemented by baskets, and perhaps by wooden and skin containers for collection and transportation purposes.

Two unbaked clay bowls represent an extension of modelling techniques and experimentation with the plastic qualities of clay. Although too small and non-functional to be classed as vessels, these bowls, viewed in the context of rapidly expanding container requirements and increasing familiarity with clay technology, may be considered as a prelude to the manufacture of pottery containers.

From the evidence it may be concluded that the Mureybitans possessed much of the technology for pottery manufacture, and must have been aware of the effect of fire on clay through familiarity with the material in refractory contexts. Containers of stone, bone and probably of other materials were in use, and one may speculate that if the idea of making vessels of clay had occurred or been introduced to the inhabitants, it would have been favourably received. Mureybit gives the impression of being on the verge of pottery manufacture.

NOTES

1. 4 successive Natufian levels were distinguished during the most recent excavations. The 'round house' phase was built partly upon the Natufian remains and partly upon virgin soil. Cauvin 1972, 106-108.
2. van Zeist, 1970, 176.
3. van Loon, 1968, 256-282.
4. Lack of both wild einkorn and barley in the area today initially led van Zeist to conclude that both grains were gathered by the Mureybit inhabitants during annual sorties to the hills of south-eastern Turkey, some 150km. away. van Zeist and Casparie, 1968, 44-53, van Zeist, 1970, 172.
In 1973, however, van Zeist published his revised conclusions. It is unlikely that a people already partially dependent upon cereal foods would have settled so far away from a regular source of supply; and furthermore, the transportation of wild grains in the quantities indicated by the finds at the site, would have been virtually impossible without considerable numbers of pack animals. It is therefore much more probable that wild seed grain was brought to the site and deliberately planted, thus representing a very early stage in agriculture and plant domestication.
van Zeist, 1973.
5. No attempt at animal domestication is evident from the Mureybit faunal assemblage, and the 3 major suppliers of wild meat, onager, Bos and gazelle were equally favoured. Ducos, 1970, 273-289.
6. Cauvin, 1972, 110.
7. van Loon, 1968, 288-289.
8. These techniques were used to build rectangular structures from their first appearance. In later levels the same techniques were also applied to round houses.
9. Cauvin, 1972, 110.
10. Cauvin, 1972, 109.

11. Pits were believed to have been used both for the cooking of meat and the parching of morphologically wild grain prior to threshing. Flannery, 1965, 1252.
12. Provision of such bins may have coincided with the beginning of crop conservation.
13. Cauvin, 1974, fig. 4.
14. "...qui sont assez éloquents quant à la précocité de l'utilisation de ce matériau sur l'Euphrate".
Cauvin, 1974, 48.

NAHAL OREN

Site: Cave and associated terraces, 500 sq. m.

45-55m. above sea level.

Location: On western cliff of Mount Carmel in Wadi Fellah,
25 km. south of Haifa, Israel.

Years of Excavation: 6 seasons between 1951 and 1960, 1970.

Excavators: M. Stekelis, T. Yizraely (1st 6 seasons); T. Noy,
A.J. Legge, E. Higgs (1970).

Area Excavated: First 6 seasons: "extensively examined";
1970: 3 squares, each 2.5m. x 2.5m.

Depth of Deposit: Varies according to degree of slope.

Minimum circa 3m. to bedrock. Maximum 4.2m.

Stratigraphy: Site repeatedly occupied. Remains of 'Kebaran'
(lower and upper), 'Natufian', 'Pre-Pottery
Neolithic' cultures identified.
Stratum 2, Pre-Pottery Neolithic to be discussed.¹

Chronology: No dates available for 'Pre-Pottery Neolithic'
or Natufian horizons. The excavators suggest
that the site was contemporary with PPNA Jericho
and Mureybit, although the cultural level is
generally lower than at either of these sites.
The flint industries however are comparable.²

ENVIRONMENT

A recent analysis of prehistoric resource distribution in the Mount Carmel region has shown that despite a considerable body of plant remains recovered from Nahal Oren and the many phases of occupation identified, the area was most unsuitable for agriculture and had a generally low economic potential.³ 8% of the territory surrounding the site consisted of dune, 7% was arable, 27% marsh, and 58% rough grazing (Fig. Nahal Oren 1). Thus the productive potential of the immediate environment was hardly encouraging for settled occupation.

It has been suggested that the amenities offered by the cave as a dwelling place account for Nahal Oren's selection as a 'preferred' site. However, habitation was primarily centred outside the cave entrance, traces of occupation within being minimal.⁴ A second explanation considers the abundant local supply of raw materials for the manufacture of chipped stone tools and weapons, the predominant industry throughout all occupation periods. Whilst both these factors no doubt exerted some influence upon the selection of the site, Higgs suggests that Nahal Oren was repeatedly settled primarily because of an abundance of gazelle within the immediate environment, which he believes may have been herded. "...this (the number of young gazelle bones) could indicate a close man-gazelle type relationship at the site, which may have been a forerunner of the domesticated gazelle in Dynastic times in Egypt".⁵

Although today the surrounding land is suitable only for grazing, there is a constant supply of fresh water issuing from 3 springs within 500m. of the site. There is every reason to suppose that these, or similar springs existed during the prehistoric era, when a small stream also flowed through the gravelly bed of the wadi, emptying into the Mediterranean.

CULTURAL ASSEMBLAGE

<u>Subsistence</u>	<u>Cultivation:</u> Possibly wheat, barley, lentil; all morphologically wild forms. ⁶ <u>Collecting:</u> Wild grasses, vetch, acorn, carob. <u>Herding:</u> Believed gazelle, some goat. ⁷ <u>Hunting:</u> Roe deer, fallow deer, <u>Bos</u> , pig.
<u>Architecture</u>	14 houses 9-15 sq.m. Roughly circular or oval. Co-operate planning evident in utilisation of terrace levels by common walls. Stone foundations, pisé floors. Hearth areas surrounded by stone kerbs.
<u>Chipped</u>	Mainly flint, few fragments of obsidian.
<u>Stone</u>	Arrowheads, knives (12-15cm. long), sickle blades with serrated edges, scrapers of inferior workmanship. Small % of borers, awls, notched tools.
<u>Ground and</u>	<u>Querns</u> (usually plano-convex in basalt and limestone),
<u>Polished</u>	pestles, mortars, grinding stones. Axes, chisels
<u>Stone</u>	of flint, chert, basalt. Cutting edges only polished. Platters and bowls, varying sizes, traces of polishing.
<u>Worked Bone</u>	Few tools. Spatulas, tool handles found in burials.
<u>Ornaments</u>	<u>Stone:</u> Very few, roughly made cylindrical beads. <u>Bone:</u> Very few cylindrical beads. <u>Shell:</u> Many circular beads of worked dentalium.
<u>Basketry and</u>	-
<u>Textiles</u>	
<u>Wood</u>	-

Figurines 3 examples, all female.

Made of incised pebbles, body parts incised in schematic lines.

Miscellaneous -

Finds

Burial Primary burials, tightly contracted in sub-floor pits. Cranium frequently removed.

Customs Few grave gifts including bone hafted flint knives, shells, polished pebbles, simple tools.

Pottery -

USES OF CLAY IN THE NAHAL OREN ASSEMBLAGE

Architecture: Fig. Nahal Oren 2.

Site Plan— 14+ houses built on 4 descending terraces.
Common walls join houses of adjacent levels.
Suggests co-operate planning.

Structures— Oval or elliptical houses, shape dictated by
width of terrace.
Area of individual houses, 9-15 sq.m.

Construction— Large undressed stones piled without bonding for
materials and foundations, and 1m. high stone walls to 80cm.
techniques thick, superstructure unknown, believed to have
been wood and brush lashed to posts.

Wall finish— None detected.

Floor finish— Usually of hard-packed pisé. Many refloorings
evident. Some pebble on clay floors.

Roofing— Believed to have been dome shaped forming part
techniques of superstructure. Cup-marked stone situated
near hearths thought to have held roof and super-
structure supports.

Refractory facilities

Hearths Location— Within houses, no uniform position
within floor area

Size/shape— Usually circular 40-60cm. diam.

Construction— Small boulders embedded several cm.
materials and in clay floor.

methods

Ovens

No evidence.

Storage Facilities

No evidence. 8

Figurines

No clay figurines found.

Few incised pebbles tentatively classified as figurines.

Miscellaneous Clay Finds

No evidence.

NON-POTTERY CONTAINERS IN THE NAHAL OREN ASSEMBLAGE

Basketry

Direct evidence: none.

Indirect evidence: agricultural and food gathering activities suggest the use of some form of container.

Baskets would have been practical.

Wooden Vessels

No evidence.

Stone Vessels⁹

Materials— Exclusively limestone

Shapes — Bowls large and small.

Platters to 0.5m. diameter, all shapes with rounded bases and tapering rims.

Technical— No details stated other than 'traces of data polishing'.

Possible— Sole container type, therefore great variety
uses of uses; rudimentary food preparation vessels, eating vessels, and temporary storage of dry and liquid goods most likely.

SUMMARY OF THE NAHAL OREN ASSEMBLAGE IN RELATION TO THE
EMERGENCE AND SIGNIFICANCE OF THE PORTABLE POTTERY CONTAINER

Clay Usage and Clay Technology

Stone was the preferred building material at Nahal Oren. The oval or elliptical houses were built with durable stone foundations, and walls partially of stone and partially of perishable materials which were probably renewed or repaired each occupation season. Hard packed clay covered by pebbles, or packed pisé was used for flooring in all houses excavated. In a refractory context, a portion of the clay floor of each house was carefully enclosed by a stone kerb to serve as a hearth. The effect of fire on clay is likely to have been observed in this context. However no further use of clay was evident in the assemblage.

Nahal Oren is an example of a settlement demonstrating the beginnings of clay technology.

SUMMARY OF CERAMIC TECHNOLOGY.
AT NAHAL OREN.

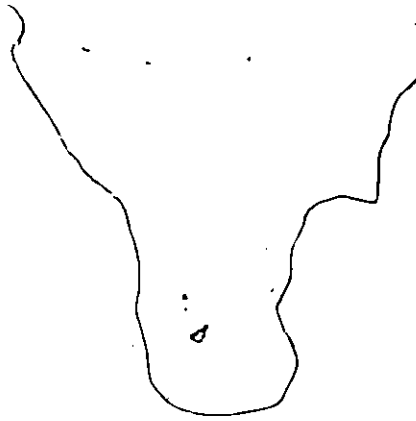
Vegetable temper.	X
Mineral temper	
Modelling	
Bonding	
Burnishing	(
Decoration, painted.	/
Decoration, other.	incision on pebbles.
Firing	

CONTAINERS

The diet of the Nahal Oren inhabitants seems to have consisted mainly of meat obtained from hunting, and perhaps herding first gazelles, and later goats. Vegetal food was gathered and some may have been cultivated on a small scale. The cultural assemblage suggests that it was unlikely that storage facilities, elaborate cooking pots or tableware were necessary at the site, which may have been seasonally occupied. However a considerable quantity of querns, grinders and the like indicates an incipient interest in more complex food preparation than the simple roasting of meat or consumption of raw plant material. The bulk and weight of these artifacts renders them quite unsuitable for a nomadic existence, and their presence usually suggests the beginnings of sedentism. Furthermore a quantity of limestone vessels was recovered, varying in shape and size, and often with traces of polishing. These vessels, like the grinding assemblage, ~~were~~ totally unsuitable for transportation and provide further evidence of settled existence. Large stone platters, too cumbersome for carrying trays may have served for the sorting and drying of plant food. Bowls were probably used for simple food preparation such as the mixing of groats for gruel, and for liquid and dry goods storage. An occasional finely finished piece suggests the beginnings of pride in workmanship, and the concept of personal possession.

If, as the excavators suggest, the occupation at Nahal Oren was purely seasonal, the stone assemblage may have been

hidden in the cave or its environs during unoccupied periods. Although the stone vessels were the only containers found at the site, vessels of perishable materials such as baskets or skin bags were probably used for plant collection.



NOTES

1. Terminology used for the various phases is that of the excavators. Stekelis and Yizraely use the term 'Pre-Pottery Neolithic' to define strata 1 and 2, whilst certain other writers prefer 'Proto-Neolithic'. Stratum 2, believed to be contemporary with the PPNA phase at Jericho has been selected for study. Stratum 1 is poorly preserved and has yielded few remains. Stekelis and Yizraely, 1963, 3.
2. Noy, Legge and Higgs, 88.
3. Vita-Finzi and Higgs, 1970, 1-37.
4. Noy, Legge and Higgs, 1973, 95.
5. Vita Finzi and Higgs, 1970.
6. Only 400 identifiable seeds were collected during the 1970 excavations (the first time flotation methods had been used at the site) compared with over 8000 animal bones. Although the botanical assemblage suggests some interest in plant foods (perhaps the first tentative steps in cultivation), it would seem that these played a very minor role in the Nahal Oren diet. Noy, Legge and Higgs, 1973, 93.
7. 76.4% of bones found on the site were those of gazelle, 60.9% of which were identified as representing immature animals. This pattern is identical to that which denotes herding and domestication. Within stratum 2 the proportion of immature goat bones also shows a marked increase over earlier levels, suggesting that the emphasis was switching from gazelle to goat with its more adaptable feeding habits. Noy, Legge and Higgs, 1973, 91.
8. It is improbable that such facilities existed. Crop production if practised at all was minimal, and the people are unlikely to have conserved food other than on a very short-term basis.
9. "The great quantity of stone vessels, platters, and small bowls distinguishes the site". No numerical details are available, and neither manufacturing data nor illustrations of the stone vessel assemblage have been published. Stekelis and Yizraely, 1963. 10.

JERICOHO

Site: Mound 23m. high, covering 10 acres (PPN area 7.8 acres). 300m. b.s.l.

Location: On western side of Jordan Valley, at foot of Judah mountains, and at western edge of oasis of modern Jericho.

Years of excavation: a) 1907-1909.

b) 1930-1936.

c) 1952-1958.

Excavators: a) Austrian-German mission directed by E. Sellin and E. Watzinger.

b) John Garstang.

c) Kathleen Kenyon.

Area Excavated: circa $\frac{1}{2}$ acre: Plan. Jericho 1.

Depth of Deposit: 23m.

Stratigraphy: Lower 15m. of mound aceramic; occupation began in Mesolithic (Natufian) era. Occupation continuous through Mesolithic, Proto-Neolithic, and Pre-Pottery Neolithic A and B.¹ Upper 8m. of mound Bronze Age to modern.

<u>Chronology:</u>	<u>Level</u>	<u>C¹⁴ date</u>	<u>reference</u>
	PPNA (beginning)	8350 BC	PPS 37, 1971, 27
	PPNA (end)	7350 BC	
	PPNA (end)	7632 $\pm$ 89 BC	Radiocarbon 4.
	PPNB	6850 $\pm$ 210 BC	Kenyon 1957a, 105.
		6770 $\pm$ 210 BC	

ENVIRONMENT

Jericho lies in the lower Jordan valley at one of the valley's widest points (32km.). Mountains to the west reach 1400m. above sea level, whilst the Moab range to the east is still higher. The spring, now called En Elisha, rising from the foot of the tell caused the formation of the Jericho oasis. The oasis is extremely fertile, and today supports the farming of tropical fruits including citrus, banana, pomegranate, mango and guava.

The climate is transitional between that of the dry steppe and eastern desert, and the very moist conditions near the dead sea. Ample raw materials are available, including rich alluvial clay, gypsum, and a variety of hardstone.

CULTURAL ASSEMBLAGE, JERICHO PPNA²

Subsistence Cultivation: 2-row hulled barley, emmer³.

Collecting: Figs positively identified.

Herding: Gazelle may have been herded; no positive evidence of domestication.

Hunting: Gazelle 36.9% of all bones found. Cattle, goat, boar.⁴

Architecture 22 building phases. Round or oval semi-subterranean houses entered through passages with wooden steps. Courtyards separated house. Stone defensive wall 3m. thick x 4m. high with 10m. diameter round towers, believed to have encircled entire 10 acre settlement.

Chipped Essentially same industry as in previous Proto-Neo-
Stone lithic period. Blades predominant; abundant burins, borers, scrapers. Few arrowheads.⁵

Ground and Grinding implements present; no details available.

Polished: Chipped stone axes with polished cutting edges.

Stone

Worked Bone 'Splendid bone industry'.⁶

Ornaments -

Basketry and -

Textiles

Wood Many traces of wattle, bamboo and branch roofs.

 Many stone axes suggest considerable woodworking.

Figurines -

Miscellaneous -

Finds

Burial Contracted sub-floor burials in definite graves. No evi-

Customs dence of skull removal as in later phase. No grave gifts.⁷

Pottery -

CULTURAL ASSEMBLAGE, JERICHO PPNB

- Subsistence Cultivation: 2 row barley, emmer, einkorn, pulses including peas, lentil, broad beans.
- Collecting: Possibly chick pea and bitter vetch, although these may have been cultivated.⁸
- Herding: Domestic goat.⁹
- Hunting: Gazelle reduced in importance from PPNA (14%). Wild pig, wild cats.
- Architecture Rectangular houses, large rooms to 'stereotyped' plans. Walls of cigar-shaped mud bricks. Timber framed doorways, lime-plastered floors and walls. Domestic courtyards separated dwellings.
- Chipped Stone Industry a 'glowing change' from PPNA.¹⁰ Largely well-made, long, thin blades. Several categories of arrowheads. Well-made sickle-blades with signs of long usage.
- Ground and 'Digging sticks' only evidence of cultivation imple-
Polished Stone ments.¹¹ Hammerstones, pestles, polishing stones, unique trough querns. Limestone dishes and bowls, well worked and finished.
- Worked Bone No details.
- Ornaments 1 bone bead; no further details.
- Basketry and Circular or oval coiled rush mats, used for floor
Textiles covering. Similar shapes may have been bases of baskets.
- Wood Wood used in architecture.¹²
- Figurines Several small, horned animals of unbaked clay.
- 1 "mother goddess" figure.
- 1 small carved stone head.

Miscellaneous Fragments of life-sized modelled plaster figures,
Finds use unknown.

Burial Secondary, mass, sub-floor burials. Skulls
Customs frequently removed and great care lavished on
remodelling of features in plaster. Eye-sockets
inset with shells. Paint often applied after
modelling.¹³


Pottery



USES OF CLAY IN THE JERICHO PPNA AND PPNB ASSEMBLAGES.

Architecture

PPNA

Site plan— Exact plan not determined. Extended to cover entire site (10 acres) during period. Enclosed by stone wall with towers. Storage areas built against wall.

Structures— Semi-subterranean; circular, sub-circular or oval houses. Entered through sloping passage-way with wooden steps down to floor level in one instance.

Construction— Walls of 'hog-back' bricks = intermediate materials and stage between pisé pads and moulded mud techniques bricks. Walls incline inwards as they rise suggesting domes.

Wall finish— Interior walls: no details, burnished plaster inferred.

Exterior walls: many traces of wattle. 1 example entirely covered with reeds or bamboo¹⁴.

Floor finish— Beaten clay. Many refloorings. Mat covered.

Roofs— Clay plastered branches, possibly dome-shaped.

PPNB

Site plan— Houses separated by, or grouped around courtyards. Fortification wall with towers built after 10 building phases.

Structures— Rectangular houses, varying sizes. 1 extremely large example 6.8 x 4m., identified as temple.¹⁵ Usually 2 rooms, living and storage. Wide doorways with timber framework.

Construction— Flattened cigar-shaped mud-bricks, deeply materials and thumb-impressed to facilitate application techniques of thick clay mortar.

Wall finish— Highly burnished gypsum plaster, sometimes over entire wall surface, sometimes only lower half.

Floor finish— 1 thick layer gypsum plaster covered by very fine layer. Highly burnished and pinkish or cream coloured. Pits in floors also plaster lined: no further details available.

Roofs— Reeds plastered with clay. Flat or simple gable roof.¹⁶

Refractory Facilities

PPNA: Hearths and ovens located, but no details supplied.

PPNB: Hearths situated in courtyards, one 'oven-base' found.

No details published.¹⁷

Storage Facilities

Storage Enclosures: PPNA.¹⁸

Location— Against fortification wall.

Size/shape— Semi-circular enclosures, over 3m. high.

Construction— Built of stone with thick outer layer of

Materials , clay plaster.

and methods

Possible use— Believed to have served as grain silos.

✓ Storage Rooms: PPNB

Location — Adjacent to living rooms, sharing common walls

Size/shape— Much smaller than living areas.

Construction— As houses

materials

and methods

Possible use— Grain storage, replacing storage areas of
previous phase.

Figurines

Categories:

- a) Animal - several examples.
- b) Human - 1 example.

Provenance— a + b: no particular provenance in both cultural levels.

Material— Unbaked clay.

Technical— a) Roughly modelled, usually horned, some
data incised decoration.
b) "...more striking is a figurine of a woman,"
only some 2 inches high, an elegant little lady
with flowing gown gathered at the waist, her
arms akimbo and her hands beneath her breasts..."¹⁹
Head missing.

Miscellaneous Clay Finds

PPNB: 1 unbaked clay cone with 'swastika' design on base.
Thought to have been a seal.²⁰

NON-POTTERY CONTAINERS IN THE JERICHO ASSEMBLAGE

Basketry: PPNB

Direct evidence; Circular 'mats' may have been basket bases.²¹

Indirect evidence: Coiling definitely known.

Many coiled mats, circular and oval, found as silica skeletons, in situ on plaster floors.²²

Wooden Vessels

No direct or indirect evidence, although Kenyon suggests when describing the stone vessels, that the use of perishable wooden vessels cannot be ruled out, as stone forms, particularly ovals are reminiscent of wooden shapes.²³

Stone Vessels "Large numbers of stone bowl fragments".²⁴

Material— Mainly limestone, some basalt examples.

Shapes — Simple circular and oval dishes and bowls.

Technical— Well worked and finely finished. Highly
data polished.

Possible— Food preparation and eating vessels.

uses

SUMMARY OF THE JERICHO ASSEMBLAGE IN RELATION TO THE EMERGENCE
AND SIGNIFICANCE OF THE PORTABLE POTTERY CONTAINER

Clay Usage and Clay Technology

Considerable and varied exploitation of clay is apparent throughout the PPN period at Jericho. Clay was the most significant domestic building material at the site. The PPNA round houses were constructed from hog back bricks, described as representative of an intermediate stage between pisé and moulded, plano-convex, mud-brick. Floors during this phase were of beaten clay, and a thick clay layer was used to waterproof roofs of brush and branches. Rectangular houses in PPNB were built of cigar-shaped mud bricks bonded with thick clay mortar. Walls and floors however, were now finished with highly burnished gypsum plaster, thus indicating a good knowledge of basic structural materials and the selective application of these materials according to purpose. PPNB roofs, like those of the previous phase, were waterproofed with clay. In PPNA, large storage areas against the fortification walls were built of stone and plastered with clay. These probably served as grain silos. In PPNB, small rooms adjacent to the living areas were used for this purpose.

Several roughly modelled animal figurines, and one superior human example were recovered, but modelling skill at Jericho is fully evident in the shape of excellently worked gypsum plastered skulls with shell and paint decoration.

A single seal of unbaked clay suggests a concept of ownership.

By the beginning of PPNB, all technology necessary for the manufacture of pottery was known and utilised in other capacities. Tempering and bonding (hog back bricks, mud bricks, clay mortar) were used in architecture; plastered skulls are excellent examples of modelling ability; burnishing was applied to floors and walls; painting (skulls) and incision (seal and figurines) indicates some facility with surface decoration; and the presence of gypsum plaster is evidence of the ability to achieve firing temperatures in excess of those required for the simple baking of clay for permanence. Although no details of the construction of refractory facilities have been published, it is likely that the effect of fire on clay was known in this context.

SUMMARY OF CERAMIC TECHNOLOGY.

AT JERICHO, PPNB, PPNB.

	PPNA	PPNB
Vegetable temper.	X	X
Mineral temper		
Modelling	X	X
Bonding		X
Burnishing	X possibly wall plaster	X
Decoration, painted.		X
Decoration, other.	X incision (figurines)	X incision (figurines, seal)
Firing		X

CONTAINERS

The site of pre-pottery Jericho extends over 7.8 acres, and ~~is~~ believed to have supported a permanent population of about 3,000. A substantial food supply was thus necessary, and seems to have been achieved through agriculture, herding and some hunting. Both crop growing and animal husbandry showed development from PPNA to PPNB. A variety of industries flourished, and at least bone and flint tool making are thought to have been controlled by specialised craftsmen. Trade is suggested by finds of obsidian cowries and turquoise.

In view of the apparent sophistication of the economy, the level of ceramic technology and the diversity of clay usage at Jericho, it would have come as no surprise to find that pottery vessels were used at the site. Pottery making would have been the product of technological evolution, rather than a revolutionary achievement.

No specific numbers are available, but 'many' stone bowls described as 'lavish equipment' seem to have constituted the most frequent container type at Jericho. These were doubtless used for food preparation and eating vessels, although they would have been unsuitable for cooking purposes. Large baskets may also have been in use, most probably for the gathering of grain, and transportation of goods.

The reasons why no pottery vessels were produced or used at Jericho must, for the present, remain within the realms of speculation. It is possible that the inhabitants were

satisfied with vessels of stone for most of their container requirements, or that no cooking pots were needed as food preparation was confined to roasting meat and mixing crushed grain with water to make gruel. Alternatively, the idea of making vessels from clay may never have occurred to the Jericho inhabitants, despite considerable outside contacts.²⁵ Whatever the reasons for the lack of pottery at the site, all technology was available for its manufacture, and well-made containers in other materials had long been in use. Pottery would have represented a mere step in cultural and technological evolution.

NOTES

1. Paucity of finds for the Mesolithic and Proto-Neolithic renders detailed discussion of these periods impractical. Evidence of mesolithic occupation was recovered during the 1958 excavation season, when a rectangle of hard-packed clay, resting directly on bedrock, and enclosed by a low stone wall was discovered. This platform bore traces of post-holes, and was scrupulously clean in contrast to the adjacent rocky surface which was strewn with occupation debris. Kenyon, 1960, 100.
A very small area bore traces of Proto-neolithic occupation. Slightly built structure footings of stone and clay balls were found, which appeared to have served as supports for temporary walls of clay, branches, and probably skins. The uppermost layers of this proto-neolithic accumulation contained the first evidence of the permanent curvilinear architecture of the PPNA phase. "Somewhere around 8000 (C¹⁴ dates nearer to 7000 BC) mesolithic hunters started to visit the spring of Jericho. Their descendants settled on the site, and their occupation became increasingly permanent until by 7000 BC it had developed into a town with massive defences covering an area of some 10 acres". Kenyon, 1960, 99.
2. "... this was undoubtedly a community undertaking indicating some form of communal organisation, some form of group government. Here clearly we have a civitas". Kenyon, 1956a, 187.
Indications of community organisation are implicit in the complex defensive system and in the agricultural practices at Jericho. As the population of the 10 acre site has been estimated at roughly 2000, an assured food supply of some considerable size was necessary. "It is improbable that such a supply would have been obtained from the area watered by the spring in its natural state. It may thus be suggested that a system of irrigation had been developed". Kenyon 1960, 101.

3. "on the basis of the finds described, cultivation in Jericho during the Pre-pottery A phase could possibly be traced to the taking into cultivation of wild plants". Hopf, 1969, 358.
4. Clutton-Brock, 1971, 41-55.
5. Kirkbride, 1960a, 115.
6. The PPNA bone industry was apparently a continuation of that begun in the proto-neolithic age. No specific details have been published. Kenyon 1956b, 73.
7. Kenyon 1957a, 107.
8. Hopf, 1969, 356.
9. Clutton-Brock, 1971, 51.
10. Kirkbride, 1960, 116.
11. "Moreover, though the sickles attest the gathering of grain, and the querns its use, none of the stone implements appears to be designed to cultivate the soil. It is possible that a large number of large pierced discs of stone may be weights for digging sticks thus supplying the deficiency". Kenyon 1956a, 185.
12. Surprisingly no heavy axes or other carpentry tools were found, either of chipped or ground stone. Kenyon 1969a, 49.
13. Kenyon, 1954, 2-8, Fig. 5, Fig. 6.
Kenyon 1953a, 603.
14. Kenyon 1956b, 73-74.
15. This particular room had a normal plaster floor, and a plastered, rectangular fire-scorched basin in centre. Annexes with curved walls were built at each narrow end. If not a temple, this must, at least, have been a public building. Kenyon, 1956a, 186.
16. Many reed impressed clay fragments discovered.
Kenyon 1956c, 504.
17. The domestic purpose of the courtyards is attested by a series of hearths (no further details), and layers of charcoal between layers of beaten clay which was the normal courtyard flooring. Kenyon 1956c, 505.

18. Kenyon 1957a, pl. xxi.
19. "... in attitude the figure is typical of the Mother Goddess common in much later cultures, and it is evidence that our early inhabitants already identified a personified deity". Kenyon, 1956b, 84.
20. Kenyon 1955, 110 and pl. xxiii.
21. Kenyon 1956a, 185.
22. Kenyon 1955, 110.
23. "These vessels no doubt would have been supplemented by others of materials which have perished, probably of skin, and possibly of wood". Kenyon 1969a, 49.
24. Described as "lavish equipment". Kenyon 1956a, 185.
25. Dead Sea asphalt, sulphur and salt have been suggested as possible commodities for barter, possibly in exchange for Çiftlik obsidian which appears throughout the neolithic era, cowrie shells from the Mediterranean, and turquoise from Sinai. Trade is believed to have played a significant part in the PPNB economy. Kenyon 1969a, 50; Anati, 1963, 28; Perrot, 1968.

GANJ DAREH

Site: Oval mound 40m. diameter. 1350m. above sea level.

Location: 15km. from Bisitun in Gamas Ab valley, near town of Harsin, Kermanshah district, Iran.

Years of Excavation: 1965 (sounding), 1967, 1969, 1971, 1974.

Excavator: P.E.L. Smith.

Area excavated: circa 400 sq. m.

Depth of deposit: Almost 8m.

Stratigraphy: 5 levels numbered E-A (bottom to top).

Believed to represent continuous neolithic occupation.

No later building at site.

Chronology:

<u>Level</u>	<u>C¹⁴ date</u>	<u>Reference</u>
E	8450 $\pm$ 150 BC	Mellaart, 1975
D	7289 $\pm$ 196 BC	
	7018 $\pm$ 100 BC	
'Later levels'	6960 $\pm$ 170 BC	
	6938 $\pm$ 98 BC	

ENVIRONMENT

Ganj Dareh is situated in the north-west Zagros range outside the oak pistachio belt. The climate in the area is generally warm. Summers are very hot (upwards of 90°F) and the average January temperature is 48°F. Mean annual rainfall measures 327.7mm., and there is no reason to suggest any marked fluctuations since the prehistoric era. Rich deposits of clay were available in the Gamas Ab river valley.

CULTURAL ASSEMBLAGE

Cultivation: Data not yet available.

Subsistence Collecting: Data not yet available.³

Herding: Goat, most probably sheep.⁴

Hunting: Deer, pig, large ungulates.

Architecture Level E (campsite): No permanent architecture, pit complex only.

Levels D-A: permanent rectangular structures of plano-convex bricks or chineh. Tightly-packed plan without courtyards or open areas. Many storage buildings.

Level A: Very poorly preserved.

Chipped Industry consistent throughout levels. Entirely flint.

Stone No obsidian. Reaping knives/sickle blades first appear in level D. Mainly blade industry, no arrowheads found.

Ground and polished No polished stone axes or celts. Many querns, mortars, pestles, hammerstones (except level E). Few fragments of stone vessels (except level E).

Stone

Worked bone 'Wrist guard' (level D). Handles for flint blades.

Ornaments Stone: beads, pendants.

Bone: -

Shell: Necklaces.⁵

Clay: -

Basketry and Impressions of matting or coarse textile found in connection with adult burial.

Textiles

Wood -

Figurines

Human and animal figurines found in all levels.

'Stalk' figurines in level D. All of clay.

Miscellaneous

Many geometric clay shapes, including spheres, cones, ovoids, 'seals'.

Finds

Burial

41 burials found to end of 1974 season. Adults, children; flexed and extended. Children

Customs

usually in sub-floor plastered niches. 3 adults, extended in clay brick sarcophagus with clay roof.

Few grave gifts (ornaments). 1 mat wrapped burial.

Pottery

1 sherd, level E. Small quantities D-A. Mostly large vessels presumably for storage. Few miniatures in D. Very poor, friable throughout.

USES OF CLAY IN THE GANJ DAREH ASSEMBLAGE

Architecture: Fig. Ganj Dareh 2.

Level E: No permanent architecture. Believed to have been camp site, possibly building camp.

Level D:

Site plan— Houses tightly packed, built contiguously with party walls. No trace of courtyards, streets or open spaces.

Structures— Small rectangular rooms or alcoves, interconnected by 'portholes' sealed with cones or discs of clay. Houses believed to have been 2 stories with living quarters situated above ground floor storage areas and workshops.⁶

Construction— 4 types: a) Walls of straw-tempered, plano-
materials convex mud- bricks in varying sizes. Average
and 1m. long. Bonded with clay mortar. (Commonest
techniques construction method).

b) Chineh walls.

c) Old mud-brick rubble core, plastered on both sides with thick layer of clay plaster.

d) Large flat stones incorporated into chineh walls.

Wall finish— Clay plaster, sometimes white in colour with high lime content (not yet scientifically analysed).

Floor finish— Clay plaster with some raised areas, presumably to accommodate storage vessels.⁷

Roofing — Beams and canes, sometimes interwoven, infilled
techniques and coated with thick layer of clay.

Levels C, B:

Site plan — C Houses built contiguously as in D, but covering much smaller area towards western end of mound.

B Slight expansion of C.

Structures — Rectangular contiguous houses of similar plan to D.

Construction — Walls built entirely of chineh.

materials and

techniques

Wall finish — White lime and clay plaster (no analysis as yet)

Floor finish —

Roofing —

techniques

Level A: Very poorly preserved. Apparently a return to plano-convex clay bricks.

Refractory Facilities

Hearths: Few found. None in 'rooms'. Shape, size and construction data not mentioned in reports.

Ovens/Kilns: 2 examples.⁸

Location — Levels D, A. Outside house areas.

Size/shape — Roughly circular, domed.

Construction — 'Stone lined', dome believed to have been⁹
materials and constructed of clay.

methods

Roasting Pits: Level E only: Fig. Ganj Dareh 1.

Location — Scattered haphazardly across occupation level E. Some connecting pits found.

Size/shape — Oval or roughly circular depressions, 0.8-1.7m. diameter, and circa 0.5m. deep.

Construction — Shallow depressions cut into virgin soil.

materials 1 example surrounded by arc of stones set on edge. Many contained limestone cobbles (boiling stones?) and ash.¹⁰

Storage Facilities

Storage compartments:

Location — Within rooms as subdivisions.

Size/shape — Rectangular.

Construction — Thin, vertical clay slabs with bevelled edges prefabricated and sundried;

materials

and methods plastered into position to form series of compartments.

Use — Unknown, no contents.¹¹

Storage bins:

Location — Within rooms, sometimes several within one room.

Size/shape — 'Domed'.

Construction — Clay; no further details available

materials

and methods

Use — Believed to be for grain storage.¹²

Storage jars:

Location— Within rooms, often raised on plastered surfaces and plastered to floor.

Size/shape— Wide-bodied, narrow top opening; up to 80cm. high; thick walled.

Construction—Heavily straw-tempered clay. Built and
materials possibly lightly baked outside structures
and methods before being plastered to room floors.

Use — Food storage, possibly liquid.

Storage niche: 1 example

Location— Within house wall, level D.

Size/shape— Long rectangular recess

Construction—Cut into wall fabric;

materials 2 sheep skulls plastered into place.

and methods

Use— Rarity of structure and presence of skulls suggest ritual purpose.¹³

Figurines

Categories:

Human, including one 'Venus' type in level E.

Animal, mainly sheep and goat, 1 example of bearded goat.

'Stalk' figurines.

Provenance— All categories found throughout levels with exception of 'Venus' type (exclusive to level E). Greatest concentration in level D.

Materials— Sundried or lightly baked clay.

Technical— Modelling "quite realistic". Some examples
data decorated with finger-nail impressions.¹⁴

Miscellaneous Clay Finds

Quantities of lightly fired geometric objects including spheres, cones, discs and 'seal-like' pieces.

Clay Sarcophagus

Location— Level D

Size/shape— Rectangular, size not indicated in reports.

Construction— Straw-tempered mud-brick walls; clay slab
material roof and floor
and methods

Use— Burial of 3 adults in extended position

Boulder mortars

Location— Within rooms, against walls.

Size/shape— Roughly circular

Construction— Thick clay rim attached to limestone boulder
materials mortar; set into clay foundation and packed
and methods with pebbles.

Use— Presumably for food preparation.

NON-POTTERY CONTAINERS IN THE GANJ DAREH ASSEMBLAGE

Basketry

Direct evidence: None

Indirect evidence: Weaving techniques were known as witnessed by coarse textile or mat fragments found in conjunction with adult burial.

Wooden Vessels

No direct or indirect evidence.

Stone Vessels

Few fragments of polished stone bowls found. No profiles or specifications presently available.

Portable Pottery Containers at Ganj Dareh

Amount of Pottery—Level E: 1 sherd recovered.

D-A: 'very small amount' (no details available)

Wares, surface — Coarse, thick, extremely friable. No surface treatment other than punctate impressions.

Temper, firing — Heavy chaff temper. Very low fired.

Shapes — Sherds of large bowls and jars. Storage vessels, some miniature. 1 gourd-shaped vessel, level D.

Colour — No details available.

Decoration — Some punctate impressions.

SUMMARY OF THE GANJ DAREH ASSEMBLAGE IN RELATION TO THE
EMERGENCE AND SIGNIFICANCE OF THE PORTABLE POTTERY CONTAINER

Clay Usage and Clay Technology

A massive use of clay is evident throughout the Ganj Dareh assemblage from the earliest levels. As a structural material clay was used for house building in the form of chineh (pisé) and plano-convex mud bricks, the latter bonded with clay mortar. Clay cones or discs acted as rudimentary doors between living and work areas, and floors, walls and roofs were all finished with variously tempered clay plaster of differing consistencies.

Of the refractory facilities found, only the ovens are described in any detail in the preliminary reports. These were stone-lined with clay domes and may have been used for grain parching, and pottery making. A substantial array of storage facilities existed at Ganj Dareh, all involving the use of clay. Storage niches were cut into the house walls, storage bins were built entirely of clay, and prefabricated, sun-dried, clay slabs with bevelled edges were plastered vertically into place to form a series of storage compartments. Perhaps the most surprising storage facilities found within the assemblage were a number of large, heavily straw-tempered jars, built and possibly baked in the open, before being plastered into place within the room areas. These are suggestive of surplus production.

A varied, well-modelled figurine assemblage was recovered at Ganj Dareh, some examples being decorated with finger-nail

impressions, a technique also applied to pottery. A considerable quantity of lightly fired geometric shapes was also found.

Evidence of the concept of life after death came in the shape of a straw-tempered mud-brick sarcophagus (unique within the sites examined) with clay slab roof and floor. It contained three adult burials accompanied by personal ornaments.

Clay was also used in conjunction with stone for food grinding receptacles. Boulder mortars were sometimes equipped with clay rims to prevent spillage.

SUMMARY OF CERAMIC TECHNOLOGY.
AT GANT DAREH

Vegetable temper.	X P
Mineral temper	
Modelling	X P
Bonding	X
Burnishing	
Decoration, painted.	
Decoration, other.	p : punctate impressions
Firing	X possible lime slaking. Fired figurines and geometric objects. P

CONTAINERS

The permanent village, levels D-A (level E tentatively identified as a campsite) is thought to have had an agricultural economy. Although botanical data is not yet available, the ground stone assemblage and varied storage facilities suggest at least the utilisation of plant food.

Aside from the small amount of pottery, the only durable vessels found at Ganj Dareh were a few polished stone bowls, the specifications of which are not yet available. It is possible that baskets were used for plant collection, for weaving was known at the site. Gourds may also have served as containers, and a pottery vessel based on a gourd prototype was recovered during excavations. The stone and pottery vessels however, suggest that durable containers were required for roles for which basketry and possibly gourds were unsuitable. Although gourds can be used for the slow heating of liquids, and will last for some time if subjected to moderate heat, they will rapidly disintegrate if exposed to the strong, direct heat required for many cooking purposes. Without further details it is impossible to do more than speculate upon the role of stone vessels at Ganj Dareh. They were polished, and may have been tableware, pottery being reserved for food preparation and cooking, being more suitable than either gourds or stone for the latter purpose.

The pottery of Ganj Dareh "...may well represent an early or experimental stage of pottery making".¹⁵ All sherds found were of extremely coarse quality and poorly fired. Shapes were based upon natural prototypes such as the gourd-shaped



vessel from level D. The first ceramic containers appear to have included very large storage jars, although without further details of the diet of the inhabitants, the use of these jars must remain speculative.

There is no reason to suppose that the idea of pottery making, or the pottery itself was imported to Ganj Dareh. The inhabitants were familiar with clay technology in other contexts, clay was readily available, and the vessel shapes may well have been based upon those of containers of other material already in use. Furthermore the cultural assemblage suggests an imaginative approach to problems of shelter (unique 'porthole' doorways with removable covers, for example), food preparation (the construction of domed ovens, rimmed boulder mortars, for example), and tool manufacture (craft specialisation indicated by presence of workshops for example).

Scientific analysis of sherds and of local clay sources should assist in ascertaining whether or not the Ganj Dareh pottery was of local manufacture.

5

NOTES

1. Lack of morphological change in the chipped stone and figurine industries suggests that the site was occupied by one group of people throughout the habitation period, including the 'camp-site' level E.
3. "The situation for floral remains is much less conclusive, in spite of the flotation practices followed, although there is much indirect evidence for plant use in the form of mortars, pestles, clay bins and containers". Smith, 1972, 168. Bricks too were straw-tempered.
4. Domestic goats identified by D. Perkins. Smith, 1970, 179.
Analysis of faunal remains from level E by B. Hesse (Columbia University) indicated ~~animals~~ were larger and/or older than those in later levels. "This may reflect a lesser degree of selectivity or of control over the animals in the basal level". Smith, 1975, 179.
5. 5 examples of the gastropod oliva (a marine shell probably from the Persian Gulf) were identified. This is the only indication to date of imported materials at Ganj Dareh. Smith, 1975, 180.
6. "This suggestion derived firstly from the finding of several beams too stout to have been ordinary roof supports. Secondly the size and contents of the ground floor rooms and the lack of hearths suggested their use as storerooms rather than living spaces. Smith, 1972, 166.
7. A thick-walled jar, 80cm. high, was found on such a plinth. Smith 1968, 159.
8. These structures are believed to have been used as both ovens and pottery and lime kilns. Kiln, level D, was filled with layers of burnt lime and several pottery fragments. Kiln, level A, had layers of burnt lime. Smith 1972, 168; 1975, 179.
9. Large quantities of clay rubble were cleared to expose the inner stone framework of this kiln, suggesting that the dome was made of clay. Smith, 1975, 175.

10. Roasting pits may have been used for parching grain and the cooking of plant food in addition to meat roasting. No mention is made of animal bones in pits.
11. The large number of structures which were compartmented in this manner suggests a high degree of productivity (be it crop or craft or both) and some community co-operation.
12. Smith 1972, 168.
13. Smith 1972, 166.
14. Smith 1968, 159.
15. Smith 1968, 158.

ÇAYÖNÜ

Site: Low oval mound 250m. x 150m. 4-5m. high. 830m. above sea level.

Location: Adjacent to a tributary of the Upper Tigris in Diyarbakir province, 5km. west of Ergani, S.E. Turkey.

Years of Excavation: 1964, 1968, 1970, 1972.

Excavators: Joint Chicago-Istanbul Prehistoric Project.

Directors: H. Çambel, R. Braidwood.

Area Excavated: Approximately 800 sq. m. = more than 5% of total mound.

Depth of Deposit: 4-5m. to sterile soil.

Stratigraphy: 5 occupation phases, numbered I-V (bottom to top).

Hint of sixth subphase noted in 1972 excavation season.

Continuous occupation.

Chronology:

<u>Level</u>	<u>C¹⁴ date</u>	<u>Reference</u>
IV	7570 $\pm$ 110 BC	Vogel J.C. & Waterbolk H.T.
	7250 $\pm$ 60 BC	Radiocarbon 9, 1967, 128.
V	6840 $\pm$ 250 BC	
	6620 $\pm$ 250 BC	

CULTURAL ASSEMBLAGE

Subsistence

Cultivation: einkorn, morphologically wild emmer, pea, (upper levels), lentil.

Collecting: Pistachio, almond, acorn. Flax, wild legumes (lower levels).¹

Herding: Levels I, II: domestic dog only.

Levels IV, V: domestic sheep, goat, possibly pig.²

Hunting: Levels I, II; auroch, pig, deer, sheep, goat, small game.

Levels IV, V; auroch, deer still hunted on large scale, despite domestic animals.

Architecture . Imaginative, sophisticated throughout.

Level I: characterised by pit ovens.

Level II: 'grill' foundations, plaster floors, large houses.

Level III: Large houses, open courts with sophisticated terrazzo floors.

Level IV: Mud-brick architecture on stone foundations.

Level V: Large houses, poorly preserved.

Chipped Stone Flint predominant with increasing obsidian usage in later levels. Industry homogeneous with minor development in later levels. Cutting, scraping, piercing tools predominant in earlier levels I-III whereas large obsidian blades, points, specialised tools gain importance in later IV-V levels.³

Ground and polished stone Polished celts, querns, handstones, hammerstones. Stone bowls, few and in fragmentary condition.

- Worked bone Bone tools common, particularly in level II. Some awls. Antler hafts found in level IV.⁴
- Ornaments Stone: Beads, pendants, bracelets common.
Bone: -
Shell: Limited finds.
Clay: Few beads.
Other: Drilled native copper beads.⁵
- Basketry and -
- Textiles
- Wood Wooden beams used as floor supports in 'grill' building phase. No specific woodworking tools found.
- Figurines Human, animal, stylised 'T' shaped and 'stalk' figurines in clay, from level II onwards.
- Miscellaneous Native copper beads, a small tablet, a reamer, 3 pins.⁶
- Finds 1 undrilled ellipsoid of malachite. Marine shells.⁷
Clay house model; geometric objects.
- Burial No burials found.
- Customs
- Pottery 3 pieces, unbaked, from level III. Very poorly made.

ENVIRONMENT

Çayönü is situated near the headwaters of the Tigris on the Taurus piedmont in south-eastern Turkey.

At present, the area is almost devoid of trees, although during the occupation period at the site steppe-forest dominated the vegetation, sheltering a variety of wild game and providing the inhabitants with supplementary vegetal resources including fat-rich pistachio and almond. Large stands of wild grains still may be found within the vicinity of the site. Clay, a variety of stones and native copper were locally available.

USES OF CLAY IN THE ÇAYÖNÜ ASSEMBLAGE

Architecture

Level I: Remains of possible curved mud brick wall.

Level II:

Site plan— -

Structures— Large, 5m.x10m. Rectilinear with partition walls

Construction—Stone grill foundations, overlaid with wooden materials and supports. Material of superstructure unknown.

techniques

Wall finish— -

Floor finish—Plaster, 7cm. thick. No details of composition supplied.⁸

Roofing— -

techniques

Level III:

Site plan— Complete plan unknown. Some evidence of courtyards.

Structures— Large, 9m.x10m., rectilinear.

Construction— Stone rectilinear foundations, superstructure materials and unknown. Buttressed walls.

techniques

Wall finish— -

Floor finish— "...white cobbles and pebbles set in concrete and varies from 5-20cm. in thickness. The limestone was evidently crushed for this purpose. A surface layer of primarily salmon pink pebbles 1-3cm. diameter was set into the concrete while still wet, as were at least 2 sets of parallel strips of white pebbles, to make white bands 5cm. wide and 4m. long.⁹

Roofing techniques -

Level IV:

Site plan -

Structures— Large rectangular structures, identified as workshops, 5m.x8m., containing 6 small rectangular rooms.¹⁰

Construction— Stone foundations. Superstructure of rectangular materials and angular clay bricks with gritty white techniques inclusions.¹¹ Doorways with jambs preserved.

Wall finish— -

Floor finish— -

Roofing— Possibly flat roofs.¹²

techniques

Level V: Structures 5m. x 9m. average size. No further details available.

Refractory facilities

Hearths

Location— In house floors (specific levels not indicated in reports).

Size/shape— Circular or oval depressions to 1.45m. diameter, rimless.

Construction— Depression formed in floor, bed of pebbles materials and laid in base, then lined with clay.

techniques

Ovens

Location — 2 examples found in level 1 structures.

Size/shape — 1-2m. diameter. 30-50cm. deep.

Roughly circular.

Construction — Described as 'pit-ovens' (no further details materials and supplied). Fuel consisted mostly of wood.¹³

techniques

Storage Facilities

Storage Bins

Location — Within rooms, usually in corners.

Material — Stone and clay.

Size/shape — 1 example circular, circa 1m. diameter.

1 example $\frac{1}{4}$ circular, corner fitting.

Construction — Stone curb, raised above floor level of grid buildings in level II. Lined with untempered clay.

Use — Examples located near ovens may have been fuel stores.¹⁴

Figurines

Total of 28 found by the end of the 1970 season. 'More' found in 1972 season.

Categories:

Anthropomorphic: 22 examples (to end of 1970), may be subdivided into 3 groups.

a) Fairly realistic; circa 3cm. high, seated, apparently female.

b) Stylised; headless, armless torso with flared legs.¹⁵

c) 'Stalk' figurines; long tip, perpendicular to circular base.

Animal: 6 examples (to end of 1970), 2.5-6cm. high, believed to represent caprids or cattle.

Figurines: (cont'd..)

Provenance - Found erratically throughout levels.

No particular concentration

Materials— Unbaked or accidentally fired clay.

Technical— Modelling generally crude. Body features

data roughly indicated by incision or pinching.

Occasional indications of dress or ornament.

Miscellaneous Clay Finds

Geometric objects

Spheres (11): 7mm.-2cm. diameter. Average 1.3cm.

Oval pellets (2): 2 x 1.2cm., 1.8 x 0.8 cm.

Cones (3): 1-2cm. diameter x 1cm. high.

Tetrahedron (1): 3.5cm. high x 1.2cm. diameter.

Discs (8): tapering or straight sided, 1.5-4cm. diameter.

Cylinder (1): 5mm. thick.

All carefully made and smoothed. Fine clay, no temper.

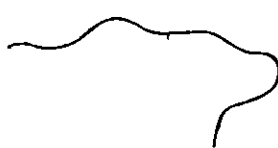
Accidentally or perhaps deliberately fired.¹⁶

Beads (5)

Crudely executed, cylindrical or biconical. May have been fired.

Clay house models (2)

Found in level V context. Represent rectangular single storey buildings with flat roof. Door with cylindrical jamb situated on one of the short sides. 20 x 15 cm.



NON-POTTERY CONTAINERS IN THE ÇAYÖNÜ ASSEMBLAGE

Basketry: No evidence, direct or indirect.

Wooden vessels: No evidence, direct or indirect.

Stone vessels: Very few fragments.

Materials— Limestone

Shapes— Too fragmentary to reconstruct.

Technical data— Thin-walled, decorated with excised triangles leaving relief patterns.

Uses— Unknown. With the exception of the 3 potsherds (see "pottery containers" section), these fragments represent the only evidence of container usage thus far recovered.

Portable Pottery Containers at Çayönü

Amount of— 3 sherds in stratified contexts. All level III.

pottery Several dozen unstratified sherds, found from surface to plough depth.

Wares,— Fine paste, unburnished.

surface

Temper— No temper. Unknown if deliberately or

Firing accidentally fired.¹⁷

Shapes— 1 massive circular piece, may have been plate or mortar. 2 miniature cups 2.10 and 1.40cm. diameter, 4.50 and 2.50cm. deep. Walls 3mm. thick.

Colour— -

Decoration—None.

SUMMARY OF THE ÇAYÖNÜ ASSEMBLAGE IN RELATION TO THE EMERGENCE
AND SIGNIFICANCE OF THE PORTABLE POTTERY CONTAINER

Clay Usage and Clay Technology

Other than a possible curved, mud-brick wall found in a level I context, the earliest confirmed use of clay as a structural material at Çayönü occurs in level IV. Level IV houses were built of grit tempered mud-brick on stone foundations. However, the effectiveness of clay as a finishing material was known prior to this level. The 7cm. thick plaster floor in a level II house is likely to have contained some proportion of clay, and both storage and refractory facilities were lined with a layer of untempered clay.

Whilst clay played something of a secondary role in the architectural assemblage, lime plaster, wood and stone apparently being preferred for most purposes, it saw widespread use as a modelling material throughout the strata. An assortment of carefully made and smoothed geometric objects, and a varied, interesting figurine collection were recovered. An unusual use of clay in a modelling capacity is represented by the 2 level V house models. Whilst the purpose of these models is unknown, they are thought to be replicas of actual dwelling houses in the settlement. Modelled clay also served as personal ornament in the form of cylindrical and biconical beads.

All the figurines, geometric objects and beads recovered were fired, either deliberately or by accident. However, the presence of lime plaster which implies the achieving of firing temperatures to circa 800°C attests more than adequate technical knowledge for the simple biscuit firing of clay.

SUMMARY OF CERAMIC TECHNOLOGY.

AT ÇAYÖNÜ

Vegetable temper.	
Mineral temper	X
Modelling	X p
Bonding	
Burnishing	
Decoration, painted.	
Decoration, other.	X incision, pinching (figurines), excision (stone vessels)
Firing	X possibly figurines and geometric objects. lime plaster. p: possibly accidental.

CONTAINERS

It is unlikely that the small number of fragmentary limestone vessels recovered were the only containers in use at Çayönü. Botanical remains indicate dependence upon both wild and cultivated plant foods, therefore some kind of collecting vessels of light, probably perishable materials were necessary. However, there is no actual evidence of such vessels.

Of the three (level III) pottery sherds found to date, at least two (miniature cups) represent an attempt to model clay into container form. This small amount of pottery may have been the results of experimentation within the settlement, using available technology, or may have been imported. Outside contacts are strongly suggested by the presence of non-local obsidian, metal ores, and marine shells. Which ever possibility holds true (without analysis of the sherds there is no way of solving this problem), the three poorly-made, and perhaps accidentally fired sherds represent an initial stage in pottery manufacture by the people of Çayönü or their contacts.

As no later examples of pottery were recovered in stratified contexts, it seems likely that the advantages of fired clay containers were not yet appreciated or found necessary within the cultural framework. Possibly the inhabitants actively preferred vessels of stone or of perishable materials which have not survived. "...like the people of Jarmo and some other early village farming communities, however, the inhabitants of Çayönü Tepesi evidently got along without the clay bowls, jars and other containers that are commonplace in the villages of later farmers.¹⁸

NOTES

1. van Zeist, 1972.
2. Reed, 1969.
3. Braidwood, Çambel, et al., 1971, 1238.
4. Braidwood, Çambel, et al., 1971, 1239.
5. A rich deposit of native copper and associated ores such as malachite, occurs within 20km. of the site, near Ergami. Of the metal objects recovered, the reamer and the pins had been shaped by hammering and abrasion. Braidwood suggests that the application of these techniques (particularly suited to metal and redundant in stone-working) may indicate "the moment in man's material progress when he may first have begun to sense the properties of metal as metal, rather than as some peculiar kind of stone". Çambel and Braidwood, 1970, 56.
6. Cf. previous note.
7. Finds of marine shells indicate contact either direct or indirect with the Mediterranean coast. Finds of marine shells, metal ores and obsidian suggest possible trade contacts. Çambel and Braidwood, 1970, 56-57.
8. Stone grills believed to have been constructed to allow ventilation beneath wood and plaster floors. Position of wooden beams indicated by rippling of plaster. Braidwood and Çambel et al., 1971, 1238 and Fig. 1.
9. Recent pyrotechnological analysis of the flooring material has revealed that the bonding agent consisted mainly of calcite with frequent quartz inclusions. No gypsum is present, therefore the binder may be described as pure lime mortar. Gourdin and Kingery, 1975, 149. Braidwood and Çambel et al., 1971, Figs. 4, 5, 6.
10. Each small room contained its own characteristic tool assemblage suggestive of a workshop complex. Braidwood and Çambel, 1971, 1239; Fig. 3.
11. Schmandt-Besserat (unpublished), 25.

12. 2 clay house models found in level V had flat roofs, probably in imitation of the roofing methods employed in the settlement. Schmandt-Besserat, 26.
13. The chief constituent of the charcoal remains found in association with the pit-ovens was tree bark, indicating the ready availability of ample supplies of wood. Braidwood and Çambel et al., 1971, 1239.
14. Schmandt-Besserat, 17.
15. "...the whole looks very much like a ski-boot". Schmandt-Besserat, 12.
16. Analysis of Zagros samples exhibiting similar characteristics determined a firing temperature of 400°-500°. It is possible to achieve such a temperature range in a domestic hearth. Kingery, Francoir and Dupont, 1971.
17. Çambel and Braidwood 1970, 55.
18. Çambel and Braidwood, 1970, 54.

ALI KOSH

Site: Circular mound 130m. diameter, 4m. above surrounding plain. Summit and southern face badly eroded. 200m. above sea level.

Location: Deh Luran Plain in north-west Khuzistan, Iran, near border with Iraq.

Years of excavation: 1961 (test sounding), 1963 (full-scale excavation).

Excavators: F. Hole, K.V. Flannery, J.A. Neely.

Area Excavated: 100 sq. m.

Depth of deposit: 7m. Lower 3m. buried by alluvium deposits.

Stratigraphy: Fig. Ali Kosh 1: 3 phases of settled village occupation (each subdivisible into 2 sub-phases), named

Bus Mordeh (C1, C2)	} earliest to latest.
Ali Kosh (B1, B2)	
Mohammad Jaffar (A1, A2)	

Chronology:

	<u>C¹⁴ Date</u>	<u>Reference</u>
C1	7380 $\pm$ 180	Hole, Flannery and Neely, 1969, 340.
C2	7670 $\pm$ 170	
B1	9950 $\pm$ 190	
	8100 $\pm$ 170	
	7740 $\pm$ 600	
B2	8850 $\pm$ 210	
	8410 $\pm$ 200	
	8425 $\pm$ 180	
	8250 $\pm$ 175	
	7770 $\pm$ 330	
A1	7220 $\pm$ 160	Long and Mielke, 1966
A2	7820 $\pm$ 190	
	8920 $\pm$ 100	
	8890 $\pm$ 200	

The excavators suggest the following occupation dates for each phase:

Bus Mordeh (C1, C2):	7000-6500BC
Ali Kosh (B1, B2):	6500-6100BC
Mohammad Jaffar (A1, A2):	6100-5500BC

ENVIRONMENT

Ali Kosh is situated in the relatively inhospitable Deh Luran plain between the foothills of the Zagros range and the Tigris river. Years of overgrazing, over-cropping and deforestation have transformed the landscape into a semi-desert for most of the year.¹ Soil samples taken in 1961 indicated a level of salinity restrictive to crop growth, and samples of water taken from the 2 major rivers were so brackish with dissolved salts from underlying gypsum as to render irrigation virtually useless. Average rainfall is 300mm., a marginal amount for dry farming, falling during the winter and early spring. Summers are hot and usually dry with temperatures often reaching over 120°F.

It is believed that during the prehistoric era natural resources were more ample and varied than those presently evident, for 13 village settlements existed in the plain in the Neolithic and Early Bronze Ages.²

Clay was available in abundance at Ali Kosh, although other raw materials, particularly hardstone had to be imported. The site itself was founded upon a bed of white sandy soil overlying a layer of sterile red clay 7.3-7.5m. below surface level. Clays with a variety of impurities occur throughout the plain.

BUS MORDEH PHASE (C1, C2) CULTURAL ASSEMBLAGE

- Subsistence Cultivation: 2 row barley, emmer and possibly Einkorn.
 Collecting (intensive): alfalfa, spiny vetch, trigonella, canary grass, goosefoot, wild caper.
 Herding: Mainly goat (believed to be wild). 40% of bones from less than 3 yr. olds. Domestic sheep herded in small numbers. Ratio goats:sheep; 10:1.
 Hunting: Gazelle commonest. Also onager, wild ox, boar and small mammals. Carp, catfish, mussel, turtle and waterfowl.³
- Architecture Small rooms 2 x 2.5m. average. Walls of cut natural clay slabs. Matting used as floor covering and probably for roof construction.
- Chipped Mainly flint from nearby river bed. 1% tools of Lake
Stone Van obsidian.⁴ 24 tool types, mostly blades. 42 sickle blades (3.4% of total assemblage).
- Ground and Pounding, sandstone abraders, flint picks, grinding
polished slabs, handstones, pestles, pebble choppers, sash
Stone weights, slicing slabs, chipped limestone discs, pecked stone balls.⁵
- Worked Bone Awls, spatulas, pressure flakers, polished fragments, cut long bones.
- Ornaments Stone: Strings of soft white stone and black asphalt disc beads; bead blanks in alabaster, pendant.
 Bone: Boar's tusk buttons, pendants.
 Shell: Pendants, buttons, beads.
 Other: Turquoise beads.

Basketry and Woven matting as floor covering. Twined basket
Textiles impressions.
Wood
Figurines 20 clay animal figurines, sundried or lightly baked.
Miscellaneous Clay geometric objects, including many cylinders,
Finds stalks, balls. Cowrie shells.
Burial 1 burial found; secondary burial of limb of 3 adults,
Customs intrusive from Ali Kosh phase.
Grave gifts: strings of beads, 3 turquoise ornaments.
burials coated with red ochre.
Pottery

ALI KOSH (B1, B2) PHASE, CULTURAL ASSEMBLAGE

Subsistence Cultivation: 40% of seeds= emmer, 2 row hulled barley; beginning of legume cultivation (lentil).⁶

Collecting: Wild legumes and grasses collected in small quantities (20%).

Herding: Domestic goat, eaten young. Increase in sheep herding.

Hunting: Increased numbers of gazelle, onager, bos. Few red fox. Carp, catfish, turtle, mussel, crab, waterfowl.

Architecture Larger, multi-roomed houses. Rooms 3 x 3m., walls to 1m. thick. Separated by courtyards containing domed ovens.

Chipped Stone Similar assemblage to Bus Mordeh phase, continuous development. Obsidian increased to 2%. Largely butchering assemblage including many blades and scrapers. Sickle blades 5.3% of total tools.

Ground and Polished Stone Grinding slabs, handstones, pestles, pounders, pebble choppers etc. Still heavy emphasis on meat preparation. increase in plant food preparation equipment.⁷

Worked Bone Awls, needles, handles, fragments of worked bone.

Ornaments Stone: Pendants, beads (turquoise, variety of stones, many imported).

Bone: Pendants, beads.

Shell: Pendants, beads (cowrie predominant).

Clay: Bell shaped pendants (pubic coverings).

Other: 1 copper bead.

<u>Basketry and</u>	Double strand woven reed mats. Possible basket
<u>Textiles</u>	bases.
<u>Wood</u>	-
<u>Figurines</u>	Animal (7), human (1), horn-shaped (1), T-shaped (1), hand-shaped (1). All of lightly baked clay.
<u>Miscellaneous</u>	Large numbers of geometric objects in clay.
<u>Finds</u>	
<u>Burial</u>	13 primary and 1 secondary found. Seated, under-floor
<u>Customs</u>	burials, usually wrapped in woven mats. Grave gifts; beads, pendants, shells. Traces of ochre frequent. ⁸
<u>Pottery</u>	-

MOHAMMAD JAFFAR PHASE (A1, A2), CULTURAL ASSEMBLAGE

- Subsistence Cultivation: Emmer, 2-row barley, lentil.
 Collecting: Prosopis (marked increase), fumitory,
 goose-grass, rye-grass, goat-face grass, vetchling, caper⁹
 Herding: Sheep increasing, goat still predominant.
 Hunting: Gazelle, onager, bos. Increase in small
 mammals.¹⁰ Aquatic resources exploited as in previous
 phases.
- Architecture Pebble wall foundations and pavements appear. Walls
 to 1m. thick of clay slab bricks as in previous
 phases, plastered and often painted. Floors covered
 with reed or club-rush mats.
- Chipped Tradition continued. 2% obsidian.
- Stone Sickle blades 7.6% of total tools.
- Ground and Meat and plant food preparation utensils as in previous
Polished phase. Hunting and agriculture still of equal importance.
- Stone
- Worked Bone Awls, needles, spatulas, chisels, handles, worked
 fragments.
- Ornaments Stone: Bracelets, pendants, labrets.¹¹
 Bone: Beads.
 Shell: Beads, pendants.
 Clay: Bell-pendants.
 Other: Pendants of claw.
- Basketry and Spindle whorls attest textile manufacture.
- Textiles Woven mats, baskets.
- Wood -

- Figurines No animal figurines found.
4 human, 4 horn-shaped, 10 T-shaped.
All of lightly baked clay.
- Miscellaneous Geometric objects of sundried clay.
- Finds Pubic coverings of asphalt, polished stone or
clay (with male burials). 'Lip-plugs' of stone
or asphalt. Spindle whorls of perforated sherds.
- Burial 5 primary burials in settlement but not sub-floor.
- Customs Semi-flexed, all facing west. No mat wrappings but
traces of ochre. Grave gifts: personal ornaments;
G-strings and bell pendants (males).¹²
- Pottery 3 types, all soft, friable, straw tempered, similar
to figurine fabric in use throughout levels.

USES OF CLAY IN THE ALI KOSH ASSEMBLAGE

Architecture

Bus Mordeh

Site plan — Impossible to ascertain. No regular planning evident.

Structures — Small rectangular houses. Average room size 2x2.5m.

Construction — No foundations. Walls of crude, untempered clay

Materials slabs, average: 15 x 25 x 10cm. Doors 1-1.5m.

and wide cut in finished walls.

Techniques

Wall finish — None

Floor finish — Stamped earth, occasionally packed clay.
Mat covered.

Roofing — Impressions from ceiling collapse suggest woven
techniques mat roof, coated with thick layer of clay.

Ali Kosh Phase: Fig. Ali Kosh 2a.

Site plan — Believed to be larger than in Bus Mordeh phase.
Houses grouped around central courtyards.

Structures — Larger than in previous phase. Multi-roomed
houses to 3m. sq.

Construction — Increase in wall thickness. Walls of untempered,
materials and neatly cut clay slabs (40 x 25 x 10cm. average),

Techniques cemented with clay mortar. No jointing or inter-
locking bricks. Walls butted together.

Wall finish — Carefully covered with 2-3cm. thick layer of fine
clay plaster. Interior and exterior walls treated
similarly.

Floor finish — Sometimes as walls. Sometimes clean clay layer over
stamped earth. Mat covered.

Roofing — Unknown.

techniques

Mohammad Jaffar Phase

Site plan—— Houses interspersed with courtyards paved with river pebbles

Structures—— Houses increased in size from previous phase.

Construction—— Foundation layer of river cobbles supporting materials and superstructure constructed in manner of techniques previous phase.

Wall finish—— Finely plastered. Often painted with red ochre.

Floor finish—— Surfaced with clean clay then neatly clay plastered. Covered with rough mats.

Roofing—— Unknown.
techniques

Refractory Uses

Hearths

Bus Mordeh phase: none positively identified.¹³

Ali Kosh Phase

Location—— In a proportion of the houses.

Size/shape—— Rough circular depression 10cm. deep x 50 cm. diameter.

Construction—— Sunk into clay plastered floor of 3 x 3m.

materials room. Lined with thin layer of clay. No

and methods burnishing or other finish.¹⁴

Mohammad Jaffar Phase

No hearths positively identified.¹⁵

Ovens

Bus Mordeh Phase

None found.¹⁶

Ali Kosh Phase: Fig. Ali Kosh 2b.

Location— In courtyard areas, none in houses.¹⁷

Size/shape— Bell-shaped, domed, 40-50cm. deep, 50cm.
base diameter.

Construction— Walls and dome of small, closely set bricks
materials of tempered clay. Inner surfaces plastered
and methods with tempered burnt clay, and burnished.

Mohammad Jaffar Phase:

None found.¹⁸

Roasting Pits: Fig. Ali Kosh 2c.

Ali Kosh Phase only.

Location— In courtyard areas.

Size/shape— Circular depression 25cm. deep x 1m.
diameter, with raised curb.

Construction— Simply sunk into earth, surrounded by 3
materials and clay-brick high curb. Carefully lined with
methods thin layer of clay.

Storage Facilities

Ali Kosh and Mohammad Jaffar Phases

Storage rooms (conjectured).

Location— Within house complexes.

Size/shape— Rectangular rooms, thought too small for
living spaces

Construction— As houses.

materials and

methods

Possible use— Storage of grain.

Storage Niches

Location Within walls of individual houses.

Size/shape Roughly rectangular 30-50cm. deep x 30-100cm. wide.

Construction materials and methods Simply cut into clay brick walls. Plastered with clay or left unfinished (Bus Mordeh).

Possible use Unknown, all found empty.

Figurines: Fig. Ali Kosh 3

All phases

Total number of figurines found: 49.

Categories according to phases.¹⁹

<u>Figurine type</u>	<u>Bus Mordeh phase</u>	<u>Ali Kosh phase</u>	<u>Mohammad Jaffar phase</u>
Animal	20	7	-
Human	-	1	4
T-shaped	-	1	10
Horn-shaped	-	1	4
Hand-shaped	-	1	-

Provenance— No particular concentration or significant find spots.

Material— Lightly baked clay, vegetable tempered

Technical data— Modelling generally poor with one superior 'mother-goddess' type.

Miscellaneous Clay Finds: Fig. Ali Kosh 4

Body ornaments (Ali Kosh and Mohammad Jaffar phases):

Clay used only for bell-shaped pendants, lightly fired.

Position suggests type of pubic covering.²⁰

Geometric objects (all phases);

Total number found

Categories according to phases:

Type	<u>Bus</u> <u>Mordeh</u>	<u>Ali</u> <u>Kosh</u>	<u>Mohammad</u> <u>Jaffar</u>
Cylinders with pinched ends	50	21	7
Cylinders with flaring ends	118	47	16
Cylinders with broken ends	110	-	12
Cylinders with application	-	9	1
Spheres	12	6	2
Polishers	-	2	
Ovoids	4	-	
'Bases'	-	-	2
'Stalks'	5	-	

Spindle whorls (conjectured): Mohammad Jaffar phase only.

Several sherds of various pottery types, perforated and edge-chipped, for use as spindle whorls.

Clay polishers: Mohammad Jaffar phase only.

Thought to have been used in burnishing pottery.

NON-POTTERY CONTAINERS IN THE ALI KOSH ASSEMBLAGE

Basketry (All phases).²¹

Total of 85 impressions on clay and asphalt throughout strata.

Materials—Reeds and rushes to 2cm. in width. Clay and asphalt used for leakproofing, particularly at joints.²²

Shapes— Varied; mainly composite basket-carrying trays, flat floored, to 40cm. diameter.

Technical— Over 1, under 1 twilling; 23 fragments (all phases).

data Over 2, under 2 twilling; 60 fragments (Ali Kosh and Mohammad Jaffar phases). Method used for basket floors. Over 1, under 1 twining; 5 fragments (Ali Kosh and Mohammad Jaffar phases). Method used for basket walls.

Possible— Collection and transportation of wild and cultivated
uses plant food, and perhaps temporary storage.²³

Wooden Vessels

No direct or indirect evidence.

Stone Vessels: Fig. Ali Kosh 5.

Bus Mordoh phase: 3 specimens.
Ali Kosh phase: 34 specimens.
Mohammad Jaffar phase: 38 specimens.

Materials— Marble, steatite (imported). Some gypsum examples.

Shapes— Open bowls with or without beaded rims 14-24cm.
diameter (commonest).

Rare miniature vessels.

1 oval bowl.

1 large shallow carrying tray.

Technical— General high degree of skill. Some crudely made
data examples, of local gypsum.

Possible— Storage of small, non-perishable items (no lids
use found).

Soaking of groats to make gruel.²⁴

Small number in imported, finely-grained marble,
suggestive of prize possessions.

PORTABLE POTTERY CONTAINERS AT ALI KOSH, MOHAMMAD JAFFAR PHASE

The sherds were classified into three types, Jaffar Plain, Jaffar Painted, and Khazineh Red. 1934 total sherds found.

Jaffar Plain

Amount of— 918 sherds recovered.

Pottery

Wares,— Friable coarse ware. Surface porous and pitted as result of burning out of vegetable fibres. All surfaces smoothed. Some burnished examples. Thin wash of paste may have been applied to some pots.

Temper,— Temper: almost exclusively chaff. Occasional grit-tempered examples. Grit .3-.7mm. diameter evenly distributed throughout paste.

Firing: Poorly fired, uneven heat distribution evident through greyish or reddish surface firing clouds. Dark unoxidised core.

Shapes— a) Small carinated bowls. No measurable examples.
b) Convex-walled bowls with deep out-turned rims, round bases. Some examples with trough spouts. Mean rim diameter; 17cm. Thickness 6-9mm.
c) Deep round or oval bowls. Round or carinated bases. Rim diameter to 40cm. Height greater than 14 cm. Thickness 6-10mm.
d) Dubious examples of hole-mouth jars.
e) Rare miniature vessels. Diameter less than 6cm.

Colour— Buff or grey-buff paste commonest. Fired surface colour varies from light brown and reddish-brown to pink, tan or buff.

Decoration— No decoration other than possible slip-wash, and occasional burnishing.

Jaffar Painted

Amount of— 836 sherds recovered.

Pottery

Wares,— Identical to Jaffar Plain.

surface

Temper,— Identical to Jaffar Plain.

Firing

Shapes— Jaffar Painted ware occurs in a single shape, a convex walled bowl, with deep out-turned rim and round base. Some examples are trough-spouted.

Heights: 12-18cm.

Rim diameter: 14-24cm.

Wall thickness: 5-8mm.

Colour— Paste and surface colours after firing identical to Jaffar Plain.

Decoration— Exterior surfaces with fugitive red-ochre paint.

Geometric designs include horizontal zig-zags and chevrons, 'checker-boards'. Net patterns rare.

Decorated bands demarcated by thick horizontal lines.

Khazineh Red.

Amount of— 180 sherds recovered.

Pottery

Wares,— Generally coarse red ware. Inconsistently made
surface and fired with variation from medium to coarse in the same vessel. Sandy, loosely compacted paste. Some wet-smoothed surfaces, majority well burnished. Frequent use of slip. Surfaces often pitted, and peeling of slip common.

Temper,— Temper: 75% of vessels chaff-tempered, 25% grit
Firing tempered (0.3-1.5mm. diam.). Temper always abundant and evenly distributed.

Firing: Core and surface highly variable, due to inconsistent firing and possibly refiring over cooking fires. Frequent grey or purple firing clouds. Approximately 50% of sherds have unoxidised cores.

Shapes— a) Hemispherical bowls with beaded rims. Diam.:
24-28cm. Height 9-12cm.
b) Carinated bowls, small, highly burnished. Diam. 15-18cm.
c) Rare flat-based bowls.
d) Rare hole-mouth jars, some with asymmetrical mouths. Diam.: circa 17cm.

Colour— Reddish paste, different from that of Jaffar groups. Fired surface colour varies from weak red to pink. Majority of sherds light red.

Decoration— None other than burnishing and application of fugitive slip.

SUMMARY OF THE ALI KOSH ASSEMBLAGE IN RELATION TO THE
EMERGENCE AND SIGNIFICANCE OF THE PORTABLE POTTERY CONTAINER

Clay Usage and Clay Technology

Clay was readily available at Ali Kosh, and was used with ever increasing dexterity and imagination throughout the occupation period.

Bus Mordeh Phase

The earliest settlers at Ali Kosh used clay for building purposes, for storage facilities, and for modelling figurines and geometric objects. The earliest structures at the site were built of crude clay slabs, simply cut from the ground and laid without bonding. Clay was used as a finishing material for floors, rendering them waterproof and easy to clean. Knowledge of the waterproofing properties of clay was also applied to roof construction. Rough, unlined niches cut into the clay walls provided the Bus Mordeh inhabitants with storage facilities. In addition to a variety of clay geometric objects, twenty crudely modelled figurines were found, all representing animals. Both geometric objects and figurines were of tempered clay, and lightly fired.

Ali Kosh Phase

Clay was used for building, for storage and refractory facilities, for modelling figurines and geometric objects and for a particular type of personal ornament. Neatly cut, untempered clay slabs bonded with clay mortar were used for house building, whilst small tempered clay bricks were preferred for refractory facilities. Fine clay plaster covered walls, floors, and lined storage niches. Ovens were lined with thick tempered clay plaster for additional strength

and heat resistance. Small rooms, structurally identical to the living quarters are thought to have served as grain storage facilities. Tempered clay was again used to model figurines and geometric objects which were subsequently lightly fired, and also bell-shaped pendants found in burials, and thought to be pubic coverings.

Mohammad Jaffar Phase

Clay was again used in architecture and for storage facilities. No hearths or ovens were found, but this may be due to the generally poor preservation of the Mohammad Jaffar levels. Geometric objects, figurines and personal ornaments continued in production, and clay tools appeared for the first time. Clay was joined by stone in the Mohammad Jaffar architecture. Stone foundations were surmounted by clay slab walls (to 1m. thick for added insulation) bonded with clay mortar. Walls were covered with fine clay plaster and frequently decorated with red ochre. Floors were of plaster over a clean clay subsurface. Storage facilities continued as in the Ali Kosh phase. The figurine assemblage recovered (18 examples) was entirely anthropomorphic and included highly stylised 'T-shaped' and 'horn-shaped' forms. Geometric objects continued in production, although perhaps in smaller quantities. Only 40 examples were found compared to 85 in the Ali Kosh phase, but this reduction may be due to the poor state of preservation of strata A1 and A2. Specialised clay tools appeared for the first time specifically baked clay polishers (probably used for burnishing) and perforated spindle whorls cut from potsherds. Pottery appeared for the first time in the Mohammad Jaffar phase.

SUMMARY OF CERAMIC TECHNOLOGY.
AT ALI KOSH

	aceramic (BM + AK)	ceramic (MS)
Vegetable temper.	X	Xp
Mineral temper		P
Modelling	X	Xp
Bonding	X	Xp
Burnishing	X	P
Decoration, painted.		Xp
Decoration, other.		
Firing	X	Xp

CONTAINERS IN RELATION TO THE CULTURAL ASSEMBLAGE

During the Bus Mordeh phase, well-made, twilled baskets often waterproofed with clay or asphalt were in use. Some agriculture was practised and considerable quantities of wild plant food gathered, therefore it seems likely that the baskets were used for the collecting and perhaps temporary storage of grains and fruits. The environment apparently supported few trees, and a very small number of carpentry tools were found, therefore it is not surprising that there is no evidence of wooden vessels. Three fragments of carefully worked stone bowls were found in the Bus Mordeh strata. Too small for storage purposes, these are most likely to have been used in food preparation.

Reliance on agriculture and herding seems to have increased during the Ali Kosh phase. Only 25% of the plant remains represented wild species, and legumes were cultivated in addition to barley and emmer wheat. Both domestic sheep and goats were kept. The Ali Kosh cultural assemblage was more varied and sophisticated than that of the Bus Mordeh phase. For example, obsidian usage increased (1% to 2% of chipped stone finds), architecture became more complex, and personal ornaments were made in a wide range of materials including turquoise and other imported stones. Lined baskets were still produced, now with twilled floors and twined walls. Stone vessel production seems to have increased. Thirty-four well-made samples were recovered, in local gypsum, and imported marble and steatite.

Despite the poor state of preservation of the Mohammad Jaffar strata, some cultural developments are apparent from the assemblage. These include the use of stone in architecture, wall painting, the introduction of spinning and weaving, and pottery. Baskets continued in use, and it is interesting that a greater number of stone vessels were found than in either of the preceding phases. "...stone bowls achieved their maximum abundance and diversity in levels just before and during the introduction of pottery." ²⁵ It may therefore be concluded that pottery did not replace stone vessels, but rather complemented them.

Soft, friable and largely chaff tempered, the fabric of the Mohammad Jaffar pottery was practically identical to that of the ~~figurines and~~ geometric objects found in all three phases at Ali Kosh. Finishing techniques were similar to those used in wall and floor surfacing, and the pots may well have been baked in the ovens used for parching grain. Furthermore, most of the vessel shapes appear to be based on those of the well-established stone containers. All technological concepts required for the manufacture of clay vessels were already known at the site before the first appearance of pottery.

Pottery containers represented an entirely new category of possessions at Ali Kosh with economic significance for the whole settlement. They enabled their owners to add boiled meat, vegetables and cereals to their already varied diet (the stone vessels were unsuitable for boiling, as marble

and gypsum will crack if exposed to intense heat), and also afforded an expanded range of storage facilities.

Three types of wares were recovered; Jaffar plain is likely to have been the fabric of everyday cooking pots. Jaffar painted, almost as profuse as Jaffar plain among the sherds found, was produced in a single shape category. It may be speculated that painted pottery was reserved for a special function such as tableware. There is no evidence of painted decoration at Ali Kosh prior to the Mohammad Jaffar phase (when both wall and pottery painting appear) but traces of red ochre found in connection with burials during the Ali Kosh phase indicate some knowledge of pigments. The idea of pottery painting may therefore have originated within the settlement. Khazineh Red ware is represented by less than 10% of the total sherds found. This ware differs from the other categories in body, finish and shape variety, although the vessels were similarly tempered, built and fired. Khazineh Red ware may have been imported, or possibly made from a newly discovered source of clay. This problem could perhaps be solved by scientific analyses of the fabric and its inclusions.

NOTES

1. Helbaek, 1969b, 396.
2. Hole, Flannery, and Neely, 1969, 15-21.
3. The first settlers arrived with some knowledge of agriculture and herding. Wild resources were exploited for varied diet.
4. Links, possibly trade, with areas outside Khuzistan are indicated by obsidian from Lake Van (Turkey), non-native emmer wheat, and marble and steatite for the stone bowl industry. Hole, Flannery and Neely, 1969, 105.
5. The ground stone food preparation assemblage was modest at this stage. Chipped stone finds are largely related to hunting and skin preparation.
6. A marked increase in cultivation, corresponding drop in collection of wild legumes, indicates more reliance on agriculture. Helbaek, 1969b, 397.
7. Hunting of large animals proliferated. A significant increase in specialised butchering implements is noted. No special area was set aside for slaughtering. More varied food preparation assemblage corresponded with increase in crop production.
8. Respect for fellow-man is indicated by careful treatment of dead. Increased prosperity of the phase is reflected in high quality of workmanship of ornaments and variety of artifacts produced.
9. Large quantities of Prosopis seeds are typical of an area which has been subject to prolonged intense cultivation.
10. Increase in small mammal bones and decrease in those of large ungulates probably reflects changes in local vegetation precipitated by intensive cultivation. Hole, Flannery and Neely, 1969, 63-65.
11. Imported goods, possibly indicating trade, include turquoise from north-east Iran, haematite from Fars, shells from the Persian Gulf, and obsidian from Lake Van.

12. One burial was accompanied by a basket thought to have been filled with food items, suggesting belief in an after-life.
13. The excavators suggest that both hearths and ovens existed in courtyard areas which did not fall within the limits of excavation. Hole and Flannery, 1962, 109.
14. Hole and Flannery, 1962, 111.
15. Mohammad Jaffar architecture was less well preserved than that of previous phases. This may account for the lack of identifiable refractory facilities.
16. Cf. note 13.
17. The situation of the ovens may indicate some measure of co-operation in food preparation. The inhabitants may have used communal ovens as a fuel economy measure. No carbonised wood was found in connection with any of the refractory facilities. Fragments of reeds and rushes suggest that stems and leaves of marsh plants were used instead of wood, a scarce commodity at Ali Kosh. Helbaek 1969b, 389.
18. Cf. note 15.
19. Figurine distribution may have been accident of excavation. Insufficient examples were recovered to draw conclusions concerning a shift in emphasis from animal to human forms through the phases.
20. Bell-pendants invariably associated with male burials. Hole, Flannery and Neely 1969, 283, 243, Pl. 38b.
21. Hole, Flannery and Neely, 1969, Pl. 37b.
22. Ali Kosh is the only site among those studied with actual evidence of clay lined baskets. At this site the frequently quoted impetus to pottery manufacture, namely the accidental burning of a clay-lined basket may conceivably have occurred.
23. Hole, Flannery and Neely 1969, 220.
24. Helbaek 1969b, 402.
25. Hole, Flannery and Neely 1969, 106.

BEIDHA

Site: Large mound, now 80m. x 70m.; much erosion: may originally have occupied many acres. 1000m. above sea level.¹

Location: In alluvial valley bisected by Wadi Ghrab, one of many steep rift valleys in south Jordan. 8km. north of Petra, 240 km. south of Jericho.

Years of Excavation: 1961, 1963, 1964, 1965, 1967.

Excavator: D. Kirkbride.

Area Excavated: 60 x 35m. (main excavation area). Two additional trial soundings 45m. distant from main village complex ('sanctuary' complex).

Depth of Deposit: Total Neolithic deposit, slightly more than 3m.

Stratigraphy²

Levels VI-I (VI earliest) of continuously occupied permanent village settlement.

Not to scale

Temporary occupation level	↑ 3m. ↓
2m. sterile sand	
Natufian levels.	

Chronology:

<u>Level</u>	<u>C¹⁴ date</u>	<u>Reference</u>
VI	6990 [±] 160BC 6690 [±] 50 BC	Kirkbride 1965, 17
V	6690 [±] 160BC	
IV	6830 [±] 200BC 6780 [±] 160BC	
II	6600 [±] 160BC	Kirkbride 1965, 72.

ENVIRONMENT

Beidha lies in a wide, well-watered valley surrounded by steep Cambrian sand-stone cliffs, beside a seasonal torrent bed which has eroded much of the site since it was abandoned circa 6500 BC. To the east rises the high cretaceous limestone ridge of Gebl Sharah, which still bears traces of the ancient oak, pistachio and juniper forest with which it was once covered. In recent times, overgrazing, fuel hunting, and clearance for building have gradually destroyed the vegetation cover, hastened erosion, and rendered the soil non water-retentive.

Contemporary with the village of Beidha, the valley was extremely fertile, and the surrounding woodlands supported a wide variety of game. Modern mean annual rainfall is limited to 170mm. (below the limits for dry farming), but this figure is believed to represent a decrease from ancient times.³

The nearest perennial water supply, then as now, was the spring at Dibadiba, some 4km. from the site. It would appear that the people who settled at Beidha preferred a location nearer to fertile soil where planted crops could be tended and protected, than to an immediate source of drinking water, thus indicating a heavy dependence on agriculture.⁴

In modern times, local inhabitants rely on natural + Nabatean cisterns, or rock holes for their water supply during the rainy season and shortly afterwards. Water will last for several weeks in these cisterns. It is possible that the prehistoric Beidhans appreciated the same natural containers for drinking water.⁵

Although clay was abundantly available at the site, it contained such a high percentage of sand as to render it virtually useless for building purposes. Local stone, also an abundant commodity, was the preferred structural material.

CULTURAL ASSEMBLAGE

Subsistence Cultivation: Transitional form of emmer, 2 row hulled barley.⁶

Collecting: Pistachio, acorn, goat-face grass, rye grass, wild oat, vetch, medic, cockscomb, other legumes.

Herding: Goat.

Hunting: Auroch, bezoar (ancestor to goat), ibex, gazelle, wild boar, hare, jackal, equus.

Architecture 6 phases. From level VI, terrace wall along southern perimeter to prevent erosion.

VI: Cellular plan, circular houses of stone with wood beam supports.

V: Some circular buildings. Also sub-rectangular huts, walls of clay/brush.

IV: Some circular, mostly sub-rectangular houses, single roomed, semi-subterranean.

III, II: Grid planning (co-operation). Corridor buildings, designated workshops.⁷

I: As previous phase. Also very large rectangular houses. Ill-preserved.

Chipped Principally local flint, 3 pieces obsidian. Stable
Stone industry throughout period. Hunting implements more prolific in lower levels. Sickle blades and chipped axeheads increase in levels III-I.

Ground and Grinders (most numerous class): some for ochre,
Polished majority for cereals. Pestles: basalt and granite.
Stone Axes and adzes, usually of basalt. Flat palettes; hard sandstone, both surfaces polished. Vessels of rough limestone. Many cup-bowls, 3 polished bowls.

- Worked Bone Many bone and horn tools, usually highly polished, rare incised decoration. Awls and points on long bones of ibex most numerous. Also spatulas, needles, spoons.
- Ornaments Stone: Carved stone rare; few beads and gaming pieces, 1 pendant.⁸
Bone: Beads of standard cylindrical shape, varying length.
Shell: Beads of cowrie, mother of pearl, dentalium.
Clay: -
- Basketry and Textiles Lidded baskets, and large baskets for storage; usually coated with bitumen or lime plaster. Tools made on auroch ribs, identified as weaving implements, found in level II workshop.
- Wood Many wooden containers used. Preserved in shadow form. Wood apparently preferred to stone. Widespread use of wood in architecture.
- Figurines Few animal examples including ibex, bezoar. One seated female figurine (level II workshop). All of accidentally baked clay.
- Miscellaneous One tiny, modelled, clay bowl with scalloped rim.
- Finds Unfired.
- Burial 43 burials found. Many child burials under floors, particularly of disused buildings. Intact skeletons.
- Customs Adult burials secondary. Grave gifts: ornaments near noses. Nose beads possibly worn in life.⁹
- Pottery -



USES OF CLAY IN THE BEIDHA ASSEMBLAGE

Architecture¹⁰

Level VI (lowest level): Fig. Beidha 1.

Site Plan — Houses arranged in separate clusters like cells round honeycomb. Each cluster with own courtyard. Site surrounded by boundary wall to prevent erosion.

Structures — Semi-subterranean (floor 50cm. below ground level), entered by means of 3 stone steps. Sub-circular shape (usually roughly 6-sided).

Construction — Interior framework of posts infilled with large materials and stones. Smaller stones in interstices.¹¹ Usually

techniques 6 short wall segments. Joints unbonded.

Wall finish — Plastered with fine clay plaster with low lime content. Traces of colour, particularly red ochre.

Floor finish — Plastered as walls.

Roofing — Brush and reeds supporting thick layer of clay.

techniques Extra clay layers often added.¹² Some wood sub-structure.

Level V

Site plan — No plan identified, level poorly preserved.

Structures — Variety of house forms. Some post-houses as in VI, also free-standing circular and sub-rectangular houses.

Construction — Continuous circular stone walls. Walls thick, materials and often on foundations of large, flat slabs.

techniques

Wall finish — Plastered as in VI.

Floor finish — Plastered as in VI.

Roofing —

techniques

Level IV

- Site plan— Group of large houses 5x6m. in central area.
Group of smaller rectangular houses on perimeter of site.¹³
- Structures— Semi-subterranean, single roomed. Rectangular with slightly curving walls. Separated by open spaces or yards.
- Construction— Straight, flat slabs of 'mud-stone',¹⁴ laid with materials and sandy clay mortar.
- techniques
- Wall finish— Lime plaster used in some houses, majority still preferred clay plaster as in VI and V.¹⁵
- Floor finish— As in VI and V - clay plaster.
- Roofing — -
- Techniques

Levels III and II: Fig. Beidha 2.

Site plan—— Village laid out on grid basis. One very large house flanked by series of long, rectangular 'corridor' buildings, laid in neat rows.

Structures—— Large house rectangular 9 x 7m. Smaller rectangular structures all identical in size and construction, having central corridor and 6 small cubicles 1 x 1.5m. Believed to have had upper storey living quarters over ground floor workshops.¹⁶

Construction—— Walls of large stones with interstices filled with smaller stones. Stone fittings in main materials and techniques house included bench and stone-lined pit. Small 'workshops' divided one from another by strong, wide stone baulks.

Wall finish—— Large house: plastered with lime plaster and burnished. Red bands painted on plaster. Small rooms: No wall finish.

Floor finish—— Lime plastered.

Roofing—— -

techniques

Level I

Almost destroyed by terracing for agriculture.

Site plan could not be traced.

One collapsed house appears similar to those of IV.

Refractory Facilities

Hearths

Location In courtyards in early (VI, V) levels.
In houses in later (IV-I) levels.

Size/shape Roughly circular, sunken in houses.

Construction Raised, plastered sills. In both houses and
materials and courtyards often surrounded by sandstone
methods slabs, apparently used as tables as bones
still lay on them.

Ovens

None found.¹⁷

Storage Facilities

None found.¹⁸

Figurines: Fig. Beidha 3a, 3b.

Total of 5 found during excavations.

Categories:

Human, 1 example (steatopygous type) (Level II).

Animal, 1 example (Level VI).

Animal Horns, 3 examples (Level VI).

Provenance— All found within house complexes.

Material— Unbaked natural clay.¹⁹

Technical— Steatopygous type small, modelled from 1 piece
data of clay. Ibex crude but lively modelling, shows
good observation.

Miscellaneous Clay Finds

Clay Bowl²⁰ : Fig. Beidha 3c.

Location— Level VI.

Materials— Unbaked, pure, untempered clay.

Technical— Thin wall with 'scalloped' (thumb impressed)
data rim, formed separately from base. Joined
to base by rudimentary pinching.

Possible— Doubtful if any useful purpose. Appears to
use be initial attempt at container modelling.

NON-POTTERY CONTAINERS IN THE BEIDHA ASSEMBLAGE

Basketry

Quantity—All levels, many impressions and lime or bitumen.
location casts.

Material—Grass or other plant fibre. Often lime or bitumen
coated on one or more surfaces.

Shapes—Circular, varying in size, some very large.

Technical—Woven (rather than coiled) across radially arranged
data ribs.

Possible—Storage of raw materials and small artifacts.

Uses Food storage. Collection of wild foods.²¹

Wooden Vessels

Quantity—Found in shadow form on house and workshop floors.

location

Material—Wood type unknown.

Size / — Circular and oval. Sizes vary, no precise dimensions
shapes are available.

Technical—Unknown because of lack of preservation
data

Possible—Storage of small artifacts, eating vessels, food

Uses storage.²²

Stone Vessels: Fig. Beidha 4.

Quantity— 3 complete bowls and 9 fragments found from
location level VI to level II.

Material— Rough limestone, sandstone and chalk (reserved
for 'cup-bowls').

Shapes— Usually roughly circular.

Technical— Crudely made. Rare attempts to flatten bases or
data shape exteriors. Hollowing shallow. No polished
finish.

Possible— Some so thick as to suggest small mortars.

uses— Otherwise eating vessels or for rudimentary food
preparation.

SUMMARY OF THE BEIDHA ASSEMBLAGE IN RELATION TO THE EMERGENCE
AND SIGNIFICANCE OF THE PORTABLE POTTERY CONTAINER

Clay Usage and Clay Technology

Clay within the immediate vicinity of Beidha has a high sand content, and is said to be unsuitable for large-scale construction such as house building. All dwellings excavated at Beidha were stone-built, although by stratum IV, clay was used as a bonding agent. Fine clay plaster, mixed with lime was widely used as a finishing material for floors and walls from the earliest occupation level. This plaster was usually hard burnished and painted with red ochre.

In the upper levels development of lime slaking technology facilitated the production of hard lime plaster which gradually replaced clay as a finishing material. Roofs at Beidha were constructed from brush and reeds, ^(wood, VI) and water-proofed with clay plaster. Clay may have been incorporated in the construction and plastering of hearths, although no details are available. No fixed storage receptacles were identified, and it is possible that insufficient surplus food was produced to merit such facilities.

In addition to its limited use in architecture, clay was also used at Beidha for the modelling of a few small artefacts. Five figurines were recovered, and a tiny clay bowl. All were simply made and appear to represent an experimental stage in modelling. The clay bowl for level VI is interesting in that it represents a conscious attempt at container modelling. However as no further examples were found in later levels, it is impossible to assess the implications of this single crude bowl.

SUMMARY OF CERAMIC TECHNOLOGY.
AT BEIDHA.

Vegetable temper.	
Mineral temper	
Modelling	X
Bonding	X
Burnishing	X
Decoration, painted.	X
Decoration, other.	X impression (clay bowl)
Firing	X

CONTAINERS

Vessels of stone, wood and basketry were found at Beidha. The excavator believes that wooden containers were preferred for most purposes at the site, and many (precise number not available) were found in shadow form. Both circular and oval shapes were identified. Large examples are thought to have served as mortars, whilst the smaller sizes were probably used as eating vessels.²² Few stone containers were found, and all were crudely made. Assuming the excavator's interpretation of the wooden bowls to be correct, it seems likely that stone vessels supplemented those of wood for food preparation purposes, and possibly also for small-scale storage.

Circular baskets in varying sizes, leak-proofed with lime or bitumen, were used for plant collection and storage, and one example was found to contain five gallons of carbonised pistachio nuts.

No pottery was found at Beidha, and it is not known whether the local sandy clay would have been suitable for the manufacture of anything other than very small vessels. A scientific analysis of the clays both on the site and within the vicinity, could indicate whether the Beidhans had no pottery because there simply was no suitable clay available, or whether the reasons for the lack of pottery should be sought elsewhere. Most of the technology required for the making of ceramic vessels was known at the site. Tempering, bonding, burnishing and even decorating techniques were applied in other contexts, and lime slaking is evidence of the ability to achieve high firing temperatures. It may be concluded that either the Beidhans

were adequately supplied with containers of other materials and had no desire for pottery, or that clay to make pottery was not available, and pottery could not be obtained through trade.

NOTES

1. Raikes, 1966, 70.
2. The present investigation will be confined to the permanent early farming village settlement, levels VI-I.
3. Raikes, 1966, 69.
4. Kirkbride, 1966b, 272.
5. Kirkbride, 1960, 136.
6. No trace of ovens found in village, therefore grain parching probably not introduced. Likely that whole spikelets were consumed. Helbaek, 1966, 64.
7. Specialised workshop areas identified in levels VI, III, II. Included were bone workers' shops, butchers' shops, and a flint working shop. Kirkbride, 1966c, Pl. XVIA, Pl. XVIB.
8. Materials used for ornament making often imported, e.g. cowries and pumice from Red Sea and Mediterranean, possibly traded for local haematite, malachite, ochre. Kirkbride, 1966a, 207.
9. Large numbers of burials of small children suggest a high infant mortality rate.
10. 3 buildings, somewhat distant from the main occupation area were identified as sanctuaries during the 1967 excavation season. As no sound stratigraphic context could be assigned to these buildings, and as their basic structural details closely resembled those of the main housing area (particularly the large house of levels III and II), they have not been studied in detail here. Kirkbride 1968a, 90-96.
11. "One gained the impression that the builders had intended to make a round house, but had not yet mastered the technique for doing so in stone". Kirkbride 1966c, 21. Kirkbride 1966a, Pl. 11.
12. Kirkbride 1968b, Pl. XXXIXa.
13. "...a hint of a privileged and a not-so-privileged class". Kirkbride 1968b, 268. This theory is plausible but unprovable.

14. No explanation given as to the nature of this building material. Possibly a type of sandstone rather than shaped clay. Kirkbride 1966c, Pl. VIIIA.
15. In levels VI and V floor and wall plaster were of a predominantly sandy clay mixture, with a strong though not very visible element of lime. The lime plaster in level IV was burnished and often stained. Kirkbride, 1966c, 22-23. No analysis has yet been made of the Beidha plaster, although it appears to have been made by the slaking process.
16. From their size, finish and contents, these rooms have been identified as specialist workshops. Kirkbride 1966c, 12, and Fig. 2.
17. Cf. note 6.
18. It is possible that some of the house units were utilised for the storage of grain, but no evidence for this was found. Indeed no actual grain was recovered during the excavations, all palaeobotanical information being derived from casts of grain and husk remains. Helbaek attributes the lack of carbonised remains to high soil porosity. Helbaek 1966, 61.
19. The animal figurines and model horns were accidentally burnt in the fire which destroyed most of level VI.
20. This artefact has been classed as a small find, for, unbaked and unique at the site, it represents a further venture in modelling rather than a utilitarian container. The Beidha bowl is a simple shape, easy to model and similar to the initial shapes made from clay by, for example, children today.
21. One very large example held 5 gallons of carbonised pistachios. Helbaek 1966, 63. Kirkbride 1967, Pl. 5A.
22. Kirkbride 1968b, 269; Kirkbride 1967, Pl. 5b.

JARMO

Site: Mound 90m. x 140m., 800m. above sea level.¹

Location: On natural promontory formed by deep wadi cuttings, overlooking wadi of Cham Gawra. 12km. from modern town of Chemchemal, N. Iraq.

Years of Excavation: 1947 (surface collection)

1948 (soundings)

1950, 1951, 1954, 1955 (intensive excavation).

Excavators: Oriental Institute of the University of Chicago Expedition. Directors: R.J. Braidwood, B. Howe.

Area excavated: Slightly more than 7% of estimated area of original mound; circa 1323 sq. m. excavated.

Depth of deposit: 7m. to sterile soil (0.8% of area excavated reached sterile soil).

Stratigraphy: 15. (numbered 15-1, bottom to top) levels representing total occupation period of 250-500 years, according to excavator's estimation.²

Chronology:

<u>Level</u>	<u>C¹⁴ date</u>	<u>Reference</u>
8	6570 $\pm$ 165 BC	Braidwood, 1958b
7	8528 $\pm$ 175 BC 6606 $\pm$ 330 BC 6707 $\pm$ 520 BC	" " Libby, 1955 " "
5	6695 $\pm$ 360 BC 6650 $\pm$ 170 BC	" " Braidwood 1958b
2	5266 $\pm$ 450 BC	Libby, 1955

The excavator's estimated date for beginning of habitation at Jarmo is 6650 BC.³

ENVIRONMENT

The landscape consists of upland grassy terraces on sandstone, interrupted by deep wadi cuttings. A perennial spring flows in the Cham Gawra wadi some 300m. from the site. Recent pollen analyses have indicated the presence of dense oak and pistachio forests in the area during the Neolithic era, occurring at altitudes of 600-1700m.⁴ As Jarmo lies close to the lower limits of this oak-pistachio belt, Helbaek has suggested that the immediate landscape probably consisted of lush grazing land with occasional groves of large trees.⁵

Present day rainfall varies between 40-60cm. per annum, falling only in winter and spring. Average summer daytime temperatures reach over 100°F.

CULTURAL ASSEMBLAGE

- Subsistence Cultivation: Emmer wheat, 2 row hulled barley, a little einkorn⁶ field pea, lentil, blue vetchling.
Collecting: Acorn and pistachio
Herding: Domestic goat throughout; domestic pig in ceramic levels.⁷
Hunting: Onager, goat, sheep, Bos, deer. (Some wolf, bear, fox, leopard, badger, marten. Also bird, fish, tortoise, crab, and great quantities of land snails.
- Architecture Houses: rectangular, varying sizes, multi-roomed, grouped around courtyards. Built of tuff, occasionally on rough stone foundations. Complex refractory facilities. Massive use of clay throughout.
- Chipped Stone Large blade tool industry (100,000+ pieces recovered), homogeneous throughout. Microliths-predominant; blades and sickle blades often with traces of bitumen most common. 60% flint, 40% obsidian.
- Ground and Polished Stone Celts, some possible hoe blades, querns, rubbing stones, hammerstones, pestles, mortars. Several large, pierced spheres; possibly mace-heads, digging weights. Over 1000 fragments of polished marble bowls (circa 350 vessels); high standard. Occasional spoons and palettes for grinding ochre.
- Worked Bone Awls commonest in various sizes and forms. Hafts for mounting blades. Spoons, needles, pins.

• Ornaments • Stone: buttons, bracelets, rings, beads, pendants.

Bone: pendants, cylindrical beads, finger rings.

Shell: dentalium beads, twin-holed 'tab' shapes,
pierced gastropod shells.

Clay: spherical, barrel, diamond, elliptical, toggle beads.

Basketry and Impressions of woven matting and probably baskets.

Textiles Some basketry impressions on bitumen, as if water-proofing attempted.

Wood No evidence.

Figurines Total 5000 fragments found; anthropomorphic and animal form. Shaping poor, usually small. Sundried, few examples may have been lightly baked.

Miscellaneous Clay: cone with spiral impression may have been seal.

Finds Many balls and cones and other geometric forms.

Burial No standardised burial position. Few skeletons found.

Customs Cemetery probably separate from settlement.

Pottery Occurs in upper third of strata. Level 5-3; 204 sherds. Level 2-1, 12,000. All vegetable tempered, buff to orange fabric, frequent dark cores.

USES OF CLAY IN THE JARMO ASSEMBLAGE

Architecture

Site plan—House complexes interspersed with tauf-walled courtyards. No regular planning evident. Entire site plan could not be traced.

Structures—Free-standing, rectangular, several rooms.⁸

Construction—Tauf on fieldstone foundations.⁹ Jambed doors,

Materials slit windows. Interior curtain walls of tauf.

and methods

Wall finish—None apparent

Floor— Floors generally made of thin layer of packed clay
finish on bed of reeds.

Roofing— Indirect evidence suggests interior tauf curtain
techniques walls used as ridge-bearing points for simple gable roof, framed with rafters and sheathed with reeds into which clay was paddled to form protective surface.

Refractory Facilities

Hearths¹⁰

Location— In house floors of earlier levels, none detected in later levels.

Size/shape— Oval depressions.

Construction—Sunk into floors and lined with thin layer of clay

Materials and frequently burnished, and baked 'in situ'. Often

Techniques contained rough cobbles believed used as boiling stones.

Ovens.

Location — Within houses, firing chamber occasionally giving on to adjacent courtyard.

Size/shape — Circular, domed, often with semi-circular chimney.

Construction — Walls and dome of tauf. Floored with fine layer materials of silty clay over foundation of coarse clay and and methods gravel with straw admixture. Invariably burnished. Frequent refloorings.

Storage Facilities

Storage rooms.¹¹

Location — Within house complexes

Size/shape — Small-sized rooms, 2m. x 1.5m. Impractical as living space. No well defined doorways.¹²

Construction — As houses

materials

and methods

Possible use — Believed to have served as storage areas for seed grain, and food for the 'lean' season.

Storage Jars: See pottery section.

Figurines: Fig. Jarmo 1.

Categories: Animal figurines: 1100 identifiable found

Human figurines: 180 identifiable found.

Provenance—Occurred at random throughout the strata without special concentration.

Materials—Clay, usually sundried. Few lightly baked examples.

Techniques—Roughly modelled with rare traces of facial features other than mouths. Some highly stylised examples, particularly in human category.

Miscellaneous Clay Finds

Body ornaments:

Clay used only for beads. Simple shapes.

Standard of workmanship inferior to that of stone counterparts.

Sundried and baked(?) geometric objects:¹³

Over 4000 small geometric shapes.

Balls and cones predominate..

NON-POTTERY CONTAINERS IN THE JARMO ASSEMBLAGE

Basketry: believed prolific.¹⁴

Materials — Not identified. Bitumen used for waterproofing.

Shapes — Impressions numerous but too fragmentary to identify profiles.

Techniques — Simple under-over weave suggesting matting.

Impressions of twining frequent on bitumen.

Uses — Bitumen lined baskets probably served for the transportation and storage of liquid and fine textured materials. Unlined baskets likely to have been used to collect and transport grain and plant materials.

Wooden vessels:

No evidence.

Stone Containers: prolific: Fig. Jarmo 2.

Material — Predominantly marble, selected with care according to colour and veining.

Shapes — Commonest = inverted truncated conical forms with flared lips. Also subspherical or elliptical forms with a variety of lip treatment; and low carinated bowls.

Techniques — High quality workmanship throughout occupation period.

Thin, highly polished walls, sharply carinated profiles. Marble worked so veining conformed to carination. Frequent drill-holes indicating repairs.

Uses — Believed to be both utilitarian and ritualistic/luxury vessels. Repairs suggest they were prized possessions. No decline in manufacture after advent of pottery.

PORTABLE POTTERY CONTAINERS AT JARMO

Level	Amount of Pottery	Wares, surface	Temper, Firing	Shapes	Colour	Decoration
1	Significant increase (ca. 400%)	Coarse ware continues. Cups and bowls smoothly finished and burnished. Few thin-walled specialised shapes	Vegetable temper usually chaff. Firing often hard. Usually incomplete	Storage jars continue. Also frequent: Carinated cups 8-20cm. diam. Carinated shallow bowls 20-40cm. diam; straight walled mugs 10-20 cm. diam. with horizontally perforated 'nose-lugs'; Fragments of 2 zoomorphic vessels	Orange-buff local clay throughout	Half of sherds recovered burnished often over fugitive red slip. ca. 10% of sherds decorated with oblique or blobbed lines.
2						
3						
4	Used sparingly	Coarse ware, thick walled some burnishing		Storage jars to 60cm. diam Globular with flat bases. Few cups, bowls.		
5	Smallest no. of sherds per stratum					

SUMMARY OF THE JARMO ASSEMBLAGE IN RELATION TO THE EMERGENCE
AND SIGNIFICANCE OF THE PORTABLE POTTERY CONTAINER

Clay Usage and Clay Technology

Clay was used as a structural material from the beginning of the Jarmo settlement. Tauf-walled houses on fieldstone foundations were randomly interspersed with tauf-walled courtyards. Interior curtain walls were also built of tauf. Floors were made of thickly spread reeds finished with a layer of packed clay. Rooms considered too small for living areas may have served for grain storage.

As a refractory material clay was used for the construction of hearths and complex ovens. Hearths were lined with burnished clay which was subsequently fired through usage. The domed ovens were built of tauf and floored with a coarse layer of heavily gravel and chaff-tempered clay, coated with hard-burnished fine clay plaster.

Before the appearance of ceramics, the Jarmo inhabitants were accustomed to modelling clay, and possibly lightly firing the products. An abundance of figurines was found, with animal representations in the majority in the lower strata. In the ceramic strata human figurines assumed more importance, possibly suggesting a diminishing preoccupation with the hunt. All examples were roughly modelled with little attention to detail. In addition to the figurine assemblage, over four thousand geometric objects of sun-dried or lightly fired clay were recovered. A few clay beads in various shapes were found, but stone, bone, and shell appear to have been the preferred materials for personal ornaments.

SUMMARY OF CERAMIC TECHNOLOGY.

AT JARMO.

	aceramic	ceramic
Vegetable temper.	X	X P
Mineral temper	X	X
Modelling	X	X P
Bonding.		P
Burnishing	X	X P
Decoration, painted.		
Decoration, other.		P
Firing	X	X P

CONTAINERS IN RELATION TO THE CULTURAL ASSEMBLAGE

With the single exception of pottery which first appears in stratum 5 (after ten aceramic levels), a remarkable homogeneity is evident throughout the material assemblage at Jarmo. Pottery represents the only innovation of any account during the 200-400 year life-span at the site.

Baskets and stone vessels were common at Jarmo both before and after the advent of pottery.

Twined and simply woven baskets were prolific throughout the occupation period. These were frequently lined with bitumen to render them leak-proof, and were probably used for grain collecting and temporary storage. Lined baskets may have been used for the transportation and storage of liquids prior to the advent of pottery. A prolific stone vessel assemblage was recovered showing no decline in magnitude and quality during the ceramic phases. Stone vessels, expertly made from carefully selected materials, were highly prized at Jarmo, and whereas in the lower strata they probably performed utilitarian functions such as food preparation, it may be suggested that after the advent of ceramics, stone bowls were reserved for occasional and perhaps ritual use. Vessels of stone are more tedious and difficult to produce than those of clay, are harder to replace, and are also fairly easily broken. Therefore, after pottery was made, the inhabitants are likely to have used pots rather than stone vessels for everyday purposes.

A complete analysis of the Jarmo ceramic assemblage is not available, but the results of F. Matson's preliminary study may be summarised. Although most of the technology (all of the technology if one accepts that the figurine and geometric object assemblage was fired) implicit in the earliest, level 5 sherds was already familiar to the Jarmo people, Matson suggests that the idea of pottery making was introduced from outside the settlement. However, the apparently conservative nature of the people, their use of other types of container, and their access to adequate clay technology, rather suggest that ceramic manufacture evolved within the settlement itself. It is possible that all pottery making took place outside the immediate dwelling area for reasons of safety. Should this have been the case, it is unlikely that any but successful pots would have been brought into the excavated area. All failures would be discarded on the spot.

Once successfully discovered, the art of pottery making at Jarmo was pursued with vigour, as is apparent from the rapid increase in sherd finds from succeeding levels.

Pottery remains were few in stratum 5 indicating a minimum use of ceramic vessels at this level. Many base sherds were found in stratum 4, and Matson suggests that the larger storage jars were first sunk into the soil at this time. Stratum 3 was the most ceramically interesting level at the site, containing many well preserved new shapes in addition to the storage jars. Pottery found in levels 1 and 2, although more abundant appears much more

friable and coarser in quality than that of the earlier strata. It has been suggested that this may be the result of the effect of soil chemicals rather than indicative of a decline in workmanship.¹⁵

The apparently broad economic base at Jarmo must have engendered the need for a great variety of food preparation and storage vessels, and the bulk of the ceramic finds consisted of such coarse containers as would be required for these purposes. The large 60cm. diameter jars are likely to have served for water and perhaps dry goods storage. Plain and carinated bowls were probably used as cooking pots, whilst the straight sided mugs provided with lugs for attaching covers may have contained dairy products or other commodities requiring careful protection.

NOTES

1. It has been suggested that at least one third of the original mound may have been eroded away as a result of incessant overgrazing of sheep and goat. Braidwood and Reed, 1957, 26.
2. Braidwood has since revised his original estimation of the occupation period (200-400 years) in view of all published dates and 15 others still pending publication. Braidwood, 1974.
3. PPS 37, 1971, 27.
4. Zohary, M, 1950.
5. Helbaek, 1956, 75.
6. Both varieties of cultivated wheat were analysed and found to be morphologically between the wild and fully domestic varieties. Oates, 1973, 157; Helbaek 1959a; Helbaek 1959b.
7. It is possible that the goat may have provided milk and dairy products in addition to meat. Reed, 1960, 132.
8. Tauf curtain walls divided a stratum V house into 7 spaces, some of which were likely used for storage. Braidwood and Howe, 1960, 42; L. Braidwood, 1952, 159 (plate).
9. Both clay and a variety of stone were locally available and both were fully exploited throughout the occupation period.
10. The location of hearths and ovens suggests that they were used for both cooking and heating purposes. Braidwood and Howe, 1960, 43.
11. Considering the complexity of the Jarmo cultural assemblage, it would seem logical to presume the existence of facilities for the long-term storage of grain. None have been positively identified. The use of 'storage rooms' is a logical conjecture.
12. Braidwood and Howe 1960, plate 14B.
13. L. Braidwood, 1952, 162 (plate).
14. No stratigraphic context is available for basketry finds, therefore it is impossible to ascertain whether or not a decline in the use of baskets took place with the advent of pottery.
15. F.R. Matson, 1960, 64.

ACERAMIC HACILAR

Site: Mound, roughly circular, 150m. diam.; 5m. high.

970m. above sea level.

Location: 25km. west of Burdur in south-west Anatolia.

Years of Excavation: 1957-1960 (Aceramic, 5 days in final, 1960 season).

Excavator: James Mellaart.

Area Excavated: 150 sq.m. (mainly courtyard area).

Depth of deposit: Aceramic, 1.5m. separated from Late Neolithic levels by .6m. of sterile soil.

Stratigraphy: 7 aceramic levels beneath 13 successive Late Neolithic building levels. Aceramic levels numbered I-VII (top to bottom).

Chronology: Level: V

C¹⁴ date: 6750 $\pm$ 180 BC.

Reference: Mellaart 1975, 95.

ENVIRONMENT

Hacilar is situated in an inter-montane valley of the Taurus range, close to a constantly flowing spring which issues from a limestone crag above the ancient village. The spring is today used to irrigate abundant orchards and gardens upon which the local economy is based.¹

To the east of the Hacilar area lie the shores of Lake Burdur, and to the south rise the lower slopes of the Taurus range. It is believed that during the prehistoric period, these mountain slopes, now almost completely denuded, bore a rich variety of arboreal vegetation, including oak, pistachio, pine and juniper. The lake-shore too, it is thought, supported a park-like forest of smaller trees such as apple, pear and nettle.²

The climate of the region is less harsh than that of the central Anatolian plateau with high (but not excessive) summer temperatures, and moderate rainy winters. The average July/August temperatures range from 80° - 86°F, whilst the January temperature varies between 25° and 32°F. Rainfall is abundant, averaging 30-50cm. annually.³

The modern landscape consists of open grasslands and villages thriving on that same rich alluvium deposit which proved so fruitful for the early settlers.

CULTURAL ASSEMBLAGE

<u>Subsistence</u>	<u>Cultivation:</u> ?Wild einkorn, emmer, hulled 2-row barley, naked 6-row barley, lentil. <u>Collecting:</u> White goosefoot, mallow, heliotrope, gromwell, vervain. <u>Herding:</u> ?Wild sheep/goat, domestic dog. ⁴ <u>Hunting:</u> Fallow deer, wild cattle, hare.
<u>Architecture</u>	Permanent rectangular structures with small rooms, separated by courtyards. Clay and lime plaster both used. Floors and walls often painted. Courtyards fitted with hearths, ovens, storage bins.
<u>Chipped Stone</u>	<u>Total found:</u> 11 pieces, 7 of local chert, 4 of Acigöl obsidian. <u>Tool types:</u> Blades, blade cores, possibly some sickle blades.
<u>Ground and Polished Stone</u>	<u>Tools:</u> 1 fully polished greenstone axe-head. <u>Containers:</u> 2 fragments of polished marble bowls.
<u>Worked Bone</u>	Several awls.
<u>Ornaments</u>	Few polished stone beads.
<u>Basketry and Textiles</u>	-
<u>Wood</u>	Axe-head suggests wood-working.
<u>Figurines</u>	-
<u>Miscellaneous Finds</u>	Several polished stone 'marbles'.
<u>Burial Customs</u>	No complete burials found. Several skulls without skeletons. 2 skulls set upright on floor of lowest level supported by pebbles, suggesting reverence for dead.
<u>Pottery</u>	-

USES OF CLAY IN THE ACERAMIC HACILAR ASSEMBLAGE

Architecture: Figs. Hacılar 1, 2, 3

Site Plan— No entire house plan recovered.⁵ Houses grouped around central walled courtyards containing domestic installations such as hearths, ovens, storage bins.

Structures— Small rectangular rooms, largest span not exceeding 4.5m. No doorways recognised, therefore possible roof entry by means of wooden ladders. Walls thin suggesting single storey.

Construction—House walls: single course (.2-.3m.) of heavily materials straw or chaff-tempered greenish clay bricks of and methods different sizes (many 72 x 28 x 8cm. suggest lath moulding). Bricks laid in headers and stretchers, bonded with clay mortar blackened by occupation debris.
Courtyard walls: to 1m. thick. Brick on stone foundations.

Wall finish—Courtyards and subsidiary rooms: clay plaster, often burnished.
Main rooms: lime plaster. Lower areas painted, or stained with red ochre to form dado. Upper areas in cream plaster occasionally painted with geometric designs in red.⁶

Floor finish—Courtyards and subsidiary rooms: clay plaster, often burnished. Main rooms: lime plaster laid on foundations of pebbles. Plaster curves up walls. Red ochre stained and burnished, or painted with simple geometric designs. Frequent replastering evident.⁷

Roof construction— No postholes (unnecessary for 4.5m. span). Roofs believed flat. No traces of roofing techniques.

Refractory facilities: Fig. Hacilar 3.

Hearths and Ovens

Located — In row along south side of courtyard.⁸

1 domestic hearth found.

Shape, size — Hearths: rectangular. Ovens: Oval.⁹

Construction — All built of straw-tempered clay bricks on materials and stone foundations. Floors of highly burnished techniques 'limey' plaster, laid on a bed of small stones. Baked 'in situ'. Hearths provided with raised, plastered clay brick kerb.¹⁰

Storage facilities: Fig. Hacilar 3.

Storage bins

Located — North of hearth-oven complex in courtyard (aceramic IV)

Shape, size — Large, rectangular, raised.

Construction — Clay, plaster and stone.

materials and techniques

Use — Silica skeletons show grain storage. Ample space was available for fuel storage on courtyard floor; provision of bins for this purpose unlikely.¹¹

Figurines

No examples found of any material.

Miscellaneous Clay Objects

No examples found.¹²

NON-POTTERY CONTAINERS IN THE HACILAR ASSEMBLAGE

Basketry

No direct or indirect evidence.¹³

Wooden vessels

Direct evidence: none.

Indirect evidence: 1 greenstone axe, Fig. Hacilar 4, indicates at least the use of wood.

Stone vessels: Fig. Hacilar 4 (2 fragments).

Materials— Marble

Size/shape— Too fragmentary to permit more than partial profiles.

Construction— 'Polished'. No further details.

materials
and methods



SUMMARY OF THE HACILAR ASSEMBLAGE IN RELATION TO THE
EMERGENCE AND SIGNIFICANCE OF THE PORTABLE POTTERY CONTAINER

Clay Usage and Ceramic Technology

A sophisticated repertoire of building techniques involving the use of clay is evident from the basal level onwards at Hacilar. Clay in the form of heavily straw or chaff-tempered mud-bricks (believed to have been mould-made) was used for house building throughout the levels. Bricks, laid in headers and stretchers, were bonded with a debris-blackened clay mortar. Courtyard walls were similarly constructed, although here mud bricks were laid upon a stone foundation layer. A variety of plastering techniques were known and used at Hacilar. Clay plaster, often burnished, coated walls and floors of courtyards and subsidiary rooms. The main rooms were finished in fine lime plaster, often burnished and painted (with geometric designs in red ochre).¹⁴

Straw-tempered clay bricks were again used for the construction of storage bins and refractory facilities. Hearths were provided with a raised clay kerb to prevent spillage, and fire surfaces were clay or lime plastered and hard burnished. Most had been baked 'in situ'.

No examples of clay modelling were found, other than the rudimentary techniques implicit in clay brick manufacture and other architectural features such as kerbs.

SUMMARY OF CERAMIC TECHNOLOGY.

AT ACERAMIC HACILAR

Vegetable temper.	X
Mineral temper	
Modelling	
Bonding	X
Burnishing	X
Decoration, painted.	X
Decoration, other.	
Firing	X

CONTAINERS

Despite limited excavation (only five days, mainly in courtyard areas) sufficient remains were recovered to suggest a well planned semi-permanent or permanent settlement. Both cereals and legumes were cultivated, and the economy seems to have been based upon a mixture of agriculture and hunting.

Two well-made, highly polished, stone bowl fragments were the only examples of containers found at Hacilar. Mellaart suggests that wooden bowls, leather containers and baskets may also have been in use, but there is no evidence to support this.

Although no pottery was recovered, all technology necessary for the manufacture, and probably the firing of pots was available at the site. Domestic hearths and ovens are likely to have been used for food preparation, and food preparation usually involves the use of containers. Eating vessels probably existed, and pigments for wall-painting must have been mixed in some type of container. Without further excavation it is impossible to do other than speculate upon the nature of portable containers in use at Hacilar. The possibility that pottery was in use, but has yet to be recovered, cannot be ruled out.

NOTES

1. Mellaart, 1958, 127.
2. Helbaek, 1970, 190.
3. Mellaart, 1970, xii.
4. The species of dog found at Hacilar resembled a modern fox terrier. It was probably used to help in the hunt. Zeuner, 1963,
5. Knowledge of all aspects of aceramic Hacilar including site planning, necessarily restricted by limited excavation. Soundings were made near the edge of the mound, and it is quite possible that more central exploration would reveal more substantial structures. Mellaart, 1970, 6.
6. Only a few fragments of painted plaster were found: their good state of preservation suggests that they were part of the wall rather than the floor decoration. Mellaart, 1970, pl. Va.
7. Mellaart, 1970, pl. IVa, b.
8. Refractory facilities were grouped in the courtyard areas presumably to reduce fire risk. None of the aceramic levels was destroyed by fire. Such grouping indicates community co-operation and planning. "Ovens and hearths are so badly preserved, and without later parallels, it would be impossible to say which was which. None of the superstructures is preserved, and both are constructed in the same manner. Hearths are already provided with a raised kerb, and ovens would often seem to have been laid out on an oval plan". Mellaart, 1961a, 72.
9. Whilst hearths were undoubtedly used for cooking and heating purposes, it is believed that oven facilities were generally employed for the parching of grain prior to grinding. Bread baking was unlikely at Hacilar as the species of grain found at the site contain little gluten. Helbaek, 1970, 198.
10. Mellaart, 1961a, 72.
11. Mellaart, 1970, 5.

12. "... the Hacilar aceramic people were good housekeepers. Not a single object was found lying on any of the house floors". Mellaart, 1970, 4.

The lack of figurines and small objects is as likely to be an accident of the limited excavations as proof that such did not exist at the site.

13. "These people had no pottery vessels, and probably used baskets, wooden vessels, and more rarely polished marble bowls, two fragments of which were found". Mellaart, 1970, 6.

14. Analyses of the 'lime plaster' have yet to be made. It is not known whether this was merely clay with a high gypsum content, or whether it was a true lime plaster involving a slaking process. Slaked lime would mean that the Hacilar inhabitants were able to produce firing temperatures of about 800°C.

15. Cf. note 13.

TELL ABU HUREYRA

Site: Mound 480m. long (N-S), 290m. wide (E-W), trapezoidal in plan. 2 gullies eroded on western slope.

Location: 130 km. east of Aleppo, and 35km. downstream from Meskene on south side of Euphrates valley in northern Syria.

Years of Excavation: 1972, 1973.

Excavator: A.T. Moore (discovered during surface survey in 1967 by van Loon).¹

Area Excavated: 49 sq. m. of mesolithic settlement, beneath 300 sq. m. of later neolithic settlement.

Depth of Deposit: 4m. - 8m.

Mesolithic - 1m. maximum.

Neolithic - 3-8m., depending upon slope of mound.

Stratigraphy: 4 major periods identified.

1. Mesolithic, followed by occupation hiatus.
- 2-4. Neolithic (early aceramic, later aceramic, ceramic), believed to be continuous development.²

Chronology: No C¹⁴ dates yet available.³

Suggested date "late aceramic, circa 6500 BC".

Pers. comm. G. Hillman.

ENVIRONMENT

Tell Abu Hureyra is situated between the Euphrates flood plain, and the steppe of the Syrian plateau. The climate is semi-arid with marked seasonal temperature variations. Summers are hot and dry, winters are very cold with frequent frost. Average annual rainfall is 200mm., falling between October and March.

Plant remains found at the site suggest little marked climatic change between the prehistoric era and the present day. However, vegetation was richer in the past; a wide range of plants from both the steppe and the flood-plain being utilised for food. A variety of animal species, predominantly steppe-dwelling gazelle was exploited for meat and possibly by-products, supplemented by wild-fowl and fish. Both the Mesolithic and Neolithic inhabitants were able to exploit the resources of the two environmentally diverse, adjacent areas.

An abundance of clay was readily available in the alluvial flood plain, together with flint of various types occurring as lumps and smaller fragments in the wadis and on the steppe.

CULTURAL ASSEMBLAGE (NEOLITHIC LEVELS)

Subsistence Cultivation: Emmer, einkorn, 6-row barley, naked barley, lentil, chick pea.

Collecting: Vetch, grape, prosopis, caper.⁴

Herding: Possibly domestic sheep and goat (late aceramic, ceramic).⁵

Hunting: Gazelle (not in ceramic), cattle, pig (rare), deer, equid, small mammals, fish, bird (rare).

Architecture 3 major phases believed to be continuous occupation. Rectangular, several-roomed mud-brick structures. Similar orientation retained throughout. Burnished plaster floors, built-in furnishings, storage facilities; all phases.

Chipped Industry essentially blade oriented. Tanged arrow-
Stone heads commonest. Limited variety in early ceramic.
Expansion in later phases with minor technical develop-
ments. Small proportion of Anatolian obsidian throughout⁶.

Ground and Saddle querns, hog-back rubbers, rough mortars of
Polished basalt, sandstone. Stone balls (earlier aceramic),
Stone purpose unknown. Fine pecked and polished greenstone
axes (all phases). Stone bowls (later aceramic and
ceramic).

Worked Bone . Industry restricted to borers in earlier aceramic.
Expansion in later phases. Many borer types, spatulae,
needles, fish hooks, clothing fasteners, bead blanks.

Ornaments Stone: Beautifully made pendants, beads. Great variety of shapes and materials.⁷

Bone: Beads

Shell: Beads.

Clay (baked): cylindrical beads }

homogeneous

throughout 3

Neolithic levels.

- Basketry and Mat impressions in soil. Basketry impressions in
Textiles bitumen. Spindle whorls, thread, evidence of spinning.
Weaving presumed.⁸
- Wood Many axes and chisels suggest thriving carpentry
industry.
- Figurines Rare, appear in later aceramic. Fragments of human
and animal figurines, unbaked lumps of modelled
clay (undetermined representation).
- Miscellaneous Baked clay stamps, seals, rectangular plaques.
- Finds
- Burial Secondary burials in shallow pits in yards or
Customs beneath floors. Skeletons and skulls buried
separately or jumbled together without matching.
Many instances of mat wrapping and ochre decoration.
Grave gifts: rare, including pebbles, flint tools, beads.
- Pottery In final occupation layers, ceramic neolithic.
Few fragmentary sherds on floors, in pits with
other debris. Coarse, crumbly fabric, limited
shape range.

USES OF CLAY IN THE TELL ABU HUREYRA NEOLITHIC ASSEMBLAGE

Site plan— Earlier aceramic: Initially relatively small area occupied with gradual expansion. Complete plan not determined, but rebuilding always followed earlier alignment. Houses faced south or south-west to catch winter sun.

Later aceramic: Village expanded to cover all mound (11.5 hectares = 28.5 acres). Entire area inhabited at one time, and evidence of long occupation.⁹ Buildings (houses and workshops) clustered tightly together, separated by narrow lanes and courts.¹⁰

Ceramic: Level badly eroded. Settlement contracted to cover half of mound. Mud brick architecture persists, but also many pits found.

Structures— All phases: Rectangular, several-roomed (at least 5 in some cases). Rooms 3-4m. long, and 1.4-2m. wide. Walls thin suggesting single storey. Partition walls pierced with rectangular porthole doorways. Outer doorways furnished with high sills and mud-brick lintels.

Construction— All phases: Entirely mud brick walls. Brick sizes materials and varying from building to building.

techniques

Wall finish— All phases: Walls coated with layer of fine clay plaster, sometimes 'white-washed'.

cont'd..

Floor finish—All Phases: Most floors were of black-burnished plaster (clay or lime not indicated), curving up adjacent walls. Occasionally stained with red, or painted with simple geometric designs. One example had a red sunburst on a black background. Several refloorings evident.

Roof — Sockets for vertical wooden posts found in
Construction upper walls. Roof supports therefore believed to be of wood, but construction details unknown.

Interior Fittings: all phases

Low platforms found along several interior walls.
Plastered as floors.

Refractory Facilities

Hearths: all phases

Set into floors towards centre. Construction data not yet available.

Ovens: None found.

Storage Facilities

Storage bins:

Placed against walls; plastered.

Storage recesses:

Cut into wall fabric; plastered.

Storage vessels: "Clearly permanent features in the rooms they occupied".¹¹

Location — Generally found in fragmentary condition in the rooms. 3 almost intact examples.

Shape, size—Rectangular, large, with openings at the top and the two ends.

Construction—'Vaisselle blanche' = a hard lime plaster. See glossary.
materials and techniques

Possible use—No details available, but suggest grain bins.

Figurines: Fig. Tell Abu Hureyra 1, No. 2.

Categories: all rare examples.

- a) fragmentary human figurines.
- b) animal figurines.
- c) modelled clay lumps, impossible to tell what they were intended to represent.

Provenance— No particular location; found in later aceramic and ceramic levels.

Materials— Unbaked clay.

Technical data—Very roughly modelled.

Miscellaneous Clay Finds¹²

Baked clay stamp seals.

Baked clay rectangular plaques.

Baked clay spindle whorls.

Baked clay cylindrical beads.

NON-POTTERY CONTAINERS IN THE TELL ABU HUREYRA ASSEMBLAGE

Basketry

Evidence: Mat impressions in soil. Basket impressions in bitumen.

Materials-Rushes: *Scirpus tabernaemontani* (bulrushes) for baskets

Reeds: *Phragmites communis*. Mainly for matting and roofing.

Shapes — Insufficient evidence to determine.

Technical —

data

Uses — As the inhabitants were well supplied with stone bowls, large 'vaisselle blanche' storage jars; and, in the ceramic period, pottery; it is likely that baskets served chiefly as carrying rather than storage devices.

Wooden Vessels

Direct evidence: None.

Indirect evidence: Large assemblage of greenstone axes and chisels.

Stone Vessels: Fig. Tell Abu Hureyra 2.

Materials-Coloured limestone and gypsum, carefully selected.

Shapes — Mostly small and hemispherical. Some with flat bottoms and splayed sides. Also oval dishes and occasional experimental unique shapes.

Technical — Carefully worked, highly polished.

data

Uses — Possibly luxury items, and/or eating vessels; storage of small items.

PORTABLE POTTERY CONTAINERS AT TELL ABU HUREYRA

Fig: Tell Abu Hureyra 1 (Nos. 3-8)

Amount of pottery— Few sherds found in pits or on surface.

Wares, surface — Coarse, crumbly textured fabric. Surfaces burnished. Few highly burnished sherds from finer pots.

Temper, firing — Straw temper.
Low firing temperature accounts for invariable black cores and crumbly texture.

Shapes — Little variety. Usually 'baggy vessels'.
Rare examples of collar necks.

Colour — Generally brown or black.

Decoration — Generally confined to surface burnish.
However, one or two sherds bear 'red decoration'. No further details available.

SUMMARY OF THE TELL ABU HUREYRA NEOLITHIC ASSEMBLAGE IN
RELATION TO THE EMERGENCE AND SIGNIFICANCE OF THE PORTABLE
POTTERY CONTAINER

Clay Usage and Clay Technology

Clay was exploited with sophistication and in a variety of contexts during the entire Neolithic occupation period. Mud-brick architecture persisted throughout the three building phases despite changes in settlement size reflecting economic fluctuation. Clay plaster coated floors, walls and interior fittings. Storage bins and niches were also lined with clay plaster. Floor plaster was usually highly burnished, and frequently stained with red ochre, or painted with geometric designs.

Some evidence of clay modelling was recovered from all levels. A scattering of crude, unbaked human and animal figurines occurred throughout the strata in addition to a quantity of modelled clay lumps, which excavator also classifies as figurines, although their form defies interpretation. The purpose of several well-shaped rectangular baked clay plaques is also unknown. Clay was used for the manufacture of specialised tools in the form of fired spindle whorls and stamp seals. The latter may have served to personalise property. Several well-made and fired cylindrical beads are evidence of the use of clay for personal adornment.

A high standard of pyrotechnology was developed at Tell Abu Hureyra prior to the appearance of pottery, evident not only in the baked clay assemblage, but also in the production of "vaisselle blanche" for large storage facilities, the shape and construction of which is suggestive of grain bins.

SUMMARY OF CERAMIC TECHNOLOGY.
AT TELL ABU HUREYRA.

	Aceramic	Ceramic
Vegetable temper.	X	X p
Mineral temper		~
Modelling	X	X p
Bonding.		
Burnishing	X	X p
Decoration, painted.	X	p
Decoration, other.		
Firing	X	X p

CONTAINERS

Occupation at the Neolithic village settlement at Tell Abu Hureyra is believed to have been continuous throughout the three phases. The highest level of prosperity was reached during the late aceramic phase when the well-planned settlement expanded to cover the entire mound and the industrial assemblage showed the greatest diversity and quality of workmanship.¹³

Although large storage vessels of 'vaisselle blanche' were in use during the aceramic, no small, portable hard lime containers were found. This may have been because the many well polished stone vessels, supplemented by containers of perishable materials, were adequate for all purposes, or because 'vaisselle blanche' as made at Tell Abu Hureyra was found to be unsuitable for anything other than large scale storage. Baskets of rushes and reeds, often lined with bitumen were common at the site and probably served for the gathering and transportation of grain, and until the advent of pottery, leather bags and gourds have been used for carrying and storing liquid commodities.

Pottery first appeared at Tell Abu Hureyra in the final, apparently degenerate occupation period, and the basis of a first preliminary report, it is impossible to speculate why this should be. However, the continued production of stone bowls of fine quality alongside ceramic vessels indicates that pottery did not immediately replace other vessel forms, but rather was adopted as an equally valued component of the container assemblage. The clay pots recovered were generally

functional in quality and were probably used for cooking, as stone is not suitable for this purpose. Pottery may also have supplemented or perhaps replaced perishable containers for liquid storage.

"The crudity of the pottery, its well-defined stratigraphic position in the Abu Hureyra sequence, and the typology of the associated flint industry, suggest this is one of the earliest occurrences of pottery in Syria".¹⁴

Although all technology implicit in the manufacture of pottery had already been demonstrated in other contexts prior to the appearance of ceramic vessels at the site, it is not possible to say whether the introduction of pottery was an indigenous development or a result of external influence. Possible trade contacts are suggested by the presence of Anatolian obsidian, cowries from the Arabian Gulf or the Red Sea, and turquoise fragments from Sinai. The idea of pottery making may have come from one of these areas, but all vessels found are likely to have been manufactured locally using tried and tested technology. Clay and pottery analysis could verify this suggestion.

1. van Loon, 1967, 7.
2. The Neolithic occupation is thus divided according to increase in size of settlement and artifact assemblage (early to late aceramic) and the appearance of pottery (late aceramic to ceramic). Occupation continuous throughout. New tool types join rather than supercede those already in use.
3. A large number of charcoal samples were collected for dating and are presently undergoing analysis.
4. Hillman, 1975, 70-73.
5. Faunal analyses to date cover but a small part of the assemblage. However, a distinct shift in economic emphasis from gazelle to ovicaprid evidently occurred some time between early and late aceramic. No indication of age of the animals concerned is given in the preliminary report, therefore suggestions of domestication must remain within the realm of speculation. Legge, 1975, 74-76.
6. A small number of long irregular blades identified as sickle blades was found in a later aceramic context. Considering the varied agriculture at the site, it is suggested that means other than sickles were used for harvesting, although what these 'means' may have been is not indicated. Moore, 1975, 60.
7. No bead or bowl making workshops were found. This is considered to be the result of limited excavation rather than the non-existence of such establishments. "These artifacts were quite rare and their manufacture must have been a skilled and lengthy process. It is likely therefore that some individuals specialised at least part time in the production of these and certain other artifacts". Moore, 1975, 65.
8. Moore, 1975, 64-65.
9. It is hoped that the C¹⁴ dates may provide some indication of the length of aceramic occupation. This information is rarely proffered, although it is of great importance to a discussion of technological development.

10. Workshops identified by artifacts. Chipping floors found and ground-stone workshops, indicating special area usage and division of labour. Moore, 1975, 64.
11. Moore, 1975, 60.
12. "These objects form a significant group indicating that the inhabitants of Abu Hureyra were familiar with baked clay some time before pottery was used at the site". Moore, 1975, 61.
13. The varied artifact assemblage and expansion of the village during the later aceramic denote a marked development in economic prosperity. The chipped stone and bone industries increase in both variety and magnitude, finely worked stone bowls make their first appearance; and many examples of useful and decorative objects, expertly made from a variety of carefully chosen raw materials occur. Buildings expand to cover the entire area of the mound. An apparent cultural deterioration takes place between the later aceramic and ceramic levels. Despite the appearance of pottery the settled area is much reduced, and the assemblage generally shows signs of degeneration. The reasons for these marked fluctuations in prosperity cannot be construed until a final analysis of the various artifacts and architectural phases has been made.
14. Moore, 1975, 62.

SUBERDE

Site: Mound 5000 sq.m. 1070m above sea level.

Location: 1km. from village of Suberde, in the Beyşehir-Suğla basin, immediately west of the Konya plain in south-central Turkey.

Years of Excavation: 1964, 1965.

Excavator: J. Bordaz.

Area Excavated: 75 cubic metres - upper prehistoric level.

50 cubic metres - lower prehistoric level.

Depth of Deposit: total 4m. Surface level, 1.5m.

Upper prehistoric level .5m.

Lower prehistoric level 2m.

Stratigraphy: Surface layer: Islamic burials, mixed material, disturbed.

Upper prehistoric layer }
Lower prehistoric layer } - village settlement.

Chronology:

<u>Level</u>	<u>C¹⁴ date</u>	<u>Reference</u>
Lower prehistoric level	6326 $\pm$ 289 6299 $\pm$ 91 6226 $\pm$ 79 6570 $\pm$ 140	Bordaz 1968, 59
Transitional between lower and upper prehistoric levels	5634 $\pm$ 85	

200 years suggested occupation for lower prehistoric level.¹

ENVIRONMENT

The Beyşehir-Sugla lake area forms an intermontane valley (150km. long x 25-50km. wide) in the north-eastern part of the western Taurus range. The site of Suberde is situated on a limestone ridge within this valley. Until recent times, the ridge was almost entirely surrounded by lake water, and during the habitation period at the settlement the lake covered a large portion of the surrounding plain.² Botanical analysis has shown that forests of cedar, pine, and juniper were present in the area in the prehistoric era, as well as chestnut, birch, and poplar in relatively large stands.³

Today the vegetation is of a degraded Mediterranean type probably as a result of deforestation and over grazing, although thick stands of Juniper still exist on the higher mountain slopes. The area receives ample rainfall for dry-farming (300-500mm. annually, mostly falling in spring) and enjoys warm, dry summers and cold, humid winters.⁴

CULTURAL ASSEMBLAGE

Subsistence Cultivation: No positive evidence.

Collecting: Small amount of plant food including graminae.

Herding: Domestic dog, possibly sheep.⁵

Hunting: Sheep/goat, ox, pig, red deer. Smaller amounts of fox, jackal, tortoise, wild cat, marten, hedgehog, badger, roe deer. Some fish, waterfowl, shellfish.

Architecture Lower prehistoric level: No site plan distinguished.

Permanent houses of mud brick bonded with clay mortar.

Upper prehistoric level: Badly preserved. Houses of mud-brick on stone foundations. Plaster floors.

Chipped Stone Predominantly of obsidian (60%). Large industry characterised by small tools. Little wastage. Hunting tools, principally projectile points constituted bulk of finds. 320 sickle blades found.⁶

Ground and Polished Stone Polished carpentry tools; axes, chisels. Polishers, grinding slabs and pounding stones (some with traces of ochre). Few querns.

Worked Bone Over 300 pieces worked bone, high quality. Majority-awls. Needles and tool handles numerous.

Ornaments Stone: Beads including cylindrical, circular and winged forms.

Bone: Cylindrical beads, flat pendants. 3 boars' tusk ornaments.

Shell: -

Clay: -

Basketry and -

Textiles

Wood Many carpentry tools found.

Figurines 21 low-fired figurines and fragments of figurines.
Boars predominant. 1 human figurine. ➤

Miscellaneous Stone: 1900 river pebbles, various colours, some
Finds incised.

Clay: Many cones, balls, cylinders from same paste
as figurines.

Plaster: 1 multifaced ball, 1 sphere, 1 cone; use
unknown.

Metal: 3 fragments of copper 'wire', thought to be
intrusive.

Burial No burials found.

Customs

Pottery 5 sherds (lower prehistoric level) identified as
pieces of coarse, low-fired portable containers.

USES OF CLAY IN THE SUBERDE ASSEMBLAGE

Architecture

Lower Prehistoric level

Site plan — Not determined.

Structures — Rectangular houses, insufficient remains to measure room sizes.

Construction — Walls 40cm. thick, of courses of reddish-brown materials and mud-bricks (60x40x6cm.) cemented with layers of techniques light brown mud mortar 4cm. thick, 3cm. thick at ends.

Wall finish — None.

Floor finish — 'Unplastered'.⁷

Roofing — Fragments of burnt clay with botanical impressions techniques suggested clay and cane roofs.

Upper Prehistoric level ('The Plaster Floor Level').

Site plan — Not determined.

Structures — Rectangular; average room size thought to be 2.5 sq.m.⁸

Construction — Mud slab walls ca. 35cm. thick built on flat materials and stone (5cm. thick) foundation. Slabs of 7cm. techniques thick, reddish-brown loam, separated by 4cm. thick courses of light brown clay mortar. Mud partition wall found in 1 room, 1½m. long.

Wall finish — -

Floor finish — Foundation layer: 10cm. clayey loam, or no foundation. 2nd layer: 10-15mm. clay mixed with small stones. Finish: Polished clay plaster 1-2mm. thick.

Roofing — -

techniques

Interior Furnishings

Lower Prehistoric level

Bench⁹

Location — Running along parts of interior house walls.

Size/shape — 30cm. wide x 45cm. high

Construction — Built up of earth, then plastered with thin materials layer of clay.

and methods

Refractory Facilities

Hearths: location and structure not stated.¹⁰

Ovens: —

Storage Facilities

Lower Prehistoric level

Storage Bins

Location — Within house floor areas.

Size/shape — Cylindrical basins 30-40cm. deep, 70-80cm. diameter.

Construction — Dug into floors. Walls lined with thick, coarse materials clay.¹¹ Carefully shaped clay rims.

and methods · Earth packed floors.

Possible uses — Liquid storage or food storage.¹²

Figurines: Fig. Suberde 1

Total of 21 examples found.

Categories: human and animal (majority animal).

Provenance—Found in both prehistoric strata, no particular find-spots.

Material—Low-fired, light reddish-brown (local) clay.

Rough surface indicates mineral inclusions.

Technical—Realistic, lively modelling, All examples poorly finished. Incised decoration on female figurine thought to represent skirt.

Miscellaneous Clay Finds

Geometric objects.¹³

Categories a) Small clay cones, generally plain, some flattened and grooved. 1 with tip resembling bird's head.

b) small balls.

c) pellets.

d) cylinders.

Material—Same fabric as figurines.

Technical—Well smoothed, low fired.

data

Uses — Unknown, possibly tallies or counters.

NON-POTTERY CONTAINERS IN THE SUBERDE ASSEMBLAGE

Basketry

No direct or indirect evidence.

Wooden Vessels

Direct evidence: none.

Indirect evidence: wood readily available in vicinity of site; large assemblage of carpentry tools found.

Stone Vessels

No direct or indirect evidence.

Portable Pottery Containers at Suberde

Lower Prehistoric Level

Amount of—5 sherds found in lower prehistoric strata. 12

Pottery similar sherds found in unstratified contexts
(mixed surface layer), presumably surface finds.

Wares, — Extremely coarse, thick wares. Walls 1.5cm. thick.
surface Surface uneven, roughly smoothed.

Temper, — Large proportion of vegetable temper. Very low
firing fired. Inner and outer surfaces lightly oxidised,
thick carbonaceous core. 14

Shapes — Impossible to reconstruct. Sherds identified as
parts of large jars, probably used for storage.

Colour — Pinkish-buff.

Decoration—None.

THE SUBERDE ASSEMBLAGE IN RELATION TO THE EMERGENCE AND
SIGNIFICANCE OF THE PORTABLE POTTERY CONTAINER

Clay Usage and Clay Technology

The properties of clay were appreciated from the foundation of Suberde. Clay was used as a structural material in both levels in the form of mud-brick, slab and mortar. Its waterproofing properties were exploited in roofing and storage facilities, and the well-made, highly polished plaster floors of the upper prehistoric level are evidence of development in architectural clay technology.

Twenty-one realistically modelled figurines, and a considerable array of geometric objects were recovered at Suberde. These were mineral tempered, and appear to have been lightly fired. A fairly sophisticated level of clay technology was achieved at the site. Tempering, both vegetable (mud-bricks, followed towards the end of the lower prehistoric period by the pottery) and mineral (figurines, geometric objects) was well known. Bonding techniques are attested by the clay mortar used in architecture, and a knowledge of the plasticity of clay is evident throughout the assemblage in a variety of modelling contexts. Clay plaster was spread on floors of the upper prehistoric level and burnished for durability and ease of cleaning, and figurines, geometric objects and the few examples of pottery were deliberately fired for permanence.

As it has been suggested that the Suberde economy was essentially based on a mixture of hunting and gathering, with meat as the most significant dietary constituent,¹⁵ the high

level of clay technology and the generally complex cultural assemblage present a problem of interpretation. Suberde represents an example of the great amount of work which still remains to be done on the correlation of economic levels, with levels of technological development.

SUMMARY OF CERAMIC TECHNOLOGY.
AT SUBERDE.

	Lower Prehistoric Level	Upper Prehistoric Level
Vegetable temper.	X p	
Mineral temper	X	X
Modelling	X p	X
Bonding	X	X
Burnishing		X
Decoration, painted.		
Decoration, other.	X incision (figurines, river pebbles)	X incision (figurines, river pebbles)
Firing	X p	X

CONTAINERS

Other than the five coarse pottery sherds found in a lower prehistoric level context, no containers of any description were found at the site. Some plant foods were used, therefore it is likely that some type of vessel was used for their collection. As no vessels were found, it is likely that plant foods were collected in perishable containers. Baskets may have been used, but they have left no trace, and it is possible that wooden vessels were fashioned with the well made carpentry tools, considerable numbers of which were found. No cooking vessels were recovered, and it may be suggested that plant food was consumed in its natural state, and meat, the major food, was roasted in open fires.

As so few sherds were found, conclusions concerning the role of pottery are difficult to draw. The extremely coarse sherds have been identified as fragments of large storage vessels, and it seems likely that they were used for storage, fired clay being more suitable than most naturally occurring materials for this purpose. Lack of burnishing suggests milk rather than water storage, as the natural oils in milk would have filled the open pores and reduced porosity. However, this is purely speculative. Without analysis it is also impossible to say whether the sherds were of local production or imported. However the level of clay technology at the site and the experimental appearance of the sherds suggests the likelihood that they were local. Pottery was not successful at Suberde. No development took place in the later level.

NOTES

1. Bordaz 1968, 61.
2. Farrand, 1964, 152-153.
3. Aytug, 1967, 107-110.
4. Farrand, 1964, 149.
5. 300,000 bonefragments were retrieved during the excavations. It was suggested after the original analysis of the faunal remains that larger animals were butchered and skinned at the site of the kill, and smaller mammals were brought to the site intact. It was concluded that the Suberde people were hunters, not herdsmen. Perkins and Daly, 1968, 103. However this view has more recently been disputed. None of the sheep slaughtered were over three years old, and this agrees with the evidence from sites where sheep and goat are considered domestic, for example Knossos; Jarman and Jarman 1968. Payne notes "... there is no evidence at Suberde that the other species (other than dog) were domesticated, but equally there is no evidence that they were wild". Payne, 1972, 193.
6. Number of sickle blades suggests a higher reliance on plant foods than botanical analysis indicates, although lack of food preparation vessels tends to reverse this suggestion. Perhaps the blades were used to cut grasses and reeds for roofing and basketry, and it is by accident of preservation that none of the latter have survived.
7. No further details of floor structure. Bordaz 1966a, 32.
8. Bordaz, 1968, 45.
9. Bordaz, 1969, 46, and fig. 5.
10. "Hearths, lenses of charcoal...were found throughout this lower layer". Bordaz, 1966, 32.
11. It is believed that these structures were accidentally fired during conflagrations which destroyed the house complexes. Bordaz, 1968, 47 and fig. 6.
12. The storage bins contained no botanical remains, ashes or charcoal, therefore suggested purposes are purely speculative.

13. In the first year of excavation, 6 small balls and pellets, 4 complete cylinders and 13 fragments, and 33 cones were found. Bordaz, 1968, 68. No more recent figures are available.
14. The fragments were definitely identified as parts of portable pottery vessels, and easily distinguishable from thick bin-liner fragments. Bordaz, 1968, 52.
15. Cf. note 4, Perkins and Daly, 1968.

TELL RAMAD

Site: Oval mound, 150m. N-S., 175m. E-W. 830m. above sea level.

Location: 15km. south-west of Damascus, on basalt plateau at foot of Hermon range near Wadi Kattana, Syria.

Years of Excavation: 1963-1970 (7 seasons).

Excavators: H. de Contenson and W.J. van Liere.

Area Excavated: 440 sq. m. total.

Depth of deposit: 5.50 - 6.0m. to basalt bedrock.

Stratigraphy: 3 main occupation levels (I-III, earliest to latest). Possible hiatus in occupation between II-III.

Chronology:

<u>Level</u>	<u>C¹⁴ dates</u>	<u>Reference</u>
I	6260 $\pm$ 50	Mellaart, 1975, 284.
	6250 $\pm$ 80	
	6140 $\pm$ 50	
II	5970 $\pm$ 50	
	5450 $\pm$ 50	
III		
(pre-used wood?)	5930 $\pm$ 55	

ENVIRONMENT

The early farming village of Tell Ramad is situated within the oak-pistachio forest belt in a dry-farming rainfall zone. The well-drained basalt plateau is and was extremely fertile, today supporting a variety of natural vegetation and crop growing. Considerable deforestation, however, has taken place since the prehistoric era thus rendering the soil less water retentive.

De Contenson concluded that the site was selected for occupation primarily because of its proximity to an abundance of fresh water.¹ Tell Ramad was established just south of the confluence of 2 fairly large seasonal rivers, and many perennial springs are located in the immediate vicinity.

The gravelly river beds provided the majority of raw materials for the chipped stone industry, although obsidian was imported from Anatolia. Clay used in architecture, figurine manufacture, and (in Ramad III) pottery was carried from the river banks; and of course basalt, widely used in both architecture and the ground stone industry was abundantly available.

TELL RAMAD I, II, CULTURAL ASSEMBLAGE²

Subsistence Cultivation: Emmer predominant, barley, einkorn, lentils, club wheat.³

Collecting: Wild grasses (chiefly bromus), vetch, almond, pistachio, hawthorn.

Herding: -

Hunting: Gazelle, deer, wild cat, an equid.⁴

Architecture Level I: Semi-subterranean oval/circular pisé huts.

Level II: Rectangular houses built around courtyards, separated by narrow lanes. Mud-brick on stone foundations

Chipped Generally local flint and chert. Considerable use of
Stone obsidian, 10% Lake Van, 90% Cappadocia. Many arrowheads and sickle-blades of 2 types. Burins, scrapers, borers also found.

Ground and Ground: Querns with double depression, mullers,
Polished grinding stones, pestles, mortars (basalt). Spindle
Stone whorls (soft limestone).

Polished: Axes, incised pebbles (use unknown), limestone or alabaster bowls.

Worked Bone Prolific industry, well made awls, spatulae, borers, polishers, tool hafts, needles.

Ornaments Stone: Rings (limestone), beads (obsidian, level II).

Bone: Beads, rings.

Shell: Beads.

Copper: 1 Bead.

Basketry and Spindle whorls suggest weaving known.

Textiles

- Wood Storage bins of wood. Many axes found.
- Figurines Materials: Sun-dried, baked or lime-covered clay.
Types: Mainly animals (ovids, bovids, equids, boars).
Highly stylised humans, often with discoid heads
and club-shaped limbs.
- Miscellaneous "Vaisselle blanche", particularly thick-walled
- Finds vessels. Clay geometric objects.
- Burial Nests of skulls near huts. Surrounded by mud-bricks.
- Customs Faces remodelled in lime and ochre smeared.
Some primary contracted burials outside houses;
virtually no grave gifts.
- Pottery Some very friable, lightly fired pottery. No burnish
or decoration.

TELL RAMAD III, CULTURAL ASSEMBLAGE⁵

<u>Subsistence</u>	<u>Cultivation</u>	} - Few remains. Similar assemblage to I and II, but emphasis appears to have shifted to animal husbandry.
	<u>Collecting</u>	
		<u>Herding</u> : Significant change from II. Goat, sheep, pig, ox, dog; domesticated. ⁶
		<u>Hunting</u> : Some gazelle and red deer.
<u>Architecture</u>		Impoverished architectural phase. No complete building plan excavated. Apparently 2 structural phases. Fragments of walls and stone platforms.
<u>Chipped</u>		Impoverished industry compared to II. Mostly flint,
<u>Stone</u>		obsidian rare. Sickle elements with large teeth.
<u>Ground and</u>		Pounders, querns of basalt. Limestone bowls and plates.
<u>Polished</u>		Limestone spindle whorls, and 1 example of limestone seal.
<u>Stone</u>		
<u>Worked Bone</u>		Types as in level II, impoverished workmanship.
<u>Ornaments</u>		Very few examples. Types as in earlier levels.
<u>Basketry and</u>	-	
<u>Textiles</u>		
<u>Wood</u>	-	
<u>Figurines</u>		Highly stylised, mostly human, of burnished clay.
<u>Miscellan-</u>	-	
<u>eous Finds</u>		
<u>Burial</u>		No burials located.
<u>Customs</u>		
<u>Pottery</u>		Crude ware, surface smoothed, some burnishing. Limited, simple shape range. Combed or incised decoration on about 10%.

USES OF CLAY IN THE TELL RAMAD ASSEMBLAGE

Architecture

Tell Ramad I:

Site plan — No regular planning apparent. Houses separate.

Structures — Oval or circular houses, semi-subterranean 3-4m.
diameter.

Construction — Walls of pisé.

materials and

techniques

Wall finish — No plastering or other finish.

Floor finish — Pisé smoothed and beaten. Occasionally lime.
Plastered with lime curving slightly up walls.

Roofs — Techniques and materials unknown.

Tell Ramad II:

Site plan — Evidence of regular planning. Houses grouped around
open courtyards and separated by narrow streets.

Structures — Rectangular, occasionally with rounded corners.

Construction — Foundations: double row of unbonded stone blocks
materials and 40-70cm. thick. Superstructure: moulded plano-
techniques convex or rectangular mud-bricks, 40x30x8cm.
Bonded with greyish clay mortar.

Wall finish — Some lime-plastering over foundation courses.

Floor finish — Some pisé but mostly hard lime plaster.

Roofs — Techniques and materials unknown.

Tell Ramad III

Site plan— Not determined. Occupation apparently confined to west of mound.

Structures— No complete floor plans discovered. Traces of walling and pit complex.

Construction—Mud-brick walling, very poorly preserved.

materials and

techniques

Wall finish— None determined.

Floor finish— -

Roofs— -

Refractory Facilities

Hearths and Ovens:⁷

Tell Ramad I and II

Location— Within house areas, and in level II, in courtyards.

Size/shape—Rectangular or oval. Details sparse.

Construction—Pisé. Occasionally simple depressions in basalt materials bedrock. Details sparse.

and methods

Tell Ramad III: No evidence of hearths or ovens.

Storage Facilities

Silos:

Tell Ramad I and II

Location— Within houses (level I). In courtyards (level II).

Size/shape— Circular, 1.80m. diameter. Roughly rectangular.

Construction—Pisé or lime-plastered hollow areas. Occasional clay materials kerbs, and traces of mud-brick domes.⁸

and methods

Possible— Storage of grain. Contained considerable amount of uses decayed organic material identified as grain.⁹

Storage bins:

Tell Ramad I and II

Location— Within houses.

Size/shape— Roughly rectangular

Construction—Constructed of wood. No further details.

materials

and methods

Possible use—Used for storage of perishable, non-food materials.

All examples contained ashes. Bin and contents
fire-destroyed.

Figurines: Fig. Ramad I

All levels:

Categories: a) stylised human
b) stylised human, plaster (lime) covered and painted.
c) animal: bovid, ovid, equid, boar.
d) stylised human heads.

Provenance— a, c: at random.

d: only occurs in phase III.

b: used as supports for plastered skulls.

Material— a: sundried clay, no temper.

b: clay covered with lime plaster.

c: sundried clay, no temper.

d: fired, burnished clay.

Technical— a, b: Modelling generally crude, few details

data indicated. 'Coffee-bean' eyes.

c: Crude but quite realistically modelled.

d: Evenly smoothed, fired and burnished. No details
of temper or degree of firing supplied.

Miscellaneous Clay Finds

Cylinders, discs, spheres, cones: all sundried clay.

NON-POTTERY CONTAINERS IN THE RAMAD ASSEMBLAGE

Basketry

No direct or indirect evidence.

Wooden Vessels

Direct evidence: none.

Indirect evidence: considerable number of carpentry tools.

Wooden storage bins and wooden brick-moulds suggest wood may also have been used for portable containers.

Stone Vessels: Fig: Ramad II

Materials — Limestone, alabaster.

Shapes — Hemispherical bowls. Lipped plates.

Technical — Well made.

data — All have highly polished surfaces.

Possible — Vessels of local limestone probably used as everyday
uses tableware and food preparation vessels. Alabaster, more difficult to obtain, possibly reserved for luxury vessels.

"Vaisselle Blanche": Fig. Ramad III¹⁰

Level II: Occasional fragments in level III may be intrusive.

Material — See sample analysis below.

Shapes — Identical to those of stone vessels. Some very large containers. Thick walls; rounded rims; short, flat bases common.

Technical — Moulding and/or coiling suggested. Ochre bands
data often applied.¹¹

Possible — As the precursor of ceramics. Tableware, food
Uses preparation, storage (large jars).

Ramad II: "Vaisselle Blanche" sample analysis.¹²

Description— Very heterogeneous and porous. Inclusions bound together by beige matrix material. Regions of pronounced yellow colouring. Very friable, easily crushed, described as 'pozzolanic'.

X-ray ——— Calcite, α quartz, minor amounts of unidentified
diffraction silicates.

X-ray ——— Large amounts: Ca, Si,

dispersive Minor amounts: Al.

analysis Traces: Ti, Cr, Ba, Fe, Cu.

(qualitative) Scans show Ca and Si evenly distributed.

Differential— Large endothermic peak at 890°C. due to calcite
thermal decomposition. Smaller endothermic peak at 116°C
analysis possibly due to dehydration of hydrated alumino-
silicates.

Optical ——— Considerable porosity $\sim$ 0.2mm. inclusions of
micrographs quartz or calcite. Some gypsum, black phase.
Fine micro-sized material dispersed between
inclusions. Some calcite remnants.

PORTABLE POTTERY CONTAINERS AT TELL RAMAD¹³

Amount of—Few sherds found in level II in conjunction with

Pottery "vaisselle blanche". Considerable number of ceramic finds in level III. No precise numbers available.

Wares, — Crude, dark-faced ware.

surface Level II: very friable.

Level III: well smoothed. Entirely burnished or strip burnished.

Temper, — Temper: micaceous and coarse grit temper,

Firing occasionally combined.

Firing: Level II sherds very low; friable ware

Level III sherds hard fired.

Shapes — Hemispherical bowls, small jars.

Some ring bases.

Plates with flaring rims.

Colour — Dark red to dark brown.

Decoration—Burnish or burnish combined with incision and combing.

SUMMARY OF THE TELL RAMAD ASSEMBLAGE IN RELATION TO THE
EMERGENCE AND SIGNIFICANCE OF THE PORTABLE POTTERY CONTAINER

Clay Usage and Ceramic Technology

Clay served as the basic structural material in all levels excavated at Tell Ramad. The earliest houses were oval or roughly circular, with walls and floors of pisé, usually unplastered but always carefully smoothed or beaten. Lime plaster was occasionally used as a floor finish, evidence that even at this early stage of development the Ramad people using simple facilities were able to achieve the necessary temperatures for lime slaking (800°C+). In phase II, subrectangular houses replaced the round variety of the earlier level. The new house form was constructed of plano-convex mud bricks set on stone foundations, greyish clay mortar serving as a bonding material. Pisé was sometimes used as a floor finish, but hard lime plaster was generally preferred for flooring and to coat the foundation courses of the walls.

Clay was again selected for the construction of refractory facilities. Oval hearths or ovens within houses (level I) and courtyards (level II) were carefully built of pisé although basalt depressions often met simple heating and cooking needs. Simple hollows lined with pisé, and sometimes lime were used for grain storage. These were frequently finished with a dome of mud-bricks. Wood appears to have been preferred for the manufacture of smaller storage bins.

Three well defined categories of figurines appeared in the Ramad I and II assemblage. One type was invariably found acting as support for plastered skulls, strongly suggesting some ritual or religious connotation. Most of the figurines were crudely modelled, and the majority were of sundried clay although the skull supports were formed from clay coated with lime plaster.

The Ramad III occupation appears to have been confined to the western area of the mound. Pottery was found at this level, despite an impoverished assemblage. Traces of poorly preserved mud-walling constitute the only architectural use of clay. Highly stylised human figurines continued to be produced.

SUMMARY OF CERAMIC TECHNOLOGY.

AT TELL RAMAD.

	aceramic	ceramic
Vegetable temper.	X	X
Mineral temper		p
Modelling	X	x p
Bonding	X	p
Burnishing	X	x p
Decoration, painted.	X	
Decoration, other.	incision (figurines)	X p: incision and combing
Firing	X	x p

CONTAINERS IN RELATION TO THE CULTURAL ASSEMBLAGE

Hunting and agriculture constituted the economic base of Tell Ramad. Levels I and II, and conservation facilities indicate a relatively assured food supply. Large quantities of obsidian from Cappadocia and the Lake Van region suggest participation in trade. A varied craft inventory and consistent fine workmanship are thought to denote some measure of craft specialisation.

Well-made vessels of both stone and lime plaster were produced in these early Ramad levels. Local limestone and "vaisselle blanche" were probably used for eating vessels and food preparation, whilst bowls of fine alabaster may have been reserved for some special function. The presence of wooden storage bins suggests that portable vessels of this material were also in use at the site.

A few sherds of ceramic vessels were recovered from Level II, but the real emergence of pottery occurred in the Level III period, curiously in association with virtually no architecture and an impoverished artifact assemblage. It has been suggested that the inhabitants (probably newcomers) had returned to a semi-nomadic existence at this stage concentrating their energies exclusively on stock-breeding. However the continuation of agricultural remains, the introduction of pottery (a breakable commodity, difficult and heavy to transport), and a few superbly made artifacts of rare materials (for example an alabaster bowl with red veining following the curvature; beads of dentalium and carnelian) all suggest that Tell Ramad III was a permanent rather than a temporary settlement. Further excavation is necessary to clarify the economic development at the site.

Pottery vessels appear to have completely replaced those of lime plaster in Ramad III, although stone vessels continued in production.

The demise of "vaisselle blanche" and associated proliferation of ceramic containers suggests that the latter were both easier to produce, and suitable for a wider variety of roles. However, reasons for the manufacture of "vaisselle blanche" (requiring a complex and sophisticated technology) before the general production of ceramics (the technology of which is less demanding) remains a mystery.¹⁴

Unfortunately the Ramad pottery is not well documented and no sherd counts are available. However observations may be made concerning the introduction of ceramics at the site, and the possible uses of pottery vessels. Although all technology necessary for pottery production was available before pots were actually made, two facets of the ceramic assemblage are new to the site. Neither grit tempering nor combed and incised decoration appear in other contexts, therefore the idea of pottery making may have come from outside the settlement. The poor quality of the Level II sherds and the 'small number' recovered suggests an experimental stage. Level III ware was hard-fired and burnished. It is unknown whether these improvements resulted from continued experimentation within the settlement, or from outside influence.

The Ramad pottery was made in three basic shapes: plates, small jars and hemispherical bowls. The plates were probably eating vessels and the jars may have served as cups (some indication of measurements would indicate if they may have been suitable for storage). The bowls are likely to have been used for cooking as no other containers suitable for this purpose were recovered. The addition of ring bases shows that some of the vessels were required to stand on a hard flat surface. All Level III pottery was burnished. Whilst burnishing reduces porosity, it is unlikely that all vessels produced were designed to hold liquids, therefore a burnished finish may have been purely decorative in some cases.

NOTES

1. de Contenson and van Liere, 1967, 19.
2. Whilst a separate assemblage analysis has been included for Ramad III where considerable innovations occur, the assemblages of phases I and II show many similarities and continuous development. Ramad I and II have therefore been considered together, artifacts specifically relating to either period individually, clearly indicated.
3. Agriculture was practised from the beginning of the settlement, and a wide variety of crops was grown. Barley (*Hordeum distichum*) has been identified as a transient variety between wild and fully domestic forms. van Zeist and Bottema, 1966, 179.
4. Hooijer, 1966, 193-195.
5. The excavators suggested Ramad III may have been a semi-nomadic settlement: de Contenson and van Liere, 1971, 285.

However, there was no evidence of agricultural decline during this phase which saw the general introduction of pottery, an unlikely commodity to be newly adopted by semi-nomads. Furthermore the extent of excavation was extremely limited, and it is not unlikely that further soundings may substantially alter the present architectural assemblage for Level III.

6. Cf. note 4.
7. Details of both location and construction of refractory facilities are sparse in the preliminary reports. No clear distinction is made between hearths and ovens.
8. de Contenson and van Liere 1967, 22.
de Contenson, 1971, 279, pl. A, B.
9. van Zeist and Bottema 1966, 179-80.
10. Very few analyses of the composition of "vaisselle blanche" have been made, and the techniques involved in vessel manufacture are virtually unknown. As lime burning, (implicit in the production of "vaisselle blanche") requires relatively high temperatures (750° -900°C) only obtainable in a closed kiln, preceded the appearance of fired ceramics in many areas, detailed study of both

the composition and techniques of "vaisselle blanche" would be of great benefit to students of early pottery. Furthermore, practical experiments with vessels manufactured from "vaisselle blanche" (in cooking, liquid storage, for example) would be of interest to those wishing to assess the economic significance of this material in a container context. For presently available information concerning "vaisselle blanche", see glossary.

11. Without inspection of the vessel remains, or experimentation with actual raw material (reproducing the composition as determined by analysis), it is impossible to venture an opinion on manufacturing techniques. Various suggestions have been made as to how "vaisselle blanche" containers were made, and these are noted in the glossary.
12. Gourdin and Kingery, 1975, 142-144.
13. The Ramad pottery is not yet well documented. No sherd counts nor informative fabric analyses appear in the preliminary reports.
- 14 Cf. note 10.

BOUQRAS

Site: Open-air site; no information available on possible original extent.

Situated: on west bank of Euphrates near confluence with the Khabur, 40km. south of Deir-ez-Zor in Syrian desert region.

Excavated in: 1965.

Excavated by: H. de Contenson and W. van Liere.

Area excavated: 2 squares, 5m. x 5m.

Depth of deposit: 5m.

Stratigraphy: 7 occupation levels divisible into 3 major occupation phases, numbered I - III from earliest (bottom level) to latest (top level).

Chronology:

<u>Level</u>	<u>C¹⁴ date</u>	<u>Reference</u>
I	6290 $\pm$ 100	Mellaart 1975
	6190 $\pm$ 60	
II	6010 $\pm$ 55	
III	5990 $\pm$ 60	

ENVIRONMENT

The settlement of Bouqras lies on a promontory of the plateau along the escarpment of the main valley of the Euphrates. Despite the proximity of two large bodies of flowing water, the Khabur river and the Euphrates, the area is semi desert in character, with an annual rainfall far below the 200mm. minimum necessary for successful dry farming.

During the occupation period the area provided rough grazing for a considerable amount of small game which constituted the main dietary staple at the site.

Schist, alabaster, coarse limestone, diorite, basalt and sandstone were locally available, and the Euphrates gravels supplied an abundance of flint in a rich variety of colours and surface. Clay also was readily available along the banks of the Euphrates.

CULTURAL ASSEMBLAGE¹

- Subsistence Cultivation } No grain remains. Sickle blades, ground
 Collecting } stone assemblage and large storage bins
 attest plant food collection and preparation.²
- Herding: Possibly wild sheep and goat herded.³
- Hunting: Wild ox, sheep, bezoar. 1 example each of
 equid and jackal.
- Architecture Rectangular houses throughout occupation. Rounded
 corners bear witness to earlier tradition.
- Level I: Pisé, with occasional plaster floors.
- Level II, III: mud-brick with many interior
 fixtures and fittings.
- Chipped Predominantly flint in various colours; pink, beige,
Stone black, chocolate, maroon. Obsidian from Nemrut Dag,
 increasing in proportion, level I - III.⁴ Homogeneous
 industry; blade tools commonest. Many arrowheads
 and sickle blades.
- Ground and Pestles, mortars, grindstones of basalt, diorite and
Polished sandstone.⁵ Many schist axes, polished over all surface.
- Stone Bowls of alabaster and marble; increase in level III
 when veining used for decorative effect. Jadeite seal(III).
- Worked Bone Spatulas, tool handles, polishers, beads. Increasing
 quantity in (III).
- Ornaments Stone: Discoid and cylindrical beads in alabaster,
 carnelian.
- Bone: -
- Shell: Beads including dentalium and mother of pearl.
- Clay: -

Basketry and Matting, simple close weave found covering level I
Textiles floors. 1 incised spindle whorl in polished stone (III).
Wood Finely polished axes; considerable use of wood in
architecture.
Figurines -
Miscellaneous "Vaisselle blanche" in level II, coarsely made.
Finds
Burial No burials located.
Customs
Pottery Appears in level III. Only 14 sherds found.
Dark burnished ware.

USES OF CLAY IN THE BOUQRAS ASSEMBLAGE

Architecture: Figs. Bouqras 1 and 2.

Level I

Site plan — -

Structures — Rectangular, occasional rounded corners and curving walls. Sizes vary. 1 example (floor 2): 6 x 5m.

Construction— Walls of pisé with high grit content, and
materials and blackened by occupation debris.
techniques

Wall finish — Not stated.

Floor finish — Beaten clay coated with plaster (composition unknown) or plain beaten clay.

Roofing — -

techniques

Levels II and III

Site plan — Western orientation observed.

Structures — Rectangular.

Construction— Walls of dark grey mud bricks, probably clay
materials and mixed with occupation debris.
techniques

Wall finish — Not stated.

Floor finish — Grey lime plaster throughout.

Roofing — Possibly very substantial, supported by pillars.
techniques

Interior Fixtures and Fittings

Pillars

Location—— Levels II and III; either free standing or attached to wall fabric.

Size/shape—— Usually square.

Construction—— Neatly built of dark coloured mud-bricks.

materials and

methods

Benches and/or shelves

Location—— Levels II and III; either adjacent to, between or in front of pillars.

Size/shape—— Length of 1m.

Construction—— Wood fronted with low clay brick wall, plastered with clay or more usually lime plaster. Row of clay bricks occasionally placed flat to form back rest.⁶

materials

and methods

Drain

Location—— Level II house, sloping towards south-west.

Size/shape—— Not indicated in reports.

Construction—— Same fabric as clay bricks.

materials

and methods

Refractory Facilities

Hearths

Location — In all house units excavated, all levels.

Size/shape — Varies, usually rectangular.

Construction — Level 1: raised pisé kerb, plastered with lime plaster
materials Levels II and III: rectangular clay brick structures,
and methods lime plastered. Clay colours vary. Sometimes
surrounded by lumps of clay instead of bricks.

Ovens: Fig. Bouqras 1.

Location — Only 1 example located in level I. Possibly others
in later levels, but excavation limited.

Size/shape — Horse-shoe shaped.

Construction — Pisé burnt through usage
materials
and methods

Storage Facilities

Storage Bins

Location — In all houses, levels II and III.

Size/shape — Rectangular, similar in size to hearths.

Construction — Surrounded by low wall of clay bricks. Interiors
materials covered with lime plaster.
and methods

Use — Unknown. No contents found.

Figurines

No clay figurines found.

Small Clay Finds

No objects of clay (other than pottery) were found.

NON- POTTERY CONTAINERS IN THE BOUQRAS ASSEMBLAGE

Basketry

Direct evidence: none.

Indirect evidence: matting, simple weave, found on floors of level 1 houses. _____

Wooden vessels⁷

Direct evidence: none.

Indirect evidence: extremely well-made and polished carpentry tools. Extensive use of wood in house furnishings.

Stone Vessels: Fig. Bouqras 3

Quantity/— Occurred in all levels, very frequent in Level III.

Location

Material— Alabaster, marble, gypsum.

Shapes — Globular bowls, carinated bowls, globular goblets and cups.

Technical— Well made and polished particularly in level III.

data Veining frequently used for decorative effect.

Possible— Food preparation, luxury items.

uses

"Vaisselle Blanche" level II.⁸

Few examples, very coarse in character, no further details available.

'PORTABLE POTTERY CONTAINERS AT BOUQRAS (Level III)

Amount of—14 sherds only recovered.

Pottery

Wares,— No details of quality of wares yet available.

Surface Surface invariably burnished.

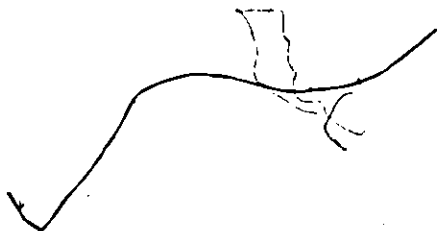
Temper,— Temper: micaceous (unclear if all sherds similarly tempered).

Firing Firing: some consistently oxidised samples, some dark cores.

Shapes— Appear to be based upon alabaster vessels.⁹
Cylindrical goblets with flat bases, and
carinated bowls identified.

Colour— Red or brown surface, dependent on firing.

Decoration—None, other than burnish.



SUMMARY OF THE BOUQRAS ASSEMBLAGE IN RELATION TO THE EMERGENCE
AND SIGNIFICANCE OF THE PORTABLE POTTERY CONTAINER

Clay Usage and Ceramic Technology

The earliest settlers at Bouqras were already familiar with many of the properties and limitations of a wide range of materials including clay, lime, a variety of stone, obsidian, and bone. They and their descendants were innovative people, and the assemblage indicates that all these raw (and in the case of lime plaster, manufactured) materials were used imaginatively in ways appropriate to their properties throughout the occupation period.

Clay was used as a structural material in all levels with grit-tempered pisé giving way to mud brick after Level I. Internal mud-brick pillars were introduced in Level II, and clay was used in conjunction with wood and lime plaster for the provision of benches and shelves in the later strata. An unusual interior fitting found in a Level II context was a drain, carefully formed from the same tempered fabric as the mud-brick. As a finishing material, lime plaster was generally preferred to clay because of its superior durability, although occasional examples of clay plastering were found, particularly in Level 1. Clay, again in conjunction with lime plaster was used for the construction of refractory facilities (hearths, ovens) at all levels, and in Levels II and III, storage bins were built of clay bricks coated with lime plaster. No examples of clay modelling (other than pottery) were found, stone being the preferred material for ornament and figurine manufacture.

SUMMARY OF CERAMIC TECHNOLOGY.

AT BOUQRAS.

	aceramic	ceramic
Vegetable temper.	X	X
Mineral temper		P
Modelling	X	P
Bonding		
Burnishing		P
Decoration, painted.		
Decoration, other.		
Firing	X	X P

CONTAINERS IN RELATION TO THE CULTURAL ASSEMBLAGE

The assemblage at Bougras shows continuous development throughout the occupation levels, and the site achieved its maximum prosperity during period III. The most obsidian and worked bone tools were found in level III contexts, and weaving, pottery and the use of seals were introduced at this phase.

A large quantity of stone vessels was recovered from all levels with the greatest concentration again in level III, reflecting the increased economic prosperity. These were expertly made from carefully selected marble, alabaster and gypsum (luxury materials) and may have been reserved for occasional use, whilst containers of perishable materials were perhaps preferred for utilitarian functions. Matting techniques were known from the initial settlement, and it is thus likely that baskets were also made and used. A prolific array of carpentry tools and widespread use of wood in architecture suggests the possibility that vessels of this material were also manufactured.

Little information is available concerning the few coarse sherds of "vaisselle blanche" found in level II. The presence of lime plaster vessels, however, indicates that the Bougras inhabitants had achieved a level of pyrotechnology in excess of that necessary to fire pots.¹⁰

Considering the limited extent of excavation, few conclusions may be drawn from the 14 sherds of dark-burnished pottery found at Bougras. It seems probable that pottery-making was not yet an established craft, but it is also

possible that in the area excavated pottery was simply not discarded in quantity. Clay had been used in a competent and imaginative way in the architecture of the entire occupation period, and adequate pyrotechnology was already available prior to the first appearance of pottery.

However, certain aspects of the ceramic remains such as the use of micaceous temper and burnishing techniques, were not found in any other context at Bouqras, suggesting that the idea of pottery making may have originated outside the settlement, perhaps through trade contacts (obsidian and dentalium were likely trade items). As no other vessels suitable for cooking were found at Bouqras, it is likely that the carinated pottery bowls filled this role. Cylindrical goblets may have been drinking cups or (depending upon their size) vessels for liquid storage. The flat base enabled them to be set down on a hard surface without fear of tipping.

NOTES

1. Unusually imaginative clay usage was evident throughout the Bougras assemblage, a major reason for the site's inclusion in the present study. However, because of the extremely limited extent of excavation, all conclusions drawn must perforce be very tentative.
2. As a considerable number of grinding implements and sickle blades were unearthed, the lack of plant remains must not be taken to illustrate a totally carnivorous society. It is likely that more extensive excavation would reveal remains of plant foods.
3. The majority of bones found in kitchen middens were those of sheep and goats. However, only a small proportion of these represented immature animals. Domestication or selective breeding was therefore discounted. Hooijer 1966, 194.
4. No figures are given in the preliminary reports to illustrate the increase in obsidian usage. Renfrew, Dixon and Cann, 1966, 40-41.
5. No grinding implements were found in level II, but this is more likely to be due to limited excavation rather than to a sudden lack of interest in plant food consumption.
6. Construction methods of benches (similar structures also identified as shelves) varied slightly. Different brick sizes were used and both clay and lime plaster were occasionally superimposed. de Contenson and van Liere, 1966a, 185.
7. In a level II house (floor 5), "...l'on remarque deux autres objets de bois carbonisé". However, no suggestions are offered as to the nature of these objects. de Contenson and van Liere, 1966a, 184.
8. For a summary of currently published research concerning "vaisselle blanche," see glossary.
9. de Contenson and van Liere, 1966a, 186.
10. Cf. note 8.

ÇATAL HÜYÜK EAST

Site: Oval mound, 650m. long, x 275m. wide x 17.5 m. high.
980m. above sea level.

Location: in centre of Konya Plain, 52km. south-east of city
of Konya, 12km. north of village of Cumra, central Anatolia.

Years of Excavation: 1961, 1962, 1963, 1965.

Excavator: James Mellaart.

Area Excavated: less than 1/10th of 32 acres.

Depth of Deposit: 19., virgin soil not reached.

Stratigraphy: 14 levels distinguished, numbered from the top
(latest) downwards; circa 1000 years of continuous
occupation.

Chronology:

<u>Level</u>	<u>C¹⁴ date</u>	<u>Reference</u>
XII (earliest)	6240 $\pm$ 99BC	
X	6015 $\pm$ 100BC	
VIII	5903 $\pm$ 97BC 5743 $\pm$ 90BC	Mellaart 1964a. 116
VIb	5867 $\pm$ 100BC	
VIa	5708 $\pm$ 100BC 5629 $\pm$ 86BC	
V	5549 $\pm$ 93BC 5690 $\pm$ 91BC	
III	5581 $\pm$ 94BC	
II	5571 $\pm$ 77BC	

Continuous occupation for about 750 years is suggested
by the C¹⁴ determinations.¹

ENVIRONMENT

Çatal Hüyük lies on the east bank of the Carsamba Cay river, the source of rich alluvial deposits important for agriculture since the earliest occupation period. Despite an annual rainfall average of only 30-50cm., the area is still known as 'Turkey's granary', wheat growing being the major local occupation, today aided by sophisticated irrigation systems.

Large quantities of wood, particularly oak and juniper, and the many bones of browsing animals recovered from the site suggest that the now barren landscape once supported considerable tree growth, and that the Konya Plain has been subject to intense deforestation since the prehistoric period.*

The topographical location of the site meant that virtually all stone must be imported, and this material was never used in a structural context.

Clay was abundantly available and fully exploited throughout the occupation period.

* Results of recent pollen analysis indicate that the Konya plain has always been an open area... pers. comm. J. Mellaart

CULTURAL ASSEMBLAGE

- Subsistence Cultivation: Mainly einkorn, naked barley, pea.
Some bread wheat, vetch.
Collecting: Crucifers, acorns, pistachios, almonds, hackberry, juniper, apples, capers.²
Herding: ?domestic cattle, ?domestic dog, morphologically wild sheep.³
Hunting: Onager, boar, red deer, roe and fallow deer, bear, wolf, birds. Fresh water fish bones recovered.
- Architecture Houses built contiguously, grouped around courtyards. Solid outer wall of settlement. Rectangular 2-roomed houses and shrines, roof entry. Much use of wood and club-rush matting.⁴
Shrines identified by decoration.⁵
- Chipped 90% obsidian from Acigöl, also flint from Syria.⁶
Stone Over 50 tool types including large proportion of projectile points (10%) to 20cm. Few microliths, some geometric. Excellent workmanship throughout.
- Ground and Materials: Limestone, volcanic rocks, greenstone,
Polished diabase, sandstone commonest.⁷
Stone Tools: Mortars, pestles, saddle querns, handstones, hammerstones, axes, adzes, polishing stones, palettes, maceheads.
Vessels: Rare (less than 12 found) of fine materials and workmanship.
- Worked Bone Artifacts: Awls, needles, bodkins, spatulae, spoons, fish-hooks, cups, ladles, 'sickles', pins, cosmetic forks, toggles, belt fastenings, dagger hafts, 'wrist-guards', knuckle bones for gaming.
Decoration: Carving, incision. Ornamental artifacts highly polished.

Ornaments

Stone: Beads, necklaces, bracelets, anklets, pendants, rings.

Bone: Beads, pendants, rings, bracelets.

Shell: Beads, pendants, rings, bracelets.

Clay: Beads, pendants, rings.

Other: Hammered copper beads, pendants, rings.

Basketry and

Textiles

Spirally worked coiled baskets. Quadruple weave matting, often patterned. Woollen textiles, wide spaced and fine weave sewn into clothing. 'Kilim' patterns in wall painting suggest patterned weaving and dyeing known. String and rope manufactured.

Wood

Prolific use of wood in architecture. Many beautifully made wooden vessels in great variety of size and shape. Handles for tools, hilts for weapons, 'sickles'.

Figurines

Small collection of animal figurines, including bovids, caprines, boar. Crudely modelled female figures with pointed legs and heads. More than 50 carefully modelled (clay) or carved (fine imported stone) statuettes. All believed to be goddesses or gods (8 males)

Miscellaneous

Findings

Obsidian mirrors (natural fracture polish); red and green pigments for cosmetic use; leather dagger sheath, clay stamp seals, balls, slingstones.

Burial

Customs

Cloth or mat wrapped secondary burials beneath sleeping platforms. Gifts: personal ornaments; weapons with men; 'precious objects'; wooden vessels, food. Baskets often used to contain gifts. No pottery or figurines. Ochre frequent.⁸

Pottery

Known from earliest level excavated. Few examples XII-VI. V-II increase in quantity and quality. Never became dominant vessel type.

USES OF CLAY IN THE ÇATAL HÜYÜK ASSEMBLAGE

Architecture: Fig. Çatal Hüyük 1, 2, 3.

Site plan— Total planning. Houses grouped around open courtyards used for waste disposal and sanitation. All communication over flat roofs. Unbroken outer walls of houses built around periphery of settlement may have served as defensive wall.⁹

Structures— Rectangular houses, average 25 sq.m. floor space. Each consisted of living room and adjoining store-room. Store-room contained plastered light-shaft.¹⁰

Construction— Timber framework infilled with chaff or sand tempered materials and sun-dried mud bricks. Bricks of regular size and techniques mould made. Level VI, standard size = 32 x 16 x 8cm., Level III = 72 x 32 x 8.¹¹ Bricks cemented with lavish layer of clay mortar. Timber frame replaced in later levels by mud-brick buttresses and pilasters¹² No doors, roof entry.

Wall finish— Plastered in fine clay with high gypsum content. Many superimposed layers in 1 dwelling. Usually painted¹³ Invariably polished, probably with limestone polishers¹⁴

Floor finish— Plastered as walls, burnished. Sometimes red ochre painted in simple bands. Covered with woven rush mats.

Roofs— 2 main and several auxiliary beams as supports. Mat foundation covered with tied bundles of reeds and surmounted by a thick layer of clay. Possible light superstructure to protect entrance hole.

Interior Fittings

Location— Within main room, dividing floor space into 3 parts. Southern area = kitchen. Sitting and sleeping benches along north and east walls. ¹⁵

Size/shape— Rectangular, varying widths and heights.

Construction— Clay construction, some pisé, some mud-brick as
materials walls. Plastered in same manner as walls and
and floors and usually covered with red ochre. Ident-
techniques tical fittings in both houses and shrines.

Relief Decoration: ¹⁶ Fig. Çatal Hüyük 4.

Location— Confined to walls and floor areas of shrines.

Motifs— Include human representations (some more than life-size) or parts thereof, believed to be deities, animals, or animal heads.

Construction— Straw-tempered clay, modelled on walls, in wall
materials niches, on separate clay-brick plinths called
and methods 'bull-pillars'. Modelling expressive and realistic.
Sophisticated technique, including use of armatures.

Refractory Facilities

Hearths. ¹⁷

Location— In both houses and shrines near to entry hole to allow escape of smoke.

Size/shape— Varied from round and oval in lower layers, to square and rectangular in upper levels. Always raised.

Construction— Mud-brick base surrounded by tempered clay curb.
materials Coated with fine-burnished, occasionally red
and methods painted clay plaster.

Ovens

Location—— Similar position to hearths in houses and shrines.
Set into wall fabric for maximum heat retention.
No flues.

Size/shape—— Oval with flat top. Varying heights.

Construction—— Mud brick structure. Coated and lined with fine-
materials burnished clay plaster.

and methods

Kilns.¹⁸

Location—— In courtyards.

Size/shape—— Similar to ovens, domed. Additional separate
firing chamber.

Construction—— No details of method of construction. Dome
materials completely closed during firing. Rebuilt for each
and methods successive firing.

Bread Ovens.¹⁹

Location—— Within courtyards, levels V and VI.

Size/shape—— Circular, very large 1.5-1.8m. diameter.

Construction—— Heavily straw-tempered mud-brick.

materials

and methods

Storage Facilities

Storage Rooms.²⁰

Location— Adjacent to main room of houses and shrines.
Entered through small 'porthole' in mud-brick.

Size/shape— Rectangular, somewhat smaller floor area than main rooms.

Construction— As houses. No interior buttresses, and less care materials in finish of walls and floor than in main rooms.

and methods Decoration rare.

Possible— Storage of large amounts of foodstuffs, principally grain, loose or in bins, or in sacks.

Storage bins.

Location— In storage rooms, in kitchen areas. In pairs or rows along walls.

Size/shape— Oval or rectangular, varying heights.

Construction— Dried clay slabs or bricks, coated with burnished materials clay plaster. Top opening for filling and bottom and methods opening for emptying, thus ensuring grain nearest to damp used first.

Possible— Storage of foodstuffs; grain for planting.²¹
uses

Storage niches²²

Location— In walls of houses and shrines.

Size/shape— Varied sizes, usually rectangular.

Construction— Cut into wall fabric, coated with clay plaster, materials often painted.

and methods

Possible— Small niches near roof opening believed to be lamp-shelves. Those in shrines in association with relief sculpture believed to be for offerings.
uses Deep, large niches near ovens for fuel storage.

Storage boxes

Location — In storage rooms.

Size/shape — Rows of small, rectangular compartments.

Construction — Shaped clay, thin slabs, plastered.

materials

and methods

Possible — Organisational storage for tools, weapons,
uses knuckle-bones, and other small artifacts.²³

Storage basins

Location — In floors of houses and shrines.

Size/shape — Circular or oval.

Construction — Sunk into floors, carefully clay plastered.

materials

and methods

Possible — Liquid storage.

uses.

Figurines: Fig. Çatal Hüyük 6, 7.

Categories:²⁴

Ex-voto figurines:²⁵ described as 'numerous'.

All animal representations.

All schematised human figurines.

Clay Cult Statues:²⁶

All carefully modelled representations of humans,
usually female, classed as goddesses.

Ex-voto Figurines

Provenance— Found in wall crevices, between mud-bricks of shrines, or in rubbish dumps.

Material— Clay, usually unbaked. Some baked examples.

Technical— Crude modelling, often (in case of animals) broken or stabbed before being placed in find-spot.

"..representations of game magically killed or disabled in a hunting ritual".²⁷

Cult Statues

Provenance— Found within shrines and in grain-bins

Material— Baked clay commonest in upper levels. Also of black volcanic stone, alabaster, limestone in various colours, calcite (all imported). Stone examples most frequent in lower levels.

Technical— Fine modelling, particularly hands, feet, features.

data Hard-fired, often painted. Products of established modelling tradition.

Miscellaneous Clay Finds

Baked clay geometric objects: all spherical, diameter 5-10cm., also quantity of smaller samples. Believed used as missiles. Large numbers recovered from all levels.

Baked clay sling-shot.

Small clay figurines, lowweights.

Baked clay stamp seals: Fig. Çatal Hüyük 5.

Incised with various geometric designs. Believed used to stamp designs on human body with vegetable dyes, and to indicate ownership and makers' marks.²⁸

Baked clay beads.

NON-POTTERY CONTAINERS IN THE ÇATAL HÜYÜK ASSEMBLAGE²⁹

Basketry: Fig. Çatal Hüyük 8.

Baskets are described as "far more usual" than vessels of other materials at all levels.³⁰

Materials— straw.

Shapes— Considerable variety in size and shape. Include oval, circular, bowl-shaped.

Technical— Coiled, i.e. bundles of reeds or straw of regular thickness tied with twine to form continuous spiral. Well made, extremely durable.

Possible uses— Very large examples believed used for grain collection and temporary storage. Bowl shapes for storage of small items such as cosmetics; varied shapes for 'offerings', funerary gifts including food, child burials.³¹

Wooden Vessels: Fig. Çatal Hüyük 9

15 different shapes completely preserved, many examples.

Materials—Locally growing poplar and willow. Harder woods from further afield.

Shapes — Great range, including shallow round dishes; deeper round bowls with flat, ring or disc bases; oval, conical bowls; footed sauceboats; boat-shaped vessels; wide, oval bowls with ledge-shaped handles, meat dishes to 50cm. long.

Technical data—Wood cut with greenstone axes and carved and finished with obsidian carpentry tools. Sophisticated, expert carving. Provision of functional knobs and handles. Occasional traces of painted decoration.

Possible uses—Possible preference for eating from wooden rather than pottery vessels.³² Wooden lidded boxes used for storage of small precious items such as jewellery. Funerary gifts also contained in lidded boxes.³³

Stone vessels

Rare, only 12 examples found in the first two excavation seasons

Materials—Luxury stones (all imported) including fine-veined red limestone, white marble.

Shapes — Varied, including spouted vessels; a thin-walled bowl shape with crescent feet; shallow dishes.

Technical data—Excellent, sophisticated carving and drilling. Highly polished finish.

Possible Uses—Rarity suggests status symbols, decorative or ritual objects rather than functional vessels. Most examples found in high status burials.³⁴

Bone Containers

More frequent than vessels of stone.

Materials—Bone and antler.

Shapes— Vessel size and shape necessarily limited by raw material. Most oval or sub-rectangular. Include small cups, bowls, scoops.

Technical— Some finely worked examples, some incised
data decoration.

Possible— Drinking cups; dishes for small quantities of
uses food. Funerary gifts.³⁵

Leather and Fabric containers (1 leather, rare fabric)³⁶

Material— Animal skins, and probably wool.

Shapes— Dagger sheath (leather)
Burial bags (fabric)

Technical— Thriving leather industry attested by large range
data of specialist bone tools. Weaving industry well developed.³⁷

Possible— Leather bags probably used for water carrying,
uses protection of meat, burial shrouds. Fabric and leather bags for gathering of wild food or animal packs. ,

PORTABLE POTTERY CONTAINERS IN THE ÇATAL HÜYÜK EAST ASSEMBLAGE. Fig. Çatal Hüyük 10

Level	BC C14	Amount 38 of pottery	Wares, Surface	Temper; Firing	Shapes	Colour	Decoration
0	ca 5650 ↑	←	Continually improving	→	a) black burnished b) fine red and cream burnished c) buff burnished	as III	
II		←					
III	5750 ↑	←	Continually improving	→			Simple motifs - geometric in red paint on cream wares
IV	5790 ↑	←		Continuation of V			
V	5830 ↑	"common"	←	Continuation from VIA	a) black burnished b) fine red and cream burnished	None	
VIA VII	5880 ↑	←	Continuation of VIII improving in quality and increasing quantity				
VIII	6200 ↑	"used sparingly"	Thinner burnished	Small grit temper. Hard fired	Cooking pots, bowls, cups, boxes; flat bases, round or square; round, oval, rectangu- lar mouths. Hole mouth shapes predom- inate. Lugs, bas- ket handles.	Dark, mainly black.	None
IX 39 XI	6280 ca. 6700 ↑	←	Continuation of XII - smaller quantities				No paint after XII, occasional wash

cont'd...

PORTABLE POTTERY CONTAINERS IN THE ÇATAL HÜYÜK EAST ASSEMBLAGE (cont'd...) FIG. ÇATAL HÜYÜK 10

Level	BC C14 Date	Amount of pottery	Wares; Surface	Temper; Firing	Shapes	Colour	Decoration
XII	ca 6700 ↑ ?	"used sparing- ly"	Heavy thick- walled burnished	Grit and straw Temper. Poorly fired Virgin soil not yet reamed	Simple bowls, flat based bowls, Shallow basins, occasional ovals, no lips, lugs, handles.	Buff cream light grey	Splodges of paint. Primitive painted ornament Occasional red wash.

SUMMARY OF THE ÇATAL HÜYÜK ASSEMBLAGE IN RELATION TO THE
EMERGENCE AND SIGNIFICANCE OF THE PORTABLE POTTERY CONTAINER

Clay Usage and Clay Technology

The inhabitants of Çatal Hüyük were aware of the properties of clay from the earliest levels thus far excavated. The topographical location of the site necessitated the importation of virtually all stone, and this material was never used in a structural context. However clay was abundant at the site, and a massive and varied use of clay is evident throughout the Çatal Hüyük assemblage. Tempering, modelling and moulding, bonding, burnishing, surface decoration and firing were used with facility through the entire lifespan of the site in pottery and a variety of non-pottery contexts.

As a structural material, tempered and untempered clay was used for the building of walls, buttresses, plinths, and interior furnishings. Clay mortar was used for bonding; plaster, highly burnished and stained or painted with geometric and naturalistic designs was the exclusive finishing material for floors and walls; and roofs were waterproofed with a thick layer of clay on a brush and reed foundation. Modelled relief decoration in those buildings identified as shrines is unique in those Neolithic sites so far excavated.

Clay was also the raw material for hearths, ovens, kilns and a variety of fixed storage facilities. Beautifully modelled and decorated cult statues, a large number of 'ex-voto figurines' and many geometric shapes were also formed from clay. Fired clay stamp seals may have served to decorate the human body, or to indicate the manufacturer or owner of goods such as textiles. Personal ornaments included fired clay beads; ~~some of the~~ ^{some of the} whorls and sling shot constituted the specialised clay tool collection.

SUMMARY OF CERAMIC TECHNOLOGY.
AT ÇATAL HÜYÜK EAST.

Vegetable temper.	X	P (levels XII - VIII)
Mineral temper	X	P (all levels)
Modelling	X	P
Bonding	X	P
Burnishing	X	P
Decoration, painted.	X	P
Decoration, other.	X relief (wall sculptures), incision (figurines, bone containers, stone artefacts, seals)	
Firing	X	P

CONTAINERS IN RELATION TO THE CULTURAL ASSEMBLAGE

The most numerous and diverse container range of the Neolithic era was found at Çatal Hüyük. The urban nature of the site seems to have created the requirement for a vast range of vessels for food preparation, the storage of food and artefacts, and for ritual purposes. It is quite possible that a similar range of containers existed elsewhere, but the evidence is missing. No other such fortunate acts of preservation as the great conflagrations which carbonised the Çatal Hüyük VI assemblage, occurred at other neolithic sites. The great number and variety of basket shapes found were probably used for grain collection and sorting, storage of small items such as cosmetics, for funerary gifts, and as burial jars for small children. The wooden bowl collection is unsurpassed throughout prehistory in variety and quality of workmanship. Eating vessels, lidded jewel boxes, and funerary gift containers were all expertly carved from well-chosen wood. Small drinking cups and dishes were made of finely worked and incised bone, and leather and fabric bags were used for water and food carrying, possibly as animal packs, and as funeral shrouds. The rarity, superb quality and find-spots of the Çatal stone vessels suggest they were reserved for decorative and ritual functions.

Pottery was present in all levels thus far excavated at Çatal Hüyük. Shapes were simple and included many based on wooden or basketry prototypes. All pottery was built by the coiling method, and was probably fired in regular domestic ovens. Few vessels were obviously copies of stone ancestors; hardly surprising considering the dearth of stone containers found at the site.

In the upper 6 building levels V-0, pottery showed a gradual increase in quantity and quality, although it is significant, in the light of massive clay usage in other contexts, that comparatively little importance appears to have been attached to ceramic vessel manufacture throughout the entire occupation period.

Pottery functioned as a component part of the varied container assemblage, and was regarded neither as a luxury item nor a medium of aesthetic expression. "The pottery seems to have played a purely utilitarian role at Çatal Hüyük throughout the Neolithic period".⁴⁰ Most pottery vessels were used as cooking pots, clay being the most practical available material for this purpose. Storage jars, often buried to the neck in the ground, simple drinking cups and boxes were also identified.⁴¹

No pottery lids appeared in association with storage jars, and it is possible that lids of wood were used to cover those commodities requiring protection from rodents and insects. Additionally, the horizontal or vertical perforated lugs common on vessels from level VIII onwards, may have served as anchor points for covers of cloth or similar light material.

All pottery found was functional. No 'ritual' vessels were identified, nor any pieces displaying the special care in manufacture or finish suggestive of luxury items.

The comparative unimportance of pottery at Çatal Hüyük is further demonstrated by the small total number of vessels found. Within the area excavated in 1961 and 1962, estimates showed that a level II house contained an average of 20 pots, a level IV house 14 pots, and a level V house 8 pots. In

level VI pottery was found in only 16 of the 44 rooms excavated. Although it is impossible to draw definite conclusions from these estimates, the gradual increase in pottery usage appears to indicate advances in food preparation techniques, and a possible slow realisation that vessels of clay were both easier and quicker to manufacture, and also more convenient for many roles previously filled by wooden containers, or those of basketry.

However, pottery was never to become the dominant container type at Çatal Hüyük. The many fine vessels of wood and basketry, and occasional luxury stone bowls continued to be fashioned until the end of the settlement.

Traces of crudely painted decoration and the use of a red slip, particularly on level II and III vessels, can hardly be described as the aesthetic expression of particular concepts. Such painting rather indicates an attempt to improve the otherwise dull appearance of a functional object. At Çatal Hüyük, the creative urge appears to have been fulfilled through the media of magnificent wall-painting, modelling and carving, rather than through pottery decoration.

It is clear that at Çatal Hüyük, pottery was "...a technical advance like any other, and was no doubt useful for cooking (and some categories of storage) but it was easily breakable, hard to transport, in these early days not so easy to fire well, and aesthetically not very attractive".⁴²

1. Fifteen more C¹⁴ dates are now available for Çatal Hüyük, but these do not change the chronological framework as set out here. For additional dates see Radiocarbon.
2. Pistachios and acorns provided a valuable variety source of protein; seasonal fruits were gathered, including the hackberry which may have been used for wine making. Helbaek, 1964, 123.
3. Some controversy exists concerning the wild or domestic nature of the Çatal Hüyük cattle. Through a survey of the bones of immature animals found, Perkins has concluded that domestication had taken place. It is certain however, from the many artistic representations of cattle, and the number of cattle bones found in the assemblage, that this animal, whether wild or domesticated, played an extremely important part in the economy. D. Perkins, 1969, 96-106.
4. Large-scale use of wood in architecture contributed to many conflagrations. Fleeing inhabitants abandoned a wealth of possessions from which an excellent picture of town life may be reconstructed.
5. Mellaart 1963d, 29-38.
6. Renfrew, Dixon and Cann, 1966, 59.
7. Many raw materials, including all stone and some types of wood had to be imported, indicating the likelihood of trade. It is, therefore, not unreasonable to suppose the existence, within a well organised social framework, of a segment of the populace whose occupation was exclusively trade.
8. Burials were invariably secondary. Excarnation prior to internment was suggested. Wrapping in matting, the application of ochre, grave gifts and the position of burials within the houses suggests reverence for the dead. Differences in social stature and status of the sexes are apparent from grave collections. Mellaart 1964a, 93-95.
9. Mellaart 1964a, 40.
10. No difference in construction was apparent between houses and shrines, and shrines were identified only by decoration.

11. Up to 6 courses of mud-bricks were used as a foundation layer. The clay used for brick-making and that used for mortar appear to have been dug from different locations. The mortar clay was blackened with occupation debris suggesting it was dug either inside or in the close vicinity of the settlement, whilst the clean clay used for bricks probably came from the river banks. Mellaart, 1963a, 57.
12. It is thought that the earliest settlers were conscious of a building tradition consisting of a wooden frame with wood or mat walls; and did not trust the locally available material (clay) to support the weight of a flat roof. Mellaart, 1963a, 60.
13. Adequate, detailed descriptions of the geometric and naturalistic Çatal Hüyük wall paintings may be found in each of the preliminary excavation reports and in the final publication. Mellaart, 1967, 131-177.
14. Many limestone polishers were found during the excavations. Mellaart 1962a, 48.
15. Most burials were found beneath benches. Adult males were usually buried beneath northern platform. Mellaart, 1963a, 59.
16. Mellaart, 1963a, 45, 50, 75.
17. Mellaart, 1963a, 44.
18. Mellaart, 1967, 21, 7, 63. Mellaart, 1962a, 47.
19. Location in courtyards rather than in house complexes possibly indicates a communal bakery.
20. Mellaart, 1962a, 46.
21. Mellaart, 1963a, 45.
22. Mellaart, 1963a; 49, 70. (Houses). Mellaart, 1964a, 57. Mellaart 1963a, 63 (Shrines).
23. Examples of small artifacts were found in several of the boxes, even cosmetics! Mellaart 1967, 63.
24. Figurine classification follows excavator's terminology, based on workmanship and provenance.
25. Mellaart, 1962a, Pl. VII. Mellaart, 1963a, Pl. XVIII.

26. A final numerical analysis of 'cult statues' of stone and clay is not available. In the 1962 excavation season, 19 stone statuettes, and 'a few' of clay were recovered from level VI. Mellaart 1963a, 93.
27. Mellaart, 1967, 180.
28. A figurine with body designs, apparently stamped, suggested this possible use of seals. Mellaart, 1963a, fig. 28.
29. The many conflagrations at Çatal Hüyük, particularly the great fire which destroyed level VI, resulted in the preservation of many container types of perishable materials. We are able, therefore, to study a range of containers which possibly existed elsewhere, but which were not subject to such a fortuitous act of conservation.
30. Baskets are still more common than other container types in the Konya region today. Mellaart 1963a, 85.
31. Mellaart 1964a, 94, Pl. 22.
32. Mellaart 1964a, 95. /
33. Complete 'dinner-sets' of wood were identified, Mellaart 1963a, 86. Also many vessels were believed to be luxury or ceremonial items, for example the 20 magnificently carved vessels found in shrine E.VI.10.
34. For example the excellently crafted, spouted red sandstone vessel found in a high status burial level VI. Mellaart 1967, pl. 112.
35. Mellaart, 1964a, 84, Pl. XVIII.
36. Fabric containers known only from impressions.
37. For fabrics woven and weaving techniques deduced from remains of textiles, see the following articles:
Burnham, 1965, 169-174.
Ryder, 1965, 175-176.
38. No final numerical analysis of the potsherds is available. In the first, 1961 excavation season, the average number of pots found per house was as follows: level II, 30; III, 20; IV, 14; V, 8; VI, 1. Pottery was found in only 16 of the 44 level VI rooms excavated. No pottery was recovered from the levels below VIII. Mellaart, 1963a, 102.

During the 1963 season, 6 sherds were recovered from level IX, and 10 from level X. Less than 50 vessels and fragments were found in level VI in 1963.

Mellaart 1964a, 82. In 1965 a total of 300 sherds were recovered from levels VIb-XII. Mellaart 1965, 174.

39. Levels IX-XI pottery is similar to that found in the upper layer at Beldibi and Bêlbaşı (cave sites in S. Turkey) and Küçükkoy, a small mound a few miles west of Çatal Hüyük. The latter is considered essentially a local development. Mellaart 1964a, 84.
40. Mellaart, 1967, 214.
41. Mellaart 1964a, 82.
42. Mellaart, 1967, 216.

ACHILLEION

Site: Low mound 200m. x 260m.

Location: on south-eastern edge of Karditsa plain in heart of Thessaly, northern Greece.

Years of Excavation: 1973, 1974.

Excavators: University of California, Los Angeles; Director: Marija Gimbutas.

Area Excavated: 4 squares of 5 x 5m. in centre of mound, and 2 test pits.

Depth of Deposit: 4.20m. to sterile ground.

Stratigraphy: 4 phases (numbered I-IV, bottom to top), all attributed to Neolithic period. Each phase divided into 2 or 3 subphases. Continuous occupation for approximately 1000 years.¹ Levels I (a,b,c) and II (a,b) occupied for about 500 years according to excavator's estimations based on C¹⁴ dates.

Chronology:

<u>Level</u>	<u>C¹⁴ Date</u>	<u>Reference</u>
I	6521±77 6310±177 6130±50	- Gimbutas, 1974a 283, Table 2.
II	6100±50	
	6660±50	
	6060±80	
	6050±50	
	6192±68	
	6182±95	
	6087±76	
	6031±85	

ENVIRONMENT

Achilleion is one of several hundred Neolithic (pre-farming and early farming) mounds in the Karditsa plain, the vast majority of which have been identified by surface collection only.

When the first settlers arrived at Achilleion, the immediate environment offered suitable conditions for an agriculture-based economy. Fertile ground and a perennial source of water were present (conditions which still apply today), and ample raw materials were available for the manufacture of tools and utensils.²

Pollen analysis has shown that the climate was most probably wetter and cooler than at present.³ Mixed forests stood close to the site, sheltering such wild fauna as roe deer, red deer, fallow deer, aurochs, wild boar, red fox, and other small mammals and birds. The arboreal environment also supplied seasonal fruits, nuts and berries.

PHASES I (a,b,c,), II (a,b) CULTURAL ASSEMBLAGE

Subsistence Cultivation: Principally emmer, also einkorn, club wheat, millet, 6-row barley.

Collecting: Seasonal nuts, fruits, berries, acorns predominant.⁴

Herding: Domestic sheep, goat, pig, cattle, dog; 93.8% of total bones.⁵

Hunting: Very few examples (6.1% of total) of hunted animals.

Architecture Phase I: permanent rectangular dwellings. Pisé walls on stone foundations.

Phase II: Post houses, wattle and daub walls. Wood beam floors covered with matting. Possible 'pit-houses' also.

Chipped Details of industry not yet available. "Antler hoes
Stone and a number of small chert and obsidian blades with the silica sheen of reaping were also found."⁶
Mainly local material, but also Melian obsidian (300 km. distant).⁷

Ground and Querns, pestles, pounders, grinders. Chisels, axes,
Polished adzes (carpentry). Tiny (possibly ceremonial)
Stone greenstone axes. Vessels of marble, alabaster and greenstone.

Worked Bone Quantities of awls, borers. Fine bone needles.
Antler hoes.

Ornaments Stone: Ornaments of marble and alabaster, pendants of serpentine and marble.

Basketry and Woven reed mats. Spools and spindle whorls suggest
Textiles fabric production.

Wood Heavy use of wood in architecture. Many fine carpentry tools.

Figurines Level I: Assemblage includes expertly carved birth-giving goddess (pendant).
Level II: Pregnant and birth-giving goddesses.

Miscellaneous Finds Clay ladle (level I), clay and alabaster seals, clay discs made from potsherds (use unknown), rectangular solids of clay, miniature axes.

Burial No burials located.

Customs

Pottery Developed industry from beginning of settlement. Prolific. 2 fabrics; white kaolin and orange earthen. Shows continuous improvement and innovation throughout occupation.

USES OF CLAY IN THE ACHILLEION ASSEMBLAGE

Architecture

Level Ia: insufficiently excavated.

Level Ib + Ic: Fig. Achilleion 1.

Site plan — Not determined, insufficiently large area excavated.

Structures — Rectangular houses, 2 x 2m. floor space.

Construction — Stone foundations, pisé walls.

materials and techniques

Wall finish — -

Floor finish — 'Plastered'; composition of plaster not analysed. Clay content?

Roofs — No evidence.

Level II: Fig. Achilleion 2.

Site plan — Not determined. Insufficiently large area excavated.

Structures — Rectangular post-houses 4m.x 3m. floor area.

Construction — Framework of posts, arranged in 3 rows. Wattle materials and and daub infill.

techniques

Wall finish — -

Floor finish — Wooden beams covered with crossing branches and reed matting near work areas.⁸

Roofs — No evidence.

Interior Fittings

Level IIa only

Bench (example)

Location— Against wall in Level II house.

Size/shape— Narrow, rectangular.

Construction— Foundation core of pottery sherds and stones of
materials varying sizes, covered with layer of smooth clay.
and methods

Refractory Facilities

Hearths and Ovens⁹

Level I : No mention of either structure in preliminary report.

Level II, Fig. Achilleion 2.

Location— Inside and outside house areas.

Size/shape— Irregular, roughly circular.

Construction— No information available.¹⁰

materials

and methods

Storage Facilities

Level I: Simple unlined pits, apparently rubbish pits.

Level II: Storage pits.

Location— Outside houses.

Size/shape— 3m. diameter; roughly circular.

Construction— No indication of lining in report, except in bottom.

materials All pits had yellow clay plaster floors.

and methods

Possible uses— Grain silos.¹¹

Figurines: Fig. Achilleion 3.

A total of 227 stone (well chosen and finely worked) and clay figurines occurred at Achilleion. No percentages according to level are given in the reports, but apparently only 'a few' occurred in I and II.¹²

Categories¹³

a) Deities. Female deities most commonly represent pregnant or birth-giving goddesses.

b) Sacred animals.

Clay figurines.

Provenance— "Within dwellings or in the sacrificial circular hearth in the courtyard."¹⁴

Material— Hard-fired, well-prepared clay.

Technical— Well modelled, realistic. Stylisation rare.

data

Miscellaneous Clay Finds (over 3000 total)

Clay ladles (Ib): one found in association with figurines.¹⁵

Geometric objects: 'hundreds' of discs and rectangular solids, either plain or with pitted decoration.¹⁶

Fired clay seals.

Miniature clay axes: replicas of stone prototypes, suggested ceremonial use.

Clay spools and spindle whorls (II).

NON-POTTERY CONTAINERS IN THE ACHILLEION ASSEMBLAGE

Basketry (Levels I and II)

Direct evidence: none.

Indirect evidence: inhabitants had a developed knowledge of weaving both fabrics and matting.

Wooden Vessels (levels I and II)

Direct evidence: none.

Indirect evidence: considerable array of well-made carpentry tools.

Stone Vessels (Levels I and II)

Little technical or category information in interim report. Very few examples found, but of high quality. A greenstone dish with ring base from Level Ia, suggested ceremonial use.

PORTABLE POTTERY CONTAINERS AT ACHILLEION: Levels I and II. Fig. Achilleion 4, 5.

Level	Amount of Pottery	Wares, Surface	Temper, Firing	Shapes	Colour	Decoration
II	↑ No figures available. However, very large quantities of pottery manufactured throughout	Improvement in burnishing techniques	No details	As in phase I. Now include high-necked vessels and folded rims. Round and flattened elliptical handles introduced. Applique appendages.		Slips now bond well. White paint introduced. New motifs: parallel lines and chevrons in white, net patterns in red. Coarse ware often finger-nail impressed or incised.
Ib			'Heavily tempered'.	Simple shapes, now include large vessels with flaring ledge rims. Closed forms with up-turned rims. Outflaring ring bases.		Fugitive kaolin-based paint coloured with red iron oxide, applied over white slip. Patterns restricted to triangle.
Ia	↓	Thick walls, porous, of Kaolin or earthen fabric. Surfaces roughly smoothed and burnished.	'Considerable temper'.	Simple, either hemispherical or globular, blunt lipped. Round bases, ring bases, small pierced lug handles. Knob appendages.	White and orange	Slip only. Poor bonding to porous surface.

SUMMARY OF THE ACHILLEION ASSEMBLAGE IN RELATION TO THE
EMERGENCE AND SIGNIFICANCE OF THE PORTABLE POTTERY CONTAINER

Clay Usage and Clay Technology

In addition to its prolific use in the pottery industry, clay was also employed as a structural material in the form of pisé and wattle and daub. In this capacity clay was complemented by a considerable use of wood, both materials being readily available and fully exploited according to their individual properties. Level I houses were built of pisé on stone foundations, whilst those of level II had a post framework infilled with wattle and daub. Fine clay plaster was used as a floor finish in both levels. An interesting structural use of clay was discovered in a level II context. Broken potsherds formed the foundation for a clay plastered bench. This, together with many sherd discs (possibly ornaments) suggests that pottery, even after it was broken, retained some economic value.

Clay was used in both levels I and II for the manufacture of figurines (human and animal) and geometric objects. Clay stamp seals perhaps served to indicate ownership or the manufacturer of a particular artifact, and baked clay was also used for the manufacture of specialised tools such as spindle whorls and spools. Economically valuable materials such as imported alabaster, marble and serpentine seem to have been preferred for personal ornaments, although clay discs may have been used for clothing decoration.

SUMMARY OF CERAMIC TECHNOLOGY.
AT ACHILLEION.

Vegetable temper.	X P
Mineral temper	
Modelling	X P
Bonding	P
Burnishing	P
Decoration, painted.	P
Decoration, other.	impression (geometric objects) P: impression and incision
Firing	X P

CONTAINERS IN RELATION TO THE CULTURAL ASSEMBLAGE

The permanent village settlement of Achilleion was founded in an area abundant in natural resources. Agriculture animal husbandry and a sophisticated industrial economy were in evidence throughout the occupation period. The high degree of skill manifest throughout the artifact assemblage suggests that the first settlers arrived at Achilleion with a long technical tradition.

Although clay vessels formed the great bulk of the container assemblage at the site, several fine stone bowls were found, which, the excavator suggests may have been reserved for ceremonial use. These were of superior workmanship, and the one example described in the report was ring-based and made from polished greenstone. As matting and weaving were known at Achilleion, it is likely that baskets were made for the gathering of grain, and despite the lack of direct evidence, the manufacture of wooden vessels cannot be precluded - so common was the use of wood in other capacities.

Achilleion was settled by people with a developed knowledge of pottery making. Tempering, shape variety, firing, and finishing techniques including the use of slips and pigments, betray considerable experience in the craft. Application of ring-bases, knobs and handles indicate that the potters were finding ways of improving the functional quality of their products. For example the addition of knobs would enable a hot cooking pot to be lifted more easily, and perforated lug handles allow a storage vessel to be suspended.

In addition to its functional purpose, the Achilleion pottery also served as a vehicle for the self-expression of its makers. The first tentative surface designs appeared in level Ib, and the art of pottery painting showed improvement with each subsequent phase. The potters thus attempted to beautify utilitarian objects. No particularly fine pieces were recovered however, and it is possible that stone bowls may have been preferred to ceramics for ceremonial use.

NOTES

1. As the site was founded with developed pottery, it was considered necessary to examine only the earlier 2 stratigraphic phases, which show a continuing tradition in pottery shapes and manufacturing techniques. Phases I and II illustrate the initial stages of pottery manufacture at the site.
2. Resources include abundant deposits of clay including pure kaolin. Greenstone and red jasper are also readily available. Theocharis, 1973, 40.
3. Theocharis, 1973, 161-162.
4. A complete analysis of the plant remains and wood samples is not yet available.
5. The very high percentage of domestic animal bones suggests a long tradition of dependence upon herding.
6. Gimbutas, 1974a, 285.
7. Dixon, Cann, Renfrew, 1968, 43.
8. Whilst it is not indicated in the interim report, it would seem logical to assume some type of clay or packed earth infill to form a substantial floor.
9. As little information is available concerning the refractory facilities at the site, it was considered unnecessary to afford hearths and ovens separate analyses.
10. "... clusters of stones used in fire-cooking area". Gimbutas 1974a, 286; table 5.
11. The excavator suggests that these may have been 'pit-houses', but as rectangular dwellings prevailed from the beginning of the settlement, and no specific crop storage facilities have been located, it would seem possible that these structures represent grain silos.
12. Gimbutas, 1974a, 227.
13. Excavator's interpretation of anthropomorphic and zoomorphic figurine types, based upon workmanship and provenance.

14. Gimbutas, 1974a, 269.
15. A full description and stratigraphic context for all figurines found is not yet available. Those described in the report are representative examples.
16. The excavator suggests that the geometric objects at Achilleion were used as clothing decoration. Figurines were often found bearing a similar knob-like treatment.
Gimbutas 1974a, 302.
17. Gimbutas 1974a, 299.

NEA NIKOMEDIA

Site: Mound 220m. (E-W) x 110m. (N-S). Height 2m. above surrounding plain. Built up of accumulated occupation debris and disintegrated mud walling. 8-9m. above sea level.

Location: 10.5km. north-east of Verroia in Plain of Macedon, north-east Greece.

Years of Excavation: 1961, 1963.

Excavator: R. Rodden.

Area excavated: 1816 sq.m.

Depth of deposit: 3.30m. to sterile soil.

Stratigraphy:¹

	Surface
Plough soil	50 cm.
Disturbed	1m.
Late Neolithic	1.5
	2.0
	2.5
Early Neolithic	3.0
	3.5
Sterile soil	

Chronology:

<u>Level</u>	<u>C¹⁴ date</u>	<u>Reference</u>
Early Neolithic	6220 $\pm$ 150 BC	Willis E.H., Radiocarbon 4, 69.
	5607 $\pm$ 91 BC	Mellaart 1975, 286.
	5830 $\pm$ 270 BC	

ENVIRONMENT

The dominant feature of the Plain of Macedon during the prehistoric and early historic eras was the large (now drained) lake of Yiannista. Several prehistoric settlements have been identified on rich alluvial terrace land between the marshy lake shore, and the foothills of major mountain blocks to the west and south.

It has been suggested that Lake Yiannista was joined to the Gulf of Thessaloniki as late as the Classical era.² In this case Nea Nikomedia would have had immediate access to marine resources.

At present the area enjoys a modified Mediterranean climate with rainfall distributed evenly throughout the year. The seasonal temperature range is greater than in southern Greece, and the streams flow perennially, thus ensuring a constant fresh water supply.³ The vegetation is transitional between true Mediterranean and continental European with mixed deciduous forests on the lower foothills and thick stands of beech and conifer on the upper slopes.

The results of pollen analysis on samples from the cultural layers at Nea Nikomedia indicate that the area immediately surrounding the site during the prehistoric era was predominantly open and unwooded.⁴

CULTURAL ASSEMBLAGE

- Subsistence Cultivation: Domestic emmer, einkorn, 6-row barley, peas, vetch, lentil.
- Collecting: Acorns, cornelian cherry, plum, pistachio.⁵
- Herding: Sheep/goat, cattle (believed domestic), dog.⁶
- Hunting: Pig (slight evidence to suggest domestication), deer, hare, tortoise (small numbers). Fish, bird, shellfish.
- Architecture Open settlement, houses (rectangular, to 8x11m.) well separated. Central building 12x12m. appeared to be temple. House walls in trenches dug into virgin soil. Timber framework. Clay daub infill.
- Chipped Almost all examples finished and/or used artifacts.
- Stone Few waste flakes. Materials: flint, chert, quartz from Vermion range and nearby stream beds. Primarily blade industry, flint preferred. 5 sickle blade segments identified.
- Ground and Marble or serpentine axes and chisels, sawed and
- Polished polished. Hammerstones, querns, mortars, grinding
- Stone slabs of basalt, schist, granite, sandstone, limestone.
- Worked Bone Points, chisels, needles, fish-hooks.⁷ Sophisticated techniques: grooving, splintering. Frequent polished finish.
- Ornaments Stone: Beads, 'nose-plugs', pendants; of serpentine and local marble.
- Bone : Beads, belt fasteners.
- Shell: Necklaces (cardium); excellent workmanship.
- Clay: None.

Basketry and Textiles Basketry: 31 impressions found; sophisticated weaving techniques.
Textiles: Eyed needles, spindle whorls, loom weights.

Wood Indirect evidence only: axes, adzes, chisels.

Figurines Great majority anthropomorphic, female } - sundried clay.
Few animals. }

3 expertly carved serpentine frogs.

Miscellaneous Finds Clay: well-made plugs, called 'ear' or 'nose-plugs'.⁸
Seals or stamps; large number of 'roundels';
sling-stones.

Burial Customs Little attention to disposal of dead. Skeletons
thrust into shallow pits outside house walls in
variety of contracted positions.
Primary burials; single save 1 woman with 2 small
children in arms.⁹ No grave gifts.

Pottery First settlers well acquainted with pottery
manufacture (100,000+ sherds from E.N. and L.N.
levels). Generally monochrome; simple shapes;
burnished, slipped.
Some painted ware.

USES OF CLAY IN THE NEA NIKOMEDIA ASSEMBLAGE

Architecture: Fig. Nea Nikomedia 1.

Site plan— Open settlement, detached individual structures.

Houses aligned E-W to avoid prevailing northerly winds. Grouped around larger structure identified as shrine.¹⁰

Structures— Rectangular, 1 or 2 room houses, maximum 8x11m.

Construction— Foundation trenches up to 1m. deep. Posts 1-1.5m.

materials apart set into clay marl which was allowed to sun

and dry before building of superstructure. Super-

techniques structure: wooden framework infilled with tied bundles of reeds set on end, plastered and infilled with clay.

Wall finish— Outer surface plastered with clay with high gypsum content. Inner surface daubed with heavily chaff-tempered clay:

Floor finish— Clay plastered on to matting of broad-leaved marsh grasses laid on to clay sub-soil.

Roofs— No direct evidence, but likely to have been steep-pitched on timber supports with overhanging eaves.¹¹

Refractory Facilities

Hearths: only 1 example found within a house; no details supplied.¹²

Ovens: 2 poorly preserved examples found.

Location — In timber framed enclosure (possibly lean-to)
outside north wall of larger houses.

Size/shape — Roughly cylindrical, open at top.

Construction — Basin scooped from sub-soil. Walls set in basin.

materials Walls of baked clay with heavy straw and vegetable
and methods admixture.

Storage Facilities

Storage Bins

Location — In houses adjacent to 'raised cooking areas'.¹³

Size/shape — Not stated in preliminary reports.

Construction — Sunk into raised clay plastered dais. Lined
materials with clay.

and methods

Possible uses — Grain storage, water storage or location
suggests fuel storage.

Storage Pits: 3 examples.

Location — Outside north wall of 'temple'.

Size/shape — All 3 situated in area 6x3m. Deep, roughly circular,
inclined sides and flat bottom.

Construction — It seems most probable that these pits were origin-
materials ally dug to obtain clay to make mud walls for the
and methods adjoining building. Unlined, surrounded with timber.

Possible — Scarcity of animal bones in the fill, regular shape
uses and timber surround suggest pits used for storage,
although commodities stored unknown.

Clay Figurines: Fig. Nea Nikomedia 4.

Categories: Anthropomorphic female, both realistic and stylised,
7 examples.

: Anthropomorphic, head only. 2 examples.

: Zoomorphic. Unspecified small number found.

Provenance—Anthropomorphic figurines concentrated in 'temple'.

Location of zoomorphic figures and human heads
not specified.

Material—Most examples of lightly baked clay. Zoomorphic
probably sun-dried.

Technical—Anthropomorphic: more sophisticated examples made
data in sections, then pegged together. Modelling
skillfull in all cases. Frequent exaggeration of
the thighs.¹⁴

Baked clay heads: well modelled, with prominent
straight noses and coffee-bean eyes. Mouths not
indicated.¹⁵

Zoomorphic: Modelling cruder than in human examples.
Heads-only occasionally represented.¹⁶

Miscellaneous Clay Finds

Clay stamps or seals: Fig. Nea Nikomedia 3.¹⁷ Made from baked
clay. All with incised or appliqué geometric designs.

2 clay spindle whorls: perforated potsherds.

Baked clay loom weights.

Geometric objects: baked clay roundels, several hundred found,
use unknown.¹⁸

Baked clay plugs: so called 'ear-plugs',¹⁹ Fig. Nea Nikomedia 2.

Baked clay slingstones: 13 examples found during 1961
excavations.

NON-POTTERY CONTAINERS IN THE NEA NIKOMEDIA ASSEMBLAGE

Basketry

Materials—Reeds, rushes, grasses in varying widths, all carefully selected.

Shapes — Insufficient remains to ascertain specific shapes.

Technical— 2 distinct techniques:

- data. a) Twill: 2 x 2 weave with occasional irregularities
 Rushes $\frac{1}{2}$ cm. wide.
 b) Twining: usually 2-3 warps, 4-5 wefts per cm.
 Finer exceptions; 5 warps, 8-9 wefts per cm.
 Weft thread, probably grass, slopes left.

Possible — Probably specifically for grain and wild food
uses collecting.

Wooden Vessels

Direct evidence: none.

Indirect evidence: large assemblage of carpentry tools.

Stone Vessels

No evidence.

PORTABLE POTTERY CONTAINERS IN THE NEA NIKOMEDIA EARLY

NEOLITHIC ASSEMBLAGE

Amount of—Extraordinarily prolific, over 100,000 sherds found

Pottery at the site, over half of which were in an Early Neolithic context.

a) Plain wares 88.6% of total sherd sample.²⁰

b) Decorated wares, 11.4% of total sherd sample.

Wares, — a) Plain wares; include:

Surface i Pink slipped ware (48% of total sherd sample)...

ii Light coloured slipped ware (13%).

iii Red slipped ware (6%).

iv Dark burnished ware (8%).

v Brown burnished ware (1.5%, only small thin walled bowls).

vi Grey-beige monochrome ware (9%).

vii Coarse ware (3.6%, thick walled utility ware).

b) Decorated wares; include;

i Red on cream/white painted ware (9%).

ii White-painted ware (0.5%).

iii Finger-tip, finger-nail impressed (1.9%).

a + b Thicknesses vary, surfaces well smoothed (exterior only in coarse wares). Burnishing competent.

Temper, — Temper: a) i Limestone, quartz or crushed sherds.

Firing ii-v Quartz grits.

vi Limestone grits.

b) i Crushed or powdered limestone or marble.

ii Quartz grits.

Firing: a) Generally poor and uneven.

b) Generally better fired than 'a' although dark cores occur.

Shapes — Commonest: open or slightly close-mouth bowls, simple rims, low ring or disc bases. Rolled or thickened rims occur. Vertical or horizontally pierced lugs frequent. Some examples of narrow-mouthed storage jars. 3 asymmetrical narrow-necked vessels based on gourd prototypes. Few examples of miniature 'egg-cups'.

Colour — a) Beige, reddish-beige or tan fabric with slips as above.

- b) i Buff beige fabric, with cream or greyish slip, red paint.
- ii Brick-red to caramel brown fabric, with white paint.
- iii Buff-brown, loam brown, greyish brown fabric.

Decoration — a) i-v Burnished or slipped and burnished according to variety.

b): Slipped and painted, usually external surface only. Motifs include pendant triangles, squares with straight or irregular borders, undulating lines.

- ii Slipped, painted and burnished. Motifs include wavy lines, divided curved bands.

- iii Impressed designs usually restricted to band beneath rim.

In other sherd samples, anthropomorphic relief wares were found with human faces, and occasionally whole figures modelled below rims in appliqué technique.

SUMMARY OF THE NEA NIKOMEDIA ASSEMBLAGE IN RELATION TO THE
EMERGENCE AND SIGNIFICANCE OF THE PORTABLE POTTERY CONTAINER

Clay Usage and Clay Technology

The inhabitants of Nea Nikomedia were familiar with the properties of clay, and used the material with facility for a wide range of purposes. In a structural capacity, clay was used in conjunction with wood and reeds for the building of the neat 1 and 2 roomed houses. Gypsum tempered clay provided exterior walls with a strong, waterproof finish, whilst interior wall surfaces were coated with clay with a heavy chaff content. Floors were made from broad-leaved marsh grasses coated with clay.

Refractory facilities were concentrated in courtyard areas at Nea Nikomedia to reduce fire risk. Oven walls were constructed of heavily chaff tempered clay and baked through usage. Clay lined bins, each on a clay plastered dais for protection against damp, were probably used for the storage of surplus grain.

Skilfully modelled, anthropomorphic figurines were concentrated in the area identified as a temple, and may have had ritual or religious significance. Roughly modelled animal beads and complete animals were also found, in addition to large numbers of lightly baked geometric objects. Baked clay stamps or seals may suggest the concept of ownership, a token of an organised economy. Baked clay weaving tools were found, and clay 'ear-plugs' may have been used for personal adornment.

5

SUMMARY OF CERAMIC TECHNOLOGY.

AT NEA NIKOMEDIA.

Vegetable temper.	X
Mineral temper	X p
Modelling	X p
Bonding	p
Burnishing	p
Decoration, painted.	p
Decoration, other.	Incision (figurines). Incision and application (seals). p : finger-nail impression.
Firing	X

CONTAINERS IN RELATION TO THE CULTURAL ASSEMBLAGE

Nea Nikomedia was a well-planned permanent village community with a mixed economy. Herding is thought to have been practised and domesticated crops cultivated with annual surplus production, but hunting of land and marine resources still appear to have provided a significant part of the food supply.

A considerable tradition in the art of basketry is evident from the variety of woven impressions recovered. Finely woven baskets may have served such specific household needs as the storage of small tools and hunting implements, whilst the larger coarsely woven examples were undoubtedly used for the collection of grain and wild food. No wooden or stone vessels were found, despite the ready availability of both materials.

The earliest pottery at Nea Nikomedia demonstrates great technical competence in manufacture, and imagination in vessel shapes and decoration. The first settlers obviously arrived at the site with considerable experience in pottery making. A variety of mineral tempers was used according to the intended purpose of the finished product. Coarse cookware bodies usually contained a considerable amount of limestone grits for additional strength, whilst exceptionally fine wares were tempered with powdered quartz or marble.

Shapes also varied according to function. The range included cookware, storage and food preparation vessels, and a category identified as fine luxury wares. Storage vessels

were usually equipped with perforated lugs for suspension or for attaching a protective cover of cloth or other material. Three asymmetrical narrow-necked vessels, reminiscent of gourd prototypes are thought to have been used for heating liquids in hot ashes.²¹ Coarse cookware was easily identifiable. Exterior surfaces only were burnished, although interiors were smoothed to facilitate cleaning. Exterior burnish often bore traces of characteristic burn crackling from prolonged usage.

A wide variety of slips and pigments were used, and bonding of appendages was good, again indicative of a considerable technical tradition. Although far outnumbered by plain ware sherds, a considerable amount of painted ware was produced. This was generally more finely made and finished, and better fired than its plain counterpart. Vessels so produced were probably reserved for occasional, or perhaps ceremonial use.

The people who settled at Nea Nikomedia had developed their pottery making techniques before the settlement was founded. It is likely that gourds had been in use at the former place (or places) of habitation, and perhaps also vessels of stone and wood. However by the time the people arrived in Macedonia, pottery had replaced other materials for most container requirements. Baskets served those needs for which ceramics were unsuitable; for example the weight and cumbersome nature of pottery vessels made them impractical for the gathering of grain.

NOTES

1. Following the Early Neolithic period the site appears to have been uninhabited for a considerable time, the exact duration of which is unknown. The present study is concerned with the initial pottery using strata, the first settlement horizon.
2. Struck, 1908, 76.
3. Rodden, 1965, 113.
4. Rodden, 1962, 274.
5. J.M. Renfrew, 1973a, 161.
6. Sheep and goats are believed to have been domesticated on account of the large proportion of immature caprovine bones found. Cattle are believed to have been domesticated through analogy with the bones of modern British animals; surely an unreliable comparison. However, if the bones are conclusively identified as those of domestic cattle, they will be the earliest known.
Higgs, E.S. in Rodden 1962, 272.
7. One curved needle is believed to have been used as a netting needle. Several bone fishhooks were recovered during the 1963 excavation season. Rodden, 1964b, 605, fig.19.
8. There are several interpretations of the use of these unusual objects. The shorter, thicker variety are generally believed to have been nose or ear plugs, whilst several slenderer examples reminiscent of nails (1963 excavation) were identified as head-dress decorations.
Rodden 1972, 100.
9. Rodden, 1964b, Figs. 14, 15, 21.
10. Five 'fertility' goddesses, 2 outsize greenstone axes, 2 caches of new flint blades, 2 gourd-shaped pottery vessels, several hundred clay roundels, were all found together in the northeast corner of the building. This assemblage together with the unusual proportions of the structure suggested it may have served some ritual purpose.
11. The builders were obviously aware of the necessity to construct strong waterproof foundations to keep the walls dry. It therefore seems reasonable to suppose that the same principle applied to roof construction. Overhanging eaves would have protected the clay-plastered walls.
Rodden 1964a, 564.

12. 'Raised platforms with hearth basins' and 'raised cooking areas' mentioned in reports, but no details supplied. Rodden 1964a, 566.
13. Cf. previous note.
14. Many variations in approach and degree of stylisation are represented. Many figurines show pronounced abdomens and sex organs, leading the excavator to conclude "...that fertility beliefs played a part in the life of this Neolithic community. " Rodden, 1972, 102.
15. Similar baked clay heads have been found at E.M. Pyrasos (Theocharis 19 13), early painted pottery levels at Tsani (Wace and Thompson 1912, 147), Proto-Sesklo phase at Otzaki (Milojčić, 1959; fig. 1, Wace and Thompson 1912, 54), Daudza (Wace and Thompson 1912, 169).
16. Rodden, 1964b, Fig. 2. Heads of goat and lamb.
17. The excavator suggests that seals may have been used to stamp designs on the human body. Rodden 1964b, 605. It is equally likely that seals were used to indicate the maker or owner of goods such as textiles.
18. Rodden, 1964b, 606, Fig. 12.
19. Cf. note 8.
20. All percentages are based upon a study of 1025 sherds found in two hollows. Rodden, 1962, 261.
21. Rodden 1964a, 566, Fig. 9.

THE EARLY NEOLITHIC SETTLEMENT AT KNOSSOS

Site: On small hill, 90m. above sea level.

- a) Aceramic: $\frac{1}{2}$ acre = circa 25 hectares.
- b) Early neolithic (EN) 1: 5 acres = circa 2 hectares¹.

All neolithic strata overbuilt with later Minoan palace levels.

Situated: On south-east tip of fertile coastal plain near Heraklion, northern Crete.

Excavated in: a) 1923-1924

b) 1957

c) 1958-60

1969-70

Excavated by: a) Sir Arthur Evans } (later settlement)
b) Sinclair Hood. }

c) J.D. Evans. (EN settlement)

Area Excavated: Limited by overlying palace levels. Several 4sq. m. soundings in central and west court areas. Fig. Knossos 1.

Depth of Deposit: Aceramic: 30cm.-1.2m. (depending on area).

E.N.1.: 2.5 - 3m.

Stratigraphy: 5 neolithic levels identified at Knossos:

aceramic, E.N.1., E.N. 11, M.N., L.N.

aceramic = stratum X

E.N.1. = strata IX-V²

Fig. Knossos 2.

Chronology (Aceramic and E.N. levels).

<u>Level</u>	<u>C¹⁴ date</u>	<u>Reference</u>
X	6100 $\pm$ 180 BC 5960 $\pm$ 140 BC 5790 $\pm$ 140 BC	Evans, 117
	6000 $\pm$ 100 BC 6100 $\pm$ 200 BC 5800 $\pm$ 120 BC	
IX	5620 $\pm$ 150 BC	Evans, 117
VI	4260 $\pm$ 150 BC	
V	5050 $\pm$ 180 BC 4190 $\pm$ 150 BC	

ENVIRONMENT

The settlement of Knossos lies at the southernmost tip of the fertile, alluvial, coastal plain south of Herakleion in northern Crete. During the prehistoric period the site saw virtually continuous habitation which ended only with the final fall of the Late Minoan palace complex in 1500-1450 BC.

The environment was extremely congenial to settled occupation. The hill of Kephala, the site of Knossos, is situated at the confluence of 2 small rivers, the Vlychia and the Kairatos. Additionally, many springs are known to have issued from the marly, limestone bedrock, all of which, however, are now dry. This drying has been due to erosion resulting from forest destruction which has been constant since the prehistoric era. Formerly, oak, chestnut, pine and cypress stands abounded in the immediate vicinity of Knossos, providing browsing and shelter for a wide variety of animals.

Diverse mineral deposits occur within a short distance of the site, and these are known to have been utilised during the neolithic era, particularly for the manufacture of axes and other polished tools.

Marine resources were abundant but an hour's walk from Knossos, and a wide range of wild fruits and nuts were locally available as dietary supplements.

The climate of the area is pleasant and generally dry with moderate rainfall restricted to the winter months October to March.

CULTURAL ASSEMBLAGE, ACERAMIC AND E.N.1.

- Subsistence Cultivation: Sample studied almost exclusively bread wheat. Few grains emmer, einkorn, naked and hulled barley, lentil.³
- Collecting: No details available.
- Herding: Caprovids 61.5-64.9%, pig 20.9-13.9%, cattle 13.6-22.7% (aceram.-EN1).
- Hunting: Apparently minimal, few marine molluscs.⁴
- Architecture Aceramic: post-holes, stake-holes, pits. Some traces of mud-walling.⁵
- E.N.1: plan conservative throughout. Regular planning, similar orientation str. VIII onwards. Mud brick walls (IX-VIII). Pisé on stone (VII onwards).
- Chipped Industry poor in quantity and quality. Few implements,
- Stone all small, mostly of obsidian (Melos) with some local chert. Tools described as retouched and unretouched chips.
- Ground and Many polished small axe and maceheads in wide range
- Polished of materials.⁶ Ground stone querns, mortars, rubbers,
- Stone polishers (volcanic rocks and limestone). Pot lids usually of schist (8-18cm. diameter). Pumice abraders.
- Worked Bone Very numerous, over 1000 tools found in 1957-60 excavations. Mostly points (awls, chisels, gouges). Many needles and pins.⁷
- Ornaments Stone: Beads, circlets, toggles, bracelets, pendants.
- Bone: -
- Shell: Beads.
- Clay: Studs, few beads.
- Basketry and No positive evidence until E.N.II. Needles, pins
- Textiles suggest sewing, and pierced pottery discs (str. VI) may have been spindle whorls.

<u>Wood</u>	Axes suggest carpentry industry.
<u>Figurines</u>	Fired clay, marble, 1 of bone; heads frequently missing. None found in structures, some in pits. Mainly human, but some animal figurines.
<u>Miscellaneous</u>	Lumps of red and yellow ochre throughout strata.
<u>Finds</u>	Malachite and azurite (str. IX) prized for colouring properties. ⁸ Baked clay discs, str. VII onwards, use unknown.
<u>Burial</u>	7 child burials (aceramic), flexed in shallow pits,
<u>Customs</u>	no grave goods. 1 burial in stone-lined pit covered with flat stone. No further cemetery found.
<u>Pottery</u>	Appears fully developed in E.N.1, str. IX., amount increasing throughout strata. Great variety of shapes and special utilitarian and decorative features.

USES OF CLAY IN THE KNOSSOS ASSEMBLAGE

Architecture

Aceramic Level X: Fig. Knossos 3a.⁹

Site plan— Impossible to determine; many stake holes,
post holes, pits.

Structures— No specific structures identified. Some walling
found.

Construction— Described as mud-brick similar to that of E.N.
materials and arranged in parallel rows.

techniques

Wall finish— -

Floor finish— -

roofing— -

techniques

E.N.1 Strata IX-VII: Fig. Knossos 3b.

Site plan— Separate structures, no uniform plan identified.

Structures— Roughly rectangular, single-roomed, single-
storied houses, usually circa 2.5 x 2.0m.

Construction—Mud-brick (av. 50 x 20 x 5cm.) walls.¹⁰ Admixture
materials and of stones in varying amounts, including disused
techniques querns and mortars. Pisé used for repairs.¹¹

Occasional stone foundations.

Wall finish— No trace of plaster.

Floor finish— Beaten clay.

Roofing— Pieces of daub with impressions of sticks suggest
techniques roof of brushwood covered with sun-dried clay.

Strata VII-V: Fig. Knossos 3c.

Site plan— Buildings all similarly oriented and interspersed with pebble 'paving' to form dry work area during wet weather. Suggest co-operative planning.¹²

Structures— Rectangular, single-storied, usually 2-roomed houses.

Construction— Foundations of local soft limestone (kouskouras) materials and unworked hard and soft stones. Pisé (from techniques local river-bed) superstructure.¹³

Wall finish— Coated with smooth layer of clay.

Floor finish— As strata IX, VIII.

Roofing — As strata IX, VIII.

techniques

Refractory Facilities

Aceramic level: No trace of hearths or ovens; possibly roasting pits.

E.N.1

'Hearth hollows' (no fixed hearths found).

Location— At random over house floors, in courtyards between houses. All building levels.

Shape/size— Cup-like depressions, believed to be cooking holes.

Construction— Simple depressions with floor clay pushed down as materials lining. All had traces of burning and/or ash deposits.
and methods

Ovens: 1 only found.

Location— Northern end of house D, stratum VIII.

Size/shape— Rectangular base 1m.x60cm. Domed superstructure.

Construction— Base and dome of mud-brick. Base smoothly clay materials plastered with raised clay rim.

and methods

Storage Facilities

Aceramic level: no evidence of any such facilities.

E.N.1.

Storage cupboards.

Location— In room corners or built out from walls,
strata VII-V.

Size/shape— $\frac{1}{2}$ circular or roughly semi-circular according
to location in rooms.

Construction—Area outlined by large stones or old querns,
materials containing very large ceramic jars.

and methods

Possible— Storage of liquid and solid foodstuffs.

uses

Figurines: Fig. Knossos 4.

Categories: 26 clay examples:

- a) Anthropomorphic, usually stylised.
- b) Animal.

More (a) than (b) found. 2 examples from aceramic.

Provenance—Most commonly found in rubbish pits.¹⁴

Material— Lightly fired clay.

Technical— Anthropomorphic type well made with excellent
data proportions. Often burnished and incised. Usually
highly stylised. Animal figurines more crudely
modelled, usually representations of cattle.

Heads of both varieties frequently missing.

7 stone figurines, 1 of bone and 1 of shell also found.

Miscellaneous Clay Finds: Fig. Knossos 5.

2 Baked clay studs in dark brown burnished ware. Incised decoration.

Baked clay spoons.

Pottery discs:¹⁵ small irregularly shaped discs cut from sherds, usually of fine burnished pottery. Some perforated discs.

17 unperforated examples, VII-V, 2-4cm. diameter.

5 perforated examples, VI-V, 2-4cm. diameter.

4 unperforated examples VI-V, 4-8cm. diameter.

Baked clay beads and pendants. Few examples.

3 baked clay 'shuttles', brown burnished ware. Filled incised decoration.

1 baked clay conical object, use unknown. Filled incised decoration.

Non-Pottery Containers in the Knossos Assemblage¹⁶

Basketry

Direct evidence: none.

Indirect evidence: spindle whorls suggest weaving techniques known, therefore basketry also thought known.

Wooden Vessels

No direct or indirect evidence.

Stone Vessels

No direct or indirect evidence.

PORTABLE POTTERY CONTAINERS AT KNOSSOS E.N.1.

Amount of—Very small quantity in stratum IX (earliest E.N.1),

Pottery increasing rapidly³ with each successive level.

Weight of sherds by level: IX, 10kg., VIII 40kg.,
VII, 130kg., VI, 270kg., V, 380kg.

Wares,—No hard and fast line between coarse and fine wares,

Surface other than a slight difference in wall thickness.

Clay seems to be levigated in many cases. No crumbly fabric evident. All wares usually burnished on exterior, and frequently on interior surface.

Temper,—Temper: usually gypsum powdered fine and appearing as

Firing small white flecks on surface. Insides of some vessels riddled indicating disintegration of temper.¹⁷

Firing: poor in lower levels, becoming adequate later, although brittle examples still occur.

Shapes—Many and varied from beginning. Include: open bowls with rounded, straight or splayed profile; open bowls with beaded rims; carinated bowls; narrow mouth bowls and jars; funnel neck jars; flat based dishes or mugs, oval dishes; small pedestalled bowls; 4-legged troughs. Appendages include handles and lugs; tubular lugs, ring handles, flap and wishbone handles. Very large pots suited to cooking rather than storage.

Colour—Natural red clay (limited use of slips) fired to variety of tones.

Decoration—Pointillé (most popular): white or occasionally red paste filled. Exclusively on fine ware bowls and mugs.

Plastic decoration: raised scallop-moulding, large knobs, small pellets. Most often on coarse and fine open bowls.

Incised: fine ware only, bowls and mugs.

Pattern burnish: restricted to scribble burnish and

SUMMARY OF THE KNOSSOS ASSEMBLAGE IN RELATION TO THE EMERGENCE
AND SIGNIFICANCE OF THE PORTABLE POTTERY CONTAINER

Clay Usage and Clay Technology

The use of clay was known from the earliest aceramic level at Knossos. Traces of mud-brick walling were found, suggestive of repeated or permanent occupation. Two figurines were also found in stratum X. Both were lightly fired.

Within the subsequent E.N. levels (strata IX-VII and VII-V) a sophisticated and continuously evolving clay assemblage was unearthed including technically developed pottery. As a structural material, clay was used for moulded, tempered mud-brick frequently repaired with pisé, and floors were of carefully smoothed, beaten clay. In strata VII-V, when stone for foundations replaced the exclusive use of clay in architecture, superstructures were formed of pisé rather than mud-brick. As a finishing material, clay plaster covered the stone and pisé walls of strata VII-V, and provided ovens with additional durability. Roofs were made of reeds and waterproofed with clay from the earliest Neolithic strata IX-VIII. As a refractory material clay, as part of the floor fabric, lined cooking hollows throughout the occupation period in question, and an excellent domed oven (stratum VIII) was built exclusively of clay. Well modelled figurines of clay, all lightly fired, were found together with further fine examples in other materials. A diverse collection of modelled clay artefacts, mainly tools and ornaments was also found. These were carefully made and finished in a manner similar to some of the pottery. Even utilitarian objects such as shuttles were decorated with white-paste filled incision, indicative of aesthetic appreciation.

SUMMARY OF CERAMIC TECHNOLOGY.
AT KNOSSOS.

	aceramic	ceramic
Vegetable temper.	X	X
Mineral temper		P
Modelling	X	X P
Bonding		P
Burnishing	? possibly figurines	X P
Decoration, painted.		
Decoration, other.	incision (figurines)	incision (figurines), studs, shuttles) P: "pointillé", plastic, incision.
Firing	X	X P

CONTAINERS

The E.N. farming village of Knossos appears to have been well organised supporting a considerable number of industries, the homogeneity and consistent high standard of which suggest a degree of individual specialisation. Ceramic vessels constituted the only container category found at Knossos, and it must be concluded that pottery had replaced vessels of other materials for most purposes. Considering the extremely high standard of stone carving at the site (witness the superb marble figurine, fig. Knossos 4d), it is surprising that no stone vessels were found. This indicates how immensely popular pottery had become immediately after its introduction in stratum IX. Pottery, found in a great variety of forms was used for food preparation and storage, storage of goods, tableware, and possibly in a ritual and ceremonial capacity. It may also have been the sole container type for food collecting, but this is unlikely as baskets or skins (both very perishable) would have been much more suited to the purpose.

"Even at its first appearance, however, the pottery bears all the marks of being the product of a fully developed tradition of potting. Instead of the very simple vessels which mark the beginning of pottery at so many other Neolithic sites, we find wares with a variety of shapes and a number of special features such as pointillé and incised decoration, beaded rims, wishbone handles and trumpet lugs. It therefore seems unlikely that we are dealing here with early experiments in pot-making".¹⁸

The first pottery to appear at Knossos, well made, carefully tempered, imaginative and sophisticated in shape and decoration, would appear to have been introduced from outside the settlement. In his 1968 report, Evans makes the suggestion based upon stylistic detail, that the craft of pottery making reached Knossos from western Anatolia.¹⁹

As is the case with every other site included in this study, where pottery appears suddenly in developed form, a scientific sherd analysis is required to verify or disprove a suggestion of foreign origins. The Knossos pottery presents several interpretive problems. Other than the fine ceramic assemblage (which appears in level IX in small quantities compared to subsequent layers, although pottery manufacture must be considered a prolific industry throughout the E.N. considering the limited excavation), the Knossian artefacts are indicative of a conservative people content with simple equipment manufactured almost exclusively from local material. The only foreign contacts are evident from the tool assemblage, and possibly the cattle. Obsidian was imported from Melos a mere 120 kms. distant.²⁰ The cattle may have been imported from the Greek mainland. Whilst negative evidence does not preclude foreign ceramic inspiration, it is also possible that the art of pottery making was learnt within Crete itself, and adopted by the aceramic Knossians, who were already familiar with aspects of ceramic technology. However it is not known at present, whether the E.N. Knossians were descendants of the aceramic inhabitants or newcomers, or both. A complete typological and scientific analysis of all E.N. pottery remains from the site may assist in solving some of these problems.

All large Knossian coarse-ware was conspicuously devoid of firemarks, and Furness deduced that the many 'cooking holes' found in all houses and courtyards, (all strata) were used in preference to pottery for simple roasting purposes.²¹ Pottery vessels must, however, have been used for the cooking of cereal foods, and it is likely that these were eaten directly from the vessels in which they were prepared.

Large coarse jars were identified by their shape, location, and lack of firemarks as storage vessels.²² Several examples were lidded, indicating concern for the protection of their contents from moisture, rodents and insects.

NOTES

1. Difficulties arose in determining boundaries because of necessarily limited excavation. Settlement size deduced from soundings. Plans drawn to include all soundings where aceramic and E.N.1. material found. Fig. Knossos 1.
2. The present investigation deals exclusively with the aceramic and E.N.1. strata. E.N.II and later eras represent developmental rather than pre- or initial pottery using phases. The aceramic layer (stratum X) was insufficiently well preserved to merit a detailed, separate analysis. However, as important evidence of shaped and fired clay was recovered from this stratum, the aceramic assemblage has been included with the E.N.1. analysis and appropriately documented.
3. The grain deposit was studied by Hans Helbaek. The composition suggests that the deposit formed part of comparatively pure crop of bread wheat. J.D. Evans, 1968a, 269.
4. It is surprising considering the treed environment, that hunting appears to have played no part in the Knossos economy. The only definitely wild animal identified during analysis of the faunal remains was the hare, a few bones of which were found in the aceramic deposit. The lack of marine shells is also surprising, although limited excavation must be borne in mind. Jarman and Jarman, 1968, 241-264.
5. Aceramic level originally identified as temporary camp. However in 1969-71 excavations traces of mud-walling were found calling this identification into question. Evans 1971, 101.
6. All Cretan, local materials were used, usually chlorite and serpentine. For complete analysis, see Warren 1968, 239-241.
7. Notable lack of effective cutting tools in both stone and bone. Animal teeth possibly used as chisels and borers. No solutions have been suggested for the problem of cutting tools.

8. J.D. Evans, 1964, 238.
9. The aceramic level was very poorly preserved. The function of various pits and post-holes is unknown.
10. Bricks were fired to a variety of colours, although whether they were intentionally fired or accidentally burnt is unclear. The latter is more likely, as fired bricks are elsewhere unknown in the Neolithic.
11. J.D. Evans 1964, 146.
12. Similar orientation and individual layouts preserved throughout rebuildings suggests conservatism.
13. Whilst the houses were no doubt quicker and easier to build than before, the use of pisé represents a technological retrogression. J.D. Evans 1971, 115.
14. J.D. Evans, 1964, 153; Pl. 32: 1, 2.
15. Smaller discs may have been used as tallies or counters. Larger discs possibly jar covers. Perforated discs thought to have served as spindle whorls.
J.D. Evans 1964, 235, Pl. 58: 1, 2.
16. "The first containers used on the site must have been of perishable materials, of wood, basketry or leather".
J.D. Evans, 1968a, 271.
17. Furness, 1953, 54.
18. J.D. Evans, 1964, 196.
19. J.D. Evans, 1968a, 274.
20. Cann and Renfrew, 1964, 239.
21. Furness, 1963, 106.
22. Furness, 1953, 104.

KHIROKITIA

Site: Mound circa 300m. diameter, rising to height of 60m. above river-bed level. 150 - 210m. above sea level.

Location: above River Marionou, 2.5km. from village of Khirokitia, 75km. from Nicosia, 35km. from Limassol in Cyprus.

Years of Excavation: 1936-1939, 1946.

Excavator: P. Dikaïos.

Area excavated: circa 50 house units from estimated 1000.¹

Depth of deposit: maximum 8m.

Stratigraphy: 3 major phases (numbered I-III, earliest to latest) of continuous occupation, each consisting of a variable number of floors.

Average: Period 1, 9 floors; Period II, 6 floors;
Period III, 2 floors.

Chronology:

<u>Level</u>	<u>C¹⁴ date</u>	<u>Reference</u>
Average of consistent dates	5650 $\pm$ 150 BC	Karageorghis, 1976, 19.

At present, no estimation of the possible duration of the settlement is available. Karageorghis suggests there may have been an occupation hiatus between levels II and III, but does not venture an opinion on the duration of this hiatus or whether the site was reoccupied in III by descendants of the level II people.²

ENVIRONMENT

The mound of Khirokitia appears to have been selected for settlement primarily because of its proximity to the River Marionou, which not only supplied the inhabitants with fresh water, but also with the vital raw materials upon which their industry was based.

All clay for the manufacture of pisé and later of pottery, and all stone used in architecture and in the manufacture of implements and stone bowls, was carried from the river by way of the well-built and frequently repaired main artery through the site. The magnificent stone bowl industry (a unique phenomenon in quality, variety and magnitude) was amply supplied from the river bed with quantities of diabase, picrolite and andesite. Large deposits of calcite and limestone were available both in the river area and on the hillside itself.

At present, the Marionou flows from the beginning of the rainy season, usually in late November, to mid-June or July. It is possible that local rainfall was higher during the prehistoric era, therefore the river may have flowed continuously.³ However, be this as it may, fresh water is also available from several perennial springs close to the site.

The area is presently utilised for cereal crops in addition to olive and carob cultivation. The damper land close to the river supports extensive vegetable production.

CULTURAL ASSEMBLAGE

<u>Subsistence</u>	<u>Cultivation:</u> } No direct evidence collected. Many <u>Collecting:</u> } grinding implements, sickle blades, 4 wealth of stone bowls indicate. <u>Herding:</u> Ostensibly domestic goat, sheep, possibly pig. ⁵ <u>Hunting:</u> Wild goat, fallow deer, ibex. Many shellfish consumed.
<u>Architecture</u>	Tholos type dwellings, well planned along main road of settlement. Pisé or mud-brick on stone foundations, vaulted roofs. Some large tholoi with associated corridor wall and attached small tholoi for domestic purposes.
<u>Chipped Stone</u>	Flint and chert implements with small quantity of obsidian. Homogeneous industry throughout occupation. Mainly blades, flakes, sickle blades. Many notches for hafting.
<u>Ground and Polished Stone</u>	Querns mortars pounders in considerable quantity. Prolific polished stone industry, predominantly stone bowls. Also axeheads (many sizes), spindle whorls, engraved pebbles, seals. Conical stones, use unknown. ⁶
<u>Worked Bone</u>	Awls, borers, drills, pins, needles. Also antler tool handles. All well made and finished.
<u>Ornaments</u>	Almost exclusively of stone; including picrolite, serpentine, andesite, limestone calcite carnelian. Formed into amulets, pendants, dress pins, beads (many different types, finely drilled), rings. All well polished. Few shell necklaces.
<u>Basketry and Textiles</u>	Mat impressions on base of potsherds. Stone bowls reminiscent of basketry prototypes. Spindle whorls.

Wood

Considerable use of wood in architecture. Wealth of finely made carpentry tools. Stone bowls based on wooden prototypes.

Figurines

Mainly of stone, particularly andesite and diabase. Few limestone and alabaster fragments, 1 clay head. Stylised, human, features indicated.

Miscellaneous -

Finds

Burial

Grave pits of varying size in floors of tholoi.

Customs

Normally contracted, single primary burials. Querns or large flat stones placed on dead in many cases.⁷ Many grave gifts, principally stone bowls, apparently ceremonially broken. Gifts suggest equality of sexes.⁸ 2 animal burials found; ritual?

Pottery

Early attempt at pottery making (period 1) apparent failure. Period III, pottery appears in quantity, showing developed technology. Several types distinguished including unusual 'combed' ware.

USES OF CLAY IN THE KHIROKITIA ASSEMBLAGE

Architecture: Fig. Khirokitia 1, 2, 3.

Site plan— Houses built in 'ribbon' fashion along main road, a raised structure of limestone and andesite river boulders. Well built and frequently repaired, this road served as artery for circulation through settlement and access route to river. Careful co-operate planning evident in all phases of settlement. 'Compounds' usually consist of central tholos surrounded by corridors and subsidiary small tholoi for domestic purposes.

Structures— Circular, tholos type, divided into 2 categories, large and small. Many 2 storied. Semi-circular upper storey supported by pillars.

Construction— Walls: stone, mud-brick and pisé in various combinations and configurations; Fig. Khirokitia 3.

techniques Doorways: above floor level to exclude mud and rain and allow reflooring.

Stairways: both interior and exterior, recessed into pisé.

Wall finish— Usually coating of thick pisé plaster, often mixed with pebbles or flints. Occasionally fine clay plaster used (particularly in large tholoi) and painted.

Floor finish— Usually of thick yellowish or darker pisé. Thickness 2-8cm; many refloorings. Usually smoothed, some burnished and painted.

Roofing— Continuation of pisé or mud-brick wall fabric techniques to form vault.

Interior Furnishings and Fittings

Partitions and pillars

Location—— Jutting from interior wall face of tholoi towards floor centre (partitions). Freestanding within tholoi (pillars).

Construction—Mud-brick or pisé with high stone content. Frequent
materials recessed niches in partition or pillar fabric,
and methods gypsum lined, probably served as slots for beams or facilities for the storage of small articles.⁹

Use—— To support beams for upper storey.

Seats

Location—— Abutted on interior walls of tholoi.

Construction—type (a): Pisé, seat hollowed out, back formed of
materials flat stones set against wall.

and methods type (b): cubicle type of pisé.

type (c): stone built benches.

Use—— Bench types may have doubled as sleeping platforms.

Platforms.

Location—— Abutted on walls or raised in various parts of central floor area.

Construction—type (a): pisé, solidly built, circa 1.30m. long x
materials .75m. wide x .20m. high.

and methods type (b): circular or rectangular areas paved with slabs, boulders, pebbles or single gypsum slabs; always less than 1m. square.

Use—— Type (a): sitting or sleeping platforms.

Type (b): table spaces.¹⁰

Refractory Facilities

Hearths

<u>Type</u>	<u>Number of examples</u>	<u>Location in tholoi</u>	<u>Size/shape</u>	<u>Construction materials and methods</u>
1	2	against wall, enclosed	roughly rectangular, size varies	Pisé floor between 2 converging pisé partitions
2	3	near wall, set with stones	varies, usually small	Simply area covered with small stones, usually andesite from river bed
3	4	central, with rim	circular or oval 0.4-0.5m. diameter	Central area of regular pisé flooring surrounded by rim of small stones
4	11	central, paved	circular, elongated or rectangular 0.3-0.5m. across	Area of floor paved with thin, small slabs, usually of limestone. Frequent rim of small stones or pisé-backed slabs.
5	2	central, raised	rectangular 0.2m. high	Platform of solid pisé, paved with thin slab of limestone.
6	4	towards centre with adjoining platform	large rectangular platform, attached to smaller similar	Both platforms of solid pisé. Larger platform flanked by pisé partitions. Smaller platform (hearth proper) paved with limestone or pebbles. 11

Ovens

No ovens were found despite extensive excavation.

Roasting pits or fire pits¹²

<u>Type</u>	<u>Number of examples</u>	<u>Size/shape</u>	<u>Construction materials and techniques</u>	<u>Contents</u>
1a	3	Circular 0.3-0.9m. diameter. 0.15-0.2m. deep	Dug into floor, unlined	Charcoal or charcoal and pebbles
1b	4	circular, tapering 0.4m. diameter 0.15-0.20m. deep	Dug and lined with yellowish or pink pisé.	Charcoal or charcoal and pebbles.
2a	7	circular, tapering. 0.3-0.5m. diameter 0.2-0.25m. deep	Dug and lined with yellowish pisé.	Ashes covered by andesite river pebbles.
2b	3	circular; tapering. 0.5m. diameter 0.20-0.25m. deep.	Dug and lined with yellowish pisé. 1 example half-lined	ashes, pebbles, lumps of clay, pisé. Occasional stone tools.
2c	4 (row)	circular, tapering. 0.4m. diameter 0.1-0.14m. deep	Dug and lined with yellowish pisé.	ashes, charcoal, pebbles.

Storage Facilities

Storage Pits

<u>Type</u>	<u>number of examples</u>	<u>Size/shape</u>	<u>Lining</u>	<u>Contents</u>
1a	1	Circular, 0.12m.diam. 0.16m. deep.	Stones	Animal bones and bone needle.
1b	2	Circular, sealed with pebbles or limestone boulders. 0.20-0.25m. diameter. 0.16m. deep	Stones	Animal bones, flints, pebbles.
2	2	Rectangular 0.6m. long 0.50m. wide	Pisé, 1 with pisé rim	Pebbles, spindle whorls
3	1	Rectangular, 0.67m. long 0.60m. wide 0.30m. deep	Pisé and pebbles. Hard * lime floor	Empty, believed to have been for water storage.

Figurines: Fig. Khirokitia 4.

Many stone figurines: Human (steatopygous, flat, fiddle-shaped)

: Animal.

Vast majority worked with same care evident in stone bowl industry.

1 example of a clay figurine, a clay head.

The Khirokitia clay figurine

Provenance—Period II found on tholos floor.

Material—Clay, untempered, baked or otherwise, unknown.

Technical—Naturalistic, well modelled. Features and hair

Data rendered plastically and by incision. Hole at base of
neck for attaching head to body.

Miscellaneous Clay Finds

None.

NON-POTTERY CONTAINERS IN THE KHIROKITIA ASSEMBLAGE

Basketry

Direct evidence: plaited basketry impressions on base of
potsherds.¹³

Indirect evidence: stone bowl copies of basketry prototypes.

Fig. Khirokitia 5.

: spindle whorls attest knowledge of weaving
techniques.

Wooden Vessels

Direct evidence: none.

Indirect evidence: large and varied carpentry tool assemblage.

: stone bowl copies of wooden prototypes,

Fig. Khirokitia 5.

Leather Vessels

Direct evidence: none.

Indirect evidence: stone bowl copies of leather prototypes,

Fig. Khirokitia 5.

Stone Vessels Fig. Khirokitia 5, 6.

General data

Quantity/—Enormous numbers of stone vessels were produced
location throughout the occupation period. The industry is
unique in antiquity. More than 1000 examples found.

Materials—Andesite most frequent, also dolerite, diabase, basalt,
occasionally limestone for coarser wares such as
mortars. All collected from river bed.

Shapes — Predominantly bowls. Dishes; trays, ladles in small
numbers. (See shape tables below).

Technical— Generally excellent, simple workmanship. Most interior
data and exterior work done by chipping and grinding.

Stage 1: exterior shape blocked, then interior hollowed.

Stage 2: thinning walls, grinding surface.

Stage 3: detail work, spout holes, handles.¹⁴

Possible— The most prolific container type throughout the
uses occupation period. Used for all purposes, also
trade item.

Bowl shape categories: 19 basic categories numbered as follows:

<u>Features</u>	<u>Round</u>	<u>Oval</u>	<u>Rectangular</u>
Flat base and sides diverging upwards	I	VIII	XIV
Flat base and upright sides	II	IX	XV
Flat base and convex sides	III	X	XVI
Convex base and sides curved inwards	IV	XI	XVII
Flattened base, sides curved inwards, rounded base/side junction	V	XII	XVIII
Rounded base, sides curved inwards	VI	XIII	XIX
Hemispherical	VII	-	-

Types further subdivided according to depth of bowl in relation to its diameter as follows:

- (a) Large deep bowl.
- (b) Small deep bowl.
- (c) Bowl of medium depth.
- (d) Shallow bowl.
- (e) Very shallow bowl.

PORTABLE POTTERY CONTAINERS AT KHIROKITIA

<u>Occupation period</u>	1 (floors XIII-XIV)	III
<u>Amount of Pottery</u>	Few fragments	Total of 2064 sherds found. Therefore, despite type variation, pottery still appears minor compared to stone bowl industry.
<u>Wares, Surface</u>	Clean clay. ¹⁵ Extremely coarse crumbly texture Sherds similar quality to pit linings	<u>Major:</u> red lustrous, red slip, painted (red on white) and combed, red on white, coarse ware. <u>Minor:</u> black lustrous, black combed, grey lustrous, red on red, reserved slip. Fine wares well smoothed, usually burnished. Coarse ware not burnished, roughly smoothed.
<u>Temper, Firing</u>	Temper: none Firing: open-fire technique 'insufficiently baked'.	<u>Temper:</u> finely ground stone or finely chopped straw (fine wares) Coarse ground stone (coarse wares). <u>Firing:</u> much variation, usually hard but frequent dark cores.
<u>Shapes</u>	2 bowl fragments only identifiable pieces. Much variation in wall thickness. Flat base fragments.	Bowls, necked jars, jugs. All flat-based. Rims usually flat or rounded, occasionally convex. Tubular or open spouts frequent. No handles or lugs found.
<u>Colour</u>	Grey with light core.	Much variety according to firing. Clay body appears homogeneously light buff throughout assemblage.
<u>Decoration</u>	None, although unintentional? thumbprints noted.	<u>Red lustrous, red slip:</u> slipped, burnished to varying degrees. <u>Painted and combed:</u> surface entirely slipped then combed to uncover the clay body, or broad bands of slip applied before combing. Some painted designs also in this category. <u>Red on White:</u> painted designs in bright red, frequently on both surfaces. Designs include vertical and horizontal bands, wavy bands, triangles, discs, rings, zig-zags. ¹⁶

SUMMARY OF THE KHIROKITIA ASSEMBLAGE IN RELATION TO THE EMERGENCE
AND SIGNIFICANCE OF THE PORTABLE POTTERY CONTAINER

Clay Usage and Clay Technology

The inhabitants of Khirokitia were familiar with the use and properties of clay from the beginning of the settlement. As a structural material, clay (mud-brick and pisé) was used in conjunction with stone for house building, and alone for the provision of a complexity of internal fixtures and fittings. Tempered clay plaster, usually burnished and often painted finished walls and floors.

The insulating and heat-resistant properties of clay were fully exploited in a range of refractory facilities. Both pisé and pebble-tempered clay were used to build and line hearths, and to line roasting pits which may have doubled as ovens. Pisé was again used to waterproof storage pits, although in one instance a hard lime-plaster floor was found, probable evidence of the ability to achieve sufficiently high firing temperatures for lime slaking.

With the exception of one naturalistic-clay head, no modelled clay figurines were found at Khirokitia. However many excellent figurines of stone were found representing both animals and humans. The presence of the clay head indicates that at least one of the Khirokitians was able to model well in clay, but the general material preference appears to have been for stone for small artifact manufacture. The clay head was beautifully modelled, with hair and features rendered by application (evidence of knowledge of bonding) and by incision; techniques which are intrinsic to pottery making and decoration.

SUMMARY OF CERAMIC TECHNOLOGY. AT KHIROKITIA.

	aceramic	ceramic
Vegetable temper.	X	X p
Mineral temper		p
Modelling	X	p
Bonding	X	X p
Burnishing	X	X p
Decoration, painted.	X	X p
Decoration, other.	plastic and incised (figurine) incised (stone vessels)	X p (combing on slip)
Firing	? (figurine)	p

1. The level 1 'experimental' sherds are ignored for purposes of this summary.

CONTAINERS

Khirokitia was a complex, well-planned town settlement with unique, excellently engineered architecture, and a wealth of specialised industry, not including pottery however, until the very latest phases of the occupation period.

Despite familiarity with the necessary technology for ceramic manufacture, pottery was clearly superfluous to the Khirokitia culture. The prolific and excellent stone bowl industry for which an amplitude of raw material was locally available, served virtually every need. Food was stored and prepared in stoneware, stone containers may have served as ceremonial funerary objects, as luxury and possibly ritual vessels, and their varied, individualistic and finely executed decoration shows that they were also vehicles for the self-expression of their makers.

It is impossible to do more than speculate, in the light of available evidence, why the Khirokitians chose to make vessels of stone rather than clay. Clay vessels are less time consuming and altogether easier to produce than their stone counterparts. It is possible that taste may have been a major factor in the selection of stone as the material of durable vessel manufacture.

Baskets were also used by the Khirokitia people, probably for the transportation of grain, and vessels of leather and wood may also have served specialised purposes. Copies of containers of both these materials were found among the stone bowl assemblage. It is also possible that stone vessels had replaced leather and wooden prototypes.

The first evidence of pottery making at the site, represented by a few extremely coarse friable sherds found in the hearth areas of occasional period I tholoi, appears to have been an experimental first attempt, the results of which were unsatisfactory. Failure is suggested by the low quality and poor condition of the sherds, and by the lack of subsequent attempts until the latest levels at the site.

In period III, a well-tempered, good quality pottery was introduced, the suddenness of its appearance suggesting strong external influence. Should Karageorghis' suggestion of an occupation gap between periods II and III prove correct, the developed pottery must have been brought by the period III settlers, who (judging by the stone industry and the rest of the cultural assemblage which is homogeneous throughout all levels) are likely to have been descendents of the period II people. If occupation was continuous, pottery may initially have been acquired through trade (perhaps for stone vessels), or possibly locally made in imitation of foreign wares. A scientific analysis of the sherds themselves may provide clarification.

It seems likely however, that the early, failed experiment in ceramics was made without outside influence whilst the later fully developed pottery resulted from foreign contact.

The newly acquired pottery was well received and its production showed a considerable increase towards the close of the occupation period, although the stone vessel industry continued to thrive alongside pottery without perceptible decrease in quality or quantity. As few coarseware sherds

were found compared to the number of fine burnished and painted pieces, it is felt that stone was still the preferred material for food preparation and most utilitarian purposes, although pottery allowed open hearth cooking for which stone is generally unsuitable. It is also likely that (judging by the high quality of the ceramics) the new pots were regarded as prize possessions in what must, by that stage have become a very possession oriented society.

1. Major excavation effort concentrated on south slopes and on saddle of mound. "That much of the settlement remains undug may yet be counted an advantage if we remember that techniques which today appear satisfactory, may, in later years be considered old-fashioned; if further excavations on the site are then thought desirable there will be ample scope for them." Dikaïos, 1953, 13.
2. Karageorghis, 1976, 25.
3. Dikaïos, 1953, 5.
4. Excavations to date at Khirokitia have produced no plant remains. The technology involved in the collection of such remains was not available at the time of the final (1946) season of excavation.
5. The evidence for the domestication of sheep and goat is not conclusive. A re-examination of the faunal remains in the light of modern palaeozoological knowledge would be of benefit.
6. These were possibly used as weights, gaming pieces or for 'ritual' purposes. Dikaïos, 1953, 288.
7. It is suggested that this custom denotes fear of the dead. Childe, 1945, 15.
8. The graves of both men and women contained bowls, jewellery and flint implements.
9. Dikaïos, 1953, 21.
10. It is suggested that food was placed on such tables; those eating, either sitting or squatting on the floor. It is also possible that these platforms served as work-tables, particularly in the domestic tholoi. Dikaïos, 1953, 212.
11. The larger platform in type 6 hearth configuration probably served as seating, food preparation area, or possibly drying surface for pottery.
12. Roasting pits and storage pits were distinguishable one from the other only by their contents. Roasting pits may have taken the place of ovens and served for grain parching. All roasting and storage pits were within tholoi; no particular location within floor area.

13. See for example bowl bases with catalogue numbers 1180, 799ω, 844γ . Dikaïos, 1953, Pl. LXXXII.
14. Several examples of partially finished bowls were recovered, giving a good indication of technique. Pl. CXXXII; 153, 154, 157, 155, 230, 163.
15. It is unlikely that the clay fabric of this early ware was intentionally levigated. The chosen clay deposit was probably free from major impurities.
16. The 'minor categories' included in the pottery catalogue (referring specifically to variations in paint colours), occurred in such small quantities as to suggest that they were merely accidental variants of the major groups brought about by inconsistent firing. A re-examination of the Khirokitia pottery using modern analytical techniques would help to clarify this problem.

UMM DABAGHIYAH

Site: Mound, 100 x 85m., circa 200m. above sea level.

Location: in north-central Jazira region of Iraq. 26km. west and 4km. north of Hatra.

Years of Excavation: 1971, 1972, 1973, 1974.

Excavator: Diana Kirkbride.

Area Excavated: 1500 sq. m. by 1973. Another 1500 sq.m., 1974.

N.W. quadrant and level IV in the east almost untouched.

Depth of Deposit: a little less than 4m.

Stratigraphy: 12 building levels devided into 4 main phases (I-IV, top to bottom).

Level I, II - subphases 1-5.

Level III - subphases 6-8.

Level IV - subphases 9-12.

Entirely Neolithic occupation with periods (of unknown length) of desertion suggested between main phases.

Chronology: no available C¹⁴ dates.



ENVIRONMENT

▼ The landscape surrounding Umm Dabaghiyah consists of thousands of square metres of barren rolling steppelands, relieved only by occasional salt marshes and water courses. 300m. to the west of the site, a line of thickly-growing scrub marks the course of a small run off for heavy rain which drains into one such salt marsh. Today only 30cm. of topsoil remain over a sub-surface of salt-laden gypsum, which has frustrated all attempts at agriculture since time immemorial. Furthermore, frequent blinding sandstorms and an annual rainfall of only 200mm., usually taking the form of torrential thunderstorms, are hardly conducive to permanent settlement. The excavator believes that little climatic change has occurred since the prehistoric era, and that several periods of site desertion suggest that drought often forced the inhabitants from their homes.¹ The area is singularly lacking in raw materials other than clay and gypsum. All hardstone must have been imported, and it is thought, in view of the inhospitable conditions, that much of the foodstuff consumed must also have been obtained from outside the settlement.



CULTURAL ASSEMBLAGE

Subsistence Cultivation: Few examples of domestic emmer, barley, einkorn, lentil, pea.²

Collecting: Brome, saltwort, seablight, goosefoot (probably fuel residue).

Herding: 9.7-13.2% of total bones; cattle, sheep/goat, pig, dog.

Hunting: 65.9-69.6% of total bones = onager. Few gazelle, auroch, pig, and small mammals. Various birds.³

Architecture Well planned settlement with only minor changes throughout period.⁴ Good understanding of properties of gypsum and clay. Storage blocks unique feature at site.

Chipped Mainly flint, 3 types of obsidian, occasional tools of
Stone hard sandstone and quartzite. All material imported, therefore little wastage. Assemblage includes projectile points, scrapers, borers, blades. Few sickle blades.

Ground and Gypsum querns, mortars and grinding stones.

Polished Axeheads of imported stone, rare maceheads.

Stone Stone vessels, high quality, many shapes.

Worked Bone Finely made awls, points, spatulae.

Ornaments Stone: Beads, including many heavy examples of pink and cream limestone.

Bone:

Shell: Beads including dentalium, probably from the Mediterranean.

Clay .(baked): Beads, finely burnished.

Basketry and Spindle whorls in baked clay (sherds) and gypsum.

Textiles

Wood Carpentry tools suggest some use of wood, but raw material scarce in area.

Figurines Total of 5 found during entire excavation, all human, all armless.

Miscellaneous Baked clay: 2400 double pointed and spherical sling missiles, baked and unbaked clay balls, 15cm. diam.

Finds Gypsum: basket linings, 'boot' objects (use unknown).

Burial Total of 7 crouched burials in oval pits 1.50m. -

Customs 2.0m. deep. No grave gifts save 1 pierced dentalium shell.

Pottery Appears developed from beginning of settlement. Majority coarse, but medium and fine ware occurs. Very fine burnished ware believed imported. Much variety in shape and decoration.

USES OF CLAY IN THE UMM DABAGHIYAH ASSEMBLAGE

Architecture: Fig. Umm Dabaghiyah 1, 2.

As architectural facilities for storage shared equal significance with domestic structures at Umm Dabaghiyah it was considered expedient to describe domestic and storage architecture in parallel to facilitate comparison.

Site plan: Regular, highly organised planning throughout.

Large courtyards surrounded by blocks of buildings. Storage and domestic quarters separate. Courtyards paved with moulded chaff-tempered bricks.⁵

	Domestic Structures	Storage Blocks ¹⁰
Structures	Main room with kitchen facilities. 1 or 2 smaller rooms. ⁶ Roof entry by toe holds in walls. ⁷ Doors small, roughly arched. Windows cut in exterior walls of settlement. ⁸	2 blocks of contiguous rooms, each 1.45x1.75m. 50cm. thick parallel outer walls. Inner crosswalls and internal buttresses. Interior doorways 54-75cm. high. No windows.
Construction Materials and Techniques	Thin walls of clay shaped like mud brick, superceded by thin walls of sand-tempered tauf.	Walls of heavily chaff-tempered lumps and strips of clay.
Wall finish	Gypsum or gypsum and clay plaster. Mural paintings in red, black, yellow. Some ochre staining. ⁹	No plastering.
Floor finish	Fine gypsum or gypsum-clay plaster. Frequent ochre staining.	Beaten clay.
Roofs	Thin branches across top of walls, covered with reed mats. Plastered with gypsum then tempered clay.	Unknown, but likely to have been similar to domestic structures.

Refractory Facilities.¹¹

Hearths: Fig. Umm Dabaghiyah 2.

Location— In houses and adjacent domestic courtyards.

Sometimes as part of ovens built outside, with wall opening leading to inside hearth.

Size/shape— Semi-circular or roughly circular. Plaster chimney-flue with plaster hood usually reaching kerb level. Five openings incorporated in chimney.

Construction—Slabs or lumps of heavily chaff-tempered clay materials and forming kerbs. Often plastered with gypsum. Kerbs techniques rebuilt with each plastering of floors.

Ovens: Fig. Umm Dabaghiyah 4.

Location— In houses, often in corners making use of 2 adjacent walls. In courtyards along outer walls, particularly on west side to reap benefits of dust-free west winds.

Size/shape— Circular, or semi-circular, domed, incorporating plaster chimney flue with plastered hood.

Construction—Clay slabs or lumps set in rough courses. Plastered materials and with gypsum. Floor foundation of heavy sherds techniques plastered over with burnished gypsum. Sometimes having common flue with hearths, sometimes separate flue.

Gypsum Kilns.¹²

Location— Against outer courtyard walls.

Shape/size— As ovens.

Construction— As ovens.

materials and techniques.

Storage Facilities

Storage rooms: see architecture section.

Storage bins and boxes:

Material—— Gypsum or clay and gypsum.

Shape—— Rectangular or cubic.

Construction—Either shallow gypsum-lined depression in house floor, or (rarely) raised with clay walls heavily coated with plaster.

Use—— Small items, possibly food.

Storage cupboards:

Material—— Plaster covered clay.

Shape—— Box-like, 'high'.

Construction—Clay slabs or lumps covered with plaster. Shelved in same manner. Often in room corners, utilising house walls.

Use—— Small household artifacts. Possibly also fuel as many situated near hearths.

Storage jars:

Material—— Fired ceramic.

Shape—— Various; open-mouthed, globular and carinated most common. Frequently lidded. Height to 75cm.

Construction—As pottery. Either free-standing, or more often in special plaster pot-stands, or sunk into floor and plastered to necks.¹³

Use—— Lids suggest food and water storage. Uses of jars located in storage rooms unclear.

Figurines: Fig. Umm Dabaghiyah 5.

Total of 5 found during entire excavations.

Categories: Human; all armless, all lightly baked, all realistically modelled.

Fig. 5a: Deeply rounded concave base designed to fit on seat of some kind. "Quite the most elegant yet recovered among the early cultures of Iraq".¹⁴

Fig. 5b: Apparently wearing long frilly trousers, ankle frills represented by line of incisions beneath incised toes.

Fig. 5c: Wearing coloured garment indicated by reddish-brown dots on cream slip.

Miscellaneous Clay Finds

2400 small 2-3cm. diameter baked clay objects identified as sling missiles, found in one room of eastern storage block.¹⁵

Above room also contained some 100 large (15cm. diam.) baked clay spheres. Similar spheres, apparently awaiting firing, discovered elsewhere on site. Purpose of spheres is unknown, but it has been suggested they may have served as roof weights.¹⁶
Pierced discs, possible spindle whorls.
Burnished, fired beads.

NON-POTTERY CONTAINERS IN THE UMM DABAGHIYAH ASSEMBLAGE

Basketry¹⁷

Materials— Marsh plants.

Shapes— Insufficient casts preserved to reconstruct shapes.

Technical— Variety of weaves denoting considerable experience

Data in the craft. Often lined with gypsum to render them leak-proof and thus more versatile.

Possible— Carrying containers most likely; adequate storage

Uses facilities existed in more durable materials.

Wooden Vessels

No evidence: likely none existed because of lack of raw material other than thin branches of scrub.

Stone Vessels: Fig. Umm Dabaghiyah 6.

No figures given; "various open stone bowls..."¹⁸

Materials— Mainly marble, carefully chosen veined pieces.

Either raw material or finished products imported.

No local raw material.

Shapes— Many and varied, much experimentation.

Technical— Excellent workmanship.

Data

Possible— May have been reserved for ritual or ceremonial use.

Uses Probably valued as 'possessions', the hallmark of a wealthy society.¹⁹

PORTABLE POTTERY CONTAINERS AT UMM DABAGHIYAH

Amount of — No figures given for total sherds found, or for totals in any particular category. However such phrases as "the vast majority of sherds...", "a quantity of burnished sherds...", "a great variety of decorated forms" suggest that the industry was considerable.

Pottery

Wares, —

Surface

Coarse wares throughout, with slight decline in quality above level 5. Some fine wares, particularly below level 5. All vessels seem to be coil built, with coils often appearing on surfaces. Outer surfaces even and smooth, occasionally grass-wiped. Slipped surfaces common on medium and fine wares.

Temper, —

Firing

Temper: Chaff and straw predominates, with occasional admixture of grits. Grit temper common in fine wares.

Firing: Usually light. Little fuel seems to have been available, and grey or black cores are common throughout. One category of wares (hard burnished) were invariably hard fired.

Shapes —

1. High-sided bowls, flat-based occur most frequently.
2. Bowls with flaring sides and heavy bases.
3. Oval-mouthed biconical vessels. Large - up to 50cms. high.
4. Plain 'husking-trays' without base corrugations.
5. Husking trays with base corrugations.
6. Oval bowls and shallow oval dishes.
- 7 miniature vessels (below level 5 only). Rare.

Base variations: Ring bases occasionally added to bowls.

Handles: knobs, mamelon handles, ledges, frequent.
Lugs rare.

Colour —

No indication of colour of undecorated wares.

Burnished wares: of fine almost pure pinkish-brown clay.

Painted ware: red ochre body with many firing variations.

Applied decoration ware: no colour indicated.

Incised ware: no colour indicated.

cont'd...

- Decoration— B Apparently imported ware. Well-fired, hard,
 (the vast U
 majority R thin, good burnish; of fine pinkish-brown clay,
 of sherds N
 were I Occasionally cream-slipped before burnished.
 undecorated) S
 H Rare grey burnished sherds. Found mainly below
 E
 D level 5.
-
- P^a Mostly red ochre on cream slip. Variations in
 A
 I finished colour result from firing variables.
 — N
 T Motifs: Simple geometric including dots, circles,
 E
 D 'squiggles', linear motifs. Pendant
 triangles and chevrons not infrequent.
 Few examples in 'upper layers'.
-
- A Almost invariably naturalistic or stylised human
 P
 P and animal forms.
 — L
 I Human: eyes, ears, faces, heads and shoulders,
 E
 D full figures.
 Animal: Heads of different varieties, and many
 full figures.
 Popular through all periods.
-
- I Rare and coarsely executed.
 N
 C Motifs: crosses, triangles, zig-zags, fragmentary
 — I
 S linear designs.
 E
 D Only occurs after phase 4.

SUMMARY OF THE UMM DABAGHIYAH ASSEMBLAGE IN RELATION TO THE
EMERGENCE AND SIGNIFICANCE OF THE PORTABLE POTTERY CONTAINER

A thorough familiarity with the properties and potential of locally available materials, and an advanced knowledge of building techniques is evident from the earliest phase of the site. Both clay and gypsum were each utilised in structural capacities considered most suited to their individual properties. Living quarters were initially built of thin, untempered clay slabs shaped to resemble mud bricks. This building material was found inadequate, and quickly replaced by sand-tempered tauf. The thick-walled storage blocks were constructed throughout the occupation period from heavily chaff-tempered lumps and strips of clay. Gypsum plaster was generally preferred as a finishing material for the walls and floors of domestic structures, although several examples of clay plaster with a high gypsum content were found. Mural paintings were frequent, and floors were often stained with red ochre. No wall finish was necessary in the storage buildings, the floors of which were simply beaten clay. Roofs were mat covered and waterproofed first with gypsum and then with a thick layer of tempered clay.

Both clay and gypsum were again used for the provision of refractory facilities. Hearths, ovens, and lime-burning kilns were built from lumps of heavily chaff-tempered clay and coated with hard lime plaster. Potsherds formed the foundations of kilns and oven floors which were then plastered with gypsum and burnished. A variety of storage facilities

were provided at Umm Dabaghiyah. In addition to the storage blocks, rectangular bins and boxes were constructed from gypsum or clay and gypsum, and shelved storage cupboards were gypsum plastered over a tempered clay foundation. Large, fired ceramic storage jars, usually lidded were provided with gypsum plaster potstands, or sunk to the neck in the floor, and plastered into place.

Plastic modelling occurred in the shape of five lightly fired realistic figurines, and anthropomorphic and zoomorphic decoration on pottery. Detail on the figurines was indicated by incision and the use of slips and pigments. Specialised clay tools included spindle whorls and so called 'roof-weights', and burnished fired beads illustrate the use of clay for the manufacture of personal ornaments. A large quantity of baked spheroids, tentatively identified as sling-missiles, may also have served as counters or tallies.

SUMMARY OF CERAMIC TECHNOLOGY.

AT UMM DABAGHIYAH.

Vegetable temper.	X P
Mineral temper	X P
Modelling	X P
Bonding	P
Burnishing	X P
Decoration, painted.	X P
Decoration, other.	incision (figurines) P : application , incision
Firing	X P

CONTAINERS IN RELATION TO THE CULTURAL ASSEMBLAGE

Umm Dabaghiyah is unique among the sites included in this study in that the economy is believed to have been based almost exclusively on trade. The assemblage is indicative of a well-planned, complex village settlement with a high degree of social organisation and task specialisation.

The area was most unsuitable for agriculture and without raw materials other than clay and gypsum. However, a surprisingly wealthy artefact assemblage was unearthed. Either the raw hard-stone for the fine stone-bowl industry, or the bowls themselves must have been imported. The pottery industry was vast, both in variety of form and decoration, and in sheer quantity of vessels produced. Hard fired, brightly burnished ware very different from the bulk of the ceramic assemblage, is believed to have been imported.

All these features suggest some form of trade and it is Kirkbride's belief that the only commodity available for barter in these inhospitable surroundings was the hide of the much-hunted onager. She suggests that the carcasses were skinned and jointed in the main courtyard (where many of the bones were found), and the hides subsequently dried and stored in the specially designed storage blocks.²⁰

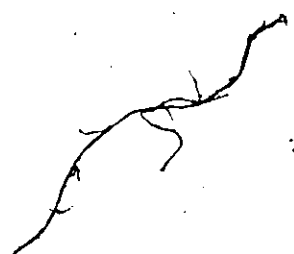
Allusions to the importance of the onager occurred within the artifact assemblage and in architectural contexts. Onagers both pregnant and otherwise appeared as applied decoration on the pottery, and the onager hunt is represented in animated wall-painting.²¹

If we assume the excavator's hypothesis to be correct (and it seems plausible in the light of present evidence), wealth derived from skin trading would explain the import of grain, of raw materials, and of luxury items such as alabaster bowls and hard burnished, fine pottery.

Baskets in a variety of weaves were found throughout the levels at Umm Dabaghiyah. These were made from the leaves of marsh plants and frequently lined with gypsum to render them leakproof. It is difficult to suggest a use for these baskets. They would have been extremely heavy if used for carrying liquids, and plenty of other suitable containers were available for this purpose. Little grain was found or apparently produced, so they were unlikely to be needed extensively for harvesting. It is possible that they, like similarly shaped pottery vessels, may have been used as husking trays.

Beautifully made stone vessels also occurred throughout the levels; these are believed to have been luxury items acquired through trade.

The art of pottery making was known from the beginning of the settlement at Umm Dabaghiyah, and pursued with vigour throughout the levels. Local clay, often heavily tempered with chaff was the commonest paste, grit admixture occurring only in those vessels believed to have been imported.²² No gypsum inclusions were evident, although gypsum-clay wall plaster was common. It is possible that a gypsum tempered



fabric had been tried in experimental pottery at the site, and abandoned in favour of the chaff-tempered ware.

It is impossible to ascertain from the pottery or its find-spots whether ceramic manufacture was a specialised craft. However, considering the industrial organisation implicit in other fields of endeavour such as architecture, hunting and trade, its extension to clay vessels seems plausible.

The Umm Dabaghiyah pottery displays an unusual liveliness of approach, and a tendency towards free experimentation. Although the majority of vessels and sherds recovered were undecorated, many examples of 4 different types of decoration were identified, and considerable shape variation occurred within all categories, both decorated and otherwise.

It is possible to suggest that the application of anthropomorphic and zoomorphic relief forms to many vessels, may have been a somewhat eccentric substitute for the usual Neolithic figurine assemblage. The figures are well-modelled and skilfully attached to the vessel surface, possibly indicating a previous tradition of modelling and 'appliqué' technique.

Painted decoration occurs in abundance throughout the levels with combinations of motifs rarely repeated. Pottery painting may have been a new experiment at the site, for the paint is generally fugitive implying poor consistency and application. Colour variations are numerous, probably resulting from erratic firing conditions.

Analysis of the contents of ovens and kilns in both houses and courtyards revealed a dearth of arboreal charcoal, and only occasional residue from the burning of scrub and

swamp plants. However, a constant supply of fuel of some description must have been available, otherwise the volume of fired pottery would have been much smaller. This fuel must have consisted almost exclusively of fresh or partially dry animal dung. As few domesticated animals were kept, it is probable that wild animal (likely onager) dung was collected. A similar practice was continued by American Indians of the mid-west. Such a slow, low-burning fuel would account for uneven surface oxidisation, persistent dark cores, and the lack of heat fusion in the oven building materials.

The hard-burnished pottery recovered was relatively rare and certainly imported. Formed from a foreign, almost pure, pink-brown clay, and levigated with a little chaff and fine grits, this category was thin walled, carefully burnished, hard-fired and fully oxidised. Within local pottery categories, burnishing usually extended only to the smoothing of coils with an instrument such as a bone spatula.

A society with apparently few agricultural products would hardly have required such a large amount of pottery for domestic use. Whilst a proportion of the vessels undoubtedly served as water carrying and food storage jars, and for culinary purposes, it is possible that the majority resulted from a need for creativity and aesthetic expression, and served no particular economic function.

NOTES

1. Kirkbride, 1972, 4.
2. Agricultural remains were few. As the gypsum subsurface and extremely adverse climatic conditions rendered agriculture virtually impossible in the region, it has been suggested that most cultivated vegetal content in the diet of the inhabitants must have been imported. Whilst short-term cultivation of barley and perhaps emmer may have been possible in small 'pockets' supplied by the run-off from non-saline soils, such production would have been insufficient to meet the needs of a community of any size for long periods of time. Pea and lentil (one example of each found) were certainly imported. Helbaek, 1972, 17-19.
3. Although the inhabitants kept 5 species of domestic animals, their bones represented only 13% of the total assemblage, thus indicating a heavy dependence on the hunted species. Bökönyi, 1973, 9.
4. After an initial phase at basal level, represented only by small oval or circular gypsum-lined basins, and thought to be the remains of a base-camp used during the building of the first permanent settlement; the village of Umm Dabaghiyah shows consistent careful planning, and excellent building techniques throughout the 4 occupation levels. During the earliest (level IV) some major re-planning took place (specifically the demolition of several domestic complexes to make room for storage blocks) after which the ground-plan remained essentially the same until the site was finally deserted at the end of Level I. Kirkbride, 1975, 4.
5. In level 2, a 15 x 12m. paved area was uncovered. Clay blocks of different sizes and angular shapes were used. These were heavily straw and chaff tempered. The most usual shape was rectangular and the average width and height measurements were 10cm. x 30cm. and more than 1m. long. Kirkbride, 1972, 3.

6. Kirkbride, 1973a, Pl. VI. b.
7. Toe-holds, cut into the tauf walls took the place of ladders in this treeless environment. Kirkbride 1975, 6, and Pl. Va.
8. An arch spanning an entire room, (its plastered springs coming from the walls at each side) in a level III house, is unique in the Neolithic era.
9. Kirkbride, 1975, 7.
10. Kirkbride, 1973a, 3.
11. The lack of wall-plaster, plain beaten earth floors, and massive walls suggest the whole complex was built for simplicity and the coolness necessary for the storage of onager hides. Kirkbride 1974, 86.
12. Although it had turned red or brown the clay construction material of both hearths and ovens showed no signs of heat fusion. This is possibly the result of an inadequate fuel supply. Gypsum burning kilns were identical to the ovens, and identified only by the residue of burnt gypsum they contained. Situated in the eastern corner of the settlement, they were probably used only when a strong west wind was blowing, driving all unpleasant fumes away from the village. No pottery kilns were identified. Kirkbride 1973b, 209.
13. Kirkbride 1974, 88.
Kirkbride 1973b, Pl. LXXXa.
14. Kirkbride 1972, 8, and Pl. VIIIb.
15. Kirkbride 1973b, Pl. LXXXb.
Kirkbride 1974, 88.
16. Kirkbride 1973b, 209.
17. Basket impressions preserved as casts on gypsum basket linings and gypsum and clay pot-lids. Kirkbride 1972, Pl. VIa and b.
18. Kirkbride, 1972, 5.

19. Several stone bowls were found in a fragmentary condition, and no attempt at repair was evident. Many were removed intact from the floors of the uppermost level, apparently carelessly abandoned when the site was deserted.
Kirkbride 1973a, Pl. IIIa.
20. Kirkbride 1974, 88-91.
21. Kirkbride 1975, 3-10, Pl. VIIIa, VIIa.
22. Heavy chaff and straw temper in both pottery and architecture presents a problem for the excavator's interpretation of the Umm Dabaghiyah economy. As little agriculture was practised, and most of the plant food was thought to be imported, it is difficult to suggest a source for the large quantities of agricultural waste necessary for pottery and architecture. More studies of the economic situation are necessary.

ERBABA

Site: Mound, 80m. diameter, extending over 5000 sq.m.
1130m. above sea level.

Location: on natural hill, 10km. north-northwest of Beyşehir,
immediately east of road from Beyşehir to Isparta in south
central Turkey.

Years of Excavation: 1969, 1971.

Excavator: J. Bordaz.

Area excavated: Grid of 2 x 1m. rectangles over area of site;
series of 13 test pits (2 x 1m.) to sterile soil.

Depth of deposit: 2.1-3.2m.

Stratigraphy: 3 layers representing at least 10 distinct phases
on virgin soil. Established, continuous occupation.

Chronology:

<u>Level</u>	<u>C¹⁴ Date</u>	<u>Reference</u>
Not indicated	5780 $\pm$ 171	Science 1971, 282.

ENVIRONMENT

Erbaba is situated on a small natural hill within the Beyşehir-Sugla basin, close to the shores of lake Beyşehir. More than 60 prehistoric sites have been identified in the immediate vicinity, although most are known only from surface collections. The region was suitable for permanent settlement having fertile soil, an abundance of fresh water, and a variety of raw materials for the manufacture of tools, weapons, and utensils.

A large outcrop of easily cut limestone located some 500m. south-west of the site provided the basic raw material for architecture for the entire occupation period.

Today the area receives 300-500mm. of precipitation annually, an ample amount for dry farming.¹

CULTURAL ASSEMBLAGE

Subsistence Cultivation: Cereals and legumes, very few specimens.²

Collecting: Information not yet available.

Herding: Possibly sheep, goat, cattle.³

Hunting: Very few species of hunted animals found.

Architecture Numerous walls and rectangular rooms of cut limestone blocks cemented with clay mortar. All structures orientated 20°E of N., in cellular pattern.

Chipped 50% flint, 50% obsidian, $\frac{1}{2}$ of waste and flakes =

Stone obsidian from mountains to E. of Konya plain.

 Principally notched tools, sickle blades and scrapers.

 Flint preferred for larger, heavier tools.

Ground and More than 150 ground stone pieces found, including

Polished grinders, handstones, pestles. Small number of

Stone polished celts (axes and chisels) for carpentry.

 Polishers and spheres of unknown use. No stone vessels.

Worked Bone Includes antler. Over 150 pieces; mainly awls, needles, spatulae, spoons. Antler handles common.

 1 belt buckle.

Ornaments Stone ornaments only found. Beads of various coloured stone, pendant.

Basketry and -

Textiles

Wood Small carpentry assemblage suggests some use of wood.

Figurines 3 fragmentary, of clay. Most complete is female, 2cm. high accounting for missing head.

Miscellan-
eous Finds -

Burial No burials located.

Customs

Pottery 2 types of ware. Lower levels: dull black or brown, sand tempered. Upper levels: polished monochrome; red, brown or yellowish. Gastropod tempered.

USES OF CLAY IN THE ERBABA ASSEMBLAGE

Architecture

- Site plan — Cellular plan; houses oriented 20°E. of N.
Plan conserved during several rebuildings.⁴
- Structures — Houses rectangular with party walls, average room size 4 x 3.7m. Thick north-south walls. Thinner east-west walls. Entrance through roof in lower (earlier levels). Doorways found in latest level.
- Construction — Foundation of large limestone blocks 30-50 x 20x20cm. Walls of superimposed courses of flatter blocks (usually in 3 rows), 25-60 x 10-30 x 5 - 7cm. 2 outer rows usually more carefully laid. All blocks cemented with clay mortar.⁵
- Materials and Techniques
- Wall finish — -
- Floor finish — Poor quality grey plaster, composition unknown.
- Roofs — No traces found.

Refractory Facilities

No hearths or ovens identified to date.

Storage Facilities

Storage pits

- Location — Within houses, all levels.
- Size/shape — Not stated.
- Construction — Simply dug into house floors, may have had lining materials of clay.
- and methods
- Possible use — Believed to have been refuse pits. However, large amount of carbonised seeds found in 1 example suggest use as storage pits.⁶

Figurines: 3 fragmentary, anthropomorphic.

Provenance — Not stated.

Material — Sundried or lightly fired clay.

Technical — Unusually small (largest 2cm. high), well modelled
data and finished.

Non-Pottery Containers in the Erbaba Assemblage

Basketry

No direct or indirect evidence.

Wooden Vessels

No direct or indirect evidence (small carpentry assemblage).

Stone Vessels

No direct or indirect evidence.

PORTABLE POTTERY CONTAINERS AT ERBABA

<u>Occupation Level</u>	Layer 1 (lower)	Layers II and III (upper)
<u>Amount of Pottery</u>	Prolific (20,000 sherds found in all).	Prolific, but sherd count diminished, in III from previous levels.
<u>Wares, Surface</u>	Coarse paste, thin walls in relation to later levels	Well-polished monochrome ware. Coarse paste, thicker walls than in 1.
<u>Temper, Firing</u>	Sand temper with large amounts of muscovite	Large proportion of gastropod temper.
<u>Shapes</u>	Hole-mouth jars with direct rims. No shaped lips. Flat bases; some crescent lugs, vertically perforated.	As layer 1, increase in crescent lug frequency.
<u>Colour</u>	Dull brown or black.	Red, brown, yellowish grey.
<u>Decoration</u>	No details available.	No details other than burnish.

SUMMARY OF THE ERBABA ASSEMBLAGE IN RELATION TO THE EMERGENCE
AND SIGNIFICANCE OF THE PORTABLE POTTERY CONTAINER

Clay Usage and Clay Technology

Although over 20,000 pottery sherds were recovered from the three main occupation phases at Erbaba, limited use was made of clay in other capacities.

The architecture was largely stone built, probably because vast quantities of easily cut limestone were available within close proximity of the site. Clay however was used as a bonding agent, forming a solid mortar layer between adjacent rows of limestone blocks. Floors were plastered with a greyish material of unknown composition. No refractory facilities have been located to date, but large sunken storage basins located within the individual houses may have been lined with clay.

As for small artefacts, only three tiny figurines were found. These were well modelled and finished, and may have been lightly baked.

SUMMARY OF CERAMIC TECHNOLOGY.
AT ERBABA.

Vegetable temper.	
Mineral temper	P
Modelling	X P 
Bonding	X P
Burnishing	P
Decoration, painted.	
Decoration, other.	
Firing	X possibly figurines

CONTAINERS IN RELATION TO THE CULTURAL ASSEMBLAGE

The Erbaba assemblage poses problems for a study of this type. No evidence of portable containers was recovered other than a vast number of potsherds. Although this may be an accident of excavation, it is possible that pottery containers were preferred to those of other materials for all purposes. However, in the light of present evidence it is impossible to ascertain whether or not the people had actually used bowls of wood and stone, or baskets prior to the time when pottery was adopted. It is unlikely that pottery making was developed at the site. Sand-tempering, thin walls, and the presence of knobs and lugs on the first Erbaba pottery are all indicative of an earlier developmental period.

The site is relevant to this study, only insofar as it demonstrates that people with an apparently low level of culture in other respects, can still produce pottery. The economic base at Erbaba is uncertain. It seems that no domestic animals were kept, and few plant remains were recovered. The architecture consisted of closely packed houses constructed from crude limestone blocks without a plaster finish. A few stone ornaments, a bone belt buckle and the three figurines are the only non-utilitarian artifacts recovered.

Without further evidence it is not possible to suggest why the inhabitants needed so much pottery. The Erbaba ceramic

* New evidence (post 1973) clarifying this problem is as yet unpublished. Pers. comm. J. Mellaart.

assemblage has not yet been thoroughly analysed, therefore probable uses for specific vessel forms cannot be conjectured. Horizontal and vertical perforated lugs are likely to have served as suspension points, or anchorages for a protective cover of some sort. This would suggest storage, but until more economic evidence is available it is impossible to suggest what may have been stored.

NOTES

1. Farrand, 1964, 149.
2. The amount of domestic plants recovered at Erbaba is described as a 'trace' in a preliminary statement. Perkins, 1973, 281. The excavator suggests that this 'trace' included cereals and peas, probably of the domesticate variety. Bordaz 1973, 284.
3. The theory that the goat, sheep and cattle bones recovered from Erbaba were those of domestic animals (Drew, Perkins and Daly, 1971, 280-282) has been refuted after a more recent study, Watson, 1975, 375-383. It is possible, however that the wild species were herded.
4. Bordaz, 1969, 60 and figs. 3, 4, 5.
5. Bordaz, 1969, 60.
6. Bordaz, 1973, 284.

FRANCHTHI CAVE

Site: Cave, 150m. deep x 30m. wide at mouth with associated terraces and Neolithic area known as 'paralia', 12.5m. above sea level.

Situated: at western end of rugged headland across bay from village of Koilada, 4km. north-northwest of Kranidi, near southernmost tip of the Argolid, Greece.

Excavated in: 1967-1976 (8 excavation seasons and study sessions in 1970 and 1972).

Excavated by: Thomas W. Jacobsen.

Area Excavated: 20-40m. depth across front section of cave, and terrace in front of cave. Terraces below cave mouth and 'paralia' (most important Neolithic deposit).

Depth of Deposit: Maximum 8.0m. to impenetrable mass of brecciated rockfall, within cave. 2m. Neolithic deposit in terrace area and 'paralia'.

Stratigraphy: Palaeolithic, Mesolithic and 3 Neolithic strata identified.¹

Chronology:²

<u>Level</u>	<u>C¹⁴ Date</u>	<u>Reference</u>
E.N. (late)	4990 $\pm$ 90 BC	Jacobsen, 1974, 302.
transitional E.N.-M.N.	4718 $\pm$ 74 BC	Jacobsen, 1973a, 86.

ENVIRONMENT

The Franchthi cave is thought to have been formed by solution in crystalline limestone during the Miocene period.

At the rear of the cave is a small pool possibly connected to a subterranean water supply, and perennial springs issue from the rocks just below sea level at several points along the shore below the site. Ample fresh water is thus available.

From a rocky terrace in front of the cave the ground slopes gently to the shore some 50m. distant. Woodland and fertile arable soil were available in varying measure in the vicinity throughout the occupation period.

A variety of stone, principally flint occurred locally in the form of sea and river pebbles, and was used during all periods for the manufacture of tools. Obsidian was imported from Melos in the Cyclades.³

Resources peculiar to a marine environment such as fish and molluscs were exploited from the Palaeolithic era onwards.

EARLY NEOLITHIC LEVEL, CULTURAL ASSEMBLAGE

- Subsistence Cultivation: Emmer, 6-row barley, barley (sp.), lentil.
Collecting: Pistachio, almond.⁴
Herding: Sheep/goat 70-85% of total bones, pig 5-15%,
bovid 5-10%, some dog.
Hunting: Red deer, small amount of hare, bird,
tortoise, fox.⁵ Fish frequent, 5-10% total sample.
Large quantity of shellfish and snails.⁶
- Architecture Few structural remains in cave site. Low wall of
large and small stones, stone fireplace. Lumps of
clay with reed impressions suggest wattle and daub
lean-to. Structural stonework in area outside cave
(exclusive neolithic deposit), too badly eroded to
determine nature.
- Chipped 25% obsidian, 75% flint.⁷ Tools much smaller than in
Stone preceding mesolithic phase. Include arrow-heads,
flakes and blades with sickle gloss, awls, blades
scrapers, notched forms.
- Ground and Millstones of various types (cereal preparation).
Polished Polished celts (woodwork). Many querns, mortars,
Stone pestles of soft local rock such as sandstone, diorite.
Polished tools of felsitic porphyry, serpentine.
Some stone vessels.
- Worked-Bone 3 of assemblage = points. Also spatulae, scoops,
gouges, fishhooks. Antler tools scarce.
- Ornaments Stone: Beads, pendants (mainly steatite and soapstone).
Boar tusk: 3 ornaments.
Shell: Rings, pendants, bracelets of spondylus, cowrie,
oyster, topshell.⁸
Clay: Few beads.

Basketry and Loom weights and many clay spindle whorls.

Textiles No evidence of basketry.

Wood Celts suggest considerable use of wood.

Figurines 25 total, most in 'uncertain' contexts.
Usually human, of same paste as pottery, painted.
Many heads found alone without correspondence
to bodies.⁹

Miscellaneous Worked shell: polished burnishing tools, mussel
Finds spoons. 1 clay 'sling bullet'.

Burial Primary and secondary burials in shallow pits
Customs within and outside village. Little attention
to dead other than in case of 1 child whose head
was propped up by 'pillow' of small stones.
2 instances of grave gifts:- broken pots with
child; tools with older woman.

Pottery Simple pottery, few forms. However, not primitive
or crude. Reflects well-established tradition.

USES OF CLAY IN THE FRANCHTHI EARLY NEOLITHIC ASSEMBLAGE

Architecture (Cave)¹⁰

Site Plan — -

Structures — Very little evidence. 1 wall with light super-
structure may have served as windbreak.¹¹

Construction— Wall: of large stones with small pebbles in
materials and interstices.

techniques Superstructure or lean-to: wattle and daub;
deduced from numerous lumps of clay with reed
impressions found near wall.

Wall finish — -

Floor finish — -

Roofs — -

Refractory Facilities

Hearths and Ovens: None found.

Fireplace: Constructed of small stones, found close to
wall/windbreak.

Storage Facilities

No evidence.

Figurines

Categories: Majority human, female.

Examples of zoomorphic figurines.

By the end of the 1968 season 25 total found, possibly
assignable to E.N.

Figurines, cont'd.:

Provenance— Stratigraphic context uncertain, but several believed to be E.N. Most found headless. Some heads found.

Material— Fired clay. Body similar to that of pottery. Frequently painted.

Technical— Crude modelling. Anatomical detail executed in cursory fashion. Facial features indicated by rough pinching and incision. Some emphasis on sexual features.

Miscellaneous Clay Finds

Spindle whorls

Material— Fired clay

Shapes — a) roughly circular.
b) flat or low conical.

Technical— a) Fired potsherds shaped, then drilled from both sides, in centre.

Data b) Purpose made, well finished.

Loomweights

Material— Grit-tempered clay. Surface colour varies from orange-buff to grey.

Shapes — Roughly spherical, circa 0.5m. diameter. Weight average 110 gms.¹²

Technical— Clay formed into rough sphere. Pierced by central hole (traces of string wear around hole frequent).
Data Unevenly fired causing variations in surface colour.

Clay beads.

NON-POTTERY CONTAINERS IN THE FRANCHTHI ASSEMBLAGE

Basketry

No direct or indirect evidence.

Wooden Vessels

Direct evidence: none.

Indirect evidence: Impressive assemblage of polished carpentry tools. No wood used in architecture, therefore vessel manufacture possible explanation of tool assemblage.

Stone Vessels: Fig. Franchthi I.

Rare, 11 fragments from different vessels identified.

Material— Marble.

Shapes— Simple shapes, difficult to draw complete profiles from few fragments.

Technical— Carefully made and well polished.

data . 1 example of double pierced lug handle.

PORTABLE POTTERY CONTAINERS AT FRANCHTHI CAVE¹³ Fig. Franchthi 2,3.

Amount of— No numerical details available, but E.N. known to be

Pottery least abundant of neolithic wares; 5% of total pottery found = E.N.

Wares, — a) burnished monochrome ware. 70% of E.N. sherds.

Surface b) red patterned ware, burnished after painting.
5% of E.N. sherds.

c) Fine black burnished ware, believed to represent transitional phase.

c) 'Spongy' monochrome ware; grey to light brown, believed to be accidental variant.

Temper, — Temper: small stone inclusions, no vegetal temper.

Firing Firing: uneven, many colour variations on same pot.
Frequent dark cores.

Shapes — Hole-mouth jars and deep hemispherical bowls most frequent. Open bowls and jars with low collars.

1 jug with oval neck and attached handle.

Horizontal lug handles, occasionally arranged in rows (decorative rather than utilitarian).

Colour — Brown or reddish-brown with much firing variation.

Red-patterned ware; patterned in thick reddish brown paint.

Decoration-Relief: almond shaped knobs, often in series, below rims of jars and bowls.

1 example of human face.

Painted: usually rectilinear patterns. Burnishing streaky, uneven. Burnishing always completed after painting.

SUMMARY OF THE FRANCHTHI CAVE E.N.1 ASSEMBLAGE IN RELATION TO
THE EMERGENCE AND SIGNIFICANCE OF THE PORTABLE POTTERY CONTAINER

Clay Usage and Clay Technology

There was no requirement for architecture in the cave area and thus clay usage was generally confined to the modelling of small artifacts and pottery. Knowledge of clay as a structural material, however, is attested by the remains of a low wattle and daub leanto or windbreak near the cave mouth. Although refractory facilities found at Franchthi were limited to one small fireplace, it is likely (considering the fired ceramic assemblage and the amount of grain which was presumably parched) that kilns, or at least ovens were located outside the confines of the cave. The lack of large storage facilities in an economy with an agricultural bias is surprising. Possibly ceramic or stone vessels were adequate in this capacity, or perhaps like the ovens, storage bins may have been located in a hitherto unexcavated area. Several crudely modelled human and animal figurines were recovered. These were modelled from the same mineral tempered paste as the pottery, and were often painted, decorated with incision and pinching, and invariably fired. The specialised clay tool assemblage comprised well-made, fired spindle whorls and loom-weights attesting a developed knowledge of weaving. Most ornaments were made from stone or tusk, but a few fired clay beads were also recovered.

SUMMARY OF CERAMIC TECHNOLOGY.

AT FRANCHTHI CAVE, EARLY NEOLITHIC

Vegetable temper.	
Mineral temper	X P
Modelling	X P
Bonding	P
Burnishing	P
Decoration, painted.	P
Decoration, other.	incision (figurines) P: relief.
Firing	X P

CONTAINERS IN RELATION TO THE CULTURAL ASSEMBLAGE

Although no examples of baskets were found, their existence was likely. Weaving was known, and baskets are appropriate vessels for grain collection. A large carpentry assemblage and a singular lack of wooden artifacts or architecture suggests the possible manufacture of wooden bowls which have left no trace. Well-made stone bowls were rare and it is possible that the Franchthi inhabitants had substituted clay vessels in many roles previously filled by stone, and that stone was retained for specific purposes (perhaps ceremonial or ritual as no suitable clay vessels were found), or simply through conservatism.

Pottery appeared suddenly at Franchthi.¹⁴ The E.N. wares are most abundantly represented in those deposits which lie directly on Mesolithic layers. It would seem likely, therefore, that the initial stages of this particular ceramic industry must be sought elsewhere.

The manufacture of clay vessels was introduced at a developed level of technical competence. Knowledge of temper, burnishing, firing (albeit erratic), application of slips and pigments, and appliqué decoration, is evident in the earliest wares. A handful of rough, unbaked sherds was also found in an E.N. context, but these are believed to have been potters' rejects rather than the early fumbings of a new craft.¹⁵

The range of shapes and vessel sizes suggest that pottery was primarily used as cookware and for the storage of small amounts of food. Neither large storage containers nor luxury ritual vessels were found in E.N. contexts, with the exception

of a single pot, broken almost exactly in half, found with a child burial. Ritual breakage is suggested, although whether the vessel was originally manufactured for funerary purposes is impossible to ascertain.¹⁶

Painted and appliqué decoration occurring on a small number of vessels retrieved, indicate a desire to enhance the appearance of otherwise dull functional objects.

NOTES

1. This study is confined to the E.N. (early neolithic) stratum, representing the earliest pottery using phase at the site.
2. More than 50 C^{14} dates are now available from different occupation levels within the cave. The 2 earliest suggest that Palaeolithic occupation began around 20,000BC. Jacobsen, 1976, 76.
3. Renfrew, Cann, Dixon, 1965, 239.
4. Palaeobotanical analysis from the Franchthi cave has supplied positive evidence of plant utilisation from the palaeolithic period onwards. Seeds of lithospermum, vetch, lentil and alkanet have all been identified in the earliest occupation debris. J. Renfrew, 1973b, 67.
5. Below the neolithic levels, the faunal remains show striking dissimilarities. Red deer is predominant and there is no trace of sheep or goat. Domesticated animals, therefore, arrived with the first neolithic settlers. Jacobsen 1969a, 351; Jacobsen, 1973b, 256 n.6; Jacobsen 1976, 79.
6. Range of shellfish in the neolithic included Patella (limpet), Monodonta (topshell), Cerithium (pointed, snail-like shell), Cerastoderma (cockles), Venerupis (carpet shells), Arca (Noah's ark shells), Ostrea (oysters), Mytilus (mussel). Shackleton, 1969, 378.
7. This figure (25%) represents an enormous increase in obsidian artifacts over mesolithic levels. The proportion of obsidian to flint continues to increase throughout the neolithic era, because of its superior quality for tool manufacture. Jacobsen, 1969a, 359. Jacobsen 1973a, 79.
8. Recent excavation of the neolithic deposits has revealed evidence of the possible existence of a specialised shell bead industry, flourishing in the latter part of the 6th millennium. Large quantities of bead blanks, finished beads and drilling implements were localised in the settlement along the shore. Jacobsen 1976, 84.

9. "One wonders if this kind of fragmentation of anthropomorphic figurines was intentional and perhaps part of a religious ritual". Jacobsen 1973b, 275.
10. Structural stonework found during recent excavations of the terrace area outside the cave (neolithic deposit), has been tentatively identified as the remains of retaining walls for a small settlement. The effects of long-term erosion prohibit more precise identification. Jacobsen, 1976, 83-84.
11. Jacobsen, 1973a, Pl. 14b, 14d.
12. These objects were originally classified as 'spherical weights'. Jacobsen, 1969a, 372.
Similarity in size, shape and weight of the 5 thus far found has suggested their reclassification as loom weights. Jacobsen, 1973b, 277.
13. It is presently uncertain whether the earliest evidence of animal domestication and crop growing was contemporary with the first appearance of pottery at the site. Jacobsen suggests that any delay in the start of pottery making once domestication had begun "was not a long one". Jacobsen, 1976, 82.
14. The earliest pottery at Franchthi is provisionally dated to a little later than 6000 BC. Jacobsen 1976, 84.
15. Jacobsen, 1973b, 262.
16. Mended pot found with burial of older woman more likely to have been everyday possession rather than ritual object. Jacobsen 1976, 85.

ANZA

Site: Mound, 300 x 300m., 265m. above sea level.

Location: In central Balkan peninsula, east Macedonia, on lower terrace of Nikolsa river, tributary of larger Pregalnica.

Years of Excavation: 1960, 1969-70.

Excavators: Archaeological Museum of Skopje (1960).¹

Milutin Garašanin, University of Belgrade, and

Marija Gimbutas, U.C.L.A. (1969-70).

Area Excavated: Yugoslavian contingent excavated 9 squares, 5 x 5m.

Americans excavated 24 smaller squares and

3 test pits.

Depth of Deposit: 4.70m. to sterile soil.

Stratigraphy: 4 distinct cultural layers numbered I-IV (bottom to top). Strata 1a and 1b subject of present study.²

Chronology:

<u>Level</u>	<u>Date</u>	<u>Reference</u>
1a	5320 $\pm$ 140 BC 5220 $\pm$ 50 BC 5210 $\pm$ 50BC	Gimbutas, 1974b.
1b	5160 $\pm$ 120 BC 5280 $\pm$ 170 BC 5170 $\pm$ 80 BC 5150 $\pm$ 80 BC 4890 $\pm$ 100 BC	

In addition 4 thermoluminescence determinations are available all for sherds from 1b layer. These are 6830 BC., 6730 BC., 6530 BC., 6390 BC.³

ENVIRONMENT

During the initial occupation period at Anza, the surrounding hills were densely forested, sheltering a large variety of wild game. Oak, pine and juniper were well represented during the Anza 1 period, but decreasingly so in subsequent phases. This gradual recession of woodland, which happened over the suggested 1000 year occupation, was probably a direct result of encroaching agricultural and pastoral activities, and the use of wood for structural purposes.

Climatic conditions in east Macedonia are thought to have represented a modified Mediterranean régime, with higher rainfall than at present. The soil was extremely fertile supporting a wide variety of food crops. Mineral resources were plentiful, and several perennial supply points for fresh water could be found close to the site. The location of Anza appears to have been carefully chosen and all available natural resources were utilised according to available technology.

CULTURAL ASSEMBLAGE, Anza 1.⁴

<u>Subsistence</u>	<u>Cultivation</u> : Emmer (predominant), einkorn, hulled 6-row barley, club wheat, ⁵ peas, lentils. <u>Collecting</u> : Wild fruits in season; apple, cherry, wild grape, hazelnut. <u>Herding</u> : Domestic sheep, goat (predominant) cattle, pig, dog. (Total 1157 animals). <u>Hunting</u> : Auroch, deer, wild boar, tortoise, bird (total 41 animals identified). ⁶
<u>Architecture</u>	Area excavated by American team too small for reconstruction of site plan. Houses of sun-dried, plano-convex, mud-bricks. All architecture to be published by Yugoslavian expedition.
<u>Chipped</u>	Mostly agricultural tools, few hunting implements.
<u>Stone</u>	50% quartz or cryptocrystalline silicate material from volcanic rocks. Materials derived from local stream gravels.
<u>Ground and</u>	Food preparation and grinding tools. Axes, adzes,
<u>Polished</u>	picks, hammerstones; thought to be multi-purpose
<u>Stone</u>	carpentry tool assemblage.
<u>Worked Bone</u>	Spatulae (predominant), thought to be pigment mixers or spoons. Awls, needles. 2 pipes (musical instruments) with flattened bases and wind holes. ⁷
<u>Ornaments</u>	Stone: } extremely high quality pendants, beads, Bone: } - discs and bracelets. ⁸ Shell: } Discs believed used for garment decoration. ⁹ Clay: }

Basketry and Perforated discs (spindle whorls).

Textiles

Wood Large woodworking industry deduced from high quality polished stone tool assemblage.

Figurines Human and animal figurines, anthropomorphic and ornithomorphic vases, zoomorphic protomes of 'cult' vessels. Sophisticated workmanship. Clay with detail in paint or shell.

Miscellaneous Musical instruments (see 'worked bone') most unusual find.

Finds

Burial Pithos burial common, particularly for infants.¹⁰

Customs

Pottery Developed sophisticated industry from beginning of settlement. Slips, burnishing, painting techniques known from outset. Clear distinction between coarse, and fine 'ceremonial' wares.

USES OF CLAY IN THE ANZA 1 ASSEMBLAGE

Architecture

House structure: "plano-convex mud-bricks".¹¹

Refractory and Storage Facilities

Unpublished.¹²

Figurines: Fig. Anza 1.

Categories: Human (predominant).

Animal.

Zoomorphic protomes of cult vessels.

Anthropomorphic or ornithomorphic vases.

Provenance—2 distinct locations.

a) above floors of houses or in wall debris,
usually associated with fine pottery.

b) in pits together with fine pottery, 'offering
tables', animal bones, teeth, claws.

Material— Well tempered, well-fired clay.

Technical— Cylindrical core contoured by finger modelling.

data¹³ Limbs, heads and body parts individually modelled
and joined to central core. Completed, leather-hard
figurine smoothed and usually burnished with bone
polisher, then slipped. Eyes, ornaments, hair, dress
etc. indicated by excision filled with white shell
paste, or by overpainting.

Miscellaneous Clay Finds

Ceramic discs: perforated, believed to have been spindle whorls.

'Many' baked clay beads, pendants, bracelets.

NON-POTTERY CONTAINERS IN THE ANZA ASSEMBLAGE

Basketry

Direct evidence: none

Indirect evidence: techniques probably known if woven cloth being manufactured.

Wooden Vessels

Direct evidence: none.

Indirect evidence: large quantity of well made carpentry tools.

Stone Vessels

No evidence.

PORTABLE POTTERY CONTAINERS AT ANZA 1. FIG. ANZA 1, 2.

<u>Level</u>	<u>1a</u>	<u>1b</u>
<u>Amount of pottery</u>	Prolific. Sherd counts not yet available.	
<u>Wares,</u>	a) very fine, thin walled, slipped and burnished. b) medium fine, slipped and burnished. c) medium coarse, slipped or burnished. d) coarse, no slip or burnish.	
<u>Surface</u>		
<u>Temper,</u>	a) 'almost without temper', well fired. b) grit or pebble temper; dark, unoxidised core. c) grit or pebble temper; dark, unoxidised core. d) coarse grit temper; poorly fired.	a) no temper, well fired.
<u>Firing</u>		
<u>Shape</u>	Rounded forms without lip or carination commonest. Flat and ring bases. Stringhole lugs common on coarser wares. Quatrefoil bases distinctive.	Globular jars and open bowls remain common. Necks and rims now frequent. Horizontally or vertically perforated lugs popular on coarse ware of this period.
<u>Colour</u>	a) maroon slip and red burnish on orange body. b) orange slipped, white painted. c) brown slip or pink-buff burnish. d) unslipped salmon pink or buff.	Similar to 1a with increased range of pigments.
<u>Decoration</u>	a) slip and burnish only. Poor bonding. b) painted designs include triangles, curved lines, ovals, net patterns. c) slip or burnish only. d) no decoration.	Fine and Medium-fine ware: painting usually white on red-brown or black ground. Orange-red on cream slip also found. Designs include whirl patterns of triangles, geometric leaves, buds, rows of blobbed lines, eggs, crescents. Coarse ware: stabbing, incision, finger-impression.

SUMMARY OF THE ANZA 1 ASSEMBLAGE IN RELATION TO THE EMERGENCE
AND SIGNIFICANCE OF THE PORTABLE POTTERY CONTAINER

Clay Usage and Clay Technology

Although the most obvious role of clay at Anza was in the pottery industry, a tradition of clay usage was evident in other capacities. Despite the present lack of architectural data, clay is at least known as a structural material in the form of moulded mud-bricks.

Many figurines were found all of well-tempered clay. Human and animal varieties were beautifully modelled with a central core to which body parts were carefully bonded. The finished models were highly burnished and slipped with details indicated by filled excision or overpainting. Firing was invariably hard and complete. Baked clay was also used for a large number of personal ornaments and for spindle whorls.

SUMMARY OF CERAMIC TECHNOLOGY.

AT ANZA.

Vegetable temper.	X
Mineral temper	X p.
Modelling	X p.
Bonding	X p.
Burnishing	X p.
Decoration, painted.	X p.
Decoration, other.	excision, shell paste, in-fill, slip (figurines).
Firing	X p.

CONTAINERS IN RELATION TO THE CULTURAL ASSEMBLAGE

No vessels other than those of pottery were found at Anza. Although possible, it is unlikely that none were used, for vessels of pottery would not have been suitable for all purposes at a site with an agricultural economy. Shallow baskets for example are more obviously suited to the gathering of grain, than are heavy pots.

A thriving pottery industry is evident from the foundation layer at Anza. All pottery found in this level betrays a considerable technical tradition. Knowledge of tempering appropriate to specific vessel categories; firing techniques (high temperatures achieved); shaping, smoothing and brading skills; and the manufacture and use of a wide range of slips and pigments are all evident throughout the 1a and 1b assemblage.

Vessels were deliberately made to different specifications to suit different purposes. Very fine, thin walled, expertly finished vases are believed by the excavator to have been reserved for ceremonial use.¹⁴ Coarse grit-tempered ware was made in large quantities as everyday household pottery and cookware. Storage vessels were provided with perforated lugs for suspension, or for attaching a cover, probably of cloth or skin.

Much of the pottery was burnished to reduce porosity and for aesthetic purposes. A considerable repertoire of skilfully executed decorative motifs was used in Anza 1a and 1b.

These represent an interest in aesthetic expression, and the desire to improve the appearance of everyday objects.

The Anza cultural assemblage is one of the most sophisticated included in this study. The first settlers arrived with an economy based upon developed agriculture, animal husbandry, industry and probably trade. Caprovines, cattle and pig were kept, a variety of cereal and pulse crops were grown, and seasonal fruits and a little game were added for dietary variation. A wide range of quality goods exploiting both local and imported materials was produced by specialised craftsmen. Pottery itself was probably manufactured by a small group of specialists.¹⁵ No vessels of stone, wood or materials other than clay were recovered, and whilst there is no proof, it is possible that other container fabrics had been forsaken in favour of ceramics prior to the foundation of the settlement. It is clear, however, that when Anza was founded, pottery had emerged as the dominant container type.

NOTES

1. Korošec and Saržoski, 1960, 44-46. Korošec, 1972.
2. Levels II-IV illustrate the development of the pottery industry, rather than the earliest pottery assemblage at the site.
3. Anza is the only site among those studied for which thermoluminescence dates are available. The Anza examples are all earlier than the C¹⁴ dates. However it is impossible to assess the implications of this until similar determinations are available for other sites.
4. Anza was selected for analysis firstly because of the essentially local 'personality' of its assemblage, and secondly because of the great importance of clay modelling and ceramic vessels in this sophisticated and affluent settlement.
5. The appearance of club wheat in Anza 1 is interesting. This is a domesticated hybrid particularly suited to bread-baking as it contains a high proportion of gluten (natural raising agent). The disappearance of this cereal in subsequent phases of the settlement remains a mystery. Gimbutas, 1974b, 46.
6. Wild animals represent only 6% of the faunal assemblage. It is clear that the inhabitants relied wholly on agriculture and herding for subsistence, and that wild food was consumed only for occasional variety.
7. The bone flutes from Anza 1 are unique throughout all sites analysed. They represent a form of self expression for which we have no other contemporary evidence. Gimbutas, 1972, 117, upper plate.
8. Ornaments of "Spondylus gaederopus" shell (many rings and beads) suggest possible trade contacts with the Aegean. Gimbutas, 1974b, 60.
9. This suggestion was inspired by garment decoration apparent on several figurines unearthed. Gimbutas, 1974b, 60-61.

10. The bones of a new-born baby were found in a large egg-shaped vase open at the base. The excavator has the interesting but unprovable suggestion that this indicates "... a belief in a rebirth from the earth associated with the form of an egg". Gimbutas, 1972, 116.
11. Publication of all architectural data other than that which related directly to stratigraphy, was the responsibility of the Yugoslavian team excavating the centre of the mound. This publication is forthcoming.
12. Cf. previous note.
13. Figurine types and method of manufacture homogeneous throughout Anza strata.
14. Gimbutas, 1974, 53.
15. The high quality of artifacts produced at Anza suggests craft specialisation. However, without evidence of specialised workshops this suggestion cannot be substantiated.

CONCLUSIONS

It is necessary, when considering the substantive conclusions drawn from the preceding body of evidence, to bear in mind two important facts. Firstly, the sites included for study are merely a representative selection of pre-pottery and early pottery using communities in a relatively small area of the world's surface. The study is open to considerable extension. Not only would it be profitable to investigate all Mediterranean sites, but also, there is little doubt that comparisons between aceramic and early ceramic communities in Europe and the New World, for example, would provide much useful information concerning technology as it applies to pottery on a global scale.

Secondly, and perhaps more important, standard of data-recovery and the extent and method of publication vary considerably among the sites included. These variations are contingent upon both the archaeological techniques available at the time each excavation took place, and the methods employed by the individual excavator. In a paper presented to the 1971 Sheffield conference, 'The Explanation of Culture Change: Models in Prehistory', David French pointed out that there could be no valid quantitative comparisons between material dug from two different sites unless it could be established that the same proportion of the same materials with respect to the total amount of material had been recovered.¹ French wants to see definable, measurable and repeatable methods of data-recovery applied to archaeological digs, and presumably also to the publication of data recovered.

However, even if future excavations were to follow standardised methods (unlikely in view of both national and international archaeological politics) the problem of interpreting non-standardised data from sites dug in the past still remains. During the years between the excavation of Khirokitia (1936-39, 1946) and the excavation of Franchthi (continuing into 1976), techniques of recovering, recording and interpretation have undergone vast changes. Computers and various branches of scientific investigation such as chemical and physical analysis, and plant animal genetics are now commonplace in archaeological contexts. In a recent book dealing with the history of excavation and interpretive method, David Wilson defined the new archaeology as "an attempt to apply the quantitative methods of the natural sciences to the science of archaeology, not only in obtaining answers, but also in asking questions; not only in assembling data for the archaeological record, but also in deciding what data to assemble".²

It is hoped, in the concluding section of this thesis not only to evaluate the evidence as presented in the light of the hypotheses set out in the introduction, but also to suggest some of the ways in which this data could be interpreted more meaningfully, using the techniques of modern archaeology.

Of the twenty-four sites examined, nine were aceramic throughout the occupation period studied; seven were at first aceramic and later pottery using; and eight were ceramic throughout (Table C.1.). It will be noted that

Çayönü (three sherds) and Suberde (five sherds) are classed as aceramic. It was felt that the few crude pottery samples recovered do not represent a ceramic phase, particularly as no further development took place. The 'experimental' sherds from Khirokitia are ignored for the same reason, and the ceramic phase at this site is taken to begin in period III.

Pottery, chronology and cultural level

The earliest pottery recovered thus far comes from Ganj Dareh, level E, dated to the ninth millennium. Ceramic vessels, albeit in small quantities continued in use at this site throughout the occupation period (latest date ca. 7000 BC) and it seems plausible that they were produced there. Ample clay was available, familiarity with ceramic technology is demonstrated in other contexts (e.g. architecture and the production of figurines and geometric objects), and the vessel forms may well have been based upon those of containers in other materials already in use (e.g. the gourd-shaped vessel found in level D).

Discounting the three coarse sherds from Çayönü in eastern Turkey (ca 7500 BC) pottery is next recorded in the mid to late seventh millennium at six of the sites studied, scattered over a wide geographical area (Jarmo, Catal Hüyük, Tell Abu Hureyra, Ali Kosh, Mohammad Jaffar phase, Achilleion, Nea Nikomedia). Pottery was introduced at the remaining eight ceramic sites (Tell Ramad, Bouqras, Knossos, Khirokitia, Umm Dabaghiyah, Er Baba, Franchthi, and Anza) during the sixth millennium.³ It would appear therefore, from currently available data, that the portable pottery container began to be adopted on a wide scale ca. 6500 BC and was in general use at most Neolithic sites in the area studied by the mid 6th millennium.

TABLE C1

Sites without pottery		Sites at first aceramic, later pottery using			Sites using pottery throughout occupation period studied	
Site	Earliest Occupation Date	Site	Earliest Occupation Date	Date when Pottery First Produced	Site	Earliest Occupation Date
Zawi Chemi-Shanidar	8650 $\pm$ 300*	Jarmo	6650 $\diamond$	6300 $\diamond$	Ganj Dareh	8450 $\pm$ 150*
Karim Shahir	8500 $\diamond$	Ali Kosh	7000 $\diamond$	6100 $\diamond$	Çatal Hüyük East	6240 $\pm$ 33*
Tell Mureybit	8018 $\pm$ 115*	Tell Abu Hureyra(N)	6500 $\diamond$	6000 $\diamond$	Achi Leion	6521 $\pm$ 77*
Nahal Oren	8000 $\diamond$	Tell Ramad	6260 $\pm$ 50*	5500 $\diamond$	Nea Nikomedia	6220 $\pm$ 150
Jericho PPNA PPNB	8000 $\diamond$	Bouqras	6190 $\pm$ 60*	5990 $\pm$ 60*	Umm Dabaghiyah	5750 $\diamond$
Çayönü (3 crude sherds)	7590 $\pm$ 110*	Knossos (E.N.)	6100 $\pm$ 180*	5620 $\pm$ 150*	Erbaba	5780 $\pm$ 171
Beidha	6990 $\pm$ 160*	Khirokitia	5650**	5500 $\diamond$	Franchthi Cave (E.N.)	5500 $\diamond$
Aceramic Hacilar	6750 $\pm$ 180*				Anza	5320 $\pm$ 140*
Suberde (5 crude sherds)	6326 $\pm$ 289*					

All dates BC. *...C¹⁴ dates. **...average of C¹⁴ dates.

$\diamond$ estimated date, based on excavator's estimation, or upon apparent occupation period at contemporary sites.

It is difficult to suggest a reason why the only pottery known prior to the mid seventh millennium was produced specifically at Ganj Dareh. Of the ninth millennium sites included in this study, Zawi Chemi-Shanidar, Karim Shahr and Nahal Oren all revealed a relatively low level of culture. Although it is possible that sheep were herded at Zawi Chemi, and gazelle at Nahal Oren, and that some cultivation may have been practised at Nahal Oren, food requirements at the three sites seem to have been largely supplied by hunting and the gathering of wild plants. No durable architecture was found at Zawi Chemi Shanidar or Karim Shahr, and despite planned house foundations at Nahal Oren, meagre artifact assemblages were recovered from all these sites. The beginnings of clay usage are apparent in the form of a low clay wall at Shanidar, a bin lining at Zawi Chemi and pisé floors at Nahal Oren (clay offers protection against the elements, and against damp), a hearth at Nahal Oren (clay is a refractory material) and two crude figurines at Karim Shahr (clay is a convenient modelling material). At Nahal Oren, vegetable tempered clay (pisé) was used for flooring in some of the houses, indicating that the inhabitants had learned that the addition of an aplastic material to raw clay increased its strength and improved its handling qualities. Mureybit, Jericho and Ganj Dareh, the remaining sites studied where occupation began in the ninth millennium, are believed to represent permanently occupied village settlements (the earliest pottery using level, E, at Ganj Dareh has been identified as a campsite) with economies based

on a mixture of hunting, gathering, some agriculture, and at Ganj Dareh, sheep and goat herding. Complex architecture (at Ganj Dareh, from level D onwards) and a diverse cultural assemblage was recovered from the three sites. Adequate clay technology for pottery manufacture was available at each location (it is unclear whether firing was known before PPNB levels at Jericho) in the ninth and early eighth millennium, but only at Ganj Dareh were ceramic vessels produced. The single sherd found at Ganj Dareh level E, awaits further interpretation. Assuming this sherd was not intrusive from a later level, why would people occupying a temporary camp produce heavy and fragile pottery? Perhaps the sherd represents an experiment, but this implies a prior knowledge of at least modelling and firing. It is possible that the people who made this extremely early pottery may have inhabited a more permanent settlement elsewhere. Further excavation in the area, analysis and interpretation of all data from Ganj Dareh may provide a solution to this problem.

The only site included in this study with occupation beginning in the eighth millennium is Çayönü. Sophisticated architecture was revealed, incorporating such features as grill foundations and 'terrazzo' floors, unique in the Early Neolithic era. Agriculture was practised, and domestic animals were kept in the later levels (IV and V). A varied use of clay and familiarity with ceramic technology was evident throughout the occupation period, and a diverse artefact assemblage was recovered. Three stratified potsherds were

found in a level III context, all untempered, poorly made and fired, and without surface finish other than smoothing. It is unknown whether these were locally produced or arrived through trade, but lack of any further development would suggest that, for whatever reason, pottery was not appreciated at Çayönü, and the site must be regarded as aceramic.

During the seventh millennium, pottery came to be adopted over a wide area. At Jarmo, Tell Abu Hureyra and Ali Kosh pottery using strata followed earlier aceramic levels, whilst Achilleion and Nea Nikomedia were ceramic throughout the occupation period, and at Çatal Hüyük pottery has been found in the earliest level (XII which predates the earliest C¹⁴ determination, 6240 $\pm$ 99, for the site) thus far excavated. All these sites represent permanently occupied settlements with durable architecture and complex artefact assemblages. Crop production, and (with the possible exception of Tell Abu Hureyra) herding seems to have constituted the economic base. However the cultural assemblage of Jarmo appears homogeneous throughout the strata, a picture of a gradually developing culture emerges at Ali Kosh, and at Tell Abu Hureyra the initial pottery using stratum seems to represent a cultural degeneration from earlier levels. At each site, the economic base appears to remain the same, both before and after the introduction of pottery. Furthermore, also in the seventh millennium, the sites of Beidha, aceramic Hacilar, Suberde, and the aceramic level at Knossos all revealed complex cultural assemblages, all appear to have been permanent settlements, and with the possible exception of Suberde

(assuming the published implications of botanical + faunal remains are accepted), all appear to have had mixed economies with a heavy emphasis on agriculture and/or herding.

However, no pottery was produced at any of these sites, despite, as will be observed in the following section, the availability of most of the necessary technology.⁴ It is thus impossible in the light of present knowledge, to attempt to postulate any links between economic or cultural level and the introduction of pottery with respect to the seventh millennium sites discussed.

These problems apply equally to those communities beginning to use pottery in the sixth millennium. The remaining sites studied which were originally aceramic, Tell Ramad, Bouqras, Knossos and Khirakitia all used pottery vessels by about 5500 BC. Umm Dabaghiyah, Erbab and Anza were founded as fully ceramic villages, and at Franchthi technically developed pottery was introduced at the beginning of E.N.1, circa 5500 BC.

Among the sites with earlier aceramic Neolithic levels, agriculture was definitely practised at Ramad, although no domestic animals have been identified. Sophisticated, well planned houses were built in the aceramic era (ca. 6200-5500) and a varied cultural assemblage was revealed. A few soft sherds which must be regarded as early pottery experiments appeared in phase II, but ceramic vessels were first used in 'considerable amounts' in phase III, strangely in association with seemingly impoverished architecture and culture. As at the earlier site of Tell Abu Hureyra, no explanation can be suggested for this phenomenon in the light of published data. At Bouqras, where a total of only 50 sq.m.

was excavated, and no information is available concerning methods used to recover botanical and faunal remains, no grain was found, although a substantial ground stone assemblage, sickle blades and storage facilities are indicative of a certain reliance on plant foods. The inhabitants appear to have kept no domestic animals, although wild sheep and goats may have been herded. Again a varied cultural assemblage was recovered, together with well-built houses incorporating a diverse and imaginative use of clay. White plaster vessels ("vaisselle blanche") were produced in level II, but seem to have been superseded by ceramics in level III. Fourteen sherds of micaceous tempered burnished pottery were found, which may represent trade items (micaceous temper and burnishing unknown in other contexts at the site). During the ceramic level at Knossos, little change may be detected in economic base or cultural assemblage from the previous aceramic stratum. Farming and animal husbandry were practised both before and after the introduction of pottery, although domestic animals show a significant increase in (ceramic) stratum IX. Pottery making at Knossos is thought to have been introduced from outside the settlement. No botanical or faunal remains were recovered during the Khirokitia excavations, but as at Bouqras, the artefact assemblage indicates that farming was practised. Both the architecture and cultural assemblage at Khirokitia are unique among the sites studied. 'Beehive houses' built partly of stone and partly of tempered clay, stretched in ribbon fashion along a road running through the village to the nearby

river. The Khirokitia stone vessel industry was unequalled in magnitude and overall quality throughout the prehistoric era, and when pottery was made in the later levels (probably beginning in the mid sixth millennium) it took its place in the container assemblage alongside vessels of stone.

At Umm Dabaghiyah, the economy (if the excavator's interpretation is accepted) was based on trade. A little grain was recovered, which is thought to have been imported, and a few domestic animals were kept. Pottery, some of which has been identified as imported ware on typological grounds, was used throughout the occupation period. Pottery constituted the sole container type found at Erbaba. Little information is available concerning the economy of this site, but some agriculture seems to have been practised and animals may have been herded. At Franchthi, agriculture and animal husbandry were accompanied by a varied cultural assemblage and well-made pottery, which as at Knossos is believed to have been introduced from outside the site. Anza is the latest, and also the most sophisticated settlement included in this study, with an agricultural and probably trade-based economy. Pottery production was probably a specialised industry at this site, although no workshop has been found.

In summary therefore, it seems clear that until more information is available concerning the precise nature of the economic base at each site studied, and the precise level of cultural development achieved, no further conclusions may be drawn as to possible connections between ceramic production and economics or culture. Such information may be provided by the future application of standardised scientific methods of excavation and recovery, and analytical techniques.⁵

Container types, of which pottery can logically be considered simply as another example, had long been in use.

It may be speculated that containers of materials other than those found were in use at most of the sites studied. These may have included skin bags, and naturally occurring items such as gourds. However, with the exception of the leather dagger sheath from Çatal Hüyük, no such containers have survived, and the following discussion will be confined to actual evidence recovered. Survival of archaeological material depends upon both the nature of the material, and upon climatic conditions prevailing at each site. Inorganic materials such as stone and pottery will survive under most conditions, organic materials such as wood and fibre will disintegrate unless subject to conditions of high dessication, extreme salinity, or waterlogging. Occasionally fortuitous (for the archaeologist) circumstances such as the fires which ravaged Çatal Hüyük VI, and carbonised many fine wooden vessels and baskets, will cause items to be preserved which would normally disintegrate with the passage of time.

A glance at Table C2 will show that whilst stone vessels were recovered from nineteen of the sites studied, baskets were found at ten (less than half) and wooden containers at only two. Basketry remains were generally preserved as casts in clay, gypsum, lime or bitumen. At Ali Kosh, Beidha, Jarmo, Tell Abu Hureyra, and Umm Dabaghiyah, these casts are believed to have constituted the linings of the original baskets. Although wooden containers were only found at Çatal Hüyük and Beidha (in the form of shadows at Beidha),

TABLE C2: NON-POTTERY CONTAINERS

Site	Basketry	Wooden Vessels	Stone Vessels	Vessels of Other Materials
Zawi Chemi-Shanidar	X	-	-	-
Karim Shahir	-	-	-	-
Tell Mureybit	-	-	X	a
Nahal Oren	-	-	X	-
Jericho	X	?	X	-
Ganj Dareh	?	-	X	-
Çayönü	-	-	X	-
Ali Kosh	X	-	X	-
Beidha	X	X	X	-
Jarmo	X	-	X	-
Aceramic Hacilar	-	-	X	-
Tell Abu Hureyra	X	-	X	b
Suberde	-	-	-	-
Tell Ramad	-	?	X	b
Bougras	?	-	X	b
Çatal Hüyük	X	X	X	a, c
Achilleion	-	-	X	-
Nea Nikomedia	X	-	-	-
Knossos	?	-	X	-
Khirokitia	X	?	X	-
Umm Dabaghiyah	X	-	X	-
Erbaba	-	-	-	-
Franchthi	-	-	X	-
Anza	-	-	-	-

Key: X = examples recovered.
 ? = no examples, but strong possibility of vessel-type usage
 - = no examples, and no direct evidence to prove usage
 a = bone containers
 b = vaisselle blanche
 c = leather containers.

ready availability of wood, frequent use of the material in architecture, and considerable carpentry assemblages, suggest that wooden vessels may have been hewn at many sites, although conditions were not suitable for their preservation. At Jericho, for example, wood was used for building, many stone axes were found, and stone vessels were reminiscent of wooden forms. At Ramad, many carpentry tools, wooden storage bins and wooden brick moulds were recovered; and at Khirakitia as at Jericho containers of stone echoing wooden shapes suggest the likelihood that wooden vessels were in use at the site.

Of the entirely aceramic sites included in this study only Karim Shahir and Suberde revealed no traces of containers. At Karim Shahir, identified as a flint knapping site, inhabited occasionally by a semi-nomadic people, it is likely that if any containers were in use, they would have been of the naturally occurring (skins, gourds), perishable variety. The lack of any form of container at Suberde, in the light of the relatively complex culture, presents more of a problem. No real inferences may be drawn from the five clumsily made sherds found at the site. Plant foods were exploited, thus some type of collecting device, possibly baskets, was likely, but no traces have been found. A large carpentry assemblage suggests the possible use of wooden vessels, but this again cannot be substantiated.

At all sites studied, with the exception of Knossos, which were initially aceramic and later pottery using, some form of container predating the introduction of ceramic vessels

has been recovered. A very small area (16sq.m. at most) of the aceramic level at Knossos was excavated, and this could explain the lack of container finds. Vessels of lime plaster were made before pottery at Ramad, Bouqras and Tell Abu Hureyra. The analysis of the Ramad example (an endothermic peak at 890°C caused by the decomposition of calcite was observed during refining experiments) indicated a level of pyrotechnology in excess of that needed for the simple biscuit firing of pottery.⁶ The whole subject of lime slaking, lime plaster and the curious plaster vessels known as 'vaisselle blanche', presents an avenue of study which could lead to a better understanding of ancient pyrotechnology.⁷

It is notable that when pottery appeared at sites previously aceramic, vessels of other materials continued to be used. At Ali Kosh, baskets persisted throughout the occupation period, and the stone bowl industry reached its maximum diversity and magnitude just before and during the introduction of pottery. At Jarmo, there was no noticeable decline in the use of either baskets or stone bowls in the ceramic strata. At Tell Abu Hureyra, Ramad and Bouqras, although baskets (Abu Hureyra), and stone (Ramad and Bouqras) continued in use throughout, 'vaisselle blanche' appears to have been abandoned in favour of portable pottery containers. This may be explained by the greater speed and ease of manufacture (whatever techniques were employed in making lime plaster vessels, the entire process including preparation of the material, must have been laborious), and lower firing

temperatures required for pottery making. It follows therefore, that pottery replaced "vaisselle blanche" for some purposes whereas stone and basketry were so suitable for their particular roles (which cannot be precisely defined in the light of present knowledge), that their manufacture was still considered worthwhile. No containers were found in E.N.1 contexts at Knossos. However basket remains have been recovered from E.N.II, and as weaving and matting techniques were known in the early levels, there is a strong possibility that baskets too were manufactured. At Khirokitia, the magnificent stone bowl industry continued without decline, despite the advent of pottery.

Of the fully ceramic sites discussed, only Erbaba and Anza are without containers of other materials. At both sites it would seem that pottery containers were preferred for virtually all purposes (pottery is unsuitable for plant gathering, and it is likely that baskets and the like were also in use), and had replaced other vessel types, being easier and quicker to produce from material in immediate supply.

It is thus clear, that when pottery was introduced at a particular site, it usually occupied a place within an already existing container assemblage. The concept of container usage dates back to the mid ninth millennium BC, Zawi Chemi providing the earliest evidence. Perishable containers were probably used prior to that date, but lack of remains prohibits unqualified statement. Once begun, the use of pottery increased throughout the occupation period of most sites (Çayönü and Suberde are notable exceptions). Pottery

was therefore accepted as an extremely useful container type which was relatively simple and quick to manufacture, and thus easily replaced if broken. At some sites, ceramic vessels were so successful that they appear to have ousted containers of other materials.

All technology required for the manufacture of pottery was developed prior to its emergence, through the use of clay in other roles.

In the area covered by this study, clay was appreciated as a raw material from at least the end of the ninth millennium, and probably, as noted in the introductory section, much earlier, although actual remains are few. Whilst clay saw minimal use at Zawi Chemi-Shanidar, Karim Shahir and Nahal Oren during the ninth and early eighth millennium, large amounts of clay used in a variety of capacities at the roughly contemporary settlements of Mureybit and Ganj Dareh, and the appearance of fired pottery at the latter site suggest an earlier development of clay technology in some areas, the remains of which have yet to be found.

It would be needlessly repetitive to restate all aspects of ceramic technology and clay usage practised at each site examined. This information is readily available in the charts and summaries which constitute the body of this thesis. It is interesting to note, however, that within the east Mediterranean and Near Eastern areas clay was exploited in similar ways at the majority of sites studied. Tables C3 - C6 illustrate these similarities.

TABLE C3Use of clay for building purposes: walls, floors.

Site	Pisé (tauf chineh)	Mud-brick
Zawi-Chemi Shanidar	Loamy clay	-
Karim Shahir	-	-
Tell Mureybit	X	-
Nahal Oren	X	-
Jericho	PPNA X (midway pisé-brick stage)	PPNB X
Ganj Dareh	X	X
Çayönü	-	X
Ali Kosh	-	X (also untempered slabs)
Beidha	-	-
Jarmo	X	-
Aceramic Hacilar	-	X
Tell Abu Hureyra	-	X
Suberde	-	X
Tell Ramad	X (I and II)	X (III)
Bougras	X	X
Çatal Hüyük	X	X
Achilleion	X	-
Nea Nikomedia	X	-
Knossos	X	X
Khirokitia	X	X
Umm Dabaghiyah	X	X
Erbaba	-	-
Franchthi	X (daub)	-
Anza	-	X

Clay was used in architectural contexts at all sites examined except Karim Shahir. Pisé structures were found at fourteen of the twenty-four sites, and mud brick also at fourteen. Use of the extremely sandy local clay at Beidha was restricted to plaster, and at Erbaba, limestone was favoured for building, although the blocks were cemented with clay mortar. Clay plaster was used as a finishing material at all sites except Shanidar, Karim Shahir, Ramad and Franchthi. No architecture was necessary in the cave site at Franchthi, and any peripheral structures which may have incorporated plaster have yet to be published. At Ramad, lime plaster was preferred for floor and wall finish. Roofing techniques are known from thirteen sites, and close structural similarities may be observed across the entire area studied. A wooden or interwoven brush framework was set on the upper edges of pisé or mud-brick walls, covered with matting and plastered with a thick layer of clay. This type of construction was observable from ninth and early eighth millennium Ganj Dareh in Iran, and Mureybit in Syria, to sixth millennium Umm Dabaghiyah in Iraq (gypsum plaster used in addition to clay), and Knossos in Crete. Similar roofing techniques are still employed in some areas of the Near East today.⁸ When man began to live in settled communities in order to be near his fields and animal pastures, the ready availability and advantages of clay as a structural material rendered it eminently suitable for the building of permanent shelters and essential refractory and storage facilities. It is quite possible that clay physically assisted the process of sedentism in the Early Neolithic era.

TABLE C4

Clay used for building and finishing: interior non-refractory
or storage fittings, roofs, plaster.

Site	Interior fittings	Roofs	Plaster
Zawi Chemi-Shanidar	Possible windbreak	-	Possible plaster lined storage bin
Karim Shahir	-	-	-
Tell Mureybit	X	X	X
Nahal Oren	-	-	X
Jericho	-	X	X
Ganj Dareh	-	X	X
Çayönü	-	X	X
Ali Kosh	-	X	X
Beidha	-	X	X
Jarmo	-	X	X
Aceramic Hacilar	-	-	X
Tell Abu Hureyra	X	-	X
Suberde	X	X	X
Tell Ramad	-	-	-
Bougras	X	Clay brick pillar supports	X
Çatal Hüyük	X	X	X
Achilleion	X		X
Nea Nikomedia	-	-	X
Knossos		X	X
Khirokitia	X	X	X
Umm Dabaghiyah	-	X	X
Erbaba	-	-	X
Franchthi	Windbreak or fire-shelter	-	-
Anza	Unpublished	Unpublished	Unpublished

The refractory properties of clay were appreciated throughout the Near East and Aegean. Hearths were found at all but four of the sites studied. Ovens, probably used for the parching of grain were found at 50% of the sites, and kilns were positively identified at Ganj Dareh, Çatal Hüyük and Umm Dabaghiyah. It is possible that most Neolithic pottery was fired in domestic hearths or open camp fires, and a careful examination of the coarser sherds recovered may prove this was the case. However, it is likely that the finer hard-fired wares were baked in an enclosed oven or kiln. No such facilities have been located at Achilleion, Khirokitia, Erbaba or Franchthi (the data for Anza is not yet available) where well-fired pottery was found, and it seems certain that if they existed, they were constructed outside the main settlement area to avoid risk of fire.

Similar small clay artefacts were modelled at most sites. Whilst this is not the place to suggest the cultural significance of these artefacts, it is interesting from the technological viewpoint that clay figurines (anthropomorphic, zoomorphic or both) were recovered from twenty sites, and enigmatic geometric objects from fourteen. Knowledge of spinning and weaving is attested by a number of spindle whorls and loom-weights found at nine sites, the earliest examples being at Çatal Hüyük (seventh millennium). Spindle whorls were sometimes purpose made, but often were cut from sherds, demonstrating an interesting recycling of broken pottery. Stone and bone were generally preferred for the manufacture of personal ornaments, but beads, pendants and other decorative pieces were also made of clay at nine sites. Clay seals were

TABLE C5
Refractory Uses of Clay

Site	Hearths	Ovens	Kilns
Zawi Chemi-Shanidar	-	-	-
Karim Shahir	-	-	-
Tell Mureybit	X	-	-
Nahal Oren	X	-	-
Jericho	X	X	-
Ganj Dareh	X	X	X
Çayönü	X	X	-
Ali Kosh	X	X	-
Beidha	X	-	-
Jarmo	X	X	-
Aceramic Hacilar	X	X	-
Tell Abu Hureyra	X	-	-
Suberde	X (possibly clay)	-	-
Tell Ramad	X	X	-
Bougras	X	X	-
Çatal Hüyük	X	X	X
Achilleion	X	-	-
Nea Nikomedia	X	X	-
Knossos	X	X	-
Khirokitia	X	-	-
Umm Dabaghiyah	X	X	Gypsum kiln identified by gypsum residue
Erbaba	-	-	-
Franchthi	-	-	-
Anza	Unpublished	Unpublished	Unpublished

positively identified at Abu Hureyra, Catal Hüyük, Achilleion and Nea Nikomedia, and possible examples were found at Ganj Dareh and Jericho. These may have been used to indicate the concept of ownership.

As clay was used in similar ways throughout the area studied, it follows that the technology implicit in the various uses of the material must have been similar. Three basic techniques are necessary for the manufacture of pottery: preparation of clay, modelling and firing. Preparation of clay first involves digging it from the ground, and as clay was used in some capacity at all sites, this step may be presupposed. The use of pisé and mud-brick implies knowledge of tempering. The addition of some form of aplastic material, usually chopped straw, to raw clay was thus known at most sites, both aceramic and pottery using. Some form of modelling was also evident at all sites with the exception of Zawi Chemi-Shanidar, and even there the presence of a loamy clay wall (Shanidar) and a bin lining (Zawi Chemi) show that the inhabitants were at least aware of the plastic quality of clay. Some evidence of the firing of clay for permanence, or adequate pyrotechnology acquired through lime slaking was recovered from six of the nine aceramic sites examined. The three sites without such evidence are Zawi Chemi-Shanidar, Nahal Oren, and possibly Karim Shahir. These sites represent an early stage (in their particular areas) in the development of clay technology. Peripheral techniques such as bonding, burnishing, and sometimes painted decoration were also developed at the aceramic sites (see individual technology summary charts).

TABLE C6

Small artifact modelling

Site	Figurines	Geometric Objects	Ornaments	Spindle whorls loomweights	Seals	Other
Zawi Chemi-Shanidar						
Karim Shahir	X					
Tell Mureybit	X(1 example)					2 clay bowls
Nahal Oren						
Jericho	X				X(1 example)	
Ganj Dareh	X	X			?(1 possible)	Sarcophagus
Çayönü	X	X				House models
Ali Kosh	X	X	X	X		Polishers
Beidha	X					Clay bowl
Jarmo	X	X	X			
Aceramic Hacilar		X				
Tell Abu Hureyra	X	X	X	X	X	
Suberde	X	X				
Tell Ramad	X	X				
Bouqras						
Çatal Hüyük	X	X	X	X	X	
Achilleion	X	X		X	X	ladles, miniature axes
Nea Nikomedia	X	X	? ear plugs	X	X	
Knossos	X	X	X	X		studs, spoons, conical object
Khirokitia	X(1 example)					
Umm Dabaghiyah	X	X	X	X		
Erbaba	X					
Franchthi	X	X	X	X		
Anza	X		X	X		

X = examples found.

The seven initially aceramic sites merit more detailed consideration, illustrating as they do, the actual emergence of portable pottery containers. At Jarmo, all technology implicit in the pottery made at the site was available prior to its appearance, with the exception of bonding (required for the addition of appendages) and painted decoration. Bonding techniques may have evolved from clay plastering, which was known at the site. The idea of painted decoration may have been imported. At Abu Hureyra pottery manufacture entailed no new technological developments. At Ramad the pottery was mineral tempered. A tentative explanation other than 'import', may be that as pottery was preceded by 'vaisselle blanche', the incorporation of some type of stone into the clay matrix constituted a tenuous continuation of an earlier tradition. At Bouqras mineral temper and burnishing were introduced along with fired ceramics. The Bouqras pottery may have been imported, but further analysis is required. The excellence of the E.N. Knossos pottery suggests that the art of its manufacture was introduced from outside the settlement. However all necessary technology with the exception of mineral tempering and bonding was evident in the aceramic levels, thus pottery making was an art easily assimilated by the Knossians. A similar situation is evident at Khirokitia and at Ali Kosh, where once again ceramic technology was familiar, but mineral inclusions were not evident until the introduction of pottery vessels.

On the basis of the evidence from the latter group of sites, and from the aceramic group, it is possible to hypothesise that the ceramic technology evident in non-pottery contexts at the entirely pottery using sites studied was known prior to the manufacture of clay vessels. It is unlikely that the basic techniques of tempering, modelling and firing were first learnt through pottery making and later applied to construction and to small artefacts. It is much more plausible that the reverse is true, and that ceramic technology was acquired through the use of the raw material in similar capacities to those observed at the aceramic sites, and subsequently utilised in the manufacture of portable pottery containers.

More meaningful interpretation of the data may be achieved through the application of modern analytical techniques.

Logically, the next step in the study of the emergence and significance of ceramic vessels should be an examination of the actual remains. Until recently analyses of ceramic assemblages have generally been biased in favour of shape and size distinctions (morphology) and decorative styles and motifs. Little attention has been paid to the actual fabrics from which pottery vessels are manufactured. A study of the mineral constituents of pottery fabrics can serve to indicate the precise origin of these minerals, and thus the likely origin of the pottery itself. Furthermore manufacturing techniques can often be deduced from the distribution and orientation of mineral inclusions in the fired sherd.

Such mineralogical studies have been undertaken in recent years by, for example, Cornwall and Hodges,⁹ and Peacock¹⁰ (Neolithic Britain), Freeth¹¹ (Bronze Age Britain), Catling et al¹² (Minoan and Mycenaean wares), Catling and Millett¹³ (Theban Stirrup jars), Farnsworth,¹⁴ and Boardman¹⁵ (Greek pottery), Richards,¹⁶ and Gillam,¹⁷ (Romano-British wares) and Musty¹⁸ (Medieval glazed ware). A definitive pioneering study of Central American pottery was undertaken by Anna Sheperd in 1942.¹⁹ Among many more recent studies in the United States, Arnold examined a considerable amount of Peruvian ware.^{19a} Excellent summaries of work carried out in the field of mineralogical analysis, and commonly used techniques are published by Aitken, Peacock and Tite.²⁰

No petrological or chemical studies have been made with respect to pottery recovered from any of the sites included in this thesis. Such studies would be of great benefit to students of both early technology and Neolithic trade patterns.

A further avenue of study which has not yet been pursued, with respect to early Near Eastern and Mediterranean ceramics is the determination of firing temperatures. Techniques such as refiring in a thermal gradient furnace and D.T.A. (differential thermal analysis) have been applied in recent years to pottery from widely differing areas, and produced over a long time-span.²¹ Further development and wider application of such techniques will doubtless contribute much to our understanding of ancient pyrotechnology.

This thesis has summarised the published evidence from a representative selection of aceramic and ceramic early Neolithic sites. It is essentially a preliminary study, and whilst fulfilling the first stated aim, namely to illustrate that containers were used and ceramic technology was available prior to the advent of pottery, it is intended to form the basis for a wider and more thorough examination of many of the problems inherent in this field. Before the significance of the portable pottery container at individual sites or in the Neolithic as a whole can be better understood, it is necessary, first, that more data be available leading to a more precise knowledge of economic and technological level at the time pottery appeared; secondly that modern analytical techniques such as those described above, be applied to actual artefacts (comparable techniques are available respecting non-ceramic remains); and thirdly that similar bodies of data be analysed from all areas with traces of Neolithic occupation.

NOTES

1. French, 1973, 105.
2. Wilson, 1975, 322.
3. All dates quoted in this thesis are based upon C¹⁴ determinations or on excavators' suggestions based upon C¹⁴ dates from comparable cultural assemblages. Many advances have been made in dating methods during the last decade and many dates should soon be available based on methods other than C¹⁴. For description of new dating methods and their potential, see for example, Tite, 1972, and bibliography therein.
4. At Beidha it is unlikely that pottery was not produced because of unsuitable local clay, and lack of knowledge of levigation methods.
5. On scientific retrieval methods in general, see for example, Binford, 1968; Brill, 1971; Brothwell and Higgs, 1963; Creighton and King, 1969; Cutbill, 1971 and 1973; Lewis, 1965; Rensberger and Berry 1970. On analytical techniques in general see Brill, 1971 (particularly part 2, 'Analytical Surveys'); Brothwell and Higgs, 1963 (particularly section 4, 'Artifacts'); and Tite, 1972. For methods applying to evaluation of economic level, see Ucko and Dimbleby, 1969; Higgs 1971; and Clason, 1975.
6. Gourdin and Kingery, 1974, 133-150.
7. See glossary for references to current research into composition and manufacturing data of "vaisselle blanche".
8. Wulff, 1976, 133-135.
9. Cornwall and Hodges, 1964.
10. Peacock, 1968, 1969.
11. Freeth, 1967.
12. Catling, 1961, 1963; Blin-Stoyle and Richards, 1961; Catling, Blin-Stoyle and Richards, 1963.
13. Catling and Millett, 1965.
14. Farnsworth, 1964.
15. Boardman and Schweizer, 1973.
16. Richards, 1959.
17. Gillam, 1963.
18. Musty and Thomas, 1962.

19. Shepard, 1942.
- 19a. Arnold, 1972.
20. Peacock, 1970; Tite 1972. For additional works on analytical techniques, see Brothwell and Higgs 1969, 513-525 and 564-566; Matson, 1960.
21. For methods and application, see Kingery 1974; Matson 1971, 1974; Roberts, 1963.

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Glossary of Ceramic Terminology

Appliqué decoration and applied parts:

Preformed utilitarian appendages or decorative pieces added to pottery at the time of its formation, or by careful luting at the leather hard stage.

Baking:

See firing.

Body (also called fabric, paste):

Clay prepared for pottery manufacture; preparation usually involving the addition of vegetable or mineral materials.

Burnishing:

Rubbing down the surface of leather-hard pottery with a smooth, rounded tool such as a pebble or a piece of bone. Burnishing compacts the surface particles thus reducing porosity, and produces a smooth, decorative effect. Scribble or pattern burnish refers to application of the technique over selected areas rather than over the entire surface of the pot.

Coarseware:

Usually refers to thick-walled, coarsely tempered pottery used for cooking or storage purposes. Although frequently burnished, coarseware was usually undecorated.

Coiling :

A method frequently used for the building of vessels. Walls are formed by the repeated addition of sausage-shaped rolls of clay.

Combing:

The technique of making incised patterns with a toothed instrument.

Core :

The central portion between the interior and exterior surfaces of a piece of baked clay. The colour and texture of the core may indicate both the efficiency of the firing method used, and the atmosphere (availability of oxygen) prevailing during the firing process.

Excision:

Decoration, usually carried out at the leather-hard stage in which the pot surface is cut, and clay removed.

Fabric:

See body.

Filler :

See temper

Fineware :

Generally refers to thin walled vessels of finely tempered clay, well made and finished, and hard-fired. Fineware was almost invariably burnished and decorated in some way.

Firing (also called baking):

The application of heat to completely dry clay ware to drive off all moisture and thus render it permanent. The point at which clay can no longer be restored to a plastic state by the addition of water is called the maturation point. During the neolithic era, firing may have been carried out in an open fire, a domestic hearth or oven, or in some type of simple kiln.

Incision :

Decoration involving the scratching or cutting of the leather-hard or plastic surface without the removal of any clay.

Inclusions :

See temper

Impressed decoration (also called Stamped):

A type of decoration achieved by pressing some object (fingernail, shell, etc.) into a still plastic or less frequently leather-hard clay surface.

Kiln :

Any structure in which the fire is set in a pit below the pottery which is itself encased in a dome provided with a ventilation hole is known as an updraught kiln, the only type discovered thus far for the neolithic period. Either the dome or part thereof had to be dismantled after each firing to gain access, and rebuilt for the subsequent firing after the wares were stacked.

Leather-hard :

After a period of drying, clayware becomes tough and aplastic. Its appearance and surface texture at this stage are reminiscent of leather, hence the term, leather-hard. Although no further modelling may be attempted (the form being fixed), the leather-hard stage is ideal for the addition of appendages and many types of decoration including burnishing, slip, paint, incision and excision.

Levigation :

The cleaning of raw clay by mixing it with water, allowing the heavier particles and organic materials to settle, and retaining the finer particles which remain in suspension. It is unlikely that this process was used during the neolithic era. Rare fine, untempered wares were probably produced from fortuitous natural deposits.

Luting:

Use of slip (liquid clay) to join parts of a pot together, or to affix appendages and appliqué decoration.

Paddle and Anvil Technique:

A method of shaping a pot by beating it on the outside with a paddle shaped piece of wood while holding a flat stone as an anvil inside the pot.

Paint:

Colouring minerals mixed with varying amounts of clay in suspension in water, used to decorate (normally by brushing) the leather hard surface of a pot.

Paste :

See body.

Plastic:

The condition of clay suitable for the formation of pottery before any drying has taken place. Plasticity may be increased by the addition of water, or reduced by mixing with some form of temper.

Pointillé (also called punctate or stabbed decoration):

A type of impressed decoration wherein the plastic or leather-hard surface is stabbed or partially pierced with a small pointed instrument, possibly made of flint, bone, or wood.

Punctate :

See pointillé.

Slip :

Clay mixed with water to a creamy consistency. Slip is used both as a glue for attaching appendages and applied decoration, and as a surface coating. In the latter case, slip clay may be the same colour as the body (then often called a self-slip) or of a different colour, thus disguising the body. Slip may be applied by dipping or by pouring over the entire inner and/or outer surface of a pot or parts of same. Slip may also be brushed, in which case the term slip-painting is used.

Slip Wash :

Term used to describe a very thin coating of slip probably applied by the dipping method.

Stabbed decoration:

See pointillé.

Stamped :

See impressed.

Temper (also called inclusions or filler):

Material added to clay to modify plasticity. Most clay in its natural state is too sticky and greasy to handle, and shrinks seriously on drying. A clay which is too plastic may be modified by the addition of a fine mineral material such as sand or small grits, or organic materials such as finely chopped chaff.

"Vaisselle blanche":

Term used to describe containers of altered mineral composition which may or may not contain clay. The single published analysis carried out to date indicated 30% reconstituted lime in a sample from Tell Ramad (Gourdin and Kingery, 1974). De Contenson (1971, 238) suggests that the material was formed into vessels by the coiled technique; Mellaart too feels that the vessels were coiled "... around a basket which left a plaited or rope-like impression on base and sides" (Mellaart, 1975, 62); whilst Singh avers that the "large receptacles ... were doubtless made in moulds" (Singh, 1974, 50). Although the results of several recent analyses of Neolithic lime plaster are now available (see for example Frierman, 1971; Belfet, H., Lafuma, H., Longuet, P., Terrier, P., "Une invention néolithique sans lendemain, vaisselles pré-céramiques et sols enduits dans quelques sites du Proche-Orient", Bulletin de la Société Préhistorique Française, 66, 1969, 188-192; Jedrzejewska, H., "New methods in the investigation of ancient mortars", in M. Levey (ed.), Archaeological Chemistry, Philadelphia, 1967, 149 f.; and Gourdin, W.H., A Study of Neolithic Plaster Materials from the Near and Middle East, unpublished M.S. thesis, M.I.T., 1974), further work is necessary to ascertain the raw materials and production techniques of Vaisselle blanche.

Wash

See Slip wash.



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