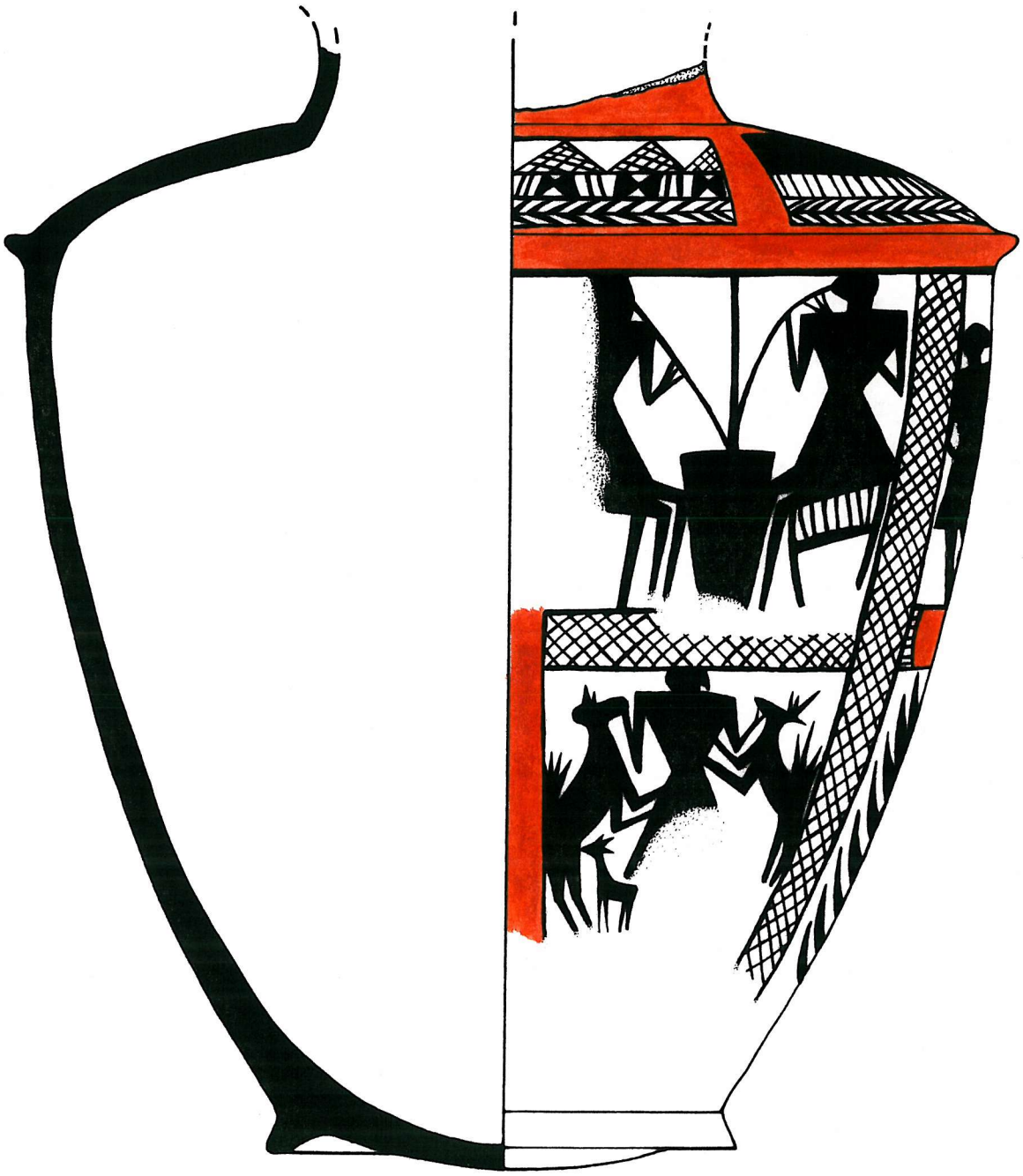
UNIVERSITY OF SOUTHAMPTON

MESOPOTAMIAN CERAMICS OF THE THIRD MILLENNIUM BC WITH ANALYSIS OF POTTERY FROM ABU SALABIKH, KISH AND UR

H. S. Mynors

Volume 1



Frontispiece Drinking scene on Early Dynastic scarlet ware jar from Khafajah

TABLE OF CONTENTS

Volume 1

Volume 2

UNIVERSITY OF SOUTHAMPTON

ABSTRACT

FACULTY OF ARTS

ARCHAEOLOGY

Doctor of Philosophy

MESOPOTAMIAN CERAMICS OF THE THIRD MILLENNIUM BC WITH ANALYSIS OF POTTERY FROM ABU SALABIKH, KISH AND UR

by Heather Siriol Mynors

This study of third millennium ceramics from southern Iraq introduces the use of petrographic analyses for characterisation and for the examination of changes in Early Dynastic pottery production. Analyses also indicate limited pottery distribution at both a regional level and over long distances. Neutron activation analyses provide corroborative evidence.

Petrographic classification of fabrics facilitates the identification of regional differences among ceramics manufactured in an area of sedimentary geology. An evaluation of traditional chronologies is based upon a detailed typology of both form and fabric for the late Uruk and Early Dynastic pottery from Abu Salabikh. Local variations in pottery production are examined and compared with Kish and Ur. Technological variations are related to chronology, to settlement type and to urban and rural production.

An illustrated catalogue of late fourth and third millennium ceramics is accompanied by a tabulated synthesis of vessel types and fabrics. The reference system enables field identifications to be related to the results of laboratory analysis.

The use of pottery in third millennium Mesopotamian society is assessed using the evidence of glyptic art.

LIST OF ILLUSTRATIONS

Volume 1

Volume 2

LIST OF TABLES

Volume 1

Volume 2

PREFACE

Having lived in Iraq for a while as a child, I have early recollections of family visits to Mesopotamian sites and archaeological excavations. The choice of third millennium ceramics as the theme of this research, however, arose from an introduction to the problems and potential of the pottery recovered during the 1978 season of excavations at Abu Salabikh, which I attended as part of my undergraduate training at Bradford University.

Encouraged by the excavation director, ceramic research began at Southampton University in 1980. As part of this programme, I assumed joint responsibility with Jane Moon for pottery study on site during the 1981 season. Further work was undertaken during a study season in the autumn of that year. Fieldwork offered a first-hand knowledge of the archaeological contexts from which the material was derived, but export restrictions precluded the retention of complete assemblages for further study. It was also instructive to work closely with staff at the Iraq Museum, Baghdad during a protracted three-month stay in 1982.

The ceramic analyses were undertaken during a period of full-time research at Southampton University completed in 1983. Since then, the task of assimilating and presenting the material has had to be accomplished alongside my responsibilities for research into Uruk pottery in Northern Mesopotamia as Wainwright Fellow at Oxford University.

In the absence of a standard translation of arabic place-names, I have followed the conventions adopted by Moorey (1978). The standard abbreviation ED has been used throughout to denote the Early Dynastic period.

Long Hanborough
September 1986

ACKNOWLEDGEMENTS

I was introduced to the application of neutron activation analysis to ceramic research by Mr A.Aspinall and Mr S.Warren (Bradford University), and my supervisor Dr. D.P.S.Peacock (Southampton University) has encouraged the use of ceramic petrology. Refinement of these techniques has benefited from discussion with colleagues in both departments, notably Dr. J.Riley (Southampton University), and with Dr. I.Freestone (British Museum Research Laboratory) and Dr. T.R.Watkins (Edinburgh University). Dr. S.Shennan (Southampton University) has commented usefully on aspects of sampling and data processing.

Particular thanks are due to Mr J.N.Postgate (Cambridge University, formerly Director of the British Archaeological Expedition to Iraq) for encouraging research on the ceramics from Abu Salabikh. For permission to work in the country, I acknowledge the Government of the Republic of Iraq (Ministry of Culture, State Organisation for Antiquities and Heritage). I am also grateful for the opportunity to discuss various aspects of my research with Dr. D.Collon (sealings); Dr. H.Crawford (Sumerian architecture; Jamdat Nasr); Dr S.Dalley (texts); Mrs Killick (nee Moon) (Abu Salabikh); Dr. A.Middleton (kilns); Dr. P.R.S.Moorey (Kish; chronology); Mr P.Murphy (molluscs); Dr. J.Reade (Mesopotamian geography) and Prof. C.Young jr. (economic systems). I am also indebted to K.Fielden, F.A.Ipson (nee Hawkin) and F.R.Matson for permission to quote from their unpublished theses.

Facilities provided by the British Archaeological Expedition in Iraq and financial assistance towards travel granted by the British School of Archaeology in Iraq (Gertrude Bell Memorial) are gratefully acknowledged. I am also indebted to the following museums and individuals for permission to take samples for analysis: Ashmolean Museum, Oxford (P.R.S.Moorey; G.Miles); Birmingham City Museum and Art Gallery (P.Watson); British Museum, Department of Western Asiatics (T.Mitchell; J.Curtis); Dr. J.Daniel (Délégation Archéoligique Français en Irak); Iraq Museum, Baghdad (Director, Dr. Muayad Sa'id Damerji; B. Al' Kaissi); Dr. D.Sürenhagen (Heidelberg) and Dr. H.Wright (Museum of Anthropology, University of Michigan). Samples from the British Museum collections were taken by staff of the British Museum Research Laboratory.

Samples selected for neutron activation analysis were generously processed at Bradford University and technical assistance

with the equipment for ceramic petrology was willingly offered by Mr N.Bradford and Mr R.Fitzgerald (Southampton University). I am indebted to the staff of the Computing Services of Bradford and Southampton Universities and to the Department of Teaching Media, Southampton University for photographic reproductions.
Production of the text and tables has been greatly assisted by the forbearance and skilful word processing undertaken by Mr B.Richardson (Duo Services, Crowborough). The thesis has been bound by Wayte Bookbinding (Tunbridge Wells).

I should also like to thank my family for their help and encouragement and finally my husband for his tireless efforts both in mounting the drawings and in help with proof reading and for his continuing moral support throughout the final stages of preparation.

1: INTRODUCTION

1 INTRODUCTION

1.1 Research design

The use of physical and chemical analyses for defining the nature and provenance of pottery assemblages has become firmly established as an integral part of ceramic research. Growing complexity of the data, however, necessitates rigorous definition of research objectives. During the past two decades, the limited scope of ceramic morphology has been superseded by the quest for a better understanding of the cultural context in which pottery was manufactured and used (Matson 1965b, 202; Rice 1982, 47). Effective exploitation of analytical techniques, however, relies not only on the field archaeologist's awareness of their potential, but also on precise definition of the questions to which available techniques can be addressed.

The problems of an overwhelming quantity of ceramic evidence from such an ancient and widespread craft have long been acknowledged (Delougaz 1952, 1; Vanden Berghe 1965, 248; Peacock 1977b, 22). The nature of the evidence therefore necessitates an organised and selective approach to data collection and analysis. Examination of stratified assemblages is therefore crucial to all aspects of ceramic research, ranging from the definition of chronologies by stratified associations to an understanding of technological development through comparative analysis.

Given close visual similarities between third millennium pottery assemblages in southern Iraq, however, ceramic research in the region has concentrated hitherto on definitions of typology, principally as a guide to chronology. Comprehensive records of complete assemblages have rarely been published and items have generally been selected for illustration in order to fill gaps in the type series. Moreover, in the absence of a systematic approach to form and fabric classification, published reports have invariably contained repetitious descriptions.

The examination of a large corpus of principally third millennium ceramics from southern Iraq therefore represents a new approach to the study of this material. Petrographic analysis has been demonstrated as a useful method of examining Mesopotamian ceramics in studies concerned both with chronological change and with differences in settlement pattern. Of particular importance is the evidence for a change in technology and manufacturing tradition from

late fourth millennium to third millennium pottery production.

Pottery from the site of Abu Salabikh (Fig. 2.1) forms the core of the pottery corpus. The Abu Salabikh assemblage spans the late fourth and third millennium BC and offers a significant demonstration of local variations in pottery production at an intra-site level.

It is apparent from earlier investigations concerned with pottery from the Early Dynastic period that stylistic similarities indicate links between the pottery assemblages from the southern Mesopotamian plain and sites outside this region (de Cardi et al. 1976; Frifelt 1970; Lamberg-Karlovsky and Schmandt-Besserat 1977, 132-134). The use of petrology and neutron activation analysis has assisted in the identification of long distance exchange between Iraq and the Oman.* Petrographic analysis, however, has proved to be the most suitable method of physical examination at both a regional and an intra-site level and has demonstrated that the majority of the material is of local origin.

The absence of comprehensive or reliable sequences of stratified pottery hinders comparisons between assemblages from a number of sites. Chronological studies are subject to the difficulties of comparison based on complex cross-referencing between sites where typological classifications have been individually devised. This need for a standardised method of classification has been fulfilled by the use of a decimalised system for the examination and recording of each sample included in the pottery corpus. The advantage of such a system lies in its potential application to all Early Dynastic ceramic assemblages.

Relative chronologies have been based hitherto solely upon typological variations in pottery form. The investigation of a large body of archaeological material, however, presents the opportunity for developing the study of ceramics beyond the examination of stylistic attributes. Analysis of fabric types forms an integral part of pottery identification and classification and thus extends the potential for ceramic studies. In addition to examining chronology, the use of a fabric classification related to stylistic attributes offers an opportunity for examining the mechanisms of ceramic production. At an intra-site level it has proved possible to link technological change with a change in the organization of pottery manufacture.

The understanding of pottery production and distribution in

* Sections 8.3.4 and 8.4.4

the early Dynastic period is enhanced by reference to textual sources and ethnographic examples. Whilst the early texts rarely refer specifically to pottery, it has been possible to infer modes of distribution using textual evidence. Ethnographic parallels have been instructive in elucidating methods of production and firing techniques. The most valuable source of information, however, has proved to be the illustration of vessels on cylinder seals and stone plaques (Section 9).

1.2 Pottery production in Early Dynastic Sumer

Whilst Early Dynastic pottery studies have generally focussed on the evaluation of possible exchange routes and patterns of distribution, much of the pottery appears remarkably homogeneous in both form and, superficially, in fabric. These stylistic similarities presumably indicate a shared system of pottery production. It would be unwise, however, to see such similarities as a demonstration of trade or exchange in ceramic vessels. Petrographic and neutron activation analyses have established evidence for only a limited exchange of pottery between each of the three major Early Dynastic sites included in the pottery corpus. These imported wares are principally confined to container vessels which were probably incidental to the goods transported in them.

Given that local production dominated the third millennium pottery industry, the emphasis of the present research is therefore centred on pottery production, including methods of manufacture and the evolution of ceramic technology. The change from late Uruk pottery assemblages which display considerable diversity of form and fabric, to a largely standardised production of utilitarian wares in the Early Dynastic period, must be considered as a significant technological development. Such a radical change in output implies a change also in the organisation of production. The opportunity for an intra-site study of the pottery assemblage from Abu Salabikh coupled with the inclusion of samples from Kish and Ur forms the basis for discussion of the organization of third millennium pottery production in southern Iraq.

1.3 Research strategy

Although the bulk of the pottery from the ceramic assemblages at Kish, Ur and Abu Salabikh is of local origin, limited exchange in ceramic container vessels has been identified. This

distribution of utilitarian wares is not confined to sites within Sumer. Container vessels exported from Early Dynastic sites in both northern and southern Iraq have been traced as far south as the Oman. The evidence for both regional and long distance distribution of pottery vessels and the possible effect of this on the local production industry is therefore considered.

In view of the emphasis on large scale production at a local level during the Early Dynastic period a detailed study of ceramic exchange between Sumer and its Near Eastern neighbours has not been attempted. Vessel types from Early Dynastic sites on the alluvial plain frequently exhibit typological similarities with the Diyala pottery assemblages, but these links appear to be confined to stylistic affinities and a shared ceramic technology. This indicates a significant association between the two areas and yet it precludes the identification of a regional pottery distribution network. The possible association between sites can, however, be examined through an analysis of their ceramic technologies.

The establishment of a chronological sequence at Abu Salabikh is crucial to an understanding of large-scale production at an intra-site level and the organization of the Early Dynastic pottery industry. Chronologically distinct groups of vessel types and fabrics have been identified, the changing ceramic technology is recorded and discussed, and technological differences are related to variations in settlement pattern.

Detailed discussion of the Abu Salabikh assemblage is intended to provide the basis for future Early Dynastic site studies. By relating typological attributes to a system of fabric classification, both chronological and technological trends can be observed. Detailed description and evaluation of the pottery from Abu Salabikh enables precise comparison with published and unpublished material from previous excavations at Kish and Ur. The intention is to demonstrate equivalent chronological divisions and similar developments in ceramic technology which can be related to changes in production methods.

The aim is therefore to examine the evidence for a changing structure of organization in the pottery industry from late Uruk/ED I through to the end of the Early Dynastic period. In addition, however, an attempt has been made to highlight the increase in the potential information available from the study of Mesopotamian ceramic assemblages by the addition of important new evidence obtained from

fabric classifications.

It has been stressed that the principal aim in the preparation of the pottery corpus and the accompanying programme of ceramic analysis has been to investigate the organization of third millennium pottery production and that the study is based on Early Dynastic material from Abu Salabikh, Kish and Ur. The importance of adhering to a standardised methodology for both fabric descriptions and the classification of typological attributes cannot be over stressed. An organised approach to sampling and the assimilation of data is a prerequisite for studies of both production and distribution. Clear criteria are therefore outlined for the programme of ceramic analysis and suggestions are made for standardization of pottery processing and publication methods in line with other ceramic studies.

1.4 Ceramic data: nature, sources and evaluation of the evidence

Ceramic assemblages represent the greatest proportion of the archaeological artifacts recovered during excavations on the majority of Near Eastern sites. The number of whole vessels and more especially the volume of sherds provide adequate quantities of archaeological data, but discrimination is needed to obtain an appropriate quality of evidence.

Owing to superficial similarities, publication of pottery assemblages from Early Dynastic sites rarely includes more than a general indication of surface texture and colour. These similarities both within ceramic assemblages from an individual site and between the pottery from different sites have been ascribed to the homogeneity of alluvial clays. Whilst this is undoubtedly true, closer and more detailed observation has enabled the refinement of significant fabric groups (Section 8.8.4). It should also be noted that the same sites from which Early Dynastic pottery fabrics have been classified as homogeneous have yielded Uruk pottery which displays a wide range of different fabrics. Such fabrics would have been produced from similar alluvial deposits to those which were used in the Early Dynastic period. A variety of tempering materials, however, has resulted in fabric groups which can be distinguished by eye. This information has been overlooked in previous assessments of the archaeological evidence, yet the present research amplifies the usefulness of such ceramic studies. Where Uruk fabric groups have been classified

(Fielden, 1981a; 1981b; McAdam 1983) a standard methodology has not been employed. Such research therefore lacks the precise details of surface texture, hardness and inclusions which are needed for comparison with other ceramic assemblages. The adoption of an accepted system of fabric description should do much to improve the nature of the ceramic evidence presented in publication.

Published literature rarely includes independently dated material recovered from Early Dynastic sites. There are indeed few excavations which have produced pottery from well stratified sequences. Dating of middle to late Uruk and Early Dynastic ceramics is therefore based primarily upon relative chronology derived from typological comparisons. Futhermore, ceramic studies are frequently dominated by whole vessels retrieved from graves. Attempts to build up an Early Dynastic sequence of Sumerian pottery thus depend primarily upon material from the cemeteries at Kish and Ur. The comprehensive catalogue of third millennium pottery from the Diyala region (Delougaz, 1952) also remains a major source of comparative material, yet it is subject to the problems of stylistic comparison between geographically distinct regions. The analysis of sherd typologies is very much a secondary source of information and the inclusion of a fabric classification to assist with chronological assessment of the pottery has rarely been attempted.

The majority of samples included in this pottery corpus are derived from featured sherds. Consequently the typological classification has expanded considerably beyond the range derived from whole vessels. The potential range of material within which chronological distinctions can be defined is thus increased, and the integration of fabric analyses with the classification of vessel forms contributes to the identification of discrete ceramic groups. Such groups are often of chronological significance. Fabric analysis has assisted, for example, in the identification of an ED II period at Abu Salabikh where typological differences in the ceramic assemblages between the ED II and ED III periods are difficult to trace.

Near Eastern ceramic research has tended to develop independently from broader themes of archaeological enquiry. Ceramic analyses have frequently been separated from the principal body of archaeological publications, although the typological classification of pottery assemblages is an important constituent of both preliminary and final excavation reports. Analytical studies involving Near Eastern ceramics have tended to combine the investigation of a

specific scientific technique with the identification of possible imports. The pottery corpus (Section 8), however, now establishes a data base for the local pottery products from three major third millennium sites in southern Iraq.

Analysis of vessel function relies partly upon archaeological context, but a significant contribution to an understanding of the uses for ceramic and other vessels comes from a study of late fourth and third millennium glyptic art. Vessels are an important component of scenes depicting both secular and religious activities. This is a potential source of evidence both for the function of various vessel types and in assessing the use of pottery in late Uruk and Early Dynastic society.

2: METHODOLOGY: EARLY DYNASTIC POTTERY ASSEMBLAGES: AN ANALYTICAL APPROACH

2 METHODOLOGY : EARLY DYNASTIC POTTERY ASSEMBLAGES : AN ANALYTICAL APPROACH

The analytical research programme was organised in four principal stages. Initial fieldwork was carried out during excavations at Abu Salabikh. This involved recording and subsequently the selection of samples for laboratory analyses. Following the classification of pottery from Abu Salabikh (Section 4.3), comparative material from museum collections and archives was recorded and sampled using the same system of classification. 630 samples were selected for petrographic analysis (Section 8.3.3), several of which were also analysed by neutron activation (Section 8.4). Finally the results have been collated and presented in tabulated form (Table 8.5). This catalogue forms the basis of the Early Dynastic pottery corpus in Section 8. The methodology in each of the principal stages of research is discussed under the relevant sections in the text, but a brief summary of these methods is included here.

2.1 Recording methods: fieldwork

All samples included in the pottery corpus have been catalogued according to a system of decimal classification for vessel types (Section 4.3.1 and Section 8.2). The typological classifications of whole vessels have been based on archive material from Kish and Ur, in conjunction with pottery from the excavations at Abu Salabikh. Sherds, however, are poorly represented amongst the museum collections. The sherd typology is therefore largely derived from the Abu Salabikh pottery assemblage (Section 4).

The post-excavation stage of pottery research using material from Abu Salabikh was hampered by export restrictions. It was therefore imperative that all pottery processing and recording was accomplished during the excavation season.

An experimental method of recording pottery was used during the first seasons at Abu Salabikh and it was not until 1981 that a recording system was established for regular use in the field. The objective was to obtain a general record of the pottery types represented in each batch or level. All sherds were washed on site, then sorted and recorded within their individual levels or batches on batch sheets (Postgate 1985, 1). A basic type series of featured sherds was evolved from pottery found during previous excavations. Types were catalogued under three sections: rims, bases and body

sherds. Sketches indicating the principal types were produced in tabulated form on the batch sheets. Quantities of each sherd type present in a single batch were then entered under the respective illustration on the sheet. Each batch of sherds was thus identified within its respective stratigraphic unit. The identification of new pottery forms was included by the addition of a representative sketch. The information from these batch sheets has subsequently been translated into the numerical classification of vessel types described in Section 4.3.1 and Section 8.2.

Owing to the volume of pottery produced during a single excavation season, it was impracticable to assign every sherd and vessel to a specific fabric until a means of rapid visual identification of individual fabric groups had been devised (Section 2.3). Field examination was therefore confined to pottery from major and chronologically significant batches (Section 4.3.3; Section 8.2.2; Table 4.3).

Pottery available for export was confined to small fragments which were of a size sufficient only to produce a sample for thin sectioning. Thus, while it was necessary to be selective in the choice of samples for analysis, it was equally important to record essential information for comparisons to be made between vessels or sherds which had been analysed and those which had been subjected only to visual examination in the field. Within the batches for which fabrics were examined, a detailed fabric description was recorded for every featured sherd. Brief notes were also taken on similar fabrics observed within the batch and among sherds from other batches. Representative samples of each fabric group identified by eye were taken for thin sectioning and each sherd or vessel thus sampled was drawn to scale (usually 1:1) on site.

The fabric descriptions obtained during fieldwork were subsequently used for attributing fabric groups on the basis of comparisons with the material which had been classified using both petrographic analysis and visual examination (Section 4.3.3 and Section 8.3.4).

A system of rapid visual identification of the major fabric groups identified within the Early Dynastic pottery assemblage has now been designed for use on site. This is intended to provide a quicker method of obtaining accurate identifications (Section 2.3; Section 4.3.3 and Section 8.3; Fig 8.93).

2.2 Sampling strategy

Sampling is a specialised discipline involving the use of sophisticated techniques during fieldwork and subsequently in the selection and processing of archaeological data (Cherry et al. 1978a, 1; Doran and Hudson 1975, 56-58; Mueller 1979; Orton 1980, 156-178). The sampling strategy devised for studying pottery from Early Dynastic sites, however, has been predetermined by two principal factors. Firstly, it has to be recognised that, apart from pottery found at Abu Salabikh, much of the material derives from museum and archive collections (Section 2.1). Such material has therefore already undergone an unquantified process of selection. Secondly, research based on pottery from Near Eastern sites is frequently subject to the limitations dictated by excavation conditions. Whilst this necessitates the use of a simplified approach to sampling, a strategy has nevertheless been devised which takes into account the restrictions on time and the availability of material for further laboratory analyses. By including a discussion of the criteria used in the present sampling strategy the simpler approach can be justified (Plog 1978, 158).

It is with the privilege of hindsight that post-excavation sampling is frequently based on a more informed approach to archaeological problems. This highlights a major difference between sampling during an excavation season and subsequent sampling of an assemblage for analysis.

> '... During excavation, it is rarely possible, except perhaps between seasons, for an evaluation of the sampling strategy thus far ...' (Cherry 1978, 311).

Two very different levels of sampling were therefore implemented. The volume of pottery retrieved during a single excavation season at Abu Salabikh was a dominant factor in the first stage of sampling. Following a prestigious precedent set by Adams and Nissen (1972) to

> '... forgo the employment of more intensive and sophisticated methods in order to provide a first approximation that would speak more comprehensively to major historical and anthropological problems... ' (Adams 1972b, 8),

the bulk of the pottery recovered during the 1981 excavation season was examined and recorded on site in order to establish the characteristic features of the assemblage. The principal vessel

shapes and fabric types were selected for sampling, representing the major chronological divisions and settlement differences observed during successive excavation seasons. The second stage was based upon a relatively small sample size culled from the assessment of preliminary sampling and identification. A more rigorous sampling procedure was, however, applied to the selection of these samples intended ultimately as an analytical database for comparative studies with material from Kish and Ur. The combination of these two approaches to sampling material was adopted as a means of retrieving a representative sample of pottery from an Early Dynastic site for subsequent analysis and a more rigorous method of classification.

2.2.1 Selection of sites

The practice of sampling sites which have been identified with a particular cultural or regional tradition is firmly established (Cherry et al. 1978a, 3). In practical terms, however, the choice of site is influenced by the availability of material for analysis.

The possibility of examining material during the progress of an excavation determined the choice of Abu Salabikh as the type site for this study of Early Dynastic pottery. Abu Salabikh is, moreover, recognised as an important Early Dynastic centre. Finally, owing to the method of excavation, it was particularly suited to the requirements of an intra-site study (Section 4.1).

It was a logical choice to include Kish and Ur as the two major sites for a comparative study of Early Dynastic pottery production. Both have been the subject of extensive excavations and research, and are amongst the few excavated sites which have yielded large and accessible collections of Sumerian pottery. Moreover these sites are situated at the extremities of the region occupied by ancient Sumer, and earlier research (Moon 1982, 67-68; Moon 1985, 9) had suggested possible regional variations between Early Dynastic pottery assemblages from northern and southern Sumer. Sufficient material was also available from each site for an analytical comparison of local production methods.

Although Kish and Ur were included for comparison with the Abu Salabikh assemblage, additional material was sampled from twenty other sites (Fig. 2.1). This has formed the basis for regional assessment of mineralogical assemblages in local pottery fabrics from sites ranging over a wide geographical area. These data have contributed to an evaluation of pottery distribution and exchange.

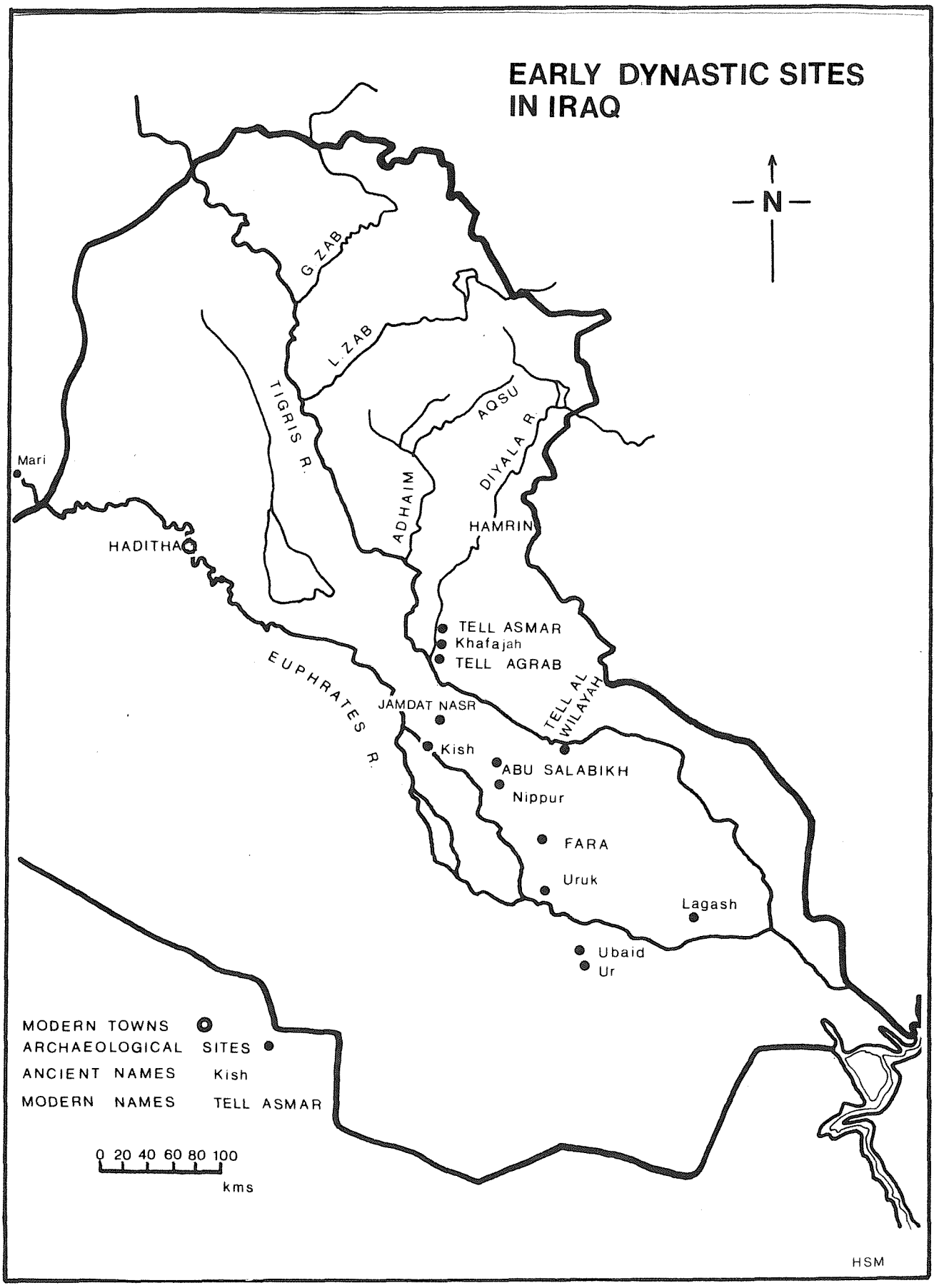


Fig. 2.1 Iraq: location map showing sites from which samples have been analysed

The regional sampling programme was subject to the limitations of obtaining a sufficient sample size from each site (Foley 1978, 59). Material available for analysis was sometimes restricted to as few as five samples or less from a single site, but it was possible to examine larger and more significant groups of material from Jamdat Nasr and Tell al 'Ubaid.

It has been suggested that regional sampling should encompass two kinds of survey (Flannery 1976, 159) not only to locate large and medium sized settlements, but also to include the smaller and less easily recognised sites. In order to fulfil this requirement, pottery from Sakheri Sughir, a rural site associated with Ur (Wright 1969), was included as a first step towards identifying differences in pottery production in settlements of contrasting size and function.

2.2.2 Assemblage Sampling

The definition of a pottery typology based on the integration of form and fabric demanded an extensive examination of the Abu Salabikh pottery assemblage. It has been stressed that one of the striking features of Early Dynastic pottery assemblages is their apparent homogeneity. This therefore precludes the application of a technique such as the five stage procedure for sampling artifact assemblages advocated by Daniels (1966, 151-153). Such an approach involves selective sampling based on a type series divided into stratigraphic units. In the case of Early Dynastic material from the Main Mound excavations at Abu Salabikh the identification of fabric groups could not be finalised until visual groupings identified in the field had been verified by petrographic analyses. Sampling was therefore carried out with the aim of securing examples of all possible fabric variations but this precluded the implementation of a rigorous selection procedure (Section 4.3.2). All samples were, however, confined mainly to featured sherds (Alcock 1951, 27) and these were related to the units of excavation - whether stratified levels or soil from surface clearance. Ultimately the classification of vessel shape and fabric for each sample was identified with the context of its batch (excavation unit) in the pottery catalogue (Table 8.3), thereby facilitating the study of intra-site variability in terms of chronological settlement differences.

Much of the pottery from the West Mound excavations at Abu Salabikh was retrieved during surface scrapes (Section 4.3.2; Table

4.3). The archaeological remains at Abu Salabikh occupy a relatively short time span and are therefore particularly suited to the technique of surface scraping for exposing architectural features (Cherry et al. 1978b, 152; Postgate 1983, 6-9). Material from these surface features is a more reliable indicator of deeper levels where the mound was occupied for a comparatively short period of time and where it did not suffer from later disturbance (Flannery 1976, 54; Haselgrove 1978, 170; Nissen 1972, 105).

Environmental conditions such as weathering and erosion also affect the degree to which pottery from surface collections may be regarded as a representative sample. Highly fired sherds and wasters constitute the greatest percentage of surface sherd collections from Abu Salabikh (Postgate 1983, 9). Although pottery samples from surface soil clearance batches were included in the corpus, care was, however, taken to ensure that the related sub-surface batches were also sampled. The majority of samples selected for analysis from the West Mound were obtained from two major batches. Batch 5408 (Table 4.3) consisted of a pit deposit containing ED I pottery and Batch 5601 contained a large deposit of late Uruk pottery exposed during surface and sub-surface soil clearance (Table 4.3).

Although assemblage sampling in the field is subject to the limits of precision inherent both in excavation procedure and in the techniques of surface collection, it is also necessary to recognise the limitations imposed on pottery assemblages retained in museum collections. Pottery archives can rarely be regarded as a representative sample of the excavated assemblage, particularly where the bulk of the sherdage has not been retained. Moreover, the practice of supplementing archive material with information from publications is of limited value in determining a fabric classification when fabric descriptions are rarely included with published pottery assemblages. Among the more frustrating aspects of the work, however, is the task of equating pottery retained in archives with excavation records, in order to identify both the context and probable date of the material!

The publication of pottery from Ur is unfortunately confined to simplified stylistic representations of vessel types (Woolley 1934, pls. 251-252). With the exception, therefore, of published plates illustrating examples of stemmed dishes, it is not possible to identify specific vessels from the excavation reports. It is even more unfortunate, however, that pottery is not included in the

catalogue of artifacts (Woolley 1934, 524-595). Relating pottery to individual contexts is therefore limited to vessels identified by grave numbers. Nearly all the Early Dynastic vessel types from Ur retained in the collections of the British Museum and of Birmingham City Museum and Art Gallery were therefore drawn to scale for the pottery corpus (Section 8). All whole vessels and sherds of probable third millennium date provenanced to Ur were also included in the corpus and classified according to both vessel type and fabric. The selection of pottery samples was therefore confined to the analytical stage and the only restriction on sampling was that imposed by the problems of obtaining material for thin sectioning from certain vessels.

In order to preserve a consistent approach to the sampling strategy for museum collections, pottery from Kish was examined, recorded and sampled in the same way. It should be noted, however, that published pottery from Kish does include individually identifiable vessels (Mackay 1924, pl.9-pl.16; 1929, pl.48-pl.54; Moorey 1978, M1B, M2B) together with remarkably informative descriptions of certain ware types identified within specific vessel categories (e.g. Mackay 1929, 240-241).

2.2.3 Selection of pottery samples for analyses

Whilst it was not possible to take a sample from every vessel type recorded from Abu Salabikh, fabric descriptions based on a visual classification were obtained for every major vessel type and featured sherd. Samples were selected for petrographic analysis, representing the principal fabric groups including the sub-divisions within each group (Section 8.8.3). Thin sections were produced from at least two and sometimes as many as five examples of each fabric. In this way, it was intended to establish the extent to which visually similar fabrics did indeed appear the same in thin-section. Samples selected for analyses thus served two functions. Firstly, the analytical results were used to assess the accuracy of fabric groups identified during fieldwork. Secondly, analysis of different fabric groups provided an insight into the techniques of pottery manufacture during the late Uruk and Early Dynastic periods.

Owing to the success of the petrological approach to analysis of ceramics from the southern Mesopotamian plain, only a limited programme of time-consuming neutron activation analysis was undertaken. The criteria employed in the selection of samples are

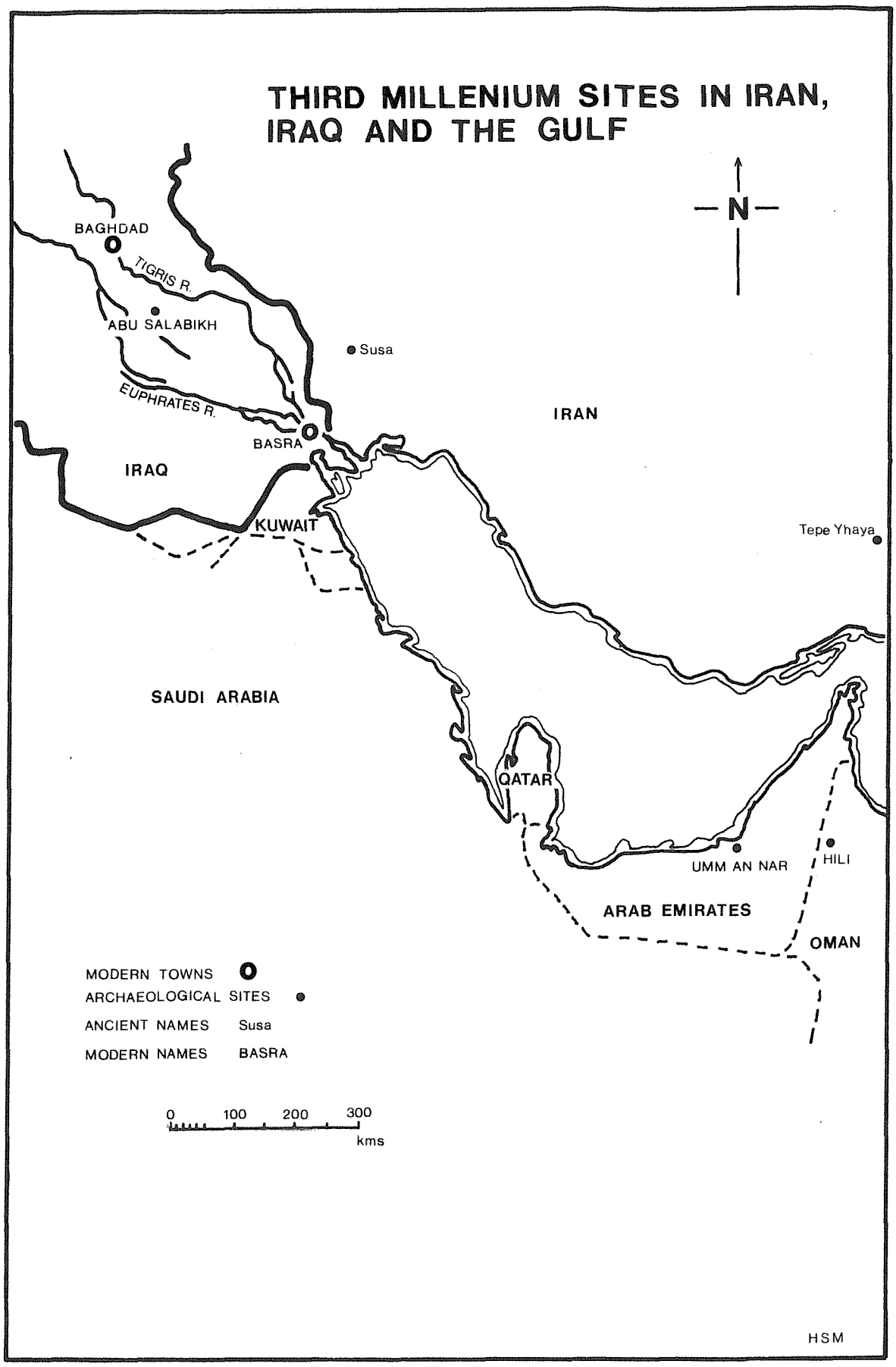


Fig. 2.2 Third millennium sites in Iran, Iraq and the Gulf region

discussed in Section 8.4.2. Initially, however, samples were taken from amongst the thin-sectioned finer wares at Abu Salabikh in order to compare mineralogical and chemical methods of identification. This sample was subsequently extended to include pottery from a range of sites over a wide geographical area (Figs. 2.1 and 2.2). The sampling strategy was directed towards examining possible imports and the evidence for long-distance exchange.

2.2.4 Quantification criteria

Statistical methods of pottery quantification cannot be applied to this evaluation of Early Dynastic pottery production. It is acknowledged that estimates of vessel numbers within different classes present in an assemblage are a useful indication of pottery consumption and possibly even production targets (Vince 1977, 63). Such calculations are generally based on the number of rim or base equivalents for each class of vessel expressed as multiples of rim or base circumferences present (Orton 1980, 167-174). For successful application, however, this method of quantification either depends upon the ability to attribute rims and bases to specific vessel types or requires a distinctive group of fabrics confined to a restricted range of vessels within which individual sherds may be readily identified. Knowledge of the fabric classification within an assemblage is a prerequisite for quantification. During the period when the present sampling programme was directed towards establishing the criteria for classification of vessel types and fabrics it would have been premature to attempt any quantification of different pottery types in the Abu Salabikh assemblage.

It is unfortunate therefore that future quantification studies carried out on assemblages from Abu Salabikh will be restricted by the limited time available during an excavation season. The identification of rim or base equivalents of each type of vessel will always be a time-consuming process owing to the minor, sometimes barely visible, differences between fabric groups. This problem is not confined to Abu Salabikh for Early Dynastic pottery assemblages from sites on the southern Mesopotamian plain generally display characteristically homogeneous fabrics which always require rigorous examination prior to classification.

In highlighting the problems of quantification within the Abu Salabikh assemblage there is no implicit intention to reject quantification as a means of examining the relationship between

pottery and its role in the material culture of the society (Orton 1978, 399). The first steps towards quantification have been taken in the compilation of the pottery catalogue (Table 8.4). Each featured sherd is quantified according to pottery type and fabric (Table 8.4, Column 2) for every sampled batch from the Abu Salabikh excavations. Whilst this precludes the estimation of vessel equivalents it does provide a basis for evaluating the proportion of vessel types in relation to fabric groups. Given sufficient quantities of comparative material this may prove to be an effective means of examining pottery production.

2.3 PETROGRAPHIC ANALYSIS

2.3.1 Introduction

There is an increasing awareness of the importance of analysis in Near Eastern provenance studies (Blackman 1981; Courtois et al. 1981; Davidson and McKerrell 1976; 1980; Oates et al. 1977). The application of analytical techniques to Near Eastern pottery studies has not, however, developed within a systematic framework. Moreover, the large quantities of pottery recovered from excavations in Mesopotamia have necessitated traditional methods of visual sorting and classification. Analytical studies are thus frequently estranged from the examination of pottery in the field.

The evidence for pottery production and exchange in Sumer is based upon stylistic affinities observed among the assemblages from major sites. There is, however, great potential for studying the pottery industry using analytical techniques to determine manufacturing processes as well as identifying the extent to which regional exchange took place. A wide variety of physical and chemical techniques are available to the archaeologist wishing to establish the nature and provenance of ceramic material. The work of Shepard (1971) and Matson (1971) provides a detailed introduction to the general nature of ceramic materials and processes as well as to many aspects of ceramic analysis. A recent review of the range and application of analytical techniques is provided by Kempe and Templeman (1983).

Near Eastern provenance studies have tended to favour the use of chemical methods of analysis although techniques such as neutron activation analysis have been used increasingly in conjunction with mineral identification (Courtois and Velde 1983a; 1983b; Hughes et al. 1982, 122). The choice of either physical or chemical techniques is invariably based on the texture of the pottery. Neutron activation analysis is suited to fine wares and has been used where fine clays could not be isolated on the basis of their mineral inclusions (Bourriau 1981, 41-43; Kilmurry 1982, 106).

124 samples were analysed by the technique of neutron activation but with limited success. Evidence for pottery being transported from southern Iraq and the Diyala region to as far south as the United Arab Emirates confirmed results from petrographic analyses conducted on the same material. Attempts to identify different production groups from sites within Sumer using neutron activation analysis have been less satisfactory. It appears that

post-deposition conditions may affect the trace element concentrations in pottery from southern Iraq (Section 8.4.1). The corrosive action of salts on sites located in the now saline alluvial plains, and in particular the effect of these conditions on the survival of pottery in its original form, remains an matter for concern. Mineralogical analyses, however, seem largely unaffected by post-deposition conditions and have been used successfully to identify the products of Early Dynastic sites in southern Iraq.

Identification of sedimentary rock and mineral assemblages amongst pottery fabrics may reflect geological distinctions in the clay deposits used by potters (Peacock 1970, 379-381; Williams 1983). The mineral composition of both the clay matrix and the inclusions may be characterised using X-Ray diffraction or electron microprobe analysis, whilst mineral analyses have also been used to identify fabric groups on the basis of distinctive suites of heavy minerals (Peacock 1967). Thin sections, however, are suitable not only for petrological identification but also for considering textural features.

Owing to the sedimentary geology of the region (Section 3.2), it initially seemed unlikely that diagnostic mineral inclusions would be found in the fabrics of locally produced ceramics. The identification of different heavy mineral suites in Euphrates river deposits (Ali 1976) and the variability of mineral inclusions, derived from metamorphic and igneous rocks, in Tigris and Euphrates river sediments (Philip 1968), however, encouraged petrological identification.

Mineral inclusions in Near Eastern ceramic material have also been examined using electron microprobe analysis (Courtois and Velde 1983a; 1983b; Kamilli and Steinberg 1979; Oates et al. 1977, 229-232). This technique, however, requires access to specialised equipment. Furthermore, it precludes any textural assessment of the material.

The extraction of heavy minerals involves crushing pottery samples which are then dissolved in a chemical solution from which the heavy minerals are filtered off. Again, however, this technique prevents the identification of textural characteristics, and information concerning sedimentary rock fragments and organic inclusions present in the material is lost. Moreover, the high proportion of iron ores in fabrics from the southern alluvial plains is likely to mask the residues in the same way that Peacock (1970,

379) encountered in Britain. It is rarely possible to obtain large enough samples for both heavy mineral analysis and thin sections. Moreover, the identification of minerals such as epidote, amphibole and pyroxene in thin sections of pottery from southern Iraq has obviated the need for heavy mineral analysis.

Ceramic analysis should not take the place of visual characterisation of fabric groups (Peacock 1977, 25). Macroscopic examination of the fabrics is an essential tool of identification and it is particularly important to relate the fabric groups defined by eye to the results of analytical research. This is most effective when visual characteristics are confirmed by the examination of thin sections, thus providing a realistic evaluation of pottery groups identified in the field. Thin sections should not therefore be used in isolation. Instead, they can be used both as an extension of the visual assessment and as a means of establishing the provenance of certain fabric groups. The potential exists for research into ceramic technology and chronology, a possibility which remains to be fully exploited (Glock 1975, 219).

2.3.2 Preparation of thin sections

Thin sections were prepared in the Department of Archaeology at Southampton University using a similar procedure to that described by Peacock (1970, 397) and Tite (1972, 215-217).

Initially the sherds were mounted on glass slides using Canada Balsam adhesive and subsequently ground down on a Cutrock vertical wheel. The final section thickness of approximately 30 microns was achieved by manual grinding on a flat glass plate using carborundum powder. A fixing coat of Durofix mixed with acetone was then applied and cover-slips were mounted using Lakeside 70, a liquid form of Canada Balsam adhesive which required heating in order to set.

Even among the finer wares, mutilated areas in the thin sections occurred during the grinding process. Hard inclusions such as quartz grains 'tore' the softer clay matrix, thus distorting the appearance of the fabric, while in some cases large inclusions did not adhere to the slide. An even greater problem was presented by the necessity of obtaining a thin section thickness of 30 microns. Identification of mineral inclusions in pottery derived from alluvial clays depends upon the ability to distinguish between quartz grains and other inclusions. If the section has not been ground down sufficiently finely the appearance of quartz grains in polarised light

may be confused with the interference colours of minerals such as epidote. However, the danger of over-grinding resulting in the loss of a valuable sample was a persistent problem with the softer fabrics.

Impregnation of sherds with microcrystalline wax produced a blurred section in which grains of carborundum powder adhered to the slide. The acquisition of a vacuum impregnator, however, provided a reliable means of preparing thin sections. Samples were placed in an araldite resin which impregnated the fabric over a period of seven hours under vacuum conditions. Once impregnation had taken place the sherds were either set aside for a period of three days for the resin to harden or baked in an oven to accelerate the hardening process. Thin sections were then produced from the impregnated sherds by the same method of grinding, using Cutrock equipment followed by a carborundum powder. Canada Balsam, however, was not used as a mounting adhesive. Sherds were mounted on glass slides using araldite and cover-slips were applied with Eukitt, an adhesive which requires no heating and which, unlike Canada Balsam, does not eventually discolour the thin section.

All sherds, including fine wares, were impregnated prior to thin sectioning, with the exception of thirty samples which had been processed before acquisition of the vacuum impregnator. This method is more time-consuming but the well preserved fabric textures justify the increased preparation time. Indeed the clarity of the thin sections assists with rapid mineral identification. Occasionally very fine wares are not fully impregnated, causing problems of differential grinding thicknesses. It is possible, however, that the problems both of increased preparation time and of incomplete impregnation may be solved by the introduction of a new resin (Nicholson and Patterson 1984).

2.3.3 Microscopic examination

Samples from sites on the alluvial plains of southern Iraq are characterised by a high frequency of derived igneous inclusions (Table 8.5, Columns 9-15) and fine sedimentary rock fragments (Table 8.5, Columns 17-20). Mineral identification was carried out using a polarising microscope (Kerr 1959, 13-50).

The processes involved in the origin and deposition of sedimentation on flood plains (Allen 1970, 136-140; Greensmith et al. 1971, 1-30), combined with the alteration of minerals during firing of the clay, has hindered the identification of mineral inclusions. Much

of the material was of a very fine sandy texture with correspondingly fine inclusions requiring examination under a high magnification, frequently as high as X400. Reference to Hatch et al. (1972), the mineral descriptions by Kerr (1959, 215-473) and in the Atlas of Rock Forming Minerals (Mackenzie and Guilford 1980) assisted the identification of both igneous-volcanic inclusions and sedimentary rock fragments. Familiarity with the material greatly improved the speed and accuracy with which fabrics were characterised.

In view of the findings of Berry et al. (1970) and Philip (1968) demonstrating variations between deposits examined at intervals along major river courses in Iraq, based on differences in the frequency of minerals such as epidote, amphibole, pyroxene and mica, an attempt was made to quantify the principal accessory minerals in each thin section (Mynors 1983). This process was successful but the quantification of mineral inclusions in very fine fabrics became subjective where the majority of such inclusions were too fine to permit certain identification. Such a time consuming method could not, however, be applied to all 630 thin sections. Instead a tabulated system was adopted for recording the petrology of each sample (Table 8.5) an explanation of which may be found in Section 8.3.2. The inclusions present in each thin section, ranging from derived igneous and sedimentary rock fragments to organic material have been recorded under nine main categories:

Quartz
Feldspar
Mica
Accessory minerals
Ferruginous material
Sedimentary rocks
Igneous rocks
Shell
Other organic material

Variations observed in the sedimentary petrology of pottery from different sites in Iraq have thus established the criteria for identifying ceramic imports amongst locally produced assemblages. This method has also proved effective in isolating the ceramic products of different regions (Section 8.3.4).

2.3.4 Identification of fabric groups

Provision was made to record various categories of tempering material in the petrographic table. These included shell temper (Table 8.5, Column 22) and other organic inclusions (Table 8.5, Column 23) such as vegetable material, and occasionally grog (Table 8.5, Column 24). The acknowledged difficulties of differentiating between tempering materials and natural inclusions (Rye 1981, 31-32) were encountered among the Abu Salabikh material.

Shell inclusions occur naturally in much of the pottery from the alluvial plains of southern Iraq, but it has been possible to distinguish between shelly wares (Group F) and shell-tempered fabrics (Group D). Shell occurs in the latter as crushed fragments rather than the small fossils of bivalve molluscs identified by P. Murphy (pers. comm.) in thin sections of Group F fabrics.

Differences between vegetable material as a natural inclusion and straw or chaff temper were usually based on visual identifications. The addition of straw and chaff as temper was recognised by the distinctive regularity in size and shape of the plant material, indicating that the fragments have been chopped prior to mixing with the clay.

Sedimentary rock fragments and quartz grains occur naturally and as tempering agents in late fourth and third millennium pottery from Iraq. The large angular rock fragments in fabrics from the Diyala region, however, contrast with rounded, weathered inclusions typical of fabrics manufactured from the clay deposits of the southern alluvial plains. Observations on the size and frequency of these inclusions have been used to distinguish different fabric groups. Table 8.5 provides a simple indication of the extent to which fabric textures are determined by sand tempering or the addition of sedimentary rock fragments (Table 8.5, Columns 4-7, 17-19 and 24).

Ethnographic studies show that fine quartz pebbles and crushed sedimentary rock fragments such as flint are a common form of tempering material used among the potters of Iran and Pakistan (Rye and Evans 1976, 9; Wulff 1966, 151). The presence, therefore, of angular inclusions of chert or sandstone in some fabrics from Abu Salabikh contrasts with the rounded inclusions typical of alluvial clays and immediately identifies fabrics which have been tempered with these materials (Section 3.2.2).

The identification of chronological divisions in the Abu Salabikh pottery assemblage is based to a large degree upon fabric

groups defined by their appearance and texture. This is determined by the extent to which quartz grains have been added as a temper.

Textural analysis involving various methods of recording quartz grain sizes and distribution has been used to characterise sand-tempered fabrics (Middleton et al. 1985; Streeten 1982). The technique was originally developed by Peacock (1971) as a means of identifying unknown kiln groups among pottery fabrics which could not be characterised from their sedimentary petrology. Sophisticated procedures are employed involving the counting and measuring of up to 150 quartz grains in each thin section. This is a time consuming process best suited to sandy fabrics which can be distinguished in no other way. The classification of late fourth and third millennium pottery fabrics ranging from medium sandy wares (Section 8.3.4, Group E) through coarse sandy wares (Section 8.3.4, Group G) to medium sand-tempered wares (Section 8.3.4, Group J) and finally course sand-tempered buff wares (Section 8.3.4, Group K) was initially accomplished from a visual examination of the fabrics. Confirmation was obtained by a simple method of recording the size and abundance of quartz grains in each thin section. These data appear in columns 4-7 of the petrographic table (Table 8.5) and a discussion of the criteria employed is included in Section 8.3.2. The ease with which these fabric groups were identified and the verification obtained from thin section examination therefore obviated the need for a more detailed analysis of quartz grains which would have been likely to yield similar results.

2.3.5 Discussion

The chosen methods of analysis have been directed towards the identification of technological change within the pottery assemblage from Abu Salabikh but comparison of the pottery from Abu Salabikh with other late Uruk and Early Dynastic assemblages has also provided an insight into the extent to which such changes are common to other Early Dynastic sites.

Evidence for a similar range of fabrics from Kish and Ur is apparent from thin sections included in the petrographic table (Table 8.5). Moreover, differences between urban and rural production can be inferred from a comparison of samples taken from Ur with those from Sakheri Sughir.

Limited exchange in ceramics between Abu Salabikh, Kish and Ur has been effectively demonstrated using petrographic analysis and

there is evidence to suggest that pottery was exported from the southern Mesopotamian plain (Section 6.2).

The importance of visual identification of fabric groups should not be underestimated. Few pottery characterisation studies can include detailed analysis of every sample. Faced with the task of examining an excavated assemblage, the choice from a wide range of characterisation techniques is often daunting. Moreover, successful application of petrographic analyses depends upon a rigorous system of fabric classification carried out in the field. Now that detailed analyses are available for the Abu Salabikh pottery assemblage, together with samples from other sites in southern Iraq and the Diyala region, this method offers a proven means of characterising further ceramic assemblages in the region. Individual site studies can contribute to an understanding of local production as well as yielding information about ceramic exchange.

3: THIRD MILLENNIUM MESOPOTAMIAN CERAMICS: THE REGION AND CHRONOLOGY

3 THIRD MILLENNIUM MESPOTAMIAN CERAMICS: THE REGION AND CHRONOLOGY

3.1 MESOPOTAMIA: THE REGION

3.1.1 Geography

Mesopotamia is not defined by natural boundaries. A variety of textual sources, principally derived from archives, furnish the philologist with numerous place-names ranging from the Mediterranean to eastern Iran (Oates 1977, 101). The name 'Mesopotamia', however, has its origins in Classical literature and was used to define the region occupied by the flood plain valleys of the Tigris and Euphrates rivers (Lloyd 1978, 12). Although archaeological research is dominated by work on sites in modern Iraq, Mesopotamia is considered to extend beyond the borders of Iraq, from the bay of Kuwait and the marshes of southern Iraq in the south, north-westwards into Syria, eastwards into Iran and westwards into Saudi Arabia (Fielden 1981, 6; Lloyd 1978, 13; Oppenhiem 1977, 33; Whitehouse and Whitehouse 1975, 64). The ranges of the Zagros mountains in western Iran form the eastern limits of Mesopotamia, the edge of the alluvium where it meets the Arabian desert, or Hamad, marks the western border of the region and the Arabian Gulf forms a natural boundary to the south (Fig. 3.1).

The division between northern and southern Mesopotamia is more clearly defined. The distinctive Mesopotamian plain of southern Iraq comprises the alluvial plains and the delta region. Here the land is relatively flat; a landscape created by the Tigris and Euphrates which have deposited alluvium over a bed of sedimentary rock. North of Baghdad, however, the countryside changes: the rivers are separated by a limestone plateau known as the Jezirah (Wright 1955, 84) which is dissected by deep valleys formed by the tributaries of the Euphrates - the Khabur and the Balikh - and the river systems which join the Tigris - the Diyala, Adhaim, Upper and Lower Zab rivers (Fig. 3.1). This natural division between north and south forms the boundary between ancient Assyria to the north and the land known in classical times as Babylonia to the south (Lloyd 1977, 14).

Numerous tells representing the ancient cities of Sumer and Akkad are scattered across the southern Mesopotamian plain. Research into Early Dynastic pottery is centred on this region.

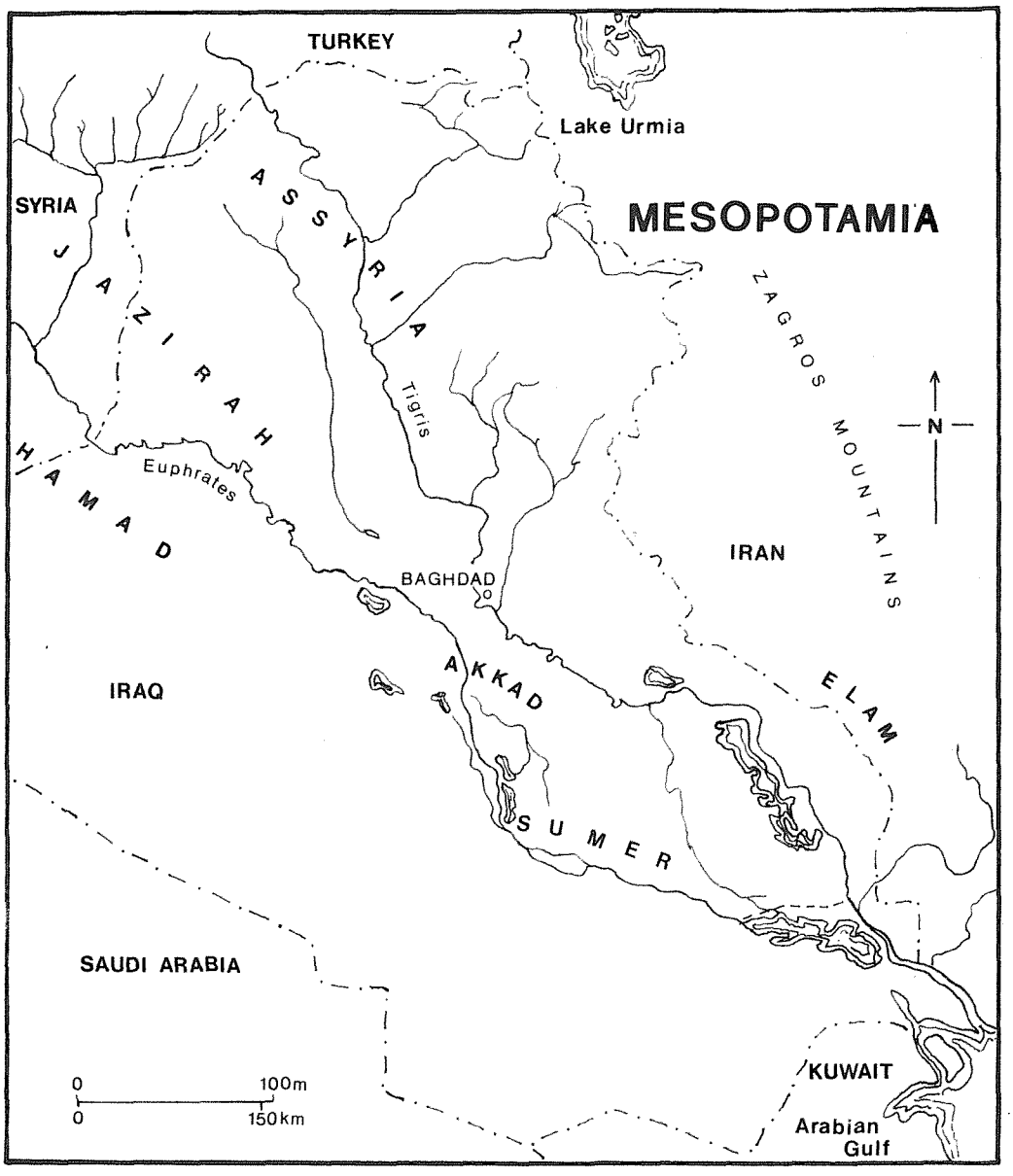


Fig. 3.1 Mesopotamia: map showing the principal regions

3.1.2 Climate

Geological investigations have shown that changes in climatic conditions took place in Mesopotamia during the period from 5500 to 3000 BC (Nützel 1976, 19). Temperatures reached a maximum at c.3500 BC with a corresponding increase in humidity. Nützel (1976, 21) has demonstrated, however, that whilst northern Mesopotamia shows a "moderate improvement in climate" reaching an optimum by c.3500 BC the Mesopotamian lowlands experienced marked and abrupt climatic changes. He has therefore concluded that the change to a more humid climate

> '... would [have] had relatively much more effect on the lowlands than in the highlands...' (Nützel 1976, 21).

A change in the climate to increasingly arid conditions, however, seems to have occurred from c.3000 BC although it appears that this effect would not have been noticeable until c.2300 BC (Nützel 1976, 21-22).

In conjunction with the wetter climates between 5500 and 3500 BC, recent discoveries also suggest that the sea level in the Gulf was at least one metre higher in the fourth millennium than the present day levels (Nützel 1975, 106). The Arabian Gulf had possibly advanced as far north as Ur by the first half of the fourth millennium, although the effects of inundation may have mitigated the silting process of the two rivers (Nützel 1975, 106-107).

Flooding of the alluvial plain was not confined to the raised sea level. The river bed rose gradually as a consequence of these sediment-bearing rivers flowing at a very low gradient. Thus, by the fourth millennium both Tigris and Euphrates rivers were already at a higher level than the surrounding plain; the rivers sometimes overflowed their banks occasionally resulting in changes of course. It is ironical that the raised banks of these rivers were both a disaster and a salvation for Mesopotamian agriculture. Although artificially high rivers were prone to flooding, their raised banks also facilitated the construction of irrigation canals. This system was only successful, however, by virtue of seasonally raised water levels.

Despite the evidence for raised water levels and a wetter climate, the climatic regime appears to have remained largely unchanged from the latter part of the fourth millennium to the present day. High summer temperatures alternate with rainfall confined to a short winter season. Whilst much of northern Iraq has adequate

rainfall, the central and southern plains experience long dry periods during which the only sources of water are from the Tigris and Euphrates rivers.

Water supply both for agricultural and everyday needs required a system of management for a resource ultimately dictated by the climatic regime and seasonal fluctuations. Irrigation systems consisted of canals and reservoirs. New canals were dug as the old ones became choked. Thus, the Sumerian farmers were faced not only with problems of irrigation during the dry season but also with the disastrous effects of flooding. The vast network of canals visible today across the southern alluvial plain is the product of successive re-cutting over a long period of time. This may testify to declining agricultural productivity. During the greater part of its early history, however, Mesopotamia was a rich agricultural land yielding not only cereals but also vegetables and fruit, of which dates were perhaps the most extensively cultivated (Ellison 1981). Surplus cereals were exchanged for the raw materials such as stone and metal which were not available within this region.

3.1.3 Salinization

The damaging effects of flooding on Mesopotamian agriculture have been equalled only by the increasing salinization of the soil. Over cultivation has ruined the fertility of large areas of land in Iraq. These areas are covered with white deposits of salts resulting from the evaporation of saline river water. The problem is exacerbated by the rising level of the ground water resulting from prolonged irrigation. Efficient drainage of the kind installed in southern Iraq should counteract this effect, but the problem of salinization is not new. Third millennium agriculturalists appear to have increased production of barley, which had a greater salt-toleration (Ellison 1981, 38-39; Helbaek 1960). The Sumerians, however, appear to have combated these effects by improved techniques of agriculture to maximise the yield from the soil.

3.2 GEOLOGY

3.2.1 Summary

The physical environment and natural resources of ancient civilizations in Iraq have been largely determined by geology. Wright (1955, 84) has identified three physiographic areas thus refining the geographical distinction between northern Iraq and the southern alluvial plain (Fig. 3.1):

1. The Zagros mountains and foothills in the north-east.
2. The Central Lowland which traverses central Iraq from north to south and is divided in the Jezirah in the north and the broad delta plain of the Tigris and Euphrates rivers in the south.
3. The Western Desert or Hamad which replaces the Jezirah to the west of the Euphrates.

The geological history falls into three phases: a long period of marine submergence; volcanic activity contributing to the formation of fold mountains; and finally the erosion of the land surface. Sediments were deposited during the marine submergence and with shifting sea levels they were subject to intermittent erosion. Streams from the rising land mass produced silts which reached the sea, subsequently depositing shale and marl over Iraq. With the retreat of the shoreline mud deposition continued with pure limestone deposits left in areas of clearer deeper water. By the end of the period of marine submergence, seas were restricted by the rising land mass. Inland seas became saline and beds of gypsum and salt were deposited in addition to the limestone.

Volcanic activity and mountain building began in the Tertiary period, forming elongated ridges and valleys which constituted a physical barrier to movement between the Iranian plateau and the Mesopotamian lowland (Wright 1955, 86).

The ensuing phase of erosion was marked by deep gorges cut by the Diyala, the Lesser and Greater Zab and the upper Tigris rivers. The material removed from the mountain belt was carried by these rivers as far as the central lowland with silt finally reaching the delta plain of the Tigris south of Baghdad (Fig. 3.1). Climatic changes during the period of erosion brought glaciation (Nützel 1975, 101-104; 1976, 12-13; Wright 1955, 84) resulting in increased rainfall and lower temperatures accompanied by rapid weathering of limestone ridges building up rubble slopes and producing clayey soil. Both the

Tigris and Euphrates were more prone to flooding than nowadays resulting in increased deposition of silt in the southern alluvial plain and delta region,

> '... nourishing the succession of kingdoms and empires which has flourished in Mesopotamia for 5000 years ...' (Wright 1955, 89).

3.2.2 Geological systems and principal rock types

Dependence upon research carried out primarily by geologists representing the Iraq Petroleum Company has provided an incomplete geological record. Several authors, however, have offered a synthesis of the stratigraphic features (Al Naqib 1967, Buday et al. 1980; van Bellen et al. 1959). Surface formations and their general distribution have been mapped from these sources on Fig. 3.2. For the purposes of comparing petrographic analysis with the general geology of southern Iraq, however, descriptions have been simplified and a synopsis of the major formations and rock types is detailed below. Descriptions are confined to the region south of central Iraq.

Alluvium and sands

In south-western Iraq the Mesopotamian alluvial plain extends west of the Euphrates river as a narrow belt with numerous wadis draining into mud flats in the wet season. Some of the saline mudflats remain even during the dry season. East of the Euphrates a shifting sand-dune belt covers most of the region, extending beyond the eastern border of Iraq and encroaching on adjacent physiographic zones.

Bakhtiari Group and Dibdibba Formation

These formations occur north-east of Baghdad and in the southernmost region of Iraq; east of the confluence of the Tigris and Euphrates rivers and in a small area north-east of Ur (Fig 3.2). The two formations overlap and can only be differentiated by examining the composition of the pebbles and sands (Buday et al. 1980, 298). Detailed research has yet to be undertaken and for the present purpose the two formations are illustrated as one stratigraphic region on the geological sketch map (Fig. 3.2). The Bakhtiari Group is characterised by fine siltstone and mudstone whilst the composition of the Dibdibba Formation is mainly course-grained sandstones and gravels, the latter including dolerite and white quartz pebbles (Al

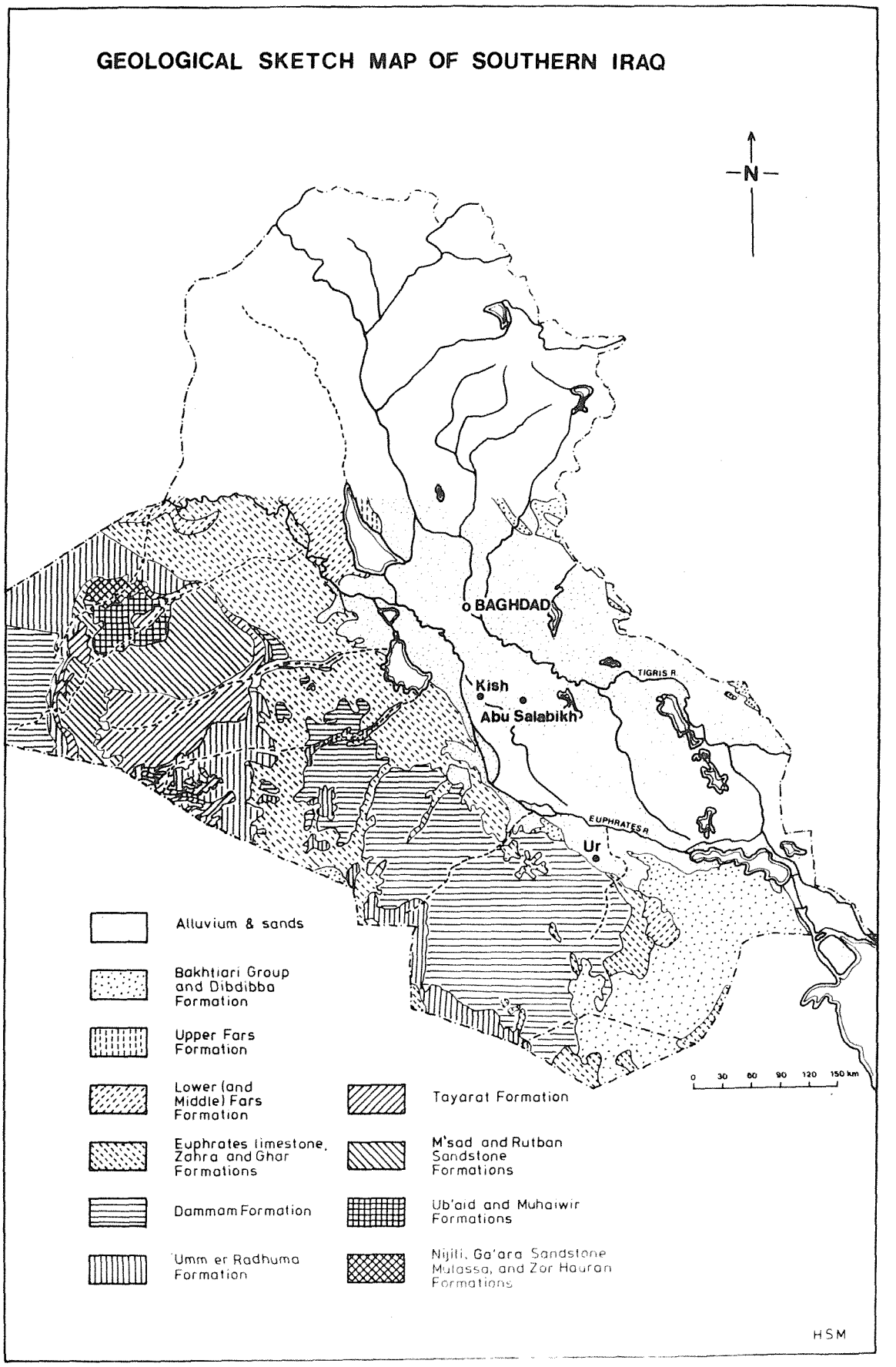


Fig. 3.2 Geological sketch map of southern Iraq

Naqib 1967, 45-47).

Upper Fars Formation

The Upper Fars Formation is not found in southern Iraq. The southernmost outcrop is north-west of Baghdad, between the Tigris and Euphrates rivers (Fig. 3.2). It is possible, however, that deposits may have been carried southwards in the silt of the eastern branch of the Euphrates.

The lithology of the formation is variable but it is essentially composed of red or grey marlstones and siltstones with medium- to coarse-grained sandstones (Buday 1980, 294). Limestones and shales also occur lower down in the formation.

Lower (and Middle) Fars Formation

The Middle Fars Formation is apparently so poorly defined in Iraq that it is generally included with the Lower Fars Formation (Al Naqib 1967, 43).

South of Ur the Lower Fars Formation (Fig. 3.2) consists mainly of evaporates, sediments resulting from the evaporation of saline water. Grey and red mudstone with streaks of gypsum, and oolitic, sandy, shelly and fossiliferous limestones make up the sequence of evaporites (Al Naqib 1967, 44).

Euphrates Limestone, Zahra and Ghar Formations

The Euphrates Limestone Formation has been equated with the Ghar Formation which comprises elastic rocks considered to have been transported and deposited by the Euphrates river. The Zahra Formation is also thought to represent fresh water deposits of the Euphrates. The relationships between all three are complex and await further research (Al Naqib 1967, 42).

The Euphrates Limestone Formation occurs over a wide area to the west of the Euphrates river (Fig. 3.2) and in some places the outcrop exceeds over 100km in width. It extends southwards along the narrow band of alluvium, west of the Euphrates in some places overlying the Dammam Formation which covers an extensive part of south-western Iraq.

Shelly, chalky, well-bedded re-crystallized limestones characterise much of the Euphrates Limestone Formation. The southern limits, however, consist of white limestone and sandy limestones with thick beds of loosely consolidated rounded sand suggesting the

incursion of the Ghar Formation (Al Naqib 1967, 41-42; Buday et al. 1980, 226-227; van Bellen et al. 1959, 94-96).

The Ghar Formation is not generally recorded in surface outcrops. It has been observed during drilling for oil wells and it is thought that the coarse sand, sandy limestone and sandstones of this formation merge into the Lower Fars and Euphrates Limestone formation (Al Naqib 1967, 43).

The Zahra beds, although equated with the Euphrates and Ghar Formations, are recorded on the extreme south-western border of Iraq near the neutral zone (Fig. 3.2). The Zahra Formation is characterised by hard sandy limestones occasionally containing freshwater molluscs. It is interesting to note that these limestones occasionally contain cavities filled with red sandy material which are thought to represent the fossilised roots of old reeds (Al Naqib 1967, 40).

Dammam Formation

Occurring in extensive sub-surface and surface outcrops, the Dammam Formation covers much of south-western Iraq (Fig. 3.2). The outcrops consist of several different beds with a complex stratigraphy. To the west of Ur, however, and to the south-west of Abu Salabikh and Kish the surface formation consists primarily of chalks and chalky limestones (Al Naqib 1967, 37-38; Buday et al. 1980, 224-227; van Bellen et al. 1959, 82-84).

Umm er Radhuma Formation

Outcrops of the Umm er Radhuma Formation occur along the western border of south-western Iraq and are exposed in the western desert region of Iraq (Fig. 3.2). The formation consists of anhydritic and dolomitic limestone. Chert and flint are distributed throughout the formation, although shelly limestone appears to be confined to the southernmost area (Al Naqib 1967, 33-34; Buday et al. 1980, 205-206; van Bellen et al. 1959, 295).

Tayarat Formation

The Tayarat Formation is confined to an outcrop approximately 200km south-west of Baghdad (Fig. 3.2). It consists of limestones ranging from chalky and fossiliferous to dolomitic and sandy limestones. Fossils in most of the Tayarat limestones, however, are invariably destroyed by recrystallization and dolomitization (Al

Naqib 1967, 31-32; van Bellen et al. 1959, 288).

M'sad and Rutbah Sandstone Formations

North of the Tayarat Formation lies the sandstone outcrop of the Rutbah and M'sad Formations (Fig. 3.2). The latter includes variable sandstone with sandy limestone bands which appear to integrate laterally with the sandstone of the Rutbah Formation. Owing to uncertainty of the relationship between these two formations they are grouped together as one physiographic unit (van Bellen et al. 1957, 247).

Sandstones of the Rutbah Formation vary from coarse to fine quartz sands, which in turn range from white to ferruginous, and sandstones which are frequently cemented to quartzites (Al Naqib, 1967, 22; Buday et al. 1980, 143).

Sands and sandy limestones are characteristic of the somewhat heterogeneous M'sad Formation. Shallow marine limestones occurring in the surface outcrop alternate with reef limestones, shelly limestones and chalky limestones (Al Naqib 1967, 24; van Bellen et al. 1959, 190-191).

Ub'aid and Muhaiwir Formations

Approximately 300km east of Baghdad lies an outcrop of the Ub'aid and Muhaiwir Formations (Fig. 3.2). The Ub'aid Formation is partly overlain by the Muhaiwir Formation but where surface outcrops occur these are composed of oolitic sandy limestones with abundant chert nodules (Buday et al. 1980, 70; van Bellen et al. 1959, 293). Oolitic, sometimes sandy limestones alternating with sandstones are also characteristic of the Muhaiwir Formation. The surface outcrop in this case, however, is confined to the limestones (Buday et al. 1980, 86; van Bellen et al. 1959, 193).

Nijili, Ga'ara Sandstone, Mulassa and Zor Hauran Formations

With the exception of the Nijili Formation these formations appear collectively as a group of outcrops adjacent to and north of the Ub'aid and Muhaiwir Formations (Fig. 3.2).

The lithology of the Ga'ara Sandstone is a mix of variegated medium- and coarse-grained sandstones ranging from white to red and black. These layers alternate in the subsurface with kaolithic clays and clays containing haematite ores, quartzite and siltstones. The underlying Nijili Formation is also composed of

sandstones (Buday et al. 1980, 45; van Bellen et al. 1959, 103).

Composed in its lower part of oolitic and sandy limestones, the upper part of the Mulassa Formation is similarly characterised by oolitic, pseudo-oolitic and sandy limestones. The upper part, however, is distinguished by a number of intrusive levels consisting of calcareous mudstone or marls (Buday et al. 1980, 59; van Bellen et al. 1959, 195).

The Zor Hauran Formation represents sediments consisting of evaporites, the majority of which are composed of marls (calcareous mudstones) and shales with beds of marly limestones, oolitic limestones and dolomitized limestones. The limestones contain poorly preserved fossils. Ferrouginous material occurs as surface deposits in this formation (Buday et al. 1980, 61; van Bellen et al. 1959, 310).

3.2.3 Geology and ceramics

Because the central lowland region is almost entirely covered by alluvium and sands (Fig. 3.2) and owing to the absence of specific geological information in this area it has not been possible to identify regional variations in pottery fabric groups related directly to geological differences. Characterisation of the fabrics has therefore included the identification of both mineral inclusions and sedimentary rock fragments (Section 8.3.3). It is instructive, however, to compare the incidence of sedimentary rock fragments in fabrics from Ur, Abu Salabikh and Kish with the geological features noted in south-western Iraq (Fig. 3.2).

Fabrics from Kish and more especially from Jamdat Nasr frequently contain abundant oolitic voids. Geological investigations have shown that the Lower (and Middle) Fars Formation consists largely of oolitic and fossiliferous limestones (Section 3.2.2), the largest outcrop of which is situated on the central and northern banks of the Euphrates river (Fig. 3.1). It is possible, therefore, that deposits containing fragments of oolitic limestone were accessible to the Kish and Jamdat Nasr potters.

Fragments of fine limestone, sandstone and siltstone are to be found in almost every thin-section of pottery examined from southern Iraq. These inclusions were presumably derived from the erosion of geological outcrops, washed down by the Euphrates river and subsequently deposited in the alluvium (Section 3.2.2; Fig. 3.2). Larger rounded fragments of these sedimentary rocks may represent the

selection by potters of coarser deposits for mixing with finer alluvial clays. The presence of temper consisting of coarse angular fragments of shelly limestone in Group Miv fabrics (Section 8.3.4; coarse red wares) and coarse angular fragments of siltstone in Groups Hv, Hvi and Hxii (Section 8.3.4; grey wares) suggests a non-local origin for pottery produced from these materials. This is further reinforced by mineralogical analysis (Section 8.3.3).

Among the tempering materials found in late Uruk and early ED I assemblages from Abu Salabikh, sand was one of the principal inclusions detected in fabrics by the presence of medium and coarse rounded quartz grains. Most of the medium to coarse sandy wares (Section 8.3.4, Groups E, G, H, J, K and M) from Abu Salabikh, Kish and Ur contain abundant fine, medium and coarse rounded quartz grains (Table 8.5, columns 6-7) similar to the sands which are typical of alluvial and deltal regions (Greensmith et al. 1971, 106). The loosely consolidated rounded sand typical of the Ghar and Euphrates limestone formation is also present (Section 3.2.2; Fig. 3.2). Fragments of shell are another common inclusion occurring either naturally or as tempering material.

Shelly deposits left by receding sea-levels were probably accessible to the potters from Ur, while the Abu Salabikh potters may have obtained shelly deposits from dried-out river systems and old canal beds. In addition to the specifically 'sandy' areas, the Surveys of Ancient Babylon indicate several "shell middens" in the region surrounding Abu Salabikh and Nippur (Fig. 1.1). It is likely, therefore, that similar sandy and shelly areas were available to the third millennium potters.

3.3 HISTORY OF ARCHAEOLOGICAL INVESTIGATIONS

Early antiquarians interested either in ancient monuments or portable antiquities from Western Asia relied upon written evidence for their interpretations. Greek and Latin histories and the Bible were the main source of information, knowledge of Near Eastern geography and Mesopotamian history being confined to these sources. During the late eighteenth and nineteenth centuries, however, the trade of the East Indiamen, taking the overland route from the eastern Mediterranean ports to the Arabian Gulf, encouraged both Britain and France to establish their influence in the Near East. The early twentieth century witnessed the establishment of a British Resident in Baghdad representing the interests of the East India Company. The appointment of these early Residents was politically motivated but successive diplomatic representatives in the Near East became increasingly fascinated by the country, the history of ancient Mesopotamia and its antiquities. Scholar-explorers such as Ainsworth (1838; 1888) and Buckingham (1827) wrote detailed accounts of their travels through Mesopotamia. Archaeological investigation in Iraq, however, was pioneered by the work of A.H. Layard who undertook excavations for the British Museum at Ninevah and Nimnid (Lloyd 1980, 101-129).

It was not until the early twentieth century that archaeological excavations were regularised and controlled by the introduction of an Antiquities Service. Gertrude Bell became the first Director of Antiquities in Iraq and founded the Iraq Museum. Foreign expeditions were now required to operate within set guidelines which required the presence of an epigraphist, an architect and a photographer as part of the excavation team. Finds were registered and excavations pursued with due attention to recording the progress of the work (Lloyd 1980, 181).

The excavations at Ur which began in 1922 under the directorship of C.L. Woolley (1923-1931; 1934; 1935; 1939; 1955) ushered in a new era of archaeological activity perhaps inspired to some extent by the discovery of the Royal Cemetery at Ur. The evidence which Woolley pieced together concerning Sumerian public life fuelled an interest in the origins of the Sumerians and the background to their culture, resulting in a preoccupation with Sumerian remains throughout the 1920s and 30s. Excavations at Warka, Kish and at Farah were instigated under the aegis of German, French and American

excavators (Lloyd 1980, 186). Interest extended to a group of cities in the Diyala region under the directorship of H. Frankfort, which subsequently proved to be one of the richest sources of evidence for the Early Dynastic period (Delougaz and Lloyd 1942; Delougaz et al. 1967; Frankfort 1939a).

The investigation of earlier occupation stages turned increasingly to the examination of pottery sequences from deep trenches dug into the accumulated debris. Three major phases were represented by distinctive pottery groups. Characterisation of such phases, however, necessitated the excavation of surface deposits attributable to each phase. The discovery of pottery at the site of al 'Ubaid, corresponding with the earliest pottery phases at Ur, Warka and Kish enabled the classification of 'Ubaid pottery types (Hall and Woolley 1927). Meanwhile excavators at Warka (Uruk) had located part of the site which corresponded with the second phase of pottery identified in the soundings at Ur and Kish. This was designated as the Uruk period. The appearance of mud-brick temples decorated with clay-cone mosaics, inscribed clay tablets and the first signs of sculptured reliefs accompanied this phase and suggested the first stages of developing Sumerian culture. Finally Langdon (1924) extended his excavations at Kish to include the site of Jamdat Nasr where the third phase initially identified in the soundings appeared to be represented on the surface by a temple and graves which produced distinctive painted wares (Mackay 1931). This phase was heralded as the dawn of the era of Sumerian dynasties, although subsequent excavations of third millennium sites in southern Iraq have suggested that the distribution of these painted wares is restricted to a few of the excavated sites (Section 3.3.2).

The classification of six major early historical and prehistoric phases in Iraq was formally determined in 1929 at an archaeological congress held in Baghdad (Postgate 1977a, 56). The sequence began with the prehistoric 'Ubaid period followed by the Uruk, Jamdat Nasr and Early Dynastic phases. Work on Tell Agrab, Tell Asmar and Khafajah in the Diyala region (Fig. 2.1) established the chronological sequence to which all earlier excavations and contemporary work on Sumerian sites were related. The division of the Early Dynastic period into ED I, ED II and ED III phases was proposed on the basis of three different pottery traditions in the Diyala sequence (Delougaz 1952). This provided a continuous sequence into which the finds from other excavations such as Warka, Kish and Ur

could be integrated. This remains the primary source of reference for archaeological discoveries from third millennium sites in southern Iraq (Adams and Nissen 1972, 100; McCown, Haines and Biggs 1978, 27-30; Moon 1985, 7; Safar and Lloyd 1981, 304).

3.4 Chronology

The following discussion is intended only as a brief analysis of the principal features which identify the chronological divisions of late Uruk, ED I, ED II and ED III periods. Detailed examination of late fourth and third millennium chronology appears in Crawford (1977, 1-16), Fielden (1981a), Hansen (1965, 201-209) and Porada (1965, 153-165, 175-177).

The problem of absolute dating has yet to be resolved. Several dynastic lists compiled by ancient Sumerian and Babylonian scribes, in particular the so-called Sumerian King-list (Kramer 1963, 328-331), have proved misleading. Kings treated as consecutive dynasties of rulers in such lists have subsequently been shown to be contemporary (Lloyd 1978, 91-93). The results of carbon 14 analysis have not always proved conclusive. Thus chronological divisions for the late fourth and third millennium BC are based primarily upon comparisons between the chronological sequence derived from the identification of stratified building levels at Tell Asmar, Tell Agrab and Khafajah in the Diyala (Delougaz and Lloyd 1942; Mallowan 1971, 241-242); from excavations at Nippur, Warka, the Palace and Cemeteries at Kish; and from the Royal Cemetery and Seal impression stratum at Ur, in the south (Porada 1965, 175; 177).

> As Crawford (1977, 14) has stressed
>
> 'at this distance in time the relative sequence of events is of greater importance that their absolute date'.

Although few carbon 14 dates have been obtained for late Uruk and Early Dynastic sites in southern Iraq, the dates for samples from Nippur, Warka, the Royal Cemetery at Ur and Abu Salabikh (Burleigh and Matthews 1982; Fielden 1981a, fig. 18) are in broad agreement with the chronological divisions deduced from the archaeological evidence and with carbon 14 dates obtained for contemporary sites in northern Mesopotamia (Fielden 1981a, fig. 18). The sequence can therefore be calibrated approximately as follows:-

late Uruk	c.3300 BC	to	c.3100 BC
Jamdat Nasr	c.3100 BC	to	c.2900 BC
ED I	c.2900 BC	to	c.2800 BC
ED II	c.2800-2700 BC	to	c.2600 BC
ED IIIa	c.2600 BC	to	c. 2500 BC
ED IIIb	c.2500 BC	to	c. 2400 BC

Although recent developments in carbon 14 dating (Gillespie et al. 1984; Ward and Wilson 1978) indicate that new approaches to archaeological sampling and dating may result in a greater resolution of chronological divisions, such techniques are at an experimental stage and archaeologists are obliged to rely largely upon traditional dating criteria. Emphasis is placed on similarities between architectural styles, sculptures, seal impressions and pottery types, as well as comparisons between grave assemblages (Childe 1969; 123-126; Frankfort 1939a, 16-18; 1955; Mallowan 1971; Moon 1985, 6-9; Porada 1965, 153-165). Tablets are also chronological indicators, and although their use is generally confined to individual levels or strata (Moorey 1975, 101; Postgate 1985, 5), more complex archaeological contexts have also been dated by this method.

One of the most striking features of Early Dynastic sites, apart from the ubiquitous pottery types, are the distinctive methods of building construction. The rectangular tile-shaped bricks used in late Uruk and Jamdat Nasr buildings are superseded by small plano-convex bricks, flat on one face but rounded on the other (Childe 1969, 148; Crawford 1977, 21; Moorey 1964, 83), frequently laid in a herring-bone pattern. This building technique is, however, confined to southern Iraq and the plano-convex brick is rarely found north of Baghdad (Crawford 1977, 44). Thus there are geographical limitations to this dating criterion. Furthermore, it has been established that plano-convex bricks continued to be used in the Akkadian period (Crawford 1977, 21; Gibson 1975, 36), thus precluding the identification of a clear distinction between late ED III and Akkadian building levels.

Third millennium architecture is not characterised solely by brick size and shape. The evolution of temple architecture follows an equally distinctive pattern (Crawford 1977, 22-28; Delougaz 1940; Delougaz and Lloyd 1942). It is also possible to detect chronological traits amongst major secular buildings and domestic housing (Crawford 1977, 29-39: Delougaz et al. 1967, 274-278).

Burial practices constitute another potential dating

criterion for Early Dynastic sites. The practice of intra-mural burial is generally believed to be typical of the ED II and ED III periods (Delougaz et al. 1967, 2; Postgate 1980b, 65; Watelin 1934, 17). Excavations have shown that the design of the grave shaft in relation to the chamber at Abu Salabikh may prove to be an equally significant diagnostic feature (Postgate 1980, 66). The simplest type of grave, with a rectangular shaft descending vertically to the chamber beneath, is thought to be an ED I burial type. A different kind of grave pit has been found in later Early Dynastic levels with a narrow vertical shaft opening out into side chambers below. Earlier examples of this type of grave have not been discovered at Abu Salabikh but precise dating of these two different grave structures within the Early Dynastic period remains to be established (Postgate 1980b, 67).

The position of the body in Early Dynastic inhumations does not appear to be diagnostic of a particular period. Flexed inhumations are common but there is otherwise no uniformity in the positioning of the body, although hands are generally close to the face (Mackay 1925, 13; Postgate 1980b, 68). Both reed matting and textiles have been found in association with Early Dynastic burials (Postgate 1980b, 71; 1980c, 103; Woolley and Moorey 1982, 39) and a few ceramic coffins are recorded (Childe 1969, 148), although examples of this type of inhumation have not been found at either Kish or Abu Salabikh (Postgate 1980b, 71-72).

Most burials contained grave goods of which the most prolific survivals are ceramic vessels. Personal ornaments, tools and weapons and copper alloy and stone vessels are usually confined to a few rich graves (Postgate 1980a, 94; 1980b, 73; 1982, 131). Metal tools and weapons are a relatively rare phenomenon in graves until the ED III period (Childe 1969, 156; Postgate 1980b, 73). Cylinder seals may also assist in dating individual graves more precisely. Their value as close chronological indicators, however, is restricted owing to the unknown extent to which they were valued as heirlooms.

It is acknowledged that pottery found in graves may have been affected by later disturbances, but none of the vessel types or fabric groups appears to have been restricted to graves. There is a possibility, however, that a small number of vessels from burial contexts at Abu Salabikh may be distinguished by their fabric (Section 8.3.4, fine red ware Group Lii).

Pottery assemblages in graves are often distinguished by

the presence of so-called 'suites' of vessels (Postgate 1980b, 73; Postgate and Moorey 1976, 163-164). Thus at Abu Salabikh or Kish, for example, each ED II and ED III grave usually contains no more than one upright handled jar (Table 8.1, Type 9) and one stemmed dish (Table 8.1, Type 10). These associations provide useful chronological evidence, but broader application of the chronology derived from grave groups depends entirely upon research capable of confirming that graves contain similar vessels to those from occupation contexts. Whilst chronological distinctions are demonstrated by art, architecture and evidence from inscriptions, pottery therefore remains the most universally applicable method of identifying chronological divisions in late fourth and third millennium sites in southern Iraq.

Nissen (1972, 100-104) has summarised the principal pottery types which are distinctive of the major chronological divisions from late fourth millennium and third millennium sites in this area. Despite regional variations in pottery types (Table 8.2), the late Uruk, ED I, ED II and ED III assemblages are broadly comparable throughout southern Mesopotamia. The distinction between the late Uruk and Jamdat Nasr period, however, is by no means so clear cut. Polychrome pottery has suggested the existence of a 'Jamdat Nasr period' based principally on the occurrence of this highly burnished polychrome decorated ware.

Painted wares of the Jamdat Nasr period do not always precede Early Dynastic types in the pottery assemblages from sites in southern Iraq although they are more common in the Diyala region. Polychrome painted ware does, however, occur in southern Sumer at Ur (Woolley 1934, 225), Lagash (de Genouillac 1934) and, further north, at Kish (Moorey 1978, 99; 102; 148), at Tell Uqair (Lloyd and Safar 1943, 146-147) and at Jamdat Nasr itself (Mackay 1931, 232). Adams and Nissen (1972, 150-153; WS219; W256) recorded some examples of painted ware from the Warka survey but painted ware was not discovered during excavations. Postgate and Moon (1982, 120-123) have argued for the absence of Jamdat Nasr painted ware in the pottery assemblage at Abu Salabikh but the black and purple-on-white polychrome sherds (Table 8.4, Sample nos. 2383-2387), and in particular Sample no. 2386, could represent fragments of this ware.

Given, therefore, that the existence of a definitive sequence of Jamdat Nasr pottery types is absent from most southern Mesopotamian sites, and that other pottery types and fabrics demonstrate a close continuity between this period and ED I,

chronological classifications in the pottery catalogue (Table 8.4, Column 3) have thus been confined to late Uruk and early ED I in order to define the pottery from the protoliterate period, except where published in excavation reports as 'Jamdat Nasr'.

Despite the limitations of dating by typological comparison, pottery continues to be regarded as one of the most reliable chronological indicators. Moreover, with the identification of technological variations in fabric related to chronological differences (Section 4.4.2 and Section 5.2) it can be envisaged that the potential exists for refining such dating.

4: POTTERY PRODUCTION AT ABU SALABIKH: AN INTRA-SITE STUDY

4 POTTERY PRODUCTION AT ABU SALABIKH: AN INTRA-SITE STUDY

4.1 INTRODUCTION

4.1.1 The site and its significance

The importance of Abu Salabikh as an Early Dynastic city was first recognised in the Akkad surveys (Goetze 1955, 127-128; Adams 1958; 1972a, 207). Subsequent excavations (Hansen 1974; Postgate 1976; 1977a; 1978; 1980a; 1982; 1983; 1984; 1985; Postgate and Moon 1982; Postgate and Moorey 1976) have revealed an urban centre with evidence for at least two public buildings (Postgate 1977a, 282-285; 1984, 98-100; Postgate and Moon 1982; 127-133) within the Sumerian city. Almost more important, however, are the results from extensive surface clearance followed by excavation which appears to reveal two different layouts of ordinary private houses and streets (Figs. 4.2 and 4.3; Postgate 1984, figs. 4, 9 and 10). Differences between the city quarter on the Main Mound and the earlier settlement on the West Mound may stem either from possible distinctions in social structure or from a radical change in town planning from the early periods (late Uruk/early ED I) to ED III.

Although excavations have been conducted at several sites with Early Dynastic occupation levels, Abu Salabikh presents the opportunity of examining a third millennium site unhampered by the considerable depth of later deposits characteristic of such huge multi-period cities as Warka or Nippur. Beyond the publication of pottery assemblages from Ur and Kish, few Early Dynastic sites have benefited from extensive publication of pottery sequences. Furthermore, whilst ceramic assemblages from Diyala sites (Delougaz 1952) provide an extremely valuable record of comparative material for the Early Dynastic period, it would be unwise to continue to rely on the chronological and typological variations of pottery from this region to date Sumerian pottery traditions.

The pottery assemblage from Abu Salabikh provides an opportunity for extending the present knowledge of the Early Dynastic ceramic sequence beyond the confines of published pottery from Cemetery 'A' at Kish (Mackay 1925; 1929) and the Royal Cemetery at Ur (Woolley 1934). Although whole vessels from Abu Salabikh are likewise primarily restricted to grave groups, a wealth of ceramic material has been retrieved from amongst the shattered remains of pottery excavated

from occupation levels such as floors and wall debris; from the ashy deposits of discarded rubbish from the administrative complexes and from numerous pits and sherd-packed rubbish heaps. It is this material which provides the basis for a study of third millennium pottery production in Sumer.

4.1.2 Petrological approach to the definition of a local ceramic sequence

The choice of Abu Salabikh as the type site for a study of third millennium pottery production was determined principally by the accessibility of an excavated Early Dynastic ceramic assemblage. Moreover, the discovery of levels containing middle to late Uruk pottery has facilitated the consideration of chronological changes in pottery production from late Uruk to the end of ED III. By examining and subsequently sampling pottery on site during the progress of excavation it has been possible to make direct comparisons between pottery found in different areas of the site. Thus chronological distinctions have been evaluated by an examination of pottery types in conjunction with preliminary fabric groups. Furthermore, important batches (e.g. Batch 5408 and 5601; Table 8.4) have been fully recorded, and each sherd or vessel in the batch is identified with a specific fabric group. Obtaining a representative collection of fabrics which may be sampled for petrographic analysis is made easier by selecting samples during the excavation. Whilst it is frequently impossible to take samples from whole vessels, comparable material from the same fabric groups may be obtained from less intrinsically valuable sherds of similar vessels. This presents a considerable advantage over the problems of obtaining samples for analysis from museum collections in which the majority of vessels retained are near perfect and consequently inaccessible to sampling.

Apart from the practical aspects of examining a ceramic assemblage in situ there are also a number of specific reasons why the pottery assemblage from Abu Salabikh lends itself to a study of third millennium pottery production. Foremost among these is the possibility of using fabric analyses in conjunction with vessel type to postulate chronological divisions in the ceramic assemblage and subsequently to test these divisions by comparison with the archaeological record.

The conclusions reached from an assessment of the fabric typology are in broad agreement with the stratigraphic evidence.

Specific examples will therefore serve to illustrate the contribution of ceramic petrology to definition of the sequence at Abu Salabikh. Reference is made to the pottery corpus in Section 8. It has been observed that transitional bowl types (Table 8.1, Type 1.2; Fig. 8.2) are usually confined to a specific fabric group (Table 4.2, Column 2 Group N). These bowls are frequently very similar in rim shape to conical bowls (Table 8.1, Type 1.1; Fig. 8.1). Since the transitional bowl is a type which apparently occurs in late ED I or early ED II contexts and is perhaps a precursor to the conical bowl, it is crucial in the identification of chronological trends to be able to distinguish between these different bowl types.

An examination of the fabrics within a batch therefore contributes to an assessment of its probable date, particularly where only body sherds have been retrieved. The range of fabrics within a specific batch may also assist in the dating of a particular level and this is perhaps most useful where ED II levels are suspected.

Attempts to detect ED I levels on the Main Mound and to trace the transition from ED II to ED III are hampered by the apparent lack of a continuous stratigraphic sequence spanning the whole of the Early Dynastic period from ED I to ED III (Postgate 1984, 107, 111; Postgate and Moon 1982, 125). The problem is further compounded by the limited nature of comparative ceramic material in southern Iraq by which specific ED II type fossils could be identified.

A number of vessels such as the ribbed hollow stands (Postgate 1984, pl. 6a) have, however, been assigned an ED II date on the basis of comparisons with more readily identifiable ED II pottery types from the Diyala region (Delougaz 1952, pl. 172), but the majority of pottery from Abu Salabikh reflects an apparent uniformity in style which is common to many of the published ceramic assemblages from sites in Sumer. A visual examination of ED II pottery fabrics, combined with petrographic analyses, has sometimes made the distinction between ED II and ED III pottery easier to define. Fabric E, for example, is a predominantly ED II fabric (Table 4.1, Batch nos. 2729 and 4032) and may be recognised amongst identifiable ED II pottery types and other vessels with a less obvious ED II vessel form.

It is possible that pottery from early ED II deposits on the Main Mound is considerably later than ED I pottery from the West Mound, the inference being firstly that there may have been a break in settlement between the two mounds and secondly that the ED I period occupies a long time span, only the earlier half of which is

represented on the West Mound. Evidence from the classification of fabric groups tends to confirm this since the fabric repertoire of ED I pottery types from the West Mound (Table 4.1, Batch no. 5408) is appreciably greater than ED II pottery types from the Main Mound and ED I/II pottery from the North-East Mound (Table 4.1, Batch nos. 2729 and 4032).

4.1.3 Pottery production

Fabric typologies for the major periods from late Uruk to ED III (Section 8.3.4; Table 4.1 and Table 8.3) offer the potential for exploring the evolution of what appears to be a prolific industry ranging from products initially manufactured by independent potters or groups of potters to apparently standardised production. Reorganisation of the settlement may imply control by a form of central administration. It is a matter for speculation whether widespread ceramic standardisation by the ED III period is a product of similar administrative intervention. Minor variations in local clay sources, clay preparation and even firing conditions may be identified using petrographic analyses (Section 8.3.4). Such variations may represent the products of either small groups of potters or individual part-time craftsmen contributing to organised production.

The fabric typology identified in late Uruk and ED I pottery assemblages is readily distinguished by visual examination. These macroscopic differences principally reflect variations in the use of tempering materials and are potential discriminators between different levels of production. Batch 5601, West Mound (Table 4.1), for example, may be shown to contain representative fabrics of almost every group identified in the local ceramic assemblage. Reference to the classification of vessel types and fabrics (Table 4.2) indicates that some fabric groups span the whole range of vessel types (e.g. Table 4.2, Group A and Group E) and may represent a form of mass production, or at least large scale production from a potter's workshop. Several fabrics, however, are restricted to one or two vessel types (e.g. Table 4.2, Group D). In the latter case there is evidence for shell-tempered wares (Group D) occurring at Ur in the late Uruk/ED I period with exchange in vessels manufactured from this fabric taking place between these two sites. By the ED III period shell-tempered wares were being exchanged between Ur and Kish, and between Kish and Abu Salabikh, although the link between Ur and Abu

Salabikh appears to have broken. It is possible, however, that this form of exchange, apparently restricted to a small number of pots manufactured from one specific fabric group, is evidence for a continuing tradition of itinerant potters travelling between the three sites.

4.1.4 The sampling strategy and its practical limitations

Quantification of pottery types and fabrics has necessarily been restricted solely to batches which have been examined in detail. The pottery corpus (Section 8) has been arranged to take into account the frequency of occurrence within different batches of each individual vessel belonging to a specific fabric group. The batch number is recorded in Table 8.4, Column 2 together with the number of vessels (in brackets) of the type recorded in Column 4 and found to belong to the fabric group recorded in Column 7. It has proved impracticable to record the frequency of occurrence of all fabrics for vessel types in every batch retrieved during the progress of even a single excavation season. Instead, recording has been confined to stratigraphically significant contexts and levels from soundings, or where large quantities of sherds are densely packed such as in pits (e.g. Table 4.3, Batch 3408) and grave fill (e.g. Table 4.3, Batch 1804).

Some two thousand pottery samples have been recorded from a total of 200 batches (levels), but whilst this forms a significant body of material it is subject to the limitations of contexts which are frequently poorly stratified, either because they are derived from grave groups and grave fill, or because the levels are disturbed by grave cuts and later pits (particularly on the Main Mound). Furthermore, whilst Abu Salabikh may be described as a small urban centre, the greater part of it remains to be excavated (Fig. 4.1).

The technique of surface clearance (Postgate 1978, 80-85; 1983, 4-5) has extended the excavation area considerably, although the sampled population is restricted in this case to surface and sub-surface deposits rather than stratified levels. Thus gaps occur in the archaeological record where large areas remain unexplored. At the other extreme it is ironic that despite the limits imposed on the extent of the excavation, principally by the size of the site, the considerable quantity of pottery produced during a single season precludes detailed examination on site. It is also unfortunate that the potential for studying samples once the season is completed is

curtailed by limited resources for exporting study material.

At present, therefore, to attempt complex statistical evaluation of the data would be impractical and unrealistic. Instead the importance of defining the range of fabrics amongst the identified vessel types (Table 4.2) is stressed. Subsequent identification of possible chronological and spatial trends by the presence or absence of specific wares is thus confined to a simple quantification of vessel types and fabrics (Table 8.4).

4.1.5 The intra-site approach and its implications

It is perhaps inevitable that regional variation in Early Dynastic pottery has been the subject of close attention since stylistic affinities and differences in the ceramic assemblages from sites in southern Mesopotamia are regarded as potential indicators of economic and political organisation (Moon 1981; 1982; 1985, 9). Such studies, however, are usually carried out at the expense of examining the pottery industry at a local level and rarely take into account local variations in fabrics or wares which may be equally crucial in establishing regional distinctions.

The temptation naturally exists to postulate a division between sites close to the seaboard on the southern Mesopotamian plain, such as Ur and Tell al 'Ubaid, and sites which cluster further north, such as Abu Salabikh and Kish. An examination of published ceramic assemblages would certainly suggest such a division, but the picture has been distorted to some extent by selective publishing of vessel types, particularly from Ur, and by the neglect of equally valid comparisons between sherds.

Stylistic evidence based on the classification of whole vessel shapes has provided insufficient evidence to answer potential questions concerning the organisation of the third millennium pottery industry. The use of petrographic analyses, however, highlights the importance of defining a pottery typology, an integral part of which is fabric classification, and which extends beyond the identification of whole vessels to include rim and featured sherds. This is a new approach to the study of third millennium ceramics in general and Early Dynastic pottery assemblages in particular. Its value for future studies cannot be over stressed, since it provides the background to a systematic study of pottery at an intra-site level. There is a need for a standardised approach to the recording and classification of pottery vessel types and fabrics. The present study

of the pottery assemblage from Abu Salabikh establishes the criteria necessary for a recording system to be used both on site and in the subsequent examination of museum archives. It is hoped that this will provide the basis for future sampling strategies directed towards further ceramic research.

4.2 EXCAVATIONS AT ABU SALABIKH

4.2.1 Geographical location and archaeological history

The position of Abu Salabikh in relation to other ancient tells was recorded by Adams in his Akkad survey (Adams 1972, 207; Map 1F) and in the surveys of Uruk and Early Dynastic settlement on the Mesopotamian plain (Adams 1981, 56-57; 64-65; Figs. 9, 10, 12 and 13; Postgate 1982, fig. 1). The site is marked at 43° 3' E, 32° 15' N on the Quarter-Inch sheet no. 1-38V, (Postgate and Moorey 1976, 134).

Situated some 20km north-west of Nippur, the cluster of mounds which form the site of Abu Salabikh are low-lying and barely rise to a maximum of 5m above the plain (Postgate 1982, 48). Although Ainsworth probably passed close to the tell, it does not appear in the accounts of his travels through Babylonia (Ainsworth 1838; 1888), possibly because the mounds are low lying. The first record of this site may perhaps be attributed to the Surveys of Ancient Babylonia (Fig. 1.1; Selby et al. 1885), where a small mound on the edge of the marshy area of 'Har Abu Samach', marked 10km west of 'Zibbleyeh' (Ziblyyat) possibly represents part of Tell Abu Salabikh.

The tell of Abu Salabikh is today hemmed in by huge irrigation ditches, the spoil banks of which break an otherwise uninterrupted sky-line (except for the towering ziggurat of the islamic site of Ziblyyat). The desert, which stretches east from Euphrates to Tigris, begins only a kilometre away and the site is dusty and barren apart from scattered bushes of camel-thorn and the tall reeds of a small marshy area near the Eastern Mounds. In the third millennium, however, Abu Salabikh must have presented a very different appearance. It seems likely that the site was near a water-course (Postgate 1983, fig. 1), possibly a canal or perhaps a branch of the Euphrates (Hansen 1974, 5; Jacobsen 1960, pl. 28). The settlement was probably surrounded by wheat and barley fields, the produce of which constituted the Sumerians' staple diet of cereals (Ellison 1981, 37). The flat terrain was perhaps relieved by date palm groves spreading outwards from the banks of the river in much the same way as those illustrated in the Surveys of Ancient Babylonia (Fig. 1.1; Selby et al. 1885).

Excavations were initially carried out at Abu Salabikh by the American Schools of Oriental Research (Biggs 1974), the intention being to examine the Uruk levels which had proved to be virtually inaccessible at the neighbouring site of Nippur (McCown, Haines and

Biggs 1978, 3). This objective was superseded by the excavation of an important archive of literary and lexical texts from a sounding on the Main Mound (Hansen 1974, 6-11). A study of these texts (Biggs 1974; Biggs and Postgate 1978) has indicated that the history of Sumerian literature is earlier than had been previously supposed. Two major literary texts were discovered which had formerly been confined to....

> 'the repertoire of the post-Sumerian scribal schools of Babylonia: the Instructions of Shuruppak and the Kesh Temple Hymn ....' (Postgate 1982, 50).

The scribal tradition used in the writing of these texts has revealed evidence for linguistic and cultural links between Abu Salabikh, Kish, Mari and Ebla, thus establishing contacts between third millennium sites on the Mesopotamian plain, north-west along the Euphrates and into Syria (Biggs and Postgate 1978, 106, 116; Gelb 1977, 8; Matthiae 1980, 159-161; Moorey 1981). Moreover, the presence of Semitic names and Semitic elements in the language of administrative tablets (Biggs 1974; Biggs and Postgate 1978, 104-105) contrasts with the Sumerian literary tradition at Nippur which is considered to be the cultural and religious 'centre' of Sumer (Postgate 1982, 50), suggesting a hitherto unsuspected semitic influence on the area.

Following the discovery of the tablets, excavations were continued on the Main Mound at Abu Salabikh with the intention of examining the provenance of the archive (Hansen 1974). Work was resumed in 1975 under the auspices of the British Archaeological Expedition to Iraq (Postgate and Moorey 1976). The plan of an administrative complex dating from the ED III period in Area E has been uncovered during successive seasons of excavation (Hansen 1974; Postgate and Moon 1982, 127-133; Postgate and Moorey 1976, 135-158), although the nature of this public building is still unknown. A second probable public building was discovered in Area A (Postgate 1984, 97-100), and further excavations supplemented by surface scraping (Postgate and Moon 1982, 123-125) have exposed the plan of a housing quarter in 5I (Fig. 4.3) which appears to be contemporary with the ED II date for construction of the north wall in the Area A public building (Postgate 1974, 100-103). Surface clearance has also been used to trace the link between Area A and Area E (Postgate 1984, 110-113; fig. 9 and fig. 10), and a plan of domestic housing, dissected by streets crossing one another at right angles, is gradually being pieced together.

The technique of planning features from a surface scrape was first applied to a large area of the West Mound (Postgate 1978, 81-85; Postgate 1983, 3, 4-8) where topsoil clearance has exposed features of ED I and Uruk buildings. The success of the technique lies principally in its value as a method for rapid and extensive coverage of surface features. The results are comparable with those achieved by resistivity or magnetometer surveys which define sub-surface archaeological features and identify potential areas for subsequent excavation.

4.2.2 Late fourth and third millennium settlement at Abu Salabikh

Although Abu Salabikh is a relatively small city in comparison with major contemporary sites such as Nippur, Warka and Lagash (Fig. 3.2), it is identified as an urban centre on the basis of evidence not only from the archive of literary and lexical texts but also from the apparent size and density of the settlement coupled with the structural remains of at least two public buildings. Moreover, it has been suggested that Abu Salabikh is the site of the ancient city of Eresh (Biggs 1974, 24; Postgate 1982, 54; Postgate and Moorey 1976, 161) which was once the capital of a minor city state. The status of the site is crucial to achieving an understanding of the organisation of its pottery industry. In order to facilitate comparisons between ceramic production related to differences in settlement pattern, pottery has been examined from each of the principal areas excavated.

The visible limits of the site extend over an area of approximately 0.5km. It comprises a cluster of mounds of which the furthest north are the North-East and North-West Mounds (Fig. 4.1) which are divided from the Main Mound, West Mound, Uruk Mound and South Mound by a modern canal. There is an area of depression south of the Main Mound which separates it from the other three mounds. This is thought to be the remains of a disused canal.

Evidence for occupation in the middle to late Uruk period and possibly even earlier (Postgate and Moorey 1976, 135) is so far confined to the Uruk Mound and the North-West Mound where surface levels are no later than the Uruk period (Postgate 1978, 80; Postgate 1983, 3). In addition, the West Mound - initially thought to have been occupied only in the ED I period - has produced material of middle to late Uruk date. Of these three mounds, however, only the West Mound has been the subject of detailed archaeological investigation (Postgate 1983). Excavation work has focussed

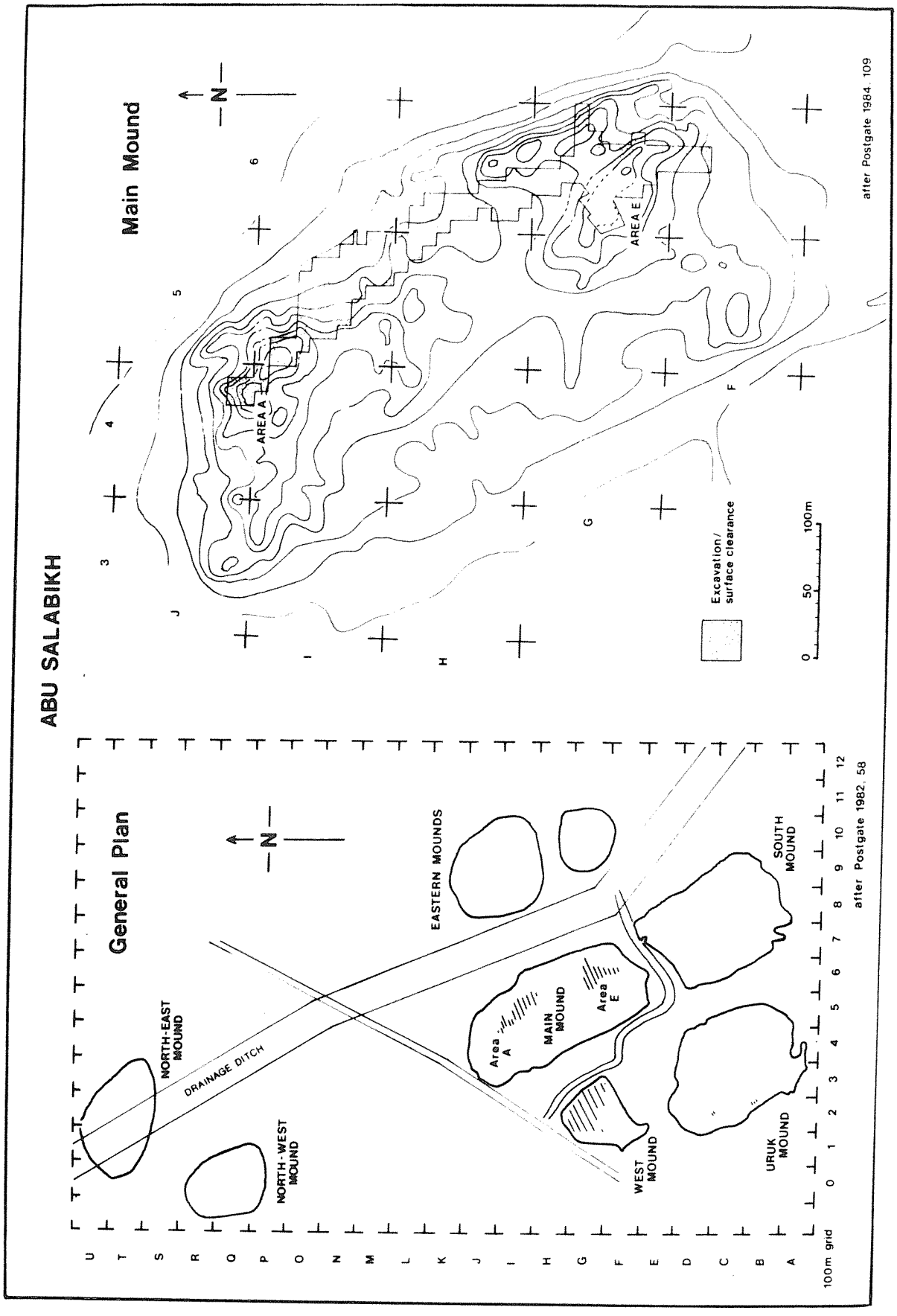


Fig. 4.1 Abu Salabikh: general plan of the site and contour map showing excavated areas

principally on the Early Dynastic levels (c. 3000 - 2400 B.C.) of the Main Mound in Area A and Area E (Fig. 4.1).

The extent to which the city was occupied at any one period is difficult to establish owing to the effects of weathering where later levels may have been eroded. Moreover, the deposition of alluvium prevents the reconstruction of links between individual mounds. Areas of the site, perhaps occupied for a relatively short period of time and contemporary with early levels revealed by excavations on the Main Mound, may lie buried beneath the alluvial soil (Postgate 1983, 1).

Bearing in mind such limitations the evidence would still appear to suggest that the ED I period witnessed greatest expansion of the city (Postgate 1983, 1). ED I levels are present on the West Mound, the North-East Mound, and appear to represent the earliest building phase on the Main Mound. It is possible that ED I levels were also present on the Uruk Mound and the North-West Mound, but were destroyed by the action of weathering since the Uruk deposits are on the surface of these mounds.

The original terminology used by Hansen (1974, 5-6) to define major building levels within the stratigraphic sequence has been revised and extended as the excavation progresses. Three major divisions, levels I to III, divide the occupation of the Main Mound: late ED I/II (level III); ED II/early ED III (level II); ED III (level I) (Postgate and Moorey 1976, 137-143).

Excavations on the Main Mound have concentrated on establishing the nature of the building complexes uncovered in both Area E and Area A (Figs. 4.2 and 4.3). Site records are related to a 100m grid. The horizontal axis is numbered from 0 to 12 and the vertical axis lettered from A to U (Fig. 4.1, general plan). Thus, Area E occupies the squares 6G and 6F. Each 100m square is sub-divided into 10 x 10m squares which are numbered from 00 to 09, reading from north to south to obtain the first number and then from west to east. Room 92 in Area E is therefore recorded in 6F15 (Fig. 4.2).

Main Mound, Area E

The size of the Early Dynastic building complexes in Area E, coupled with the discovery of an archive amongst which there were administrative tablets as well as literary and lexical texts, has led

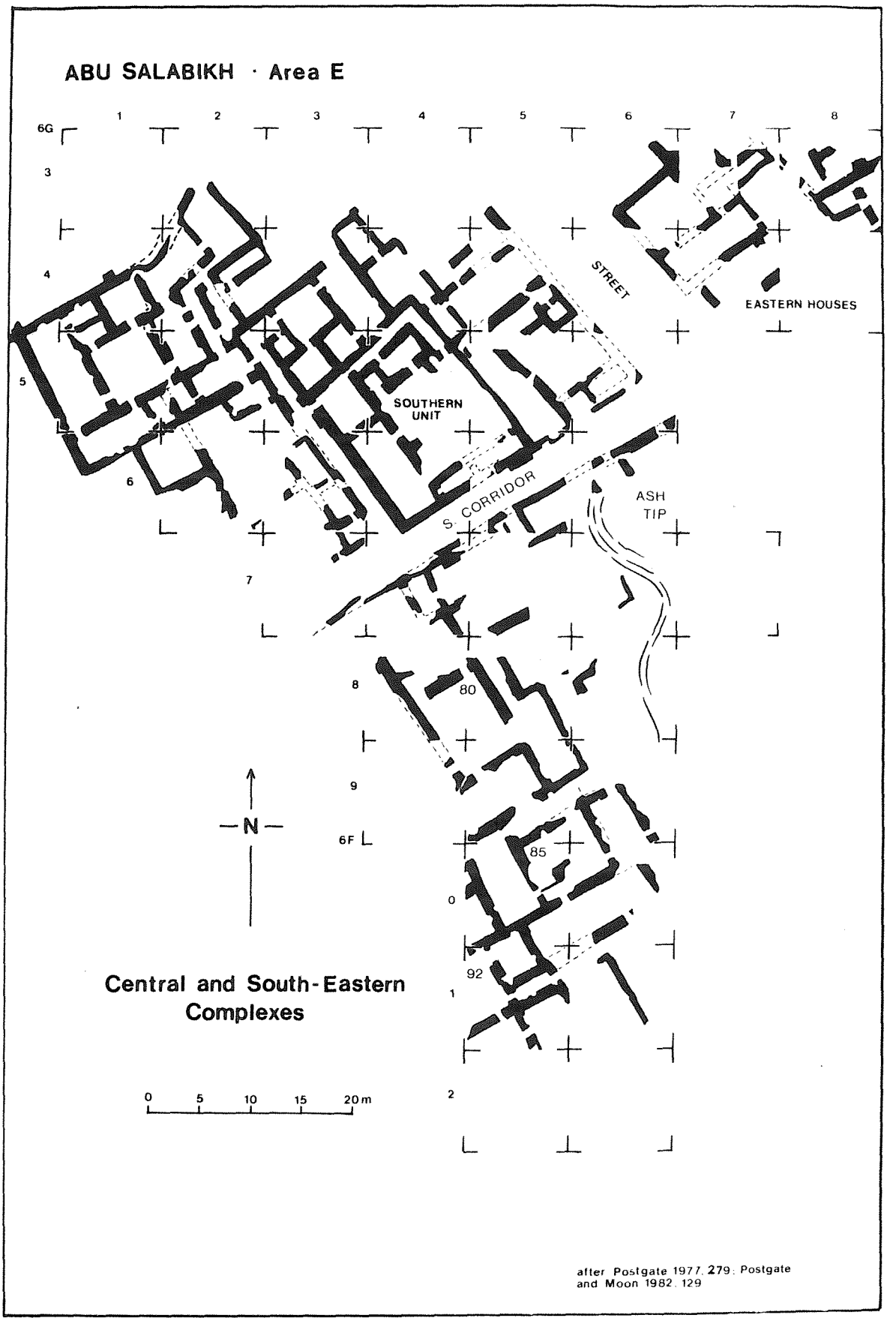


Fig. 4.2 Abu Salabikh: plan of buildings in Area E

to the suggestion that these buildings are part of an administrative centre. The precise nature of the establishment, however, is unclear since the presence of the tablets is indicative of both secular and religious institutions.

The plan of the ED III building complex is divided into two main areas separated by a wide corridor (Fig. 4.2, south corridor). North of this corridor lies the central complex containing two courtyard units consisting of several rooms arranged round a central courtyard. Three similar courtyards have been excavated in the south-eastern complex, south of the southern corridor (Fig. 4.2 nos. 80, 85 and 92; Postgate and Moon 1982, 128). Evidence for contemporary occupation of the two areas is provided by a continuous stratigraphic sequence in the southern corridor which links the main surface level of the south-eastern complex with Level 1B/Level II in the central complex (Postgate 1984, 97).

Identification of the function for different rooms in the complex is hindered by the nature of the artefact evidence which is applicable to both a temple and a palace. The courtyard houses were probably made up of a number of domestic units linked together by corridors forming a single institution. They are unlikely to have been independent residences (Postgate 1982, 55). Throughout the building there is evidence for domestic use such as cooking areas with ovens and hearths and bitumen-paved floors indicating washing areas (Postgate 1980, 88; 1982, 54; Postgate and Moon 1982, 30). The south-eastern corner of the central complex has been identified as a domestic quarter with a large domestic kiln, bread ovens and several layers of accumulated rubbish (Postgate 1980, 88).

Beyond the south-east complex and to the east is an ED III rubbish tip with a continuous stratigraphic sequence of wood ash deposits, presumably discarded from domestic ovens in rooms belonging to a building level which has since been eroded. Assuming that the rubbish is from a single source, the rooms from this lost building level may, however, have been associated with more than purely a domestic function, since more than 200 sealings were recovered during excavation of the ash tip. A number of ceramic counters, numerous small clay figurines (Postgate 1980, pl. 10) and a deposit containing at least fifty fragments of miniature clay vessels (Postgate 1980,93) were also retrieved during sieving.

The presence of both door seals (Postgate 1980, 92; 1982, 52) and jar seals indicates that the administrative complex was

associated with the storage and possibly the distribution of local and imported goods, but there is no positive identification of the building as a temple or palace. Hansen's initial premise that the buildings which he excavated in Area E were part of a temple (Hansen 1974, 17-18) remains the most likely explanation (Postgate 1980,92). It has been suggested that the figurines and miniature pottery vessels had a role in the temple cult and did not belong to a palace administration (Postgate 1982, 34). Some of these miniatures are crudely made with no life-size ceramic counterparts. Others, however, are very similar to ED III pottery types (c.f. Fig. 8.45) and there is at least one example of a miniature spouted jar (Postgate 1980, 93). It is possible that these miniature versions of large vessels may have been intended to symbolise offerings in much the same way that older vessel forms were depicted in hunting scenes and banquet scenes on sealings (see Section 9.1 and Table 9.1).

Part of the southern unit appears to have been used as a burial ground and the evidence from graves in this area supports the supposition that the complex functioned as a temple. Grave 1 is probably the most interesting of four large burials in the rectangular room to the west of the courtyard in the southern unit. The presence of rich grave goods, combined with the suggestion that the grave possesses similar features to those of priestesses of Nanna at Ur (Martin et al. 1985, 20-21; Postgate 1982, 54-55; Postgate and Moorey 1976, 146-151), is consistent with a temple context. More direct evidence for the temple theory has been cited on the basis of a land allocation text in which reference is made to a lady who is perhaps the Goddess of reeds and writing (Biggs and Postgate 1978,106; Postgate 1982, 54; Postgate and Moorey 1976, 160) and who precedes the city ruler or ensi in the text. It is possible therefore that the Area E complex is the temple of this Goddess.

The discovery of graves in both the eastern houses and the south-east complex, where burial took place during the occupation of the room, is taken as an indication that much of the Area E complex consists of domestic units and that their inhabitants were part of a temple establishment.

Main Mound, Area A: Public Building

Fig. 4.3 shows the plan of the Area A building complex together with a housing quarter planned from surface clearance in 5I.

Excavations in Area A have revealed the plan of what is believed to be a second public building in which at least two courtyard units are recognisable (Fig. 4.3, squares 5I 10/5I 11; 5I 20/5I 21; 5I 30/5I 31). They have been assigned to Level II (Postgate and Moorey 1976, 137) and dated to the early ED III period (Postgate and Moorey 1976, 141). Evidence for later occupation is largely confined to intrusions in the form of pits, cuts and graves. Later occupation is attested by a drain cut into Level II in 5I 11 and by an oven in 5I 10 which is part of a subsequent building level (Postgate and Moorey 1976, 139).

Although evidence for later structures has been eroded, it is assumed that graves cut into this important building are associated with later construction levels. The pottery from these graves is similar to vessels found in Grave 7 in Area E which implies that the corresponding occupation levels likewise originated during the first half of the ED III period (Postgate and Moorey 1976, 141). Intramural burials are common not only in Area A but also in Area E at Abu Salabikh and they are a feature of other Early Dynastic sites (Delougaz et al. 1967, 58).

Surface clearance and excavation in 4I and 4J (Fig. 4.3) has extended the plan of the Area A building complex north-west of the courtyard units in 5I. A wide 'corridor' (Fig 4.3, 4J 87 - 4J 97) has been uncovered, with rooms to the south and a large wall to the north, uninterrupted by entrances (Postgate 1984, 98). It has been possible to reconstruct several building phases of the north wall which may have originated as little more than a domestic structure. The first phase of construction of the enlarged north wall apparently began in the ED II period and is presumed to have continued into the ED III period (Postgate 1984, 98). Evidence for this sequence is adduced by sherds of hollow stands belonging to a type which is dated to the ED II period in the Diyala sequence (Delougaz 1952, 55-56, 81; pl. 172). These sherds were discovered in the construction levels of the north wall.

Although the architectural evidence is limited, it has been suggested that construction of the Area A building complex was similar to the public building in Area E (Postgate 1984, 98). The layout appears to comprise a number of rooms, probably forming part of an administrative complex, enclosed by a perimeter wall. The dimensions of this north wall imply a defensive function and it is assumed that the building was part of a palace (Postgate 1984, 100). The evidence

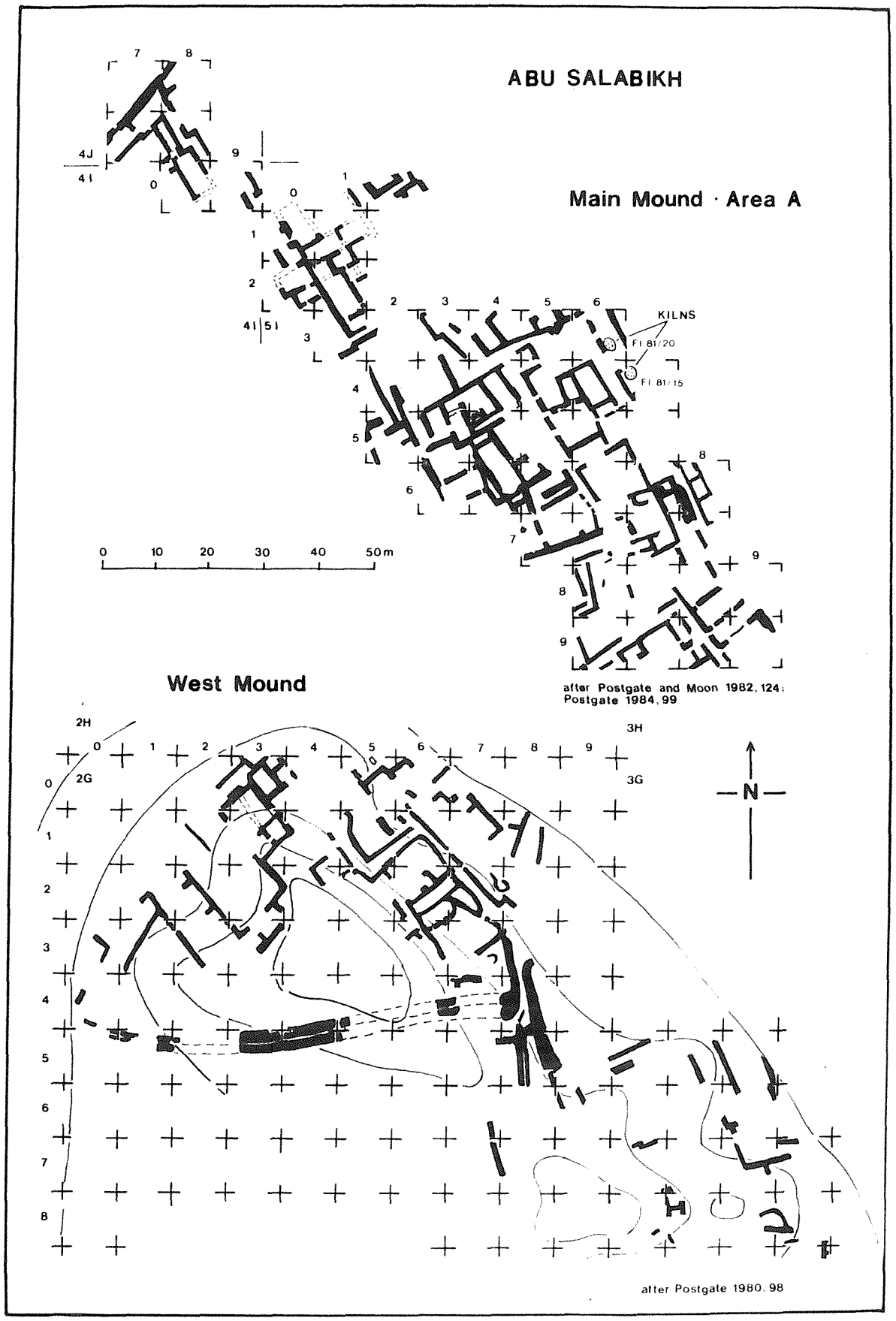


Fig. 4.3 Abu Salabikh: plan of buildings in Area A and plan showing the results from the West Mound surface scrape

for such a function is, however, largely circumstantial. A small collection of sealings, together with an administrative tablet concerned with grain distribution (Biggs and Postgate 1978, 104-105), suggest an administrative function, whilst artifacts with a military connection discovered amongst a copper hoard reinforce the defensive aspect of the building (Postgate 1984, 100).

Main Mound, Area A: Housing Quarter

An area between the two public buildings on the Main Mound was scraped and planned in 1981. The results indicate a plan of ordinary houses (Fig. 4.3, Area A, square 5I; Postgate and Moon 1982, 123) presenting the appearance of an intensively occupied residential area in which the houses are

> '.... packed tightly side by side with the occasional narrow street between them ....' (Postgate 1982, 59).

A large oval oven is featured in many of the residential courtyards (Postgate and Moon 1982, 125). Since these ovens are not known to occur as late as the ED III period, a date for the housing quarter is presumed to have been late ED I or ED II. Artifacts retrieved during the surface clearance of 5I, including ED I pottery types (Postgate 1982, 59; Postgate and Moon 1982, 123) and an ED I style cylinder seal, initially suggested an ED I date for the area. Subsequent examination, however, indicates that an ED II date is more probable (Postgate 1984, 101-102).

The excavation of a small house in 5I 88-89 and 5I 98-99 has confirmed preliminary assumptions concerning the character of the housing quarter. Adjacent to a narrow street, which had been paved with sherds (Postgate 1984, 101), the house consisted of a main reception room leading to a courtyard with a hearth to the north and a kitchen area to the south. The kitchen contained several stone tools and a jar-hearth consisting of an upturned spouted jar, the inside of which served as the base of a hearth (Postgate 1984, 101; pl. 7c). This type of pot is similarly not recorded in the ED III period (Postgate 1984, 101).

The remains of two major walls were also excavated and these appear to be broadly contemporary with one another forming the eastern city wall. On the basis of identifiable ED II pottery types, namely a large spouted jar and part of a pilgrim flask (Table 8.4 and Fig 8.62, Sample no. 1473), the wall has also been dated to the ED II

period.

As work continues in the area between the two public buildings it is becoming clear that the plan is one of domestic houses consisting mainly of small units with individual courtyards and with their own ovens. The houses are bisected by streets

> '.... at intervals of 50m on the NW - SE axis and 25m on the SW - NE axis ....' (Postgate 1984, 110).

This ordinary housing quarter apparently stretches from the Area A public building southwards to join the Area E building complex (Postgate 1984, 110-113).

West Mound

Occupation of the West Mound began at least as early as the Uruk period and does not appear to continue beyond the ED I period. Although the process of erosion may have removed later levels there are no traces of ED II or ED III artefacts which might have been expected had such levels existed.

Two major differences between the archaeology of the West Mound and that of the Main Mound are immediately apparent. Firstly the presence of numerous graves which are a recurring characteristic in excavations on the Main Mound contrasts with the absence of any form of burial on the West Mound (Postgate 1983, 12). It is possible that this is linked to the second and more striking difference in settlement pattern between the two mounds. Surface and sub-surface scraping on the West Mound has exposed a plan of buildings confirmed by excavation to comprise independent houses and courtyards within individual enclosures (Postgate 1983, 13).

Each enclosure appears to be surrounded by a large wall of mud-brick, often of more than one row in breadth (Postgate and Moon 1982, 108). The remains of three or four of these enclosures are visible in the plan of surface features on the West Mound (Fig 4.3). Postgate (1980, 99; 1982; 59) has suggested that they represent the dwellings of Sumerian extended family units. These extended families would have been largely self-contained with the owners, their servants and their livestock all housed within the same building. Such a theory gains credence from the presence of store rooms, hearths and domestic ovens, and drainage within individual enclosures (Postgate 1982, 59; 1983, 12-15).

The most readily identifiable enclosure on the West Mound

is to the north of what is presumed to be an enclosure wall, running east-west across the mound (Fig. 4.3, 2G 51 - 2G 47). This enclosure has been dated to the ED I period by the collection of surface and sub-surface sherds and by three ED I jars discovered in situ in a room to the north-west of the courtyard (Fig. 4.3, 2G 03). In the eastern part of this enclosure are several hearths and ovens indicating a working area (Postgate 1983, 13; fig. 354). To the east of this enclosure is a second one in which a similar domestic area is apparent.

Postgate and Moon (1982, 108-109) have drawn attention to Nissen's discovery of ED I enclosure walls at Warka (Nissen 1970, 120-122) which may have acted as boundary walls like those at Abu Salabikh. Nissen (1970, 120-122) demonstrated that these 'Ringmauer ' or enclosure walls were likely to have been built at the beginning of the ED I period. It is tempting to speculate that the same is true of the West Mound enclosure walls and that no occupation levels can be dated beyond the early part of the ED I period.

Differences in architecture between ED I settlement on the West Mound and ED II houses on the Main Mound, coupled with radical changes in both pottery types and fabrics, suggest that there is a considerable lapse of time between the latest occupation levels on the West Mound and ED II levels on the Main Mound.

The plan of ED II housing in Area A (Fig. 4.3, square 5I) vividly illustrates a difference in settlement pattern from the West Mound, where spacious enclosures contrast with the apparently cramped accommodation of tight clusters of houses on the Main Mound (Postgate 1982, 59-60). It is also noticeable that the large elaborate structures of domestic ovens found in the courtyards of almost every house on the Main Mound do not occur on the West Mound. The ovens excavated in West Mound houses are much simpler and more akin to the modern bread ovens (tannurs) still used in Iraqi villages today. It is possible that the large oval ovens in Area A reflect a difference in social structure. Analysis of pottery fabrics from a large batch in 2G 36 (Table 4.1 and Table 4.2, Batch 5408) indicates that there is a technological change in the production of ED I pottery from this level compared with ED II pottery from the Main Mound (see Section 4.4). This is consistent with the theory that ED I levels on the West Mound are earlier than the ED I occupation of the Main Mound.

Assuming that the difference in settlement plan is thus related to a chronological break between the ED I occupation of the

West Mound and the earliest excavated levels on the Main Mound, it is probable that there was an accompanying change in social structure. The difference between the two ceramic assemblages, particularly apparent in the fabric typology, may therefore be explained by the inevitable variation in demand for pottery of a specific type and function. Such a change in the market would have been reflected in accompanying changes in technology and modes of production.

An even more dramatic change in both pottery form and fabric is evident amongst sherds retrieved from surface scrapes and excavations on the West Mound. Comparisons between middle to late Uruk and ED I material highlight a significant break in pottery tradition with a shift to predominantly finer fabrics and the almost complete absence of vegetable tempering materials, with the exception of large coarse dishes and in situ storage bins (c.f. Figs. 8.4 and 8.10).

A technological transition from late Uruk to ED I may, however, be observed in the retention of a number of fabric groups (Table 4.1a) implying that the break in the stratigraphic sequence between ED I and Uruk occupation cannot have been of long duration (Postgate and Moon 1982, 123).

North-East Mound

Only limited excavations have been carried out on the North-East Mound and no archaeological features have been planned from this part of the city. The pottery retrieved from this mound, however, is of a type which suggests an ED I or early ED II date (Table 8.4; Fig. 8.63; Sample nos. 1516-1534). A large proportion of each batch consisted of solid-footed goblet sherds (Table 8.1, Type 1.3). Other vessels of the ED I to ED II period include lugged jars with wide carinated shoulders, one of which is a decorated cut-ware jar (Postgate 1978, Fig. 3, nos. 1 and 2) and a sherd from a spouted bowl (Postgate 1978, 80; Table 8.1, Type 1.17).

A sounding on the North-East Mound suggests that there was no occupation before the ED I period (Postgate 1980, 96-97). Distinctions between early ED I pottery and late ED I/ED II vessel types are difficult to observe in the assemblage from this area. Comparisons, however, between fabrics from a representative batch of North-East Mound pottery (Table 4.1, Batch 4032) and ED II fabrics from the Main Mound (Table 4.1, Batches 2729 and 4473) suggest that

the range of fabric groups in each batch is broadly similar. The most significant correlation between all three batches is the presence of Fabric E which is a predominantly ED II fabric. The absence of Fabric G from Batch 4032 (Table 4.1) supports this assumption since Fabric G does not occur after the end of the ED I period.

Although the sample from the North-East Mound is limited to 19 sherds and the area has not been the subject of major archaeological investigation, it is nevertheless instructive to suggest a more accurate date for some of the material from this mound on the basis of comparisons with fabrics from the Main Mound.

4.2.3 Changes in settlement pattern at Abu Salabikh

There are two major differences in settlement pattern between the Main Mound and the West Mound, the first and perhaps most important of which is the absence of any public building on the West Mound. By contrast, the remains of at least two administrative complexes - one secular, the other a possible temple building - have been excavated on the Main Mound.

A second significant difference between the two mounds is evident from the contrasting layout of domestic housing. The housing quarter on the Main Mound, Area A presents the appearance of dense settlement, whilst the large enclosures on the West Mound resemble a farmstead with several domestic units and the livestock areas contained within it.

Chronological changes may account for the difference in settlement pattern between the two mounds. Early ED I settlement contemporary with the West Mound enclosures has not been discovered on the Main Mound and clear evidence for continuity is so far lacking. It could be argued, however, that the difference lies in social structure and that the ED II housing quarter on the Main Mound indicates an urban society whilst the more spacious West Mound is part of a rural settlement. Whether the occupation of the two mounds was contemporary for part of the ED I period is not certain. It is equally possible, however, that there was a shift in settlement from the West Mound to the Main Mound in the later part of the ED I period and that by the ED II period the Main Mound had grown into a large urban centre, associated with both religious and secular institutions.

The pottery from the two areas points to a technological revolution with its beginnings in the early ED I assemblage from the West Mound. How much of this was dictated by a change in the social

character of the site remains a matter for conjecture, but fabric analyses indicate a switch in emphasis from numerous local and probably part-time potters to organised and apparently standardised production. The change from a rural economy to an urban economy administered by a central institution can be inferred.

POTTERY FROM ABU SALABIKH

Occurrence of fabric types in selected contexts

Main Mound, Area E

Batch 0584 (ED III)

Batch 1804 (ED III)

Batch 2729 (ED II)

Batch 6000 (ED III)

Main Mound, Area A

Batch 4473 (ED II)

North-East Mound

Batch 4032 (ED I-II)

West Mound

Batch 5408 (ED I)

Batch 5601 (M/L. Uruk)

Fabric	0584	1804	2729	6000	4473	4032	5408	5601
Ai	-	-	*	-	*	*	-	*
Aii	*	*	*	*	-	-	*	*
Aiii	*	*	*	*	-	*	-	*
Aiv	*	*	*	*	*	*	*	*
Av	*	*	*	-	*	-	*	*
Avi	*	*	*	*	*	-	*	*
Avii	*	*	*	*	-	-	*	*
Aviii	*	-	*	-	*	-	-	*
Aix	-	-	-	-	-	-	-	*
Ax	-	-	-	-	-	-	*	-
Bi	*	*	*	*	*	*	*	*
Bii	*	*	*	*	-	*	*	*
Biii	*	*	*	-	*	*	*	*
Biv	*	-	*	-	-	-	-	-
Bv	-	-	-	-	*	-	-	-
Bvi	-	-	-	-	-	-	-	*
Bvii	-	-	-	-	-	-	-	-
Bviii	-	*	*	-	-	-	*	*
Bix	-	-	*	*	*	-	-	*
Ci	*	*	*	*	*	*	*	*
Cii	*	*	*	*	*	-	*	*
Ciii	*	*	*	*	*	-	*	*
Di	-	*	*	-	-	-	-	*
Dii	-	-	*	-	*	-	*	*
Diii	-	-	*	-	*	-	-	-
Ei	-	-	*	-	*	*	*	*
Eii	-	-	*	-	*	-	-	*
Eiii	-	-	-	-	-	-	*	*
Fi	-	-	-	-	-	-	*	*
Gi	-	-	-	-	-	-	-	*
Gii	-	-	-	-	-	-	*	-
Giii	-	-	-	-	*	-	-	-
Hi	-	-	-	-	-	-	*	*
Hii	-	-	-	-	-	-	-	*

Table 4.1 Pottery from Abu Salabikh: occurrence of fabric types in selected contexts

Fabric	0584	1804	2729	6000	4473	4032	5408	5601
Hiii	-	-	-	-	-	-	-	*
Hiv	-	-	-	-	-	-	-	*
Hv	-	-	-	-	-	-	-	*
Hvi	-	-	-	-	-	-	-	*
Hvii	-	-	-	-	-	-	-	*
Hviii	-	-	-	-	-	-	-	*
Hix	-	-	-	-	-	-	-	*
Hx	-	-	-	-	-	-	-	*
Hxi	-	-	-	-	-	-	-	-
Hxii	-	-	-	-	-	-	-	*
Hxiii	-	-	-	-	-	-	-	-
Ii	-	-	-	-	-	-	*	-
Iii	-	-	-	-	-	-	-	-
Ji	-	-	-	-	-	-	-	*
Jii	-	-	*	*	-	-	*	-
Jiii	-	-	-	-	-	-	-	*
Jiv	-	-	-	-	-	-	-	-
Ki	-	-	-	-	-	-	-	-
Li	*	*	*	*	-	-	-	-
Lii	*	-	-	*	-	-	-	-
Liii	-	-	-	-	-	-	-	-
Liv	-	-	-	-	-	-	*	-
Mi	*	-	-	-	-	-	*	-
Mii	-	-	*	-	*	-	-	*
Miii	-	-	*	-	-	-	-	-
Miv	-	-	*	*	-	-	-	-
Mv	-	-	-	*	-	-	-	-
Mvi	-	-	-	-	-	-	-	-
Mvii	-	-	-	-	-	-	-	-
Mviii	-	-	-	-	-	-	-	-
Ni	*	-	*	-	-	-	-	*
Nii	-	-	*	-	-	-	-	-
Niii	-	-	*	-	-	-	-	*
Niv	-	-	*	-	-	-	-	*
Nv	-	-	-	-	-	-	-	*
Nvi	-	-	-	-	-	-	-	-
Nvii	-	-	-	-	-	-	-	-
Pi	-	-	*	-	-	-	-	*
Pii	-	-	-	-	-	-	*	-
Piii	-	-	-	-	-	-	*	*
Qi	*	-	*	*	-	-	*	*
Qii	-	-	*	*	-	-	*	-
Qiii	*	-	-	-	-	-	-	*
Qiv	-	-	-	-	-	-	-	-
Qv	*	-	*	-	-	-	-	-

4.3 ABU SALABIKH: POTTERY ASSEMBLAGE

4.3.1 Typological classification

Although the primary concern has been to distinguish between different wares a discussion of pottery production necessitates an integrated study of fabric groups and vessel types.

Chronological indicators amongst the ceramic assemblage have been confined hitherto to whole pots. This approach to typological classification upon which chronological divisions are based is, however, subject to several general assumptions. Probably the most crucial of these is the fact that the majority of whole pots from Abu Salabikh and the comparative material from Ur and Kish derive from grave goods. It is necessary to assume therefore that the funerary pots are broadly contemporary with the date of the grave; there is no allowance for the possibility of disturbance or heirlooms. Moreover, some specific pottery types such as cooking vessels are rarely identified amongst grave assemblages. Although the apparently mass-produced types such as conical bowls (Table 8.1, Type 1.1), solid-footed goblets (Table 8.1, Type 1.3) and some forms of spouted jars (Table 8.1, Type 5.3.1; c.f. Fig. 8.73 no. 2679) are usually well represented amongst sherds retained from occupation levels, a significant number of featured sherds recorded from Abu Salabikh have no direct parallels amongst the grave groups. It appears, therefore, that the typological classification of vessels may be seriously limited where the material is confined to assemblages of whole pots from graves. Fabric analyses highlight this point since several fabric groups appear to be absent from grave assemblages.

A second assumption is based upon the fact that the same vessel types were in contemporary use and may therefore be dated to the same period. In the absence of absolute dating for the majority of pottery batches and grave groups, such an assumption must be accepted, although rigorous characterisation of pottery fabrics, particularly in the ED II and ED III periods, has sometimes helped to differentiate between similar vessel forms. Thus, ED II vessels may be distinguished by Group E and Group G fabrics (Table 8.3, Area A, Groups Ei, Eii and Giii).

Finally, typological distinctions between the ED I, ED II and ED III periods are usually based upon the classification of types from sites in the Diyala region. The catalogue of pottery types from the Diyala (Delougaz 1952) continues to form a principal source of

POTTERY FROM ABU SALABIKH

Fabric types represented in the principal periods at Abu Salabikh

Fabric	M/L. Uruk	early ED I	late ED I	ED II	ED IIIA	ED IIIB
Ai	•	•	•	•	•	•
Aii	•	•	•	•	•	•
Aiii	•	•	•	•	•	•
Aiv	•	•	•	•	•	•
Av	•	•	•	•	•	•
Avi	•	•	•	•	•	•
Avii	•	•	•	•	•	–
Aviii	•	•	•	•	•	–
Aix	•	•	•	–	–	–
Ax	•	•	•	–	–	–
Bi	•	•	•	•	•	•
Bii	•	•	•	•	•	•
Biii	•	•	•	•	•	•
Biv	•	•	•	•	•	•
Bv	•	•	•	•	•	–
Bvi	•	•	•	•	•	–
Bvii	–	–	–	–	•	–
Bviii	•	•	•	•	–	–
Bix	•	•	•	•	–	–
Ci	•	•	•	•	•	•
Cii	•	•	•	•	•	•
Ciii	•	•	•	•	•	•
Di	•	•	•	•	•	•
Dii	•	•	•	•	–	–
Diii	–	•	•	•	•	•
Ei	•	•	•	•	–	–
Eii	•	•	•	•	–	–
Eiii	•	•	–	–	–	–
Fi	•	•	–	–	•	–
Gi	•	•	•	–	–	–
Gii	•	•	•	•	–	–
Giii	•	•	•	•	–	–
Hi	•	•	–	–	–	–
Hii	•	•	–	–	–	–
Hiii	•	•	–	–	–	–
Hiv	•	•	–	–	–	–
Hv	•	•	–	–	–	–
Hvi	•	–	–	–	–	–
Hvii	•	–	–	–	–	–
Hviii	•	–	–	–	–	–
Hix	•	–	–	–	–	–

Table **4.1a** Pottery from Abu Salabikh: fabric types represented in the principal periods at Abu Salabikh

Fabric	M/L. Uruk	early ED I	late ED I	ED II	ED IIIA	ED IIIB
Hx	•	-	-	-	-	-
Hxi	•	-	-	-	-	-
Hxii	•	-	-	-	-	-
Hxiii	•	-	-	-	-	-
Ii	•	•	-	-	-	-
Iii	•	•	-	-	-	-
Ji	•	•	•	-	-	-
Jii	•	•	•	•	-	-
Jiii	•	•	-	-	-	-
Jiv	-	•	-	-	-	-
Ki	•	•	-	-	-	-
Li	-	•	-	•	•	•
Lii	•	•	-	-	-	•
Liii	•	•	-	-	-	•
Liv	-	•	-	-	-	-
Mi	•	•	-	-	•	•
Mii	•	•	•	•	•	-
Miii	-	•	-	•	•	•
Miv	•	-	-	•	•	•
Mv	-	•	-	-	•	•
Mvi	-	-	-	-	•	•
Mvii	•	•	-	-	-	-
Mviii	•	•	-	-	-	-
Ni	•	•	•	-	-	-
Nii	•	•	-	•	-	-
Niii	•	•	•	•	-	-
Miv	•	•	-	•	-	-
Nv	•	•	-	•	-	-
Nvi	•	•	-	-	-	-
Nvii	•	•	-	-	-	-
Pi	•	•	•	•	•	•
Pii	•	•	-	-	-	-
Piii	•	•	-	-	-	-
Qi	•	•	•	•	•	•
Qii	•	•	•	•	•	•
Qiii	•	•	•	•	•	•
Qiv	•	•	•	•	•	•
Qv	•	•	•	•	•	•

reference for the characterisation of specific vessel types in relation to major chronological divisions. Thus, in the absence of published sequences from local sites in southern Iraq, the dating of ceramic assemblages from this region frequently depends upon comparisons with Diyala pottery types.

Since the two areas are in such geographically distinct regions some variation between pottery assemblages is to be expected. A number of major types found at Abu Salabikh are not registered in the Diyala publication (Table 8.2). These include spouted bowls (Table 8.1, Type 1.17), bottles (Table 8.1, Type 3) and footed cup-based jars (Table 8.1, Type 6). Type 3 and Type 6, however, are both represented at Ur and Kish (Table 8.2). Although this demonstrates the value of comparative material from local sites, it does not solve the problem of regional differences even at a relatively local level. Table 8.2 illustrates this point since a number of pottery types from Abu Salabikh are not evident in the published assemblages from Ur and Kish.

It is important to note, however, that comparisons are based on published types and, particularly in the case of pottery from Ur, Woolley's (1934, pl. 251-252) published types are inadequate for detailed comparison. Furthermore, an investigation of museum collections (Table 8.4, Sample nos. 0303-0348) has revealed several early (late Uruk/ED I) sherds which were not included in the publication of vessel types, but which make a significant contribution to the study of pottery production and the technological transition from late Uruk to ED I (see Section 6.2).

Problems encountered in adhering too closely to a rigid typology must be weighed against the temptation to sub-divide sherd types to such an extent that the broad typological category is obscured. In attempting to strike a balance between these two approaches, a decimalised system of classification according to type has been adopted, indicating the various levels of identification (see Section 8.2.2; Table 8.1). This system of decimalisation facilitates the introduction of various sub-divisions related to vessel form within principal typological categories which indicate specific functions. Rather than attempting to follow systems which involve classifying vessel types according to geometrical shapes (Delougaz 1952, 1-19; Ericson and Stickel 1973, 359), which would require time-consuming measurements combined with a complicated coding system, the principal vessel types are classified by function. Consequently,

unlike the Delougaz system of classification where, for example, spouted jars occur within several different groups (Delougaz 1952, pl. 165; pl. 182 - pl. 187), all spouted jars have been classified under Type 5 with various sub-divisions within the group. Thus, spouted jars (Table 8.1, Type 5) may be sub-divided into spouted jars with a flat base (Table 8.1, Type 5.1) and spouted jars with a convex base (Table 8.1, Type 5.2) or spouted jars with a ring base (Table 8.1, Type 5.3). These sub-divisions are subsequently broken down further into differences which may be made purely on the basis of different attributes, not necessarily related to function.

The classification of vessel types in decimalised form provides a method which may be expanded as new types are discovered and which may be applied to contemporary assemblages from other sites.

Since local production is likely to have taken place at all major sites, the assemblages may reasonably be expected to produce some degree of variation within a broad functional type. Thus, regional trends may be observed not only by searching for direct parallels with vessels from other sites, but also by taking into account the range of variability within a particular pottery type. Such a method also facilitates an examination of the relative occurrence of major types at different sites. Spouted jars from Al'Ubaid may be equated with spouted jars from Ur (Table 8.1, Type 5), for example, but within this type several variations occur which are specific to Al'Ubaid (Table 8.1, Type 5.1.5; Fig 8.49) and are not present at Ur (Table 8.2). Hence regional similarities and variations are more easily recognised.

In the absence of a corpus of well-stratified Early Dynastic pottery, the dating of ceramics relies upon whole vessels dated from funerary contexts. With the exception of the first 99 graves from Abu Salabikh (Martin et al. 1985), the majority of whole vessels from grave assemblages are as yet unpublished. Grave groups are therefore included in the catalogue principally for the purposes of comparison between the fabrics of whole pots, largely from graves, with sherds which form the bulk of the Abu Salabikh pottery assemblage. Vessels from funerary contexts are, furthermore, confined to Area E and to a lesser extent Area A and usually fall within the ED III period. Much of the pottery catalogued from Abu Salabikh (Table 8.4) consists, therefore, of featured sherds.

When the range of fabrics present within the pottery assemblage is examined, the classification of sherd types (Table 8.1,

Type 1.14; 2.4; 8 and 14) has proved to be of equal value to the typology produced for whole pots. The range of vessels represented amongst rim sherds, for example, is considerably greater than might be supposed from an examination of whole pots from graves. The fabric repertoire is equally more comprehensive.

Major rim types have been divided into bowl rims (Type 1.14; Figs. 8.2-8.4) and jar rims (Type 2.4; Figs. 8.6-8.10) with sub-divisions under a broad category description: medium bevelled/everted rims (1.14.6), for example. These sub-divisions are broken down further into minor variations in shape noted on the basis of visual comparisons: compare, for example, Type 1.14.6.1 with type 1.14.6.9 (Fig. 8.3). The range and variability of decoration is also significantly increased by recording decorated body sherds (Table 8.1, Type 8).

Following the typological classification of pottery an attempt has been made to indicate the period to which each sample probably belongs (Table 8.4, Column 3). This is based primarily on the stratigraphy of the batch (level) or grave with which the sample is associated (Table 4.2; J.N. Postgate pers. comm.). In some cases obvious differences have been observed between the pottery assemblage from the Main Mound and that of the West Mound (Table 8.4; Postgate and Moon 1982). There are fewer bowl sherds with large rims (Table 8.4, Type 1.14.7) recorded amongst batches from the West Mound compared with those recorded from the Main Mound. Conversely, the number of vertical sided bowls (Table 8.4, Type 1.14.8) is greater amongst batches recorded from the West Mound. Moreover, this type is confined to the Uruk batches.

No attempt has been made to revise the chronology of Early Dynastic pottery on the basis of vessel types alone. On the contrary, it has been necessary to compare the existing dating criteria for pottery forms with the evidence from fabric analyses of individual pottery types. Results from the fabric classification of late Uruk and Early Dynastic pottery broadly support the chronological divisions based on an analysis of shape alone. Where there is insufficient evidence, either in terms of the context of a sample or when an unusual vessel type is examined, the identification of the fabric group is particularly useful as a chronological indicator.

One additional criterion may occasionally be applied to the problem of dating pottery. The dimensions of certain pottery types can be analysed to deduce chronological changes from alterations in

size among some mass-produced types. This is possibly related to a variation in standardised measurement of capacity.

Perhaps the clearest example of a chronological change in dimensions can be seen in the development of the conical bowl (Fig. 8.1, Type 1.1). In order to illustrate differences in size and shape amongst conical bowls a number of plots have been prepared using the dimensions obtained from the conical bowl assemblages from four different graves.

Initially a plot was obtained for the frequency of occurrence of conical bowls of different heights (Fig. 4.4). Since each grave group contained a different number of conical bowls comparisons between the groups are based on the relative frequency of different heights within each grave. Thus the majority of conical bowls from Grave 1 are 7.25cm tall (Fig. 4.4; Martin et al. 1985, 34-36). This group shows a near normal distribution for conical bowl heights ranging from 6.0cm to 8.25cm. Conical bowls from the earlier grave, Grave 80 and Grave 110 range in height from 7.2cm up to a maximum of 10.2cm. In each case they show a bimodal distribution.

It could be suggested that the near normal distribution of conical bowl heights from the Grave 1 group indicates the implementation of some form of standardisation within an organised production industry. This contrasts with the bimodal distribution of the Grave 80/Grave 110 conical bowls which implies less control over production. Such a supposition accords well with the proposed dates for each grave group. Grave 1 probably belongs to the first half of the ED III period (Martin et al. 1985, 22) whilst Grave 80 has been given a probable ED II date (Martin et al. 1985, 142) and is certainly considered to be earlier than Grave 1 (Moon 1985, 9). Perhaps the most interesting assemblage, however, is illustrated by the plot of conical bowl heights from Grave 88 which span the range occupied by both the later Grave 1 group and the earlier Grave 80 group (Fig. 4.4, Grave 88). The variability and distribution of heights displayed by conical bowls from Grave 88 (Martin et al. 1985, 164-165) implied that there was no demand for a standard conical bowl size. This grave is considered to be earlier than Grave 1 on the basis of stratigraphic comparisons (Martin et al. 1985, 163), but in the same publication Moon (1985, 9) suggests a later date from the presence of a ring-based jar (Table 8.1, Type 2.3.4.3) and a small jar (Table 8.1, Type 2.1.1.1). The spouted jar (Table 8.1, Type 5.3.1) which is also part of this assemblage is probably an earlier vessel

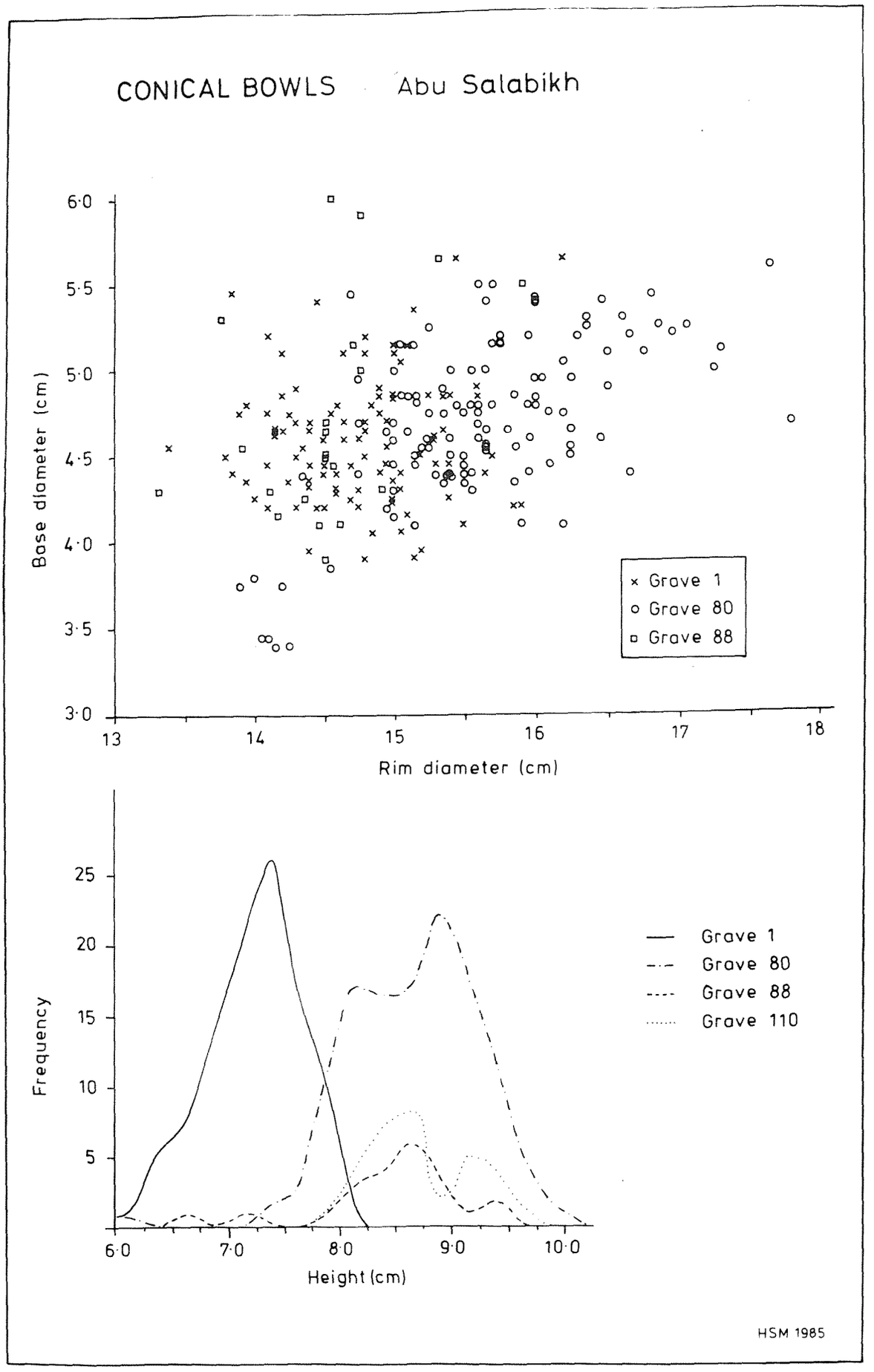


Fig. 4.4 Scattergram showing dimensions of rim against base (above) and graph (below) to show variations in the heights of conical bowls from Abu Salabikh grave groups

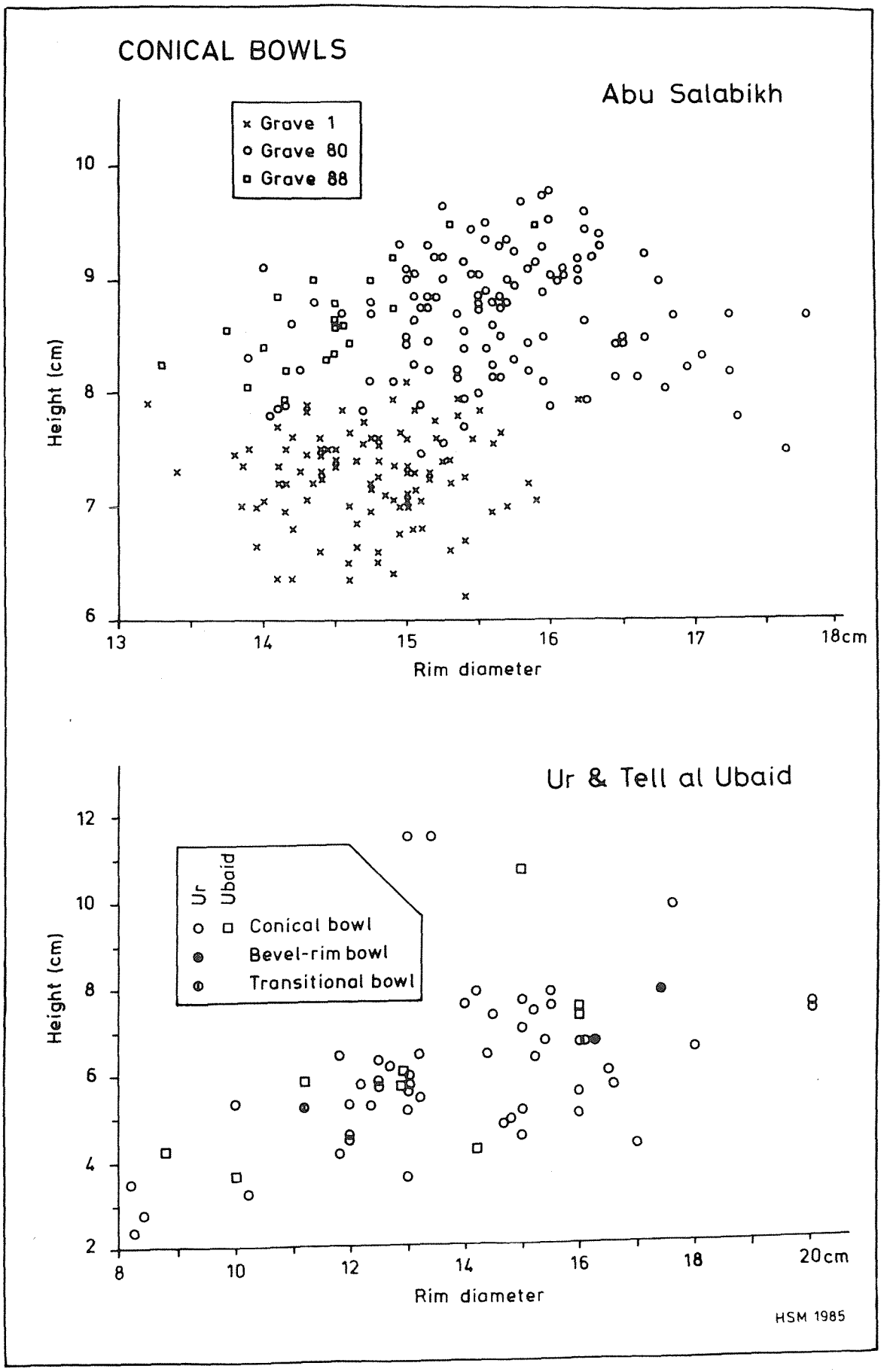


Fig. 4.5 Scattergram showing dimensions of base against height for conical bowls from Abu Salabikh grave groups (above) and from Ur and Tell al 'Ubaid (below)

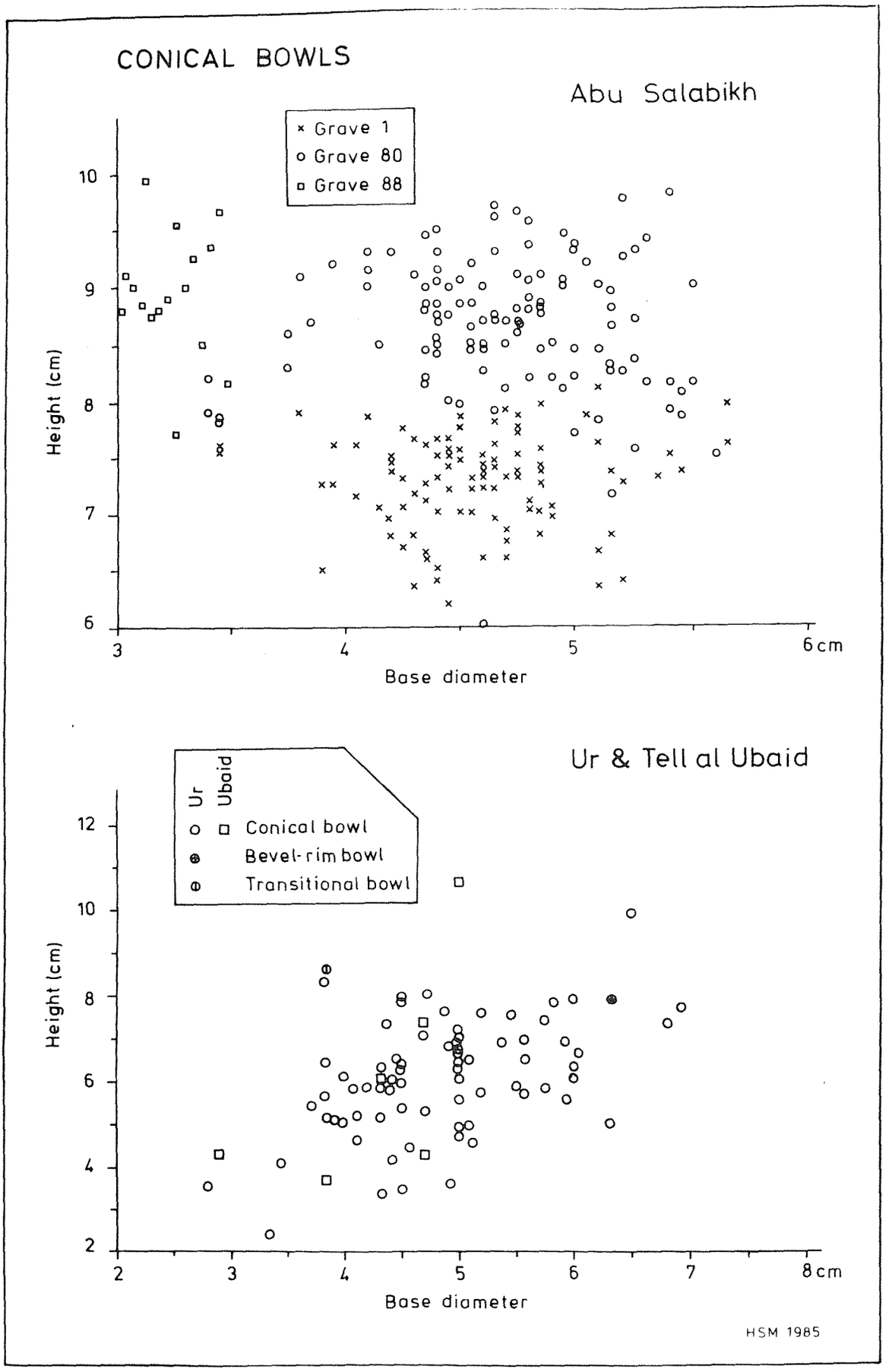


Fig. 4.6 Scattergram showing dimensions of rim against height for conical bowls from Abu Salabikh grave groups (above) and from Ur and Tell al 'Ubaid (below)

type (Moon 1985, 9) and the published fabric description

> '.... brown, medium coarse, very gritty ware....' (Martin et al. 1985, 164)

could be equated with a Group G fabric (Section 8.3.4) providing further confirmation of an early ED II date. The most likely explanation is, therefore, that this grave contains a number of vessel types spanning some considerable period of time. This is a salutory reminder for ceramic studies based on comparative material from funerary contexts alone.

Whilst measurements based on height isolate two major groups of conical bowls and illustrate the degree of standardisation within each grave group, individual grave assemblages are less easily distinguished by this single measurement. By plotting the dimensions of base against height (Fig. 4.5) and rim against height (Fig. 4.6) it is possible to suggest chronological changes in rim and base measurements as well as height. It has already been observed that the conical bowls from an ED II context (Fig. 4.5, Grave 80) are usually taller than those from the ED III grave (Fig. 4.5, Grave 1). More significantly, however, there is a considerable variability amongst both conical bowl bases and rims from Grave 80 compared with the tight clustering of conical bowls from Grave 1 (Figs. 4.5 and 4.6). This supports the suggestion of a move towards standardised production in the ED III period. The Grave 88 assemblage, however, cannot be distinguished on the basis of rims or base diameters alone. The most successful identification of the three grave groups has been achieved by plotting base against height (Fig. 4.5). Using these dimensions it is possible to differentiate between all three graves. The majority of conical bowls from Grave 88 (Fig. 4.5) are distinguished by a narrow base diameter coupled with a height measurement which is similar to that of bowls from Grave 80. The Grave 80 bowls, however, form a distinct group since, in the majority of cases, the base diameter is significantly larger. The third grave group also clusters separately from the other two graves since the Grave 1 conical bowls have a similar base diameter to Grave 80 conical bowls yet are much smaller in height. Thus, two chronologically distinct grave groups may be isolated, while the third grave group (Grave 88) consists of a combination of early and late conical bowl types. The earliest of these conical bowls possibly pre-dates the Grave 80 assemblage with tall narrow shapes reminiscent of an ED I precursor, the solid-footed goblet (Table 8.1, Type 1.3.2).

Finally, in order to compare the dimensions of conical bowls from other Early Dynastic sites with the Abu Salabikh types, two graphs were produced using material from Ur and Al'Ubaid and plotting base diameter against height (Fig. 4.6). It is immediately apparent from both graphs that the majority of conical bowls from both Ur and Al'Ubaid are similar in size to the Grave 1 group from Abu Salabikh. It is tempting to speculate that these would therefore also date to the ED III period. However, it is perhaps of greater significance to note that the difference between the dimensions of the majority of conical bowls is slight despite the fact that the two sites are several hundred kilometres apart. It can be inferred, therefore, that a shared set of standards within Early Dynastic Sumer influenced production at both a local and a regional level.

4.3.2 Sampling strategy

It could be argued that sampling should be confined to pottery from well-stratified deposits and funerary contexts. Since the majority of the pottery assemblage from Abu Salabikh is frequently retrieved from provenances which are poorly stratified, however, the exclusion of such samples would seriously curtail the research. Pottery from the West Mound, for example, is rarely given a more specific context than 'surface' or 'sub-surface' (Table 4.2). To exclude unstratified samples would therefore mean discounting all pottery from the West Mound and hence the evidence for ceramic production in the transition from late Uruk to ED I would remain unexplored. An alternative approach, however, has been used in which every featured sherd examined from a batch, whether the level represented is a major deposit from the construction debris of a pit (Table 4.1, Batch 5408); a tip-line (Table 4.1, Batch 2440); room-fill (Table 4.1, Batch 2235); grave-fill (Table 4.1, Batch 2711); or a large batch from surface and sub-surface soil clearance (Table 4.1, Batch 5601), is assigned a specific typological category (Figs. 8.2-8.10). The sample is subsequently identified with a particular fabric group (Table 8.4).

Most of the sampling was carried out during the excavation seasons of Spring and Autumn 1981 and all the featured sherds from each batch produced during these two seasons have been assigned to a typological category and classified according to fabric. Samples for thin sectioning have subsequently been processed from a number of the large pottery batches (Table 4.2).

Whole pots have frequently proved more difficult to sample and wherever possible representative sherds from identified vessel types have taken precedence. The large number of graves excavated at Abu Salabikh within a single season has precluded fabric classification for each vessel. Vessels from five complete grave assemblages (Table 4.3, Graves 163, 165, 168, 171 and 173), however, have been included in the corpus. All five graves are in Area E and are dated to the ED III period.

The ceramic corpus thus constitutes a unique case study of pottery from southern Iraq documenting the broad transition from late Uruk to ED I and from ED I to ED III. Future excavations not only at Abu Salabikh but also at other Early Dynastic sites in southern Iraq should facilitate the compilation of a more precise chronological classification of late fourth and third millennium ceramics.

Table 4.2 Third millennium Mesopotamian ceramics: classification of vessel types and fabrics. Numbers included in the tabulation refer to thin sections

THIRD MILLENIUM MESOPOTAMIAN CERAMICS: CLASSIFICATION OF VESSEL TYPES AND FABRICS

Key to Columns

1 Conical bowls (1.1)
2 Transitional bowls (1.2)
3 Goblets (1.3)
4 Bevel-rim bowls (BRB)
5 Cups (1.4)
6 Large bowls (1.5-1.8)
7 Sieve bowls (1.9)
8 Moulded bowls (1.10)
9 Bowls with perforated rim (1.11)
10 Grey burnished bowls (1.12)
11 Painted bowls (1.13)
12 Bowl rim sherds (1.14)
13 Spouted bowls (1.17)
14 Small jars (2.1)
15 Medium jars (2.2)
16 Large jars (2.3)
17 Jar rim sherds (2.4)
18 Lids (2.6)
19 Bottles (3.1-3.3)
20 Bottles: carinated (3.4-3.5)
21 Bottles: ovoid body (3.6)
22 Bottles: multi-ribbed (3.7)
23 Drinking bottles (4.1)
24 Pilgrim flasks (4.2)

Fabric	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
UR																								
Ai	111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aii	127 128	-	117 276	-	-	-	-	-	-	-	-	-	-	*	*	-	-	-	-	-	-	-	-	-
Aiii	*	-	*	-	-	-	*	-	-	-	-	172	-	136 139	*	-	138	-	-	-	-	-	-	-
Aiv	261	-	*	-	-	*	-	-	-	-	-	-	-	*	-	-	-	-	*	*	-	-	-	-
Av	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Avi	-	-	*	-	-	*	*	-	-	-	-	-	-	*	*	*	-	-	*	*	-	-	*	-
Avii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bi	279	-	159	-	-	162	-	-	-	-	-	-	-	*	-	*	-	-	-	-	-	-	-	-

Table 4.2 Third millennium Mesopotamian ceramics: classification of vessel types and fabrics. Numbers included in the tabulation refer to thin sections

THIRD MILLENIUM MESOPOTAMIAN CERAMICS: CLASSIFICATION OF VESSEL TYPES AND FABRICS

Key to Columns

25 Spouted jars (5.1-5.4)
26 Spouted jar: nipple lug(s) (5.5)
27 Wing-lugged jars (6)
28 Footed cup-based jars (7)
29 Rouletted & gouged decoration (8.1-8.2)
30 Combed decoration (8.3)
31 Lugged jar sherds (8.4)
32 Incised and impressed decoration (8.5-8.6)
33 Cut ware (8.7)
34 Striated/grooved and reserve-slipped decoration (8.8-8.9)
35 Plain ribs (8.11)
36 Decorated ribs (8.12-8.14)
37 'Well-type' (8.15)
38 Burnished (8.17)
39 Handles (8.18)
40 Lipped (8.19)
41 Upright-handled jars (9)
42 Stemmed dishes (10)
43 Hollow stands (11)
44 Painted ware (13)

Fabric	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
UR																				
Ai	-	-	-	110	-	-	-	273	107 108	-	-	*	-	-	-	-	-	112 126	-	-
Aii	132 133	-	131	-	275	-	-	267 268	115 116	113 114 269 271 274	-	-	-	-	-	-	-	119 124 130	-	-
Aiii	*	-	-	-	-	-	-	270	278	272	-	-	-	-	-	-	-	134 135	-	-
Aiv	*	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-	129	*	262 263
Av	264	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Avi	*	-	*	-	-	-	-	-	-	-	-	*	-	-	-	-	109	120- 123 125	-	-
Avii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-
Bi	-	-	-	-	-	-	-	161	-	-	-	-	-	-	-	-	-	160	-	-

Fabric	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Bii	143 144	-	141	-	-	-	-	-	-	-	-	-	-	*	*	-	-	-	-	-	-	-	-	-
Biii	*	-	*	-	-	-	-	-	-	-	-	-	-	176	*	-	-	-	-	-	-	-	-	-
Biv	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bv	*	-	-	-	-	-	*	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-	-
Bvi	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-	-
Ci	*	-	*	-	-	-	-	-	-	-	-	-	-	265	*	148	-	-	*	*	-	-	-	-
Cii	149 150	-	-	-	-	-	-	-	-	-	-	-	-	-	*	*	-	-	-	-	-	-	-	-
Ciii	*	-	-	-	-	*	-	-	-	-	-	-	-	158	-	-	-	-	-	-	-	-	-	-
Civ	*	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-	-
Di	*	-	*	-	171	-	-	-	-	-	-	-	-	169 266 317	-	*	-	-	-	-	-	-	-	-
Dii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-
Diii	174	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-	-
Div	-	-	-	-	-	-	-	-	-	-	-	-	-	164	-	*	-	-	-	-	-	-	-	-
Ei	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	301 302	-	-	-	-	-	-	-
Eii	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	*	-	-	-	-	-	-	-	-
Eiii	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fi	175	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Fabric	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
Bii	–	–	*	–	–	285	–	280 281	–	–	–	–	–	–	–	–	–	140	–	–
Biii	*	–	–	–	–	–	282 287 288 290 291	286 289 292– 298	–	–	–	–	–	–	–	–	–	–	–	–
Biv	–	–	–	–	–	–	–	299	–	–	–	–	–	–	–	–	–	142	–	–
Bv	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	*	–
Bvi	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Ci	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	145 146 147	–	–
Cii	314	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Ciii	*	–	–	–	–	–	318	–	–	–	–	–	–	–	–	–	–	151– 156 170	–	–
Civ	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Di	*	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	167	165 166 168 312	–
Dii	–	–	–	–	–	–	–	283	–	–	–	–	–	–	–	–	–	–	–	–
Diii	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	173	–	–
Div	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Ei	–	–	–	–	–	–	–	300	–	–	–	–	–	–	–	–	–	–	–	–
Eii	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	157	–	321
Eiii	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Fi	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	310	–

Fabric	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Fii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gi	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-	-
Gii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-
Hi	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-
Ii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ji	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-
Jii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	178	-	-	-	-	-	-	-	-	-
Ki	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kii	-	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Li	-	-	-	-	-	*	-	-	-	-	-	-	-	*	-	*	-	-	-	-	-	-	-	-
Other:2	177	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other:3	319	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other:4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other:5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-
Other:6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-
Other:7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-
TELL SAKHERI SUGHIR																								
Aii	-	-	-	-	-	-	-	-	-	-	-	-	-	184	-	185	-	-	-	-	-	-	-	-
Aiv	-	-	-	-	-	-	-	-	-	-	-	-	-	187	-	-	-	-	-	-	-	-	-	-
Av	-	-	-	-	-	-	-	-	-	-	-	-	-	188	-	-	-	-	-	-	-	-	-	-
Bii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Biv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	186	-	-	-	-	-	-	-	-

Fabric	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
Fii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	311	-
Gi	-	-	-	-	-	-	-	303	-	-	-	*	-	-	-	-	-	-	-	-
Gii	-	-	-	-	-	304	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hi	-	-	-	-	-	305	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ii	-	-	-	-	-	307	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ji	-	-	-	-	308	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-
Jii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ki	-	-	-	-	-	306	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Li	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-
Other:2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other:3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other:4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	320
Other:5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other:6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other:7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TELL SAKHERI SUGHIR																				
Aii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aiv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Av	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bii	-	-	-	-	-	-	-	-	-	190	-	-	-	-	-	-	-	-	-	-
Biv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Fabric	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Bvii	182	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ei	183	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Eiii	189	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Giii	-	-	-	-	-	-	-	-	-	-	-	-	-	191	-	-	-	-	-	-	-	-	-	-
Jii	-	-	-	-	-	-	-	-	-	-	-	-	-	193-195	-	-	-	-	-	-	-	-	-	-
Kii	-	-	-	-	-	-	-	-	-	-	-	-	-	192	-	-	-	-	-	-	-	-	-	-
TELL AL'UBAID																								
Ai	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aii	-	-	-	-	-	-	-	-	-	-	-	201	-	-	-	*	-	-	-	*	-	-	-	-
Aiii	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	*	-	-	*	-	-	-	-	-
Aiv	-	-	*	-	-	-	-	-	-	-	-	-	-	-	*	199	-	-	*	-	-	-	*	-
Av	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Avi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	*	-	-	-	-	-
Avii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bi	*	-	-	-	-	-	-	-	-	-	-	205	-	-	-	-	206 207	-	-	-	-	-	-	-
Bii	*	-	204	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-
Ci	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	208	-	-	-	-	-	-	-
Div	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	209	-	-	-	-	-	-	-
Ei	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Eiii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-
Giii	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	210	-	-	-	-	-	-	-

Fabric	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
Bvii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ei	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Eiii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Giii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TELL AL'UBAID																				
Ai	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aii	*	-	*	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-
Aiii	202	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-
Aiv	*	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-	-
Av	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Avi	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Avii	*	-	-	-	-	-	-	200	-	-	-	-	-	-	-	-	-	-	-	-
Bi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bii	-	-	-	-	-	-	-	-	-	-	-	203	-	-	-	-	-	-	-	-
Ci	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Div	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ei	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Eiii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Giii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Fabric	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Lii	–	–	–	–	–	–	–	–	–	–	–	–	–	*	–	–	–	–	–	–	–	–	–	–
ERIDU																								
Ai	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Aii	–	–	–	*	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Bii	–	–	180	–	–	–	–	–	–	–	–	–	–	*	–	–	213	–	–	–	–	–	–	–
Ei	–	–	214	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
LAGASH																								
Ai	*	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Aii	–	–	–	–	–	–	–	–	–	–	–	215	–	–	–	–	–	–	–	–	–	–	–	–
Aiii	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	216	–	–	–	–	–	–	–
URUK/WARKA																								
Ai	221	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Bi	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Ci	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
FARA																								
Ai	229	–	–	–	–	–	–	–	–	–	–	–	–	*	–	–	–	–	–	–	–	–	–	–
Aii	–	–	–	–	–	–	–	–	–	–	–	227	–	–	–	–	–	–	–	–	–	–	–	–
Aiii	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Aiv	–	–	228	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Bi	230	–	231 232	–	–	–	–	–	–	–	–	–	–	–	–	–	233	–	–	–	–	–	–	–

Fabric	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
Lii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ERIDU																				
Ai	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	211 212	-	-
Aii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ei	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LAGASH																				
Ai	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aiii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-
URUK/WARKA																				
Ai	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	224	-	-	-
Ci	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	222 223	-	-
FARA																				
Ai	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aiii	-	-	-	-	-	-	-	-	-	-	-	226	-	-	-	-	-	-	-	-
Aiv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Fabric	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
NIPPUR																								
A	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	236	–	–	–	–	–	–	–
ABU SALABIKH: MAIN MOUND, AREA E																								
Ai	*	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	*	–	–	–	–	–	–	–
Aii	329	–	–	–	–	–	–	–	–	–	–	*	–	–	–	–	341	–	–	–	–	–	–	–
Aiii	*	–	*	–	–	–	*	–	–	–	–	326	–	*	–	–	*	–	–	–	–	–	–	–
Aiv	*	–	*	–	–	–	*	–	–	–	–	*	–	*	–	–	345 350 357	–	–	–	–	–	–	–
Av	*	–	–	–	–	–	–	–	–	–	–	*	–	–	–	–	349	–	–	–	–	–	–	–
Avi	*	–	–	–	–	*	–	–	–	–	–	332 333	–	–	–	–	*	–	–	–	–	–	–	–
Avii	*	–	*	–	–	*	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Bi	*	–	–	–	–	–	*	–	–	–	–	*	–	–	*	–	351 352 353	–	–	–	–	–	–	–
Bii	*	*	*	–	–	–	–	–	–	–	–	*	–	–	–	–	*	–	–	–	–	–	–	–
Biii	*	–	*	–	–	–	–	–	–	–	–	347	–	–	–	–	*	–	–	–	–	–	–	–
Biv	*	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Bv	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	*	–	–	–	–	–	–	–
Bvi	–	–	–	–	–	–	–	–	–	–	–	327	–	–	–	–	–	–	–	–	–	–	–	–
Bvii	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	355	–	–	–	–	–	–	–
Bix	*	*	–	–	–	–	–	–	–	–	–	–	–	?	–	–	–	–	–	–	–	–	–	–
Ci	*	–	–	–	–	–	–	–	–	–	–	*	–	–	*	–	*	–	–	–	–	–	–	–
Cii	*	–	*	–	–	–	–	–	–	–	–	*	–	–	–	–	*	–	–	–	–	–	–	–

Fabric	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
NIPPUR																				
A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ABU SALABIKH: MAIN MOUND, AREA E																				
Ai	-	-	-	-	-	-	-	*	-	-	-	*	-	-	-	-	*	-	-	-
Aii	-	-	-	*	-	-	334	*	-	-	*	*	-	-	-	-	-	*	-	-
Aiii	-	-	-	*	-	-	*	*	-	331	*	-	-	-	-	-	*	-	*	*
Aiv	-	*	*	-	-	-	*	*	-	324	*	-	-	-	-	-	*	330	*	-
Av	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-
Avi	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-
Avii	-	-	-	-	-	-	-	-	-	*	-	*	-	*	-	-	-	*	-	*
Bi	*	-	-	-	-	*	*	*	-	*	*	*	-	-	-	-	*	*	*	-
Bii	-	-	-	-	-	-	*	*	-	-	*	*	-	-	-	-	*	*	*	-
Biii	-	-	-	-	-	-	-	-	-	-	*	*	-	-	-	-	-	*	*	-
Biv	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-	*	-	-	-
Bv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bvi	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	338	-	-	-
Bvii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bix	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ci	-	-	-	-	-	-	-	*	-	*	-	*	-	-	-	-	-	-	-	*
Cii	-	-	-	-	-	-	-	*	-	-	-	*	-	-	-	-	-	*	*	-

Fabric	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Ciii	*	-	-	-	-	-	-	-	-	-	-	*	-	-	*	*	*	-	-	-	-	-	-	-
Di	*	*	-	-	-	-	-	-	-	-	-	*	-	-	-	-	*	-	-	-	-	-	-	-
Dii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-
Diii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-
Ei	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	340	-	-	-	-	-	-	-
Eii	*	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	*	-	-	-	-	-	-	-
Gi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-
Gii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ji	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-
Li	-	-	-	-	-	*	-	-	-	-	-	*	-	-	-	-	*	-	-	-	-	-	-	-
Lii	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	*	-	-	-	-	-	-	-
Mi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-
Mii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-
Miii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-
Miv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-
Mv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-
Mvi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	356	-	-	-	-	-	-	-
Ni	-	*	-	*	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-
Nii	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-

Fabric	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
Ciii	-	-	-	-	-	-	*	*	-	-	-	*	-	*	-	-	*	*	*	-
Di	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	323
Dii	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-
Diii	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-	-
Ei	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	*	-	-
Eii	-	-	-	-	-	-	-	*	-	-	*	*	-	-	-	-	-	-	-	335 336
Gi	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-
Gii	-	-	-	-	-	-	*	-	-	-	-	*	-	-	-	-	-	-	-	-
Hi	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-
Ji	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-
Jii	-	-	-	-	-	-	-	*	-	*	-	*	-	-	*	-	-	*	*	-
Li	-	-	*	-	-	-	-	-	-	-	*	-	-	-	-	-	*	466	*	-
Lii	-	-	*	-	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-	-
Mi	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-
Mii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*
Miii	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-
Miv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mvi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ni	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	*	-
Nii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Fabric	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Niii	-	*	-	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Niv	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-
Pi	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-
Qi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other:1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other:2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

ABU SALABIKH: MAIN MOUND, AREA A

Ai	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aiv	369 378	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Av	-	-	410 411	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Avi	404	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Biii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bix	417	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ci	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cii	395? 397 398	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ciii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ei	371 381	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Eii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Giii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	426	-	-	-	-	-	-	-	-

Fabric	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
Niii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	*	-
Niv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Qi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	*
Other:1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	354
Other:2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	560
ABU SALABIKH: MAIN MOUND, AREA A																				
Ai	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	406 408	-	-	-
Aiv	-	-	-	-	-	-	-	-	-	-	-	403	-	-	-	-	-	-	-	-
Av	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	412	-	-
Avi	400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Biii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	418	416 421 422	-	-
Bix	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ci	-	-	-	-	-	-	-	-	-	-	396	-	-	-	-	-	-	-	-	-
Cii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	425	-	-
Ciii	-	-	-	-	-	-	-	-	-	*	402	-	-	-	-	-	-	423	-	-
Ei	-	-	-	-	-	-	-	-	-	-	374 383 384	-	-	-	-	-	-	370	382 390	-
Eii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	394	-
Giii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Fabric	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ABU SALABIKH: NORTH EAST MOUND																								
Ai	-	-	358	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aiii	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aiv	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bi	-	-	367	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bii	-	-	368	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Biii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ci	-	-	357	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ei	-	-	361	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ni	-	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ABU SALABIKH: WEST MOUND																								
Ai	*	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-	-
Aii	433 434 463 514	*	*	483	-	*	-	-	-	-	-	*	-	-	-	-	481 482	-	*	-	-	-	-	-
Aiii	*	464	*	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-
Aiv	*	*	435 439 459	-	-	-	-	-	-	-	-	*	-	-	-	-	440 513	-	-	-	-	-	-	-
Av	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	447	-	-	-	-	-	-	-
Avi	*	*	*	-	-	-	*	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-
Avii	-	-	-	-	-	*	-	-	-	-	-	*	-	-	-	-	437 438	-	-	-	-	-	-	-
Aviii	-	*	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-

Fabric	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
ABU SALABIKH: NORTH EAST MOUND																				
Ai	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aiii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aiv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Biii	365	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ci	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ei	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ni	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ABU SALABIKH: WEST MOUND																				
Ai	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-
Aii	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-	-	-	*
Aiii	-	-	-	-	-	-	-	-	-	-	-	*	-	*	-	-	-	-	-	*
Aiv	*	-	-	-	-	-	*	*	*	429	-	*	-	*	-	-	-	-	*	*
Av	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Avi	-	-	-	-	-	-	-	*	-	*	-	-	-	*	*	-	-	-	-	-
Avii	*	-	-	-	-	-	-	*	-	444	-	*	-	-	-	-	-	-	-	443
Aviii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Fabric	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Aix	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	*	-	-	-	-	-	-	-
Ax	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-
Bi	449 450	*	*	*	-	*	-	-	-	-	-	*	*	-	*	-	435 451 452 504 505 509	-	-	-	-	-	-	-
Bii	*	*	457	*	-	-	-	-	-	-	-	-	*	-	-	*	472 473	-	-	-	-	-	-	-
Biii	-	508	*	-	-	-	-	-	-	-	-	-	-	*	-	-	527	-	-	-	-	-	-	-
Biv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bv	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	468	-	-	-	-	-	-	-
Bvi	507	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-
Bix	*	*	-	432	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ci	-	496	*	456 502 524	-	-	-	-	-	-	-	497	-	*	-	-	471 500 501	-	-	-	-	-	-	-
Cii	*	522	*	-	-	-	-	-	-	-	-	*	-	-	-	-	436 503 520	-	*	-	-	-	-	-
Ciii	*	-	-	-	-	-	-	-	-	-	-	*	-	-	-	*	470	-	-	-	-	-	-	-
Di	-	-	-	*	-	-	-	-	-	-	-	-	-	*	-	-	526	-	-	-	-	-	-	-
Dii	-	467	-	-	-	-	-	-	-	-	-	462	*	*	-	-	495	-	-	-	-	-	-	-
Diii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-
Ei	458 465	460	430	*	-	-	442	-	-	-	-	441	-	-	-	-	510 511 512	-	-	-	-	-	-	-
Eii	530	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	*	-	-	-	-	-	-	-

Fabric	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
Aix	-	-	-	-	-	-	-	-	-	*	-	-	-	*	*	-	-	-	-	*
Ax	-	-	-	-	-	-	-	-	-	*	-	-	-	*	-	-	-	-	-	-
Bi	-	-	-	-	-	-	*	*	-	*	*	450	-	-	*	*	*	431	*	*
Bii	-	-	-	-	-	528 529	-	*	-	-	-	*	-	-	-	-	-	-	*	-
Biii	-	-	-	-	-	-	*	*	-	*	-	*	-	-	-	-	-	-	-	*
Biv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bv	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-
Bvi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bix	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ci	-	-	-	-	-	-	*	*	*	*	-	*	-	-	-	-	-	-	-	*
Cii	-	-	-	-	-	-	-	-	-	*	-	*	-	-	-	-	-	-	-	-
Ciii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	461
Di	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dii	-	-	-	-	-	-	-	*	-	-	*	-	-	*	-	-	-	-	-	-
Diii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ei	-	-	-	-	-	-	*	*	-	484	-	*	-	-	-	-	-	-	*	*
Eii	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-	-

Fabric	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Eiii	*	-	*	-	-	-	-	-	-	-	-	445	-	-	*	-	*	-	-	-	-	-	-	-
Fi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	523	-	-	-	-	-	-	-
Gi	-	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-	488	-	-	-	-	-	-	-
Gii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	454	-	-	-	-	-	-	-
Hi	-	-	*	-	-	-	-	-	-	-	-	455	-	*	-	-	553	-	-	-	-	-	-	-
Hii	-	-	-	-	-	-	-	-	-	-	-	*	-	*	-	*	534 535	-	-	-	-	-	-	-
Hiii	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	536 537	-	-	-	-	-	-	-
Hiv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	542 543	-	-	-	-	-	-	-
Hv	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-
Hvi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	544	-	-	-	-	-	-	-
Hvii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	545	-	-	-	-	-	-	-
Hviii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	546	-	-	-	-	-	-	-
Hix	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	547 549	-	-	-	-	-	-	-
Hx	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	548	-	-	-	-	-	-	-
Hxi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hxii	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	551	-	-	-	-	-	-	-
Hxiii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	552	-	-	-	-	-	-	-
Ii	-	-	-	-	-	-	-	-	-	-	-	485	-	-	-	-	*	-	-	-	-	-	-	-
Iii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	558	-	-	-	-	-	-	-
Ji	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-

Fabric	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
Eiii	-	-	-	-	-	-	-	*	-	-	-	*	-	-	-	-	-	-	*	*
Fi	-	-	-	-	-	-	*	-	-	*	-	-	-	-	-	-	-	-	-	*
Gi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hii	*	-	-	-	-	-	-	*	-	*	-	-	-	*	*	-	-	-	-	-
Hiii	-	-	-	-	-	538 539	-	*	-	-	-	-	-	-	540	-	-	-	-	-
Hiv	-	-	-	-	-	*	-	-	-	-	-	*	-	-	-	-	-	-	-	-
Hv	-	-	-	-	-	*	-	*	-	-	-	-	-	-	-	-	-	-	-	-
Hvi	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hvii	-	-	-	-	-	*	-	-	-	*	-	494	-	*	-	-	-	-	-	-
Hviii	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-
Hix	-	-	-	-	-	490 491 557	-	-	-	-	-	556	-	-	-	-	-	-	-	-
Hx	-	-	-	-	-	*	-	-	-	-	-	-	-	-	*	-	-	-	-	-
Hxi	-	-	-	-	-	550	-	-	-	-	-	-	-	*	-	-	-	-	-	-
Hxii	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hxiii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ji	-	-	-	-	-	533	-	*	-	-	-	*	-	-	*	-	-	-	-	-

Fabric	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Jii	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	*	-	-	-	-	-	-	-
Jiii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ki	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-
Li	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-
Lii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	474	-	-	-	*	-	-	-	-	
Liii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	487	-	-	*	-	-	-	-	-
Liv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	448	-	-	-	-	-	-	-
Mi	-	-	-	-	-	-	-	-	-	-	-	-	-	476	-	-	-	-	*	-	-	-	-	-
Mii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	531	-	-	-	-	-	-	-
Miii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-
Miv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	492 493	-	-	-	-	-	-	-
Mv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	561	-	-	-	-	-	-	-
Mvii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	479	-	-	-	-	-	-	-
Mviii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-
Ni	*	*	-	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nii	-	*	-	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Niii	*	*	-	*	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-
Niv	-	*	-	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nv	-	*	-	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nvi	-	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nvii	-	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Fabric	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
Jii	-	-	-	-	-	532	-	-	-	-	-	*	-	-	-	-	-	-	-	-
Jiii	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-
Ki	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Li	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Liii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Liv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mii	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-
Miii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Miv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mvii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mviii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ni	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Niii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Niv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nvi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nvii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Fabric	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Pii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-
Piii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-
Qi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	544	-	-	-	-	-	-	-
Qii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-
Qiii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-
KISH																								
Ai	*	-	-	-	-	-	*	*	*	-	-	-	-	*	*	*	-	-	-	-	-	-	-	-
Aii	*	-	-	-	-	-	-	*	-	-	-	-	-	*	-	007	006 015	-	-	-	-	-	-	-
Aiii	*	-	-	-	*	-	-	*	-	-	-	-	-	*	*	-	-	-	-	-	-	-	-	-
Aiv	-	-	-	-	-	-	-	*	-	-	-	-	-	021	-	*	035	-	-	-	-	-	-	-
Av	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	055	-	-	054	-	-	-	-
Avi	-	-	-	-	-	017	*	-	-	-	-	-	-	*	-	026 079	036 050	-	-	-	-	-	-	-
Avii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	023	*	-	*	-	-	-	-
Aviii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-
Aix	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-
Bi	*	*	-	-	-	-	-	-	-	-	-	-	-	-	*	*	-	-	-	-	-	-	-	-
Bii	-	-	-	-	*	*	-	-	-	-	-	-	-	-	-	-	090	-	-	-	-	-	-	-
Biii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	078	*	-	-	-	-	-	-	-	-
Biv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	075	-	-	-	-	-	-	-	-

Fabric	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
Pii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Piii	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-	-
Qi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Qii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Qiii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KISH																				
Ai	005	-	-	*	-	-	-	-	032	013	-	-	-	-	-	-	009 025 045	012 034	*	047
Aii	-	-	-	-	-	-	-	020	-	018	-	-	-	-	-	-	*	-	-	042
Aiii	-	-	-	-	-	-	-	-	-	022	-	-	-	-	-	-	069	-	-	-
Aiv	*	-	*	*	-	-	-	-	-	027 052	-	-	-	-	-	-	*	-	-	-
Av	-	-	-	-	-	-	048	-	053	-	-	-	-	-	-	-	-	-	-	-
Avi	-	-	-	-	-	-	-	-	-	016 072	-	038	-	-	-	-	-	-	*	029
Avii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	*	*	-
Aviii	*	-	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	019
Aix	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bi	080	-	-	-	-	-	-	-	-	087	-	-	-	-	-	-	*	-	-	-
Bii	-	-	-	089 284	-	-	-	-	-	076	-	-	-	-	-	-	-	-	-	-
Biii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	081	104
Biv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Fabric	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Bv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bvi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ci	-	-	063	-	-	065	*	-	-	-	-	-	-	-	*	-	-	-	068	-	-	-	*	-
Cii	-	-	-	-	-	-	-	-	-	-	062	-	-	*	*	-	-	-	-	-	-	-	-	-
Ciii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	066	-	*	-	-	-	-	-
Di	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	092	-	-	-	-	-	-	-	-
Ei	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	003 004 043 100	-	-	-	-	-	-	-
Eii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Eiii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	106	-	-	-	-	-	-	-
Fii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	097	-	-	-	-	-	-	-
Gii	*	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hi	-	-	-	-	-	-	-	-	-	057	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hii	-	-	-	-	-	-	-	-	-	071	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hiii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-
Hiv	-	-	-	-	-	070	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ii	-	-	-	-	-	-	-	-	-	-	-	-	073	-	-	-	-	-	-	-	-	-	-	-
Other:2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Fabric	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
Bv	-	-	-	-	-	-	086	-	-	-	-	-	-	-	-	-	-	*	-	-
Bvi	-	-	-	-	-	-	-	093	-	-	-	-	-	-	-	-	-	-	-	094
Ci	*	-	*	-	-	-	-	-	-	-	-	-	-	061	-	-	060	-	-	067
Cii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-
Ciii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	030
Di	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ei	-	-	-	*	-	-	-	040	-	-	-	-	-	-	-	-	-	-	-	-
Eii	-	-	-	-	-	-	-	039	-	-	-	-	-	-	-	-	-	-	-	-
Eiii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	059	-	-	-
Fi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	103	-	-	-
Gi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hi	-	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hiii	-	-	-	-	-	-	-	-	-	-	-	-	-	099	-	-	-	-	-	-
Hiv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ii	074	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	091	-	-	-
Other:2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	095 105

Fabric	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
JAMDAT NASR																								
Aiii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	024	-	-	-	-	*	-	-
Aiv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-
Avii	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	031	-	-	-	-	-	-	-
Aviii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	084	-	-	-	-	-	-	-
Bii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Biii	-	-	-	-	-	-	-	-	-	-	-	083	-	-	-	-	*	-	-	-	-	-	-	-
Biv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Ci	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	064	-	-	-	-	-	-	-
Cii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-
Di	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ei	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	237	-	-	-	-	-	-	-	-
Eii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Eiii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TELL AL WILAYEH																								
Aii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	238	-	-	-	-
TELL AGRAB																								
Aiv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Fabric	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
JAMDAT NASR																				
Aiii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aiv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Avii	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	008
Aviii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	037
Bi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bii	-	-	-	-	-	-	-	077	-	-	-	-	-	-	-	-	-	-	-	*
Biii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	082
Biv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	085
Ci	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	315
Ei	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	028 316
Eii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	044 058
Eiii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	046
TELL AL WILAYEH																				
Aii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TELL AGRAB																				
Aiv	-	-	-	-	-	-	-	-	-	240	-	-	-	-	-	-	239	-	-	-
Bi	-	-	-	-	-	-	-	238	-	-	-	-	-	-	-	-	-	-	-	-

Fabric	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
KHAFAJAH																								
Aii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aiv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	245	-	-	-	-	-	-	-	-	-
Av	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Avii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-
Biv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TELL ASMAR																								
Aiv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	248	-	-	-	-	-	-	-	-	-
ABU QASIM																								
Ei	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Eii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	249	-	-	-	-	-	-	-
KHEIT QASIM																								
Aiv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	217	-	-	-	-	-	-	-
Bi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	219	-	-	-	-	-	-	-
Bii	-	-	-	-	-	-	-	-	-	-	-	218	-	-	-	-	-	-	-	-	-	-	-	-
Bvi	-	-	-	-	251	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ci	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gi	252	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HALAWA																								
Ci	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	254	-	-	-	-	-	-	-
Gi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	252	-	-	-	-	-	-	-

Fabric	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
KHAFAJAH																				
Aii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	244	-	-
Aiv	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-
Av	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	246
Avii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Biv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	247
TELL ASMAR																				
Aiv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ABU QASIM																				
Ei	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-
Eii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	250
KHEIT QASIM																				
Aiv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bvi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ci	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	220
Gi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HALAWA																				
Ci	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Fabric	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
TELL AL RUBEIDHEH																								
Ai	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	614 617	-	-	-	-	-	-	-
Aii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	606	-	-	-	-	-	-	-
Bi	-	-	-	-	-	-	-	-	-	-	-	-	-	610	-	-	-	-	-	-	-	-	-	-
Biii	-	-	-	607	-	-	-	-	-	-	-	-	-	-	-	-	611	-	-	-	-	-	-	-
Bv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ci	-	-	-	-	-	-	-	-	-	-	-	618	-	-	-	-	-	-	-	-	-	-	-	-
Cii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	630	-	-	-	-	-	-	-
Ciii	*	-	-	-	-	-	-	-	-	-	-	629	*	-	-	-	-	-	-	-	-	-	-	-
Civ	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-
Di	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	621	-	-	-	-	-	-	-
Dii	-	-	-	-	-	-	-	-	-	-	-	608	-	-	-	-	-	-	-	-	-	-	-	-
Div	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	620	-	-	-	-	-	-	-
Ei	-	-	-	-	-	-	-	-	-	-	-	622	-	-	-	-	627	-	-	-	-	-	-	-
Hvi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	615	-	-	-	-	-	-	-
Hvii	616	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	605	-	-	-	-	-	-	-
Mvi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mvii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mviii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	604	-	-	-	-	-	-	-

Fabric	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
TELL AL RUBEIDHEH																				
Ai	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Biii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bv	-	-	-	-	-	-	-	625	-	-	-	-	-	-	-	-	-	-	-	-
Ci	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*
Ciii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Civ	-	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-	-
Di	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Div	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ei	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hvi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hvii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mv	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mvi	-	-	-	-	602	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mvii	-	-	-	-	-	-	-	603	-	-	-	-	-	-	-	-	-	-	-	-
Mviii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Fabric	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
SUWARI																								
Bi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	256	-	-	-	-	-	-	-
UMM AN NAR																								
Aiii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	565 566 568 569	-	-	-	-	-	-	-
Bi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	582 584 585 586	-	-	-	-	-	-	-
Bvi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	587 589 590 591 592	-	-	-	-	-	-	-
Ei	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	570 577 578	-	-	-	-	-	-	-
Fi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	583	-	-	-	-	-	-	-
Gi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	571	-	-	-	-	-	-	-
Gii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	579 580 581	-	-	-	-	-	-	-
Ii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	567	-	-	-	-	-	-	-

Fabric	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
SUWARI																				
Bi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UMM AN NAR																				
Aiii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bvi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ei	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

EXCAVATIONS AT ABU SALABIKH: BATCH (LEVEL) DESCRIPTIONS

Batch no.	Square	Description	Date
Main Mound, Area E			
0054	6G64	Rm. 39: floors	ED IIIA
0055	-do-	Gr. 27: disturbed	ED
0085	6G64b	Ash pit	ED IIIB?
0108	6G54d	Ash pit	-do-
0122	6G54c	Rm. 41: floors	ED III
0137	-do-	Fill	ED II
0208	6G65d	Disturbed grave	ED III/Akkad.
0209	6G65c	Surface	ED
0304	6G55d	Surface	ED
0306	6G55a	Rm. 47: pit	ED III
0307	6G55a	Rm. 47: pit	-do-
0354	-do-	Rm. 47: floors	ED IIIA/B
0355	6G55d	Rm. 47: pit	ED III
0356	-do-	Rm. 47: pit	-do-
0357	-do-	Gr. 30: floors	-do-
0403	6G66	-	-do-
0404	-do-	-	ED IIIB
0504	6G37b	Gr. 24: disturbed	ED III
0507	-do-	Gr. 21	-do-
0508	6G37c	Rm. 103: fill	ED IIIA
0509	-do-	Gr. 32	ED III
0534	6G37d	Rm. 104	ED IIIA?
0584	6G37a	Gr. 135: fill	ED III
0611	6G74b	Rm. 52	-do-
0612	-do-	Rm. 52: pit	-do-
0613	-do-	Rm. 51: pit	-do-
0614	-do-	Rm. 52: floors	ED IIIA
0615	-do-	Disturbed grave	ED III
0616	-do-	Rm. 52	-do-
1801	6G85	Sub-surface soil	ED IIIA
1804	6G85c	Gr. 163: disturbed	ED III
1805	-do-	Gr. 165: robbed	-do-
1809	6G85b	Gr. 171: undisturbed end of grave	
2078	-	-	-
2235	6G62a	Rm. 69: fill	ED IIIA/B
2420	6G36d	Rm. 119: fill	ED III
2436	6G36a	Tip lines	ED IIIB?
2440	6G36a	Tip lines	-do-
3701	6G64b	Southern unit	ED II/IIIA
2711	-do-	Disturbed grave fill	ED III
2729	-do-	Tip line	ED II
2785	-do-	-	ED IB
2792	-do-	-	-do-
3203	-do-	-	L. ED I
3205	-do-	-	-do-
3215	-do-	-	-do-
3216	-do-	-	-do-
3222	-do-	-	ED II
3223	-do-	-	-do-
3229	-do-	-	L. ED I
3237	-do-	-	-do-
3238	-do-	Gr. 162: robbed grave	-do-
3618	6G75a	-	ED IIIA/B
3626	-do-	-	-do-
5212	6F25	Gr. 173	ED III
6000	6F05b	Gr. 168	-do-
6012	6F05	Gr. 183: disturbed	-do-
Main Mound, Area A			
1029	5I10b	Disturbed grave	ED IIIB
1235	5I11	Late cut: tip	-do-
4473	4J97		ED II
North-East Mound			
4032			ED I(-II)
4039			ED I(-II)
4047			ED I(-II)
4049			ED I(-II)
4050			ED I(-II)
4054			ED I(-II)
West Mound			
5004	2G80	Sub-surface	ED I?
5005	2G70	-do-	-do-
5012	2G80	-do-	-do-
5020	2G00	-do-	-do-
5027	2G51	-do-	-do-
5028	2G41	-do-	-do-
5029	2G31	-do-	-do-
5030	2G21	-do-	-do-
5031	2G11	Surface	-do-
5033	2G21	-do-	-do-
5034	2G11	Sub-surface	-do-
5040	2G72	-do-	-do-
5047	2G32	-do-	-do-
5051	2G12	-do-	-do-
5056	2G13	-do-	-do-
5059	2G33	-do-	-do-
5060	2G23	-do-	-do-
5061	2G43	Surface	-do-
5069	2G73	Sub-surface	-do-
5073	2G74	Surface	-do-
5083	2G24	Sub-surface	-do-
5085	2G14	-do-	-do-
5090	2G65	Surface	-do-
5092	2G55	-do-	-do-
5093	-do-	Sub-surface	-do-
5094	2G45	Surface	-do-
5098	2G35	Sub-surface	-do-
5103	2G65	-do-	ED I
5107	2G76	-do-	-do-
5109	2G66	-do-	-do-
5117	2G26	-do-	-do-
5179	2G97	-do-	-do-
5180	2G98	Surface	-do-
5401	2G36	Pit from surface	-do-
5403	-do-	-do-	-do-
5408	2G36b	Construction of empty large pit	-do-
5410	2G36	Pit	-do-
5411	2G36d	Top of quad: floors	-do-
5412	-do-	Under 5411	-do-
5413	-do-	Pit	-do-
5416	2G36b	Pit survival fill of cut	-do-
5419	-do-	Floor levels - finely strat.	-do-
5422	-do-	-do-	-do-
5423	2G36d	Street? pit levels	-do-
5523	2G46d	brick wall	E. ED I
5544		Wall A: cut	Uruk
5547		Wall B: ashy deposits	Uruk
5550	-do-	Wall F	-do-
5551	-do-	-	-do-
5553	-do-	Street: ashy layers	-do-
5600	3G81all	Surface clearance	M/L Uruk
5601	3G81c	Sub-surface	-do-
5602	-do-	Floor	-do-
5603	-do-	-	-do-
5611	3G81a	Floors?	Uruk
5900	3G90	Surface	Uruk?
5901	3G	Sub-surface	-do-
5904	3G80	Surface	-do-
5905	-do-	Sub-surface	-do-
5906	3G81	Surface	-do-
5907	-do-	Sub-surface	-do-
5908	3G60	Surface	-do-
5909	-do-	Sub-surface	-do-
5910	3G61	Surface	-do-
5911	-do-	Sub-surface	-do-
5912	3G70	Surface	-do-
5913	-do-	Sub-surface	-do-
5916	3G50	Surface	-do-
5920	3G62	-do-	-do-
5921	-do-	Sub-surface	-do-
5922	3G72	Surface	-do-
5923	-do-	Sub-surface	-do-
5924	3G82	Surface	-do-
5925	-do-	Sub-surface	-do-
5926	3G92	Surface	-do-
5927	-do-	Sub-surface	-do-
5929	3G52	-do-	-do-
5932	3G83	Surface	-do-
5934	3G93	-do-	-do-
5935	-do-	Sub-surface	-do-
5937	3G60	F1 81/25	L. Uruk?
5939	-do-	-do-	-do-
5940	3G61	F1 81/26 SE	-do-
5941	-do-	F1 81/26	-do-
5942	-do-	F1 81/26 SE	-do-
5943	-do-	F1 81/26	-do-
5944	-do-	-do-	-do-
5945	-do-	F1 81/25 NE	-do-
5946	-do-	-do-	-do-
5947	-do-	F1 81/25 NW	-do-
5948	-do-	F1 81/25 SW	-do-

Table 4.3 Excavations at Abu Salabikh: batch (level) descriptions

4.3.3 Recording and classification of fabric groups

A system of recording the sherds from each excavated level on tabulated batch sheets has been developed at Abu Salabikh (Section 2.1). This provides a detailed catalogue of the pottery assemblage from which information may be retrieved concerning the range of different sherd types and their frequency of occurrence within each level. The information from these batch sheets has been translated into the typological classification in Table 8.1 and is included in the pottery catalogue (Table 8.4, Column 4). Whole vessels from funerary contexts have been noted on the batch sheets, but more detailed records with dimensions of each vessel and scale drawings have also been recorded separately.

It has not generally been the practice hitherto to describe fabric types in published ceramic reports from Near Eastern excavations. Practice has been determined by the large quantities of pottery produced during excavations and the difficulties involved in retaining pottery for post-excavation studies. A more obvious problem, however, is the superficial homogeneity of pottery fabrics amongst the ceramic assemblages from Early Dynastic sites in southern Iraq (Delougaz 1952, 3; 31). A method of classifying and recording fabric types has therefore been developed (see Section 2.3 and Section 8.3.2). The system is intended for use initially during field work whilst excavations are in progress and subsequently for more detailed post-excavation analyses. The methodology is based upon the standard approach to fabric classification now adopted in the publication of many ceramic reports in British archaeology (Peacock 1977b, 26-33). The principal criteria used in such pottery reports are of universal application. Thus, the fabric classification for ceramics from Abu Salabikh has been used to identify similar fabric groups amongst the assemblages from other late fourth and third millennium sites (Table 8.3).

Several systems of classifying fabric groups in the field have been devised. These frequently rely upon a collection of comparative material in the form of small samples of pottery representing each fabric already identified. The fragments may be mounted on index cards (Rye 1981, figs. 30 and 31) or marked and kept in a separate bag. Although it is useful to have a representative collection of fabric groups, practical the use of these collections requires a previous acquaintance with the fabric groups. By producing a series of contact prints such as those illustrated in Fig 8.93,

however, the broad fabric divisions are immediately apparent and the pottery recorder may begin to group different fabrics within a batch of sherds on this basis. The method is not designed to dispense with the use of comparative samples; it is merely intended to focus the attention of the recorder on the differences between the principal fabric groups. Thus in the absence of an exact parallel it is still possible to assign pottery fabrics to major ware types despite minor differences resulting from manufacture of the same ware at a different site. The more precise identification of sub-groups may subsequently be accomplished using comparative material from each site representing the whole range of fabrics present and combining a visual examination with petrographic analyses.

4.3.4 Fabric analyses

The methodology and the results from the classification of fabric groups is described in detail in Section 2.3 and Section 8.3, respectively.

The division into ware types on the basis of preliminary pottery sorting permits an initial evaluation of the assemblage. Differences between late Uruk, ED I and ED III are readily apparent. ED II fabrics are less easily identified from individual levels, but may be classified according to broad typological and chronological divisions. It is also occasionally possible to isolate an imported ware.

Petrographic analysis is undertaken to establish the validity of fabric divisions and subsequently to assist with the identification of different modes of production. The division into ware types is usually related to technological processes involved in manufacture. The use of a wide range of tempering materials, including sand, shell, and coarse vegetable material (Table 8.3; Section 8.3.4; Table 8.5) in late Uruk and ED I fabrics provides a major distinction between these early wares and the ED III fabrics in which tempering materials are generally absent, with the exception of very coarse hand-made pottery.

It is possible in the late Uruk/ED I pottery assemblage to equate fabric groups with specific vessel types. Grey wares, for example, are usually associated with strap-handled jars/jugs and combed decoration (Fig. 8.19, no. 229 and Fig. 8.66, nos. 2182-2187). It appears, however, that apart from the very coarse wares, there are no obvious fabric types which are related to specific function in ED

III pottery. Group L, however, may have had a limited distribution. This fine red ware occurs most frequently amongst stemmed dishes (Table 8.3, Type 10) and, to a lesser extent, amongst fine bowls and jars recovered from a funerary context. It is possible therefore that the fine red wares are characteristic of a particular potter or factory which has produced pottery designed specifically for use as funerary vessels. Alternatively, such vessels may simply be more highly prized than other wares and thus frequently included amongst grave goods. The second theory still suggests that fine red wares are the product of a limited number of workshops.

The identification of possible imports on the basis of a visual examination is frequently verified by petrographic analyses (Section 8.3.4). Moreover, several coarse red wares, initially presumed to be of local origin, have been analysed petrographically and established as imported vessels (Section 8.3.4, Group M). In most cases imported wares appear to have been container vessels. Although representing an extremely small percentage of the total assemblage these imported wares nevertheless indicate that limited exchange took place locally between sites in Sumer and further afield. There is evidence for imported wares from Syria. Early Dynastic pottery from the Gulf site of Umm an Nar (Fig. 8.91) is also linked by petrographic analysis with third millennium ceramics produced in southern Iraq, thus implying exchange at least as far south as the Oman.

4.4 THE POTTERY INDUSTRY AT ABU SALABIKH

4.4.1 Kilns

Despite abundant proof of local pottery production at Abu Salabikh in the form of countless nodules of vitrified clay and clusters of fused and distorted wasters, few of the kilns from which the waste was discarded have been found. Furthermore it has been established that accumulations of industrial waste from kiln firings do not necessarily indicate the presence of a kiln site nearby.

An additional problem in the identification of pottery kilns has been the presence of other large fire installations, particularly the oval courtyard ovens (Crawford 1981, 160; fig. 7). A degree of confusion has been generated by these elaborate two-storey structures which have occasionally been equated with industrial kilns (Delougaz 1940, 131-133; Delougaz and LLoyd 1942, figs. 18, 21, 102, 104, 120; Delougaz et al. 1967, 9-13; Majidzadeh 1975-76-77, 213). The term 'kiln' is frequently misused in the context of domestic ovens, but for clarity the term 'fire installation' has been used in Abu Salabikh excavation reports. This covers all structures used for firing and includes hearths, domestic ovens and industrial kilns.

The evidence for pottery kilns at Abu Salabikh is currently limited to the excavation of three structures, each of which is characterised by the presence of wasters, several layers of ashy deposits and walls which have been burnt to the point of vitrification, thus indicating high firing temperatures. The vitrification of the walls of each structure is perhaps the most conclusive proof of an industrial function for these kilns. A programme of analysis based on the contents of a number of fire installations at Abu Salabikh is being carried out at the British Museum Laboratories. Whilst the results are not yet published, it appears that one of the potential indicators for establishing the use of a fire installation as a kiln is the identification of vitrified deposits amongst the kiln debris and evidence for vitrified inner walls (A. Middleton, pers. comm.). It must be acknowledged, however, that the industrial use may not have been restricted to firing pottery. At least one of the kilns at Abu Salabikh (an ED I kiln in Area A) may have been used at some stage as a lime kiln. Evidence for the last use of this structure for firing pottery, however, is established by the presence of wasters and baked clay fragments in the firing debris. None of the pottery kilns excavated at Abu Salabikh

exhibited a complex construction and the two kilns found on the south-eastern part of the West Mound (Postgate and Moon 1982, 105) consisted of shallow bowls ringed by a wall of vitrified clay.

The bowl kilns on the West Mound (Postgate and Moon 1982, 105; FI 81/25 and FI 81/26) appear to date to the Uruk period and both were filled with ash, clinker, vitrified bricks and numerous wasters of bevel-rim bowls (Table 8.1, Type BRB). It has not been established whether the bricks formed part of the oven's superstructure. The clay walls lining the bowl, however, are very thin and would have been unlikely to support a much heavier floor or dome. It is possible, therefore, that the bricks were fired deliberately as part of a load and that these bowl kilns represent a form of open-firing such as that illustrated by the kiln excavated at Mehrgarh (Audouze and Jarrige 1979). Pottery and/or bricks would have been placed within a hollowed-out basin in the ground. The contents may finally have been covered with layers of straw and possibly even dung, since there is evidence that sheep dung was used as fuel at Abu Salabikh. Although straw appears to have been the principal fuel in the Mehrgarh kiln (Audouze and Jarrige 1979, 2-3), it is possible that dung was used as a fuel by the Sumerians, since it produces a considerable heat which can be maintained for some time. Moreover, the increase in temperature at the beginning of the kiln firing and the cooling after the firing was completed could probably be controlled more effectively and therefore reduce the risk of cracking. Ethnographic studies show that dung is sometimes chosen for firing kilns (Tschopik 1941, 22, 38-39), while Postgate and Moon (1982, 105) record sheep dung associated with the ashes of a small oven on the West Mound. In the marshes of southern Iraq it is still possible to see dung cakes stacked in pyramids to dry before being used to fuel domestic ovens.

The presence of a number of stray sherds in the debris from all three kilns suggests that these were probably used as packing material when the kilns were loaded for firing.

Two possible pottery kilns have been discovered in Area A (Fig. 4.3, 5I 36 and 5I 47), only one of which has been excavated (Postgate and Moon 1982, 127; FI 81/15). This kiln is dated to the ED I period by the presence of solid-footed goblets and ED I pottery from a grave which cut into one corner (Postgate and Moon 1982, 127).

Although the ED I kiln in Area A, being lined with bricks, is a more substantial structure than the two Uruk kilns on the West Mound, all three kilns appear to share a common technology in their

construction. None of the structures appears to be sufficiently robust to have supported a superstructure. Each possessed a flue or entrance. The inner walls of all three were vitrified and at the last time of firing, each seems to have been used primarily for one specific vessel type.

The ED I kiln differs in having the appearance of a more permanent structure than the Uruk bowl kilns. In addition, quantities of crushed bone fragments were discovered amongst the ashy deposits in the ED I kiln. One possible explanation for the presence of so much bone ash is that it was used as a flux to stabilise firing conditions in the kiln.

Few later fourth and third millennium pottery kilns have been excavated in southern Iraq, and comparative material from other sites in Mesopotamia is largely confined to Iran (Delcroix and Huot 1972). Majidzadeh (1975-76-77, 210-214) describes a number of fourth and third millennium firing structures but these are not published in detail. From the discussion it is apparent that several of the more elaborate fire installations are unlikely to have been used as pottery kilns. It seems probable that the kilns at Abu Salabikh are similar to the simpler prehistoric kilns in Iran, with a fire box and a stoke hole, and that the kiln was covered either with fuel piled above the stacked pots or a temporary dome was built and then demolished after each firing (Majidzadeh 1975-76-77, 220).

It is perhaps surprising that the pottery kilns at Abu Salabikh are all of a similar plan and that apart from the more permanent character of the ED I kiln there is no evidence for a developing technology. No fire installations have been excavated which indicate a move towards the more elaborate second millennium kilns, such as the example at Tal-i-Iblis (Caldwell and Sarraf 1967, 277). The absence of more complex kilns may, however, be related to the fact that ED II and ED III kiln sites have not yet been discovered. Furthermore, small firing structures, such as the three excavated at Abu Salabikh, were probably built and used by part-time potters for localised consumption. Larger and more advanced pottery kilns are more likely to have been confined to an industrial quarter which remains to be discovered.

Ethnographic studies based principally on kilns used by potters in Iran demonstrate that simple kilns are not always abandoned in favour of more complex structures. The type of pot produced and the extent of demand for the product often dictates the type of kiln

adopted (Caldwell 1967, 397; Majidzadeh 1975-76-77, 220; Scott 1954, 36; Wulff 1966, 159).

The presence of two ED I kilns in the Area A housing quarter argues for production of pottery in residential areas. The advent of a standardised technology evident in ED II and ED III fabrics implies a change in organisation (see Section 9.3). Pottery produced in bulk would necessitate an industrial area devoted to potters workshops and perhaps with large permanent kilns. Apart from some kiln debris discovered beneath the southern unit (Postgate 1977, 281) which is therefore early in date, there is no evidence for an industrial kiln site. Several late Uruk/Jamdat Nasr pottery kilns were discovered at Ur which had been repaired and re-used several times (Woolley 1930b, 1955, 65-66; Woolley and Moorey 1982, 26). Again, however, this so-called factory cannot have constituted an industrial area. Fragments of highly fired ceramic 'rings' have been discovered amongst the sherd collections from both Kish and Ur and presumably represent items of kiln furniture (Fig. 4.7). A number of fire installations were recorded at Kish (Mackay 1929, 115-116), but unfortunately they are described in insufficient detail. The structure of these fire installations appears to resemble the elaborate domestic ovens and it is therefore doubtful whether there is any justification for calling them pottery kilns.

The most interesting evidence so far comes from Al Hiba, where recent excavations on the third millennium site have uncovered an industrial quarter (Killick and Black 1985, 222). Apart from an area littered with ash, wasters and manufacturing clay this industrial quarter has produced a large collection of microlithic tools in association with broken shell waste. In the light of such evidence it would seem reasonable to suppose that there existed a similar industrial quarter related to third millennium pottery production at Abu Salabikh, probably located outside the immediate settlement area. Such a radical change in the siting of pottery kilns would necessarily reflect an equally significant change in the organisation of pottery production.

Pottery fired in structures similar to the Uruk bowl kilns would not have exceeded temperatures of more than 1000°C (Rye 1981, 100) and, whilst surfaces could have been oxidised, the central core would remain reduced (Rye 1981, 98). Amongst Uruk pottery it is frequently the case that the central core remains reduced. Moreover, the grey wares are a common fabric group in Uruk pottery assemblages

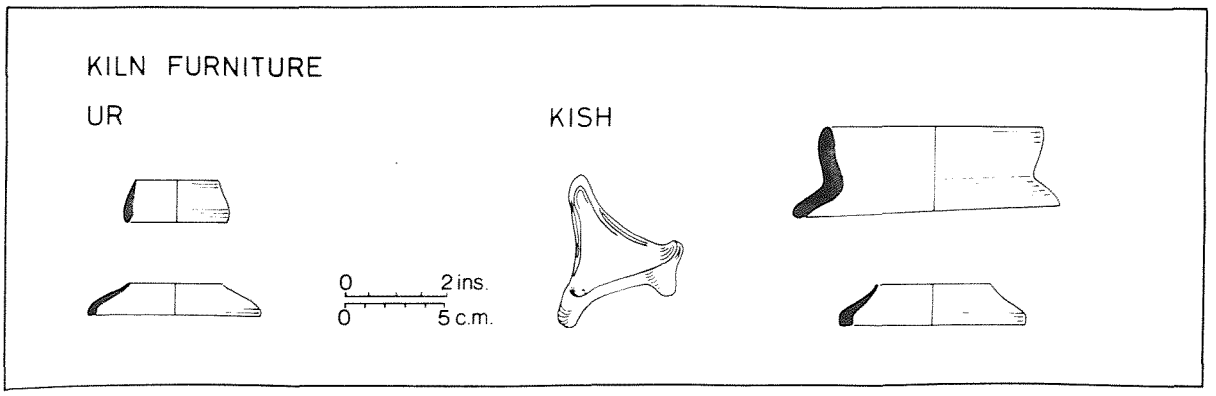


Fig. 4.7 Ceramic kiln furniture from Kish and Ur ($\frac{1}{4}$)

(Section 8.3.4, Group H). Not all the Uruk pottery is reduced, however, since a smooth pink ware with thick cream slip is also characteristic of Uruk assemblages (Section 8.3.4, Group Dii). This suggests that a more elaborate kiln is being used, presumably by potters trained in a different tradition. By the ED III period fabrics are invariably uniformly oxidised implying greater sophistication in firing techniques. The transition, however, to producing wares at higher temperatures involves more than substituting kilns for oven-firing. With an increase in firing temperatures vessel shapes suitable for low-fired pottery may cause stresses resulting in damage to the product (Rye 1981, 100). One instance of this is apparent from a study of conical bowl bases which sometimes display large S-shaped stress cracks.

Compensation for increased firing temperatures is not, however, confined to modifications in the pottery firing technique. The range of materials used are dictated to some extent by firing conditions. At increased temperatures large inclusions in sand-tempered fabrics are subject to cracking (Rye 1981, 107; fig 100a). The decline and eventual disappearance of sand-tempered wares by the ED III period may therefore be explained by increased firing temperatures reflecting more sophisticated firing techniques.

The identification of kiln sites is crucial to establishing the mechanisms of local pottery production. In the late Uruk period at Abu Salabikh bowl kilns from the West Mound apparently represent a transition from pit kilns, similar to those used in modern India (Saraswati and Behura 1966, 129) and Pakistan (Rye 1981, fig. 86; Rye and Evans 1976, 12), to more permanent updraught kilns. Elaborate kiln structures, presumably used for firing the standardised products of the ED III period, cannot have wholly replaced the technique of oven-firing since large hand-made coarse ware jars more suited to open-firing were still being manufactured.

4.4.2 Ceramic technology

The most striking feature of local pottery production at Abu Salabikh is the contrast between fabric types from the West Mound and those from the Main Mound. Comparisons between pottery retrieved from these two areas highlight important differences in the technology employed in the manufacture of ceramics from chronologically distinct periods.

Although by the late Uruk period much of the pottery was

wheel-made, the late Uruk and early ED I pottery types from the West Mound display a considerable degree of diversity in manufacturing techniques (Table 4.1, Batch 5408 and 5601). Differential firing of pottery has produced fabrics with a wide range of colours. It is perhaps more significant, however, that most pottery from this period contains an abundance and variety of added tempering agents. This widespread use of temper is a characteristic feature of late fourth millennium ceramics which had become virtually extinct by the ED II and ED III periods **(Table 4.1a)**.

Chronological differences in settlement pattern can be inferred at Abu Salabikh (Section 4.2.3). This is reflected in the different technology manifested in late Uruk and early ED I pottery production on the West Mound, compared with the ED II and ED III assemblages from the Main Mound.

Comparisons with Uruk pottery from Ur and even as far north as Tell al Rubeidheh (Table 8.4, Sample nos. 2841-2870) in the Diyala region (Fig. 3.2) indicate a broadly similar technology shared by different sites in the Uruk period (Table 8.3). Uruk pottery, however, displays far more regional variation in the use of a wide range of tempering materials than is apparent from an examination of ED III assemblages (Table 8.3). This variability in Uruk pottery is also evident at a local level where pottery from a small trench on the Uruk Mound at Abu Salabikh (Postgate and Moon 1982, 104) differs from some late Uruk shapes and fabrics represented on the West Mound. Unfortunately pottery from the Uruk Mound was confined to this trench and the quantity is insufficient for detailed analysis.

The variability in both the Uruk fabrics and several ED I fabrics from the West Mound indicates that there is unlikely to have been any strict uniformity of production methods. These wares may thus reflect the activity of a number of small workshops which were probably little more than household industries. In sharp contrast, however, to the pottery assemblage from the West Mound, the majority of ED II and ED III pottery fabrics from the Main Mound display remarkable uniformity of form, fabric and surface colouring. This trait has also been observed in Early Dynastic pottery from the Diyala region (Delougaz 1952, 31). Moreover, variations between fabrics from Abu Salabikh and from other Early Dynastic sites in Southern Iraq (Section 5) are mineralogical rather than technological. It could be suggested, therefore, that from the Early Dynastic period onwards individual city states shared a system of standardised specifications

for the production of utilitarian wares and probably also for the vessels which were designated as prestigious funerary wares. The latter, however, do display regional variations in surface decoration (Moon 1982, 66-68) whilst still occupying similar fabric groups. Thus, while it cannot be assumed that all vessels were manufactured by a single large factory or production centre at each site, this apparent standardisation of pottery manufacture on a large scale may be considered to constitute a form of mass production.

Mass-produced types have also been identified in the Uruk period, notably the bevel-rim bowls (Type BRB; Adams and Nissen 1972, 99; Johnson 1975, 304; Nissen 1970, 137) and sickles (Fig. 4.8). These may represent the output of an early attempt at organised production. An approach towards standardisation in pottery production is evident in the ED I period with a high proportion of each batch consisting of solid-footed goblets (see Table 8.4, West Mound, Type 1.3.2). A range of jar types has been found in association with this early mass-produced type (Adams and Nissen 1972, 99) many of which conform to similar types found in other late Uruk assemblages (Adams and Nissen 1972, 99-103; Nissen 1970, Taf. 104-107; Postgate and Moon 1982, 109-120; Figs 8.64, 8.65, 8.66). Such pottery types cannot be said to be mass-produced since they have been manufactured in a wide range of fabrics. It is possible, however, to observe in the West Mound assemblage the beginnings of a technological transition from late Uruk pottery production methods to the standardised pottery production of the Early Dynastic period.

By the ED I period the manufacturing process at Abu Salabikh already shows considerable standardisation where specific fabric groups may be associated with particular styles. Tab-rim jars (Type 2.4.8.8; Fig. 8.9; Fig. 8.65 nos. 2101-2109), for example, usually belong to Group Avii, a sub-group of fine red wares, with characteristic mica dusting on the surface (Section 8.3.4, Table 8.5). This move towards standardised production is perhaps best illustrated by the occurrence of transitional bowls (Type 1.2). These bowls are apparently a predominantly ED I type persisting into the ED II period (Table 4.2). They display some variation in the rim shape (Fig. 8.2), but all seem to have a string-cut base linking them with the conical bowl which is finished in a similar way. The key to their origin, however, lies in the bevel-rim bowl, since both bowl types share the same fabric group (Table 4.2, Group N) and are decorated with the same vegetable/chaff-tempered slip.

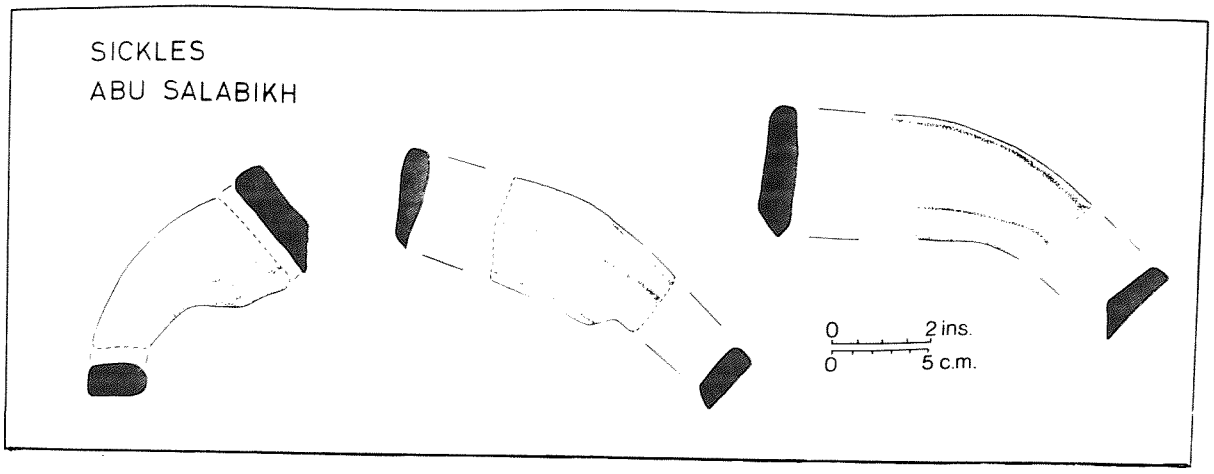


Fig. 4.8 Ceramic sickles from the West Mound at Abu Salabikh ($\frac{1}{4}$)

The most obvious explanation is that the transitional bowl is a wheel-made version of the hand-made bevel-rim bowl, and that the same fabric has been adapted to meet what is presumed to be the increased demand for a popular shape. The fact that the conical bowl was at one stage being produced alongside the transitional bowl, notably in the ED IB and ED II periods, could be interpreted as an example of two rival pottery traditions, one of which had developed the technology used in the production of the bevel-rim bowl whilst the other had merely adapted the shape of the solid-footed goblet. Such a suggestion, however, remains a matter for conjecture, but it would appear that the development of the solid-footed goblet into the conical bowl proved more successful.

Although several of the ED I fabrics are the same as those found amongst ED II and even ED III material from the Main Mound (Table 4.1a ; Table 4.1, Batch 5408), pottery batches from ED I contexts on the West Mound still contain examples of late Uruk fabrics. The products of what are presumably small household industries still remain in evidence with the continued appearance of fabrics characterised by the addition of tempering agents (Table 4.1, Group Hi, Batch 5408 and Batch 5601) such as the shell-tempered wares (Group D) and medium sand-tempered buff wares (Group J).

By ED IB and ED II occupation of the Main Mound such influences in local production seem to have died out. The change in settlement plan with a shift from extended family units to an urban society probably influenced by a temple or palace economy has presumably contributed to this change. The visual uniformity displayed by ED II and ED III pottery types, however, is less apparent on closer inspection. It is evident from petrographic analyses that fabric diversity is not restricted to the ED I period (Table 8.5). Fabric differences in the ED II and ED III periods, however, are not generally attributable to variations in firing temperatures and tempering agents. Much of the fabric variability is probably due to the wide range of local clays accessible to the discriminating potter.

Fine sandy wares (Group A) are distinguished from green-buff wares (Group B) by a colour difference probably attributable to the respective clay sources and by the presence of abundant inclusions of magnetite (Section 8.3.4). The presence of fragments of bivalve molluscs (P. Murphy, pers. comm.; Fig 8.94A) in shelly wares (Group F) and shell-tempered wares (Group D) indicates yet another type of deposit available to local potters. On the basis

of the mineralogical assemblages, petrographic analyses indicate that all these fabrics are derived from local clays. Moreover the maps in the Surveys of Ancient Babylonia (Selby et al. 1885) illustrate the accessibility of a variety of different deposits ranging from sandy soils to shelly areas (Fig. 1.1).

It is equally apparent that several fabrics indicate clay preparation. Fine levigated wares (Group I) and probably also fine wares (Group C) have been refined. In the latter case it is probable that the fine clay was produced by sieving the original deposit to remove all coarse inclusions. Fine levigated wares, however, are most likely to have been produced by the alternative method of levigation (Shepard 1956, 52, 182). The potential for mixing alluvial clays with sandy deposits may also have been exploited and the coarse sandy wares (Group G) could have been produced by this method. These wares may be distinguished by the presence of coarse rounded quartz grains (Section 8.3.4) which are a characteristic feature of wind-blown sands.

With such a variety of fabrics it is probable not only that potters used a wide range of local clays but also that several workshops were involved in producing similar assemblages including conical bowls (Type 1.1), spouted jars (Type 5), stemmed dishes (type 10) and upright-handled jars (Type 11). These vessel types were produced in a number of different fabrics (Table 4.2) and furthermore it is possible to detect several major styles within any one fabric group.

The increased standardisation of pottery production must therefore be viewed in the light of the evidence for several pottery producing groups. A uniformity of style and a superficial uniformity of fabric and texture emphasises the market demand for vessels of a principally utilitarian nature. The probability that these vessels were produced by a number of different workshops, combined with the fact that ED II and ED III pottery types are poorly finished and ineptly decorated, suggests that these are not the products of professional craftsmen.

4.4.3 Organisation of pottery production

There is very little archaeological evidence to indicate the size and distribution of possible production centres in the ED II and ED III periods at Abu Salabikh. Nor does it seem possible to determine the location and distribution of such centres in relation to areas of dense settlement.

It is probable that pottery production took the form of a part-time craft in the late Uruk period and that this continued into the ED I period on the West Mound. The small Uruk bowl kiln and the fabric variability, which is perhaps most significant within the broad category of grey wares, point to potters working on a part-time basis. The ubiquitous bevel-rim bowl (BRB) is equally unlikely to have been the product of full-time potters' workshops, owing to the crude shape of the bowls, the variations in size and thickness and the use of a simple bowl kiln for firing the vessels, all of which suggest a lack of specialist skill. It is likely therefore that production in the Uruk period at Abu Salabikh was undertaken by part-time craftsmen in small workshops. Whilst Johnson (1973) has suggested that large administrative centres in the Middle Uruk period were responsible for the centralization of craft production and the redistribution of craft items, such a system does not seem likely at Abu Salabikh. The West Mound appears to consist of a rural settlement with individual farmsteads (Section 4.2.2). This is therefore consistent with local pottery production, perhaps within the household represented by each enclosure, where pottery is manufactured solely to meet the domestic requirements of cooking wares, storage vessels and household crockery.

The move towards standardisation of pottery first seen in the ED I pottery from the West Mound had become firmly established by the ED II period on the Main Mound. The chronological break between occupation of the West Mound and the Main Mound deduced from both the archaeological and ceramic evidence occurs at this transitional period. Alternatively, it is possible that the later levels on the West Mound have been eroded and that the semi-rural settlement shifted to the urban settlement on the Main Mound. Since it seems likely that the phase of greatest occupation at Abu Salabikh occurred during the ED I period (Postgate 1983, 1) there is a possibility that both mounds were occupied simultaneously. Such a theory might explain the presence on the West Mound of pottery with fabrics akin to those from the Main Mound, which appear to have superseded the coarser fabrics retained from an earlier Uruk technology. The finer wares may derive from potters workshops on the Main Mound with the consequent decline of cruder vessel forms.

Standardised manufacture, however, need not necessarily preclude production by several part-time potters for redistribution. Part-time production may also have been encouraged by a periodic demand for large quantities of vessels by specialist consumers such as

wine merchants. This type of fluctuating market is exemplified in the second millennium by a letter of instruction, presumably written to some form of steward, requesting the collection of a large batch of wine jars (Frankena 1966, 40-41, no. 67, trans. S. Dalley).

The possibility that pottery production was principally a part-time occupation is supported by the textual sources (Section 6.2.3). By the late ED III period, however, pottery fabrics had become uniformly fine, increasing the likelihood of major production centres with full-time potters.

4.4.4 Distribution and imported wares

Imported wares are rare among the Abu Salabikh assemblage, implying a limited exchange of ceramic products between neighbouring sites on the southern Mesopotamian plain.

It is not always possible to trace the origin of imported pottery, particularly when the suspected imports are whole vessels and may not be available for detailed analyses. Petrographic analysis has shown, however, that the few imported wares identified appear to originate principally from the Diyala region (Section 8.3.4 and Section 8.4.4). The majority of these imported wares form a coherent group confined to coarse container vessels, usually of Types 2.4.1 and 2.4.2 (Fig. 8.6). Amongst such vessels coarse red wares (Group M) figure prominently, together with occasional examples of grey ware (Section 8.3.4, Groups Hv, Hvi and Hxii).

It is perhaps surprising that the bulk of imported pottery which has been analysed is confined to early pottery types from late Uruk and ED I batches on the West Mound. This includes the rare occurrence of painted wares in addition to container vessels. Although identification based solely on a visual examination could have produced a bias in favour of the more readily identifiable imported coarse wares of the earlier periods, petrographic analysis has facilitated the identification of imported vessels amongst the finer wares of the ED II and ED III periods. Some other explanation must therefore be sought for the predominance of late Uruk and ED I imported pottery at Abu Salabikh.

A simple interpretation would be that the type of settlement on the West Mound was not self-sufficient in the production of commodities such as beer and wine and that these were therefore imported. Unfortunately this does not explain why the Diyala region would have been the source of such imports. Moreover, the paucity of

imported wares at Abu Salabikh scarcely indicates a regular trade in container vessels from the Diyala sites.

The presence of several ovoid jars from ED III levels on the Main Mound is equally puzzling. These jars are distinguished by narrow bands of orange paint on the neck and shoulder, and a Syrian connection has been postulated (Postgate and Moon 1982, 131). Analyses of two such examples using petrographic and neutron activation methods suggests, however, that the two vessels analysed are local copies of a Syrian type (Table 8.5, Thin section 336; Fig. 8.107, Plot 13A, 1029A and 1029B). Sample no. 1251 (Table 8.4), on the other hand, appears to be a genuine import and is probably a fragment of a fine painted jar from the Diyala region (Table 8.5, Thin Section 560; Fig. 8.109, Plot 15A).

Imported vessels at Abu Salabikh thus appear to occur incidentally amongst both the late Uruk and ED I assemblages from the West Mound and among the ED II and ED III Main Mound assemblages. Their presence perhaps arises from contacts with merchants primarily trading in other commodities, probably indicating that Abu Salabikh was sited on a north-south trade route. Although isolated imported vessels cannot be used to examine trade routes and exchange systems they do at least establish links between the Diyala region and Abu Salabikh. Such links presumably also extended to other sites within the region of the southern Mesopotamian plain.

These imported vessels may be regarded primarily, however, as the exception to a prolific local ceramic production industry.

5: EARLY DYNASTIC KISH AND UR: THE POTTERY ASSEMBLAGES

5 EARLY DYNASTIC KISH AND UR: THE POTTERY ASSEMBLAGES

5.1 INTRODUCTION

Classification of late Uruk, ED I, ED II and ED III fabric types from stratified contexts at Abu Salabikh has assisted in the evaluation of chronological divisions at Kish and Ur. Whilst some variation occurs amongst the individual vessel types and fabrics represented at all three sites, there is a general similarity in both pottery style and fabric between the assemblages which argues for a closely comparable development of ceramic production.

Identification of individual phases of Early Dynastic occupation at both Kish and Ur has been based hitherto largely upon comparisons with architectural styles and with pottery types from Khafajah in the Diyala region. In attempting to refine the chronological divisions at both Kish and Ur it is acknowledged that the sequences are only relative. The characterisation of phases is not intended to provide absolute dating but rather to indicate a parallel development in ceramic technology between different sites.

Comparisons between the pottery from Abu Salabikh, Kish and Ur are hindered by the limited material available from occupation levels, as opposed to graves, at Kish and Ur. The discovery of a collection of unpublished late Uruk and early ED I sherds from Ur has redressed the balance, but few similar examples from Kish have been available for study and analysis.

5.2 KISH

Technological variations in fabric groups reflecting differences between the three principal divisions of the Early Dynastic period at Abu Salabikh have been used to evaluate the relative chronologies of Mound 'A' and the 'Y' sounding on Tell Ingharra.

In attempting to date the sequence of occupation at Kish, emphasis has frequently been placed on the upright handled jar (Fig. 8.12, Type 9). Typological classification and the identification of vessel fabrics including a number of ED I sherds from the 'Y' sounding, however, have now been used to compare occupation levels in the 'Y' sounding with those on Mound 'A'.

Excavations at Kish have covered a wide area incorporating a number of individual tells. Major investigations have included excavations by Gibson (1972); Langdon (1924; 1928); Mackay (1925; 1929) and Watelin (1930; 1934). A detailed analysis of these excavations and research carried out on material from Kish has been described by Moorey (1978).

The present study of Early Dynastic pottery has been confined to material from excavations on Mound 'A' and from the 'Y' sounding on Tell Ingharra.

5.2.1 Kish: Mound 'A'

Five stratigraphic sequences have been identified from excavations on Mound 'A' (Moorey 1978, 63). The sequence of occupation is traced from the construction of a palace early in ED IIIA. Subsequent alterations to the eastern and northern blocks form a second phase and are dated late in the ED IIIA period. The third phase features the destruction of the palace followed by the building of a 'primitive' settlement over its ruins. A fifth and final phase is represented by the Cemetery with graves dug during or after occupation of the settlement and extending towards Tell Ingharra. This has been dated to the end of the ED IIIB period (Moorey 1970, 101, 104; 1978, 67).

5.2.2 Palace 'A'

There is some evidence for occupation preceding the construction of the palace (Moorey 1978, 56). A spouted jar and five other vessels were discovered below the north-west corner of the

palace (Mackay 1929, pl. 51, nos. 20 and 23-27). These have been dated by comparisons with pottery from the Diyala to ED I/ED II (Moorey 1978, 56).

Large spouted jars with ring bases and plain rims (Table 8.1, Type 5.3.1) are common in grave assemblages dated to ED IIIA at Abu Salabikh (Postgate and Moorey 1976, pl. 22b; Postgate 1977, 290-291). Analysis of jar rim fabrics from Abu Salabikh (Fig. 8.7, Types 2.4.3.1, 2.4.3.2 and 2.4.3.3), the majority of which are probably from spouted jars, indicates that these types may be dated no earlier than ED II (Table 8.4, Sample nos. 0814-0850). Fabric analyses of spouted jars similar to the type discovered below Palace 'A' at Kish (Type 5.3.1) also suggests a date no earlier than ED II and more probably ED III (Table 8.4, Sample nos. 2679 and 2680).

Pottery associated with the palace appears to be largely confined to round-based cups (Table 8.1, Type 1.4.2) which are commonest in the ED III period in the Diyala (Delougaz 1952, 99-100). This was also almost the only type found in the plano-convex building at Kish (Moorey 1964, 91; 1978, 56). At Mari similar cup shapes were excavated from pre-Sargonid levels (Parrot 1935, fig. 3) in association with flat-based cups (Table 8.1, Type 1.4.1). The fabric of Type 1.4.1 from Mound 'A' at Kish (Table 8.4, Sample no. 2587; Fig 8.69) suggests an ED III date for this type of cup and Type 1.4.2 is not presumed to be much earlier.

It seems reasonable, therefore, to argue for an early ED III or late ED II date for the first occupation of the palace.

Dating the end of the palace occupation is considerably more difficult. Moorey (1978, 63) has pointed out that erosion of the palace before the third phase of occupation need not have been a prolonged process. Once roofs are removed, mud brick walls will rapidly disintegrate in the space of a few months. Between seasons, for example, walls exposed during the previous excavation season can be substantially reduced in size. Thus there is likely to have been a lapse of just a few years between the destruction of Palace 'A' and the development of later settlement.

Pottery from the third building phase, the settlement occupying the eastern site of the palace, is dominated by Mackay's type G (Table 8.2; Fig. 8.4, Types 1.15.4, 1.15.8 and 1.15.9). These coarse ware bowls were also found in contemporary grave groups and Moorey (1978, 63) has suggested a late ED III date on the basis of comparisons with pottery from Mari and the Diyala. Similar vessels

were, however, found in ED II, ED III and late Uruk contexts at Abu Salabikh (Table 8.4; Sample nos. 1460, and 1835-1839) and this vessel type may occur over a longer period of time than had been supposed hitherto. Although this does not contradict evidence for a late ED III date, the relatively high proportion of this type of coarse ware from 'primitive' settlement deposits may be attributed to a social change rather than to chronology.

The presence of a footed or cup-based jar decorated with shell inlay (Table 8.1, Type 7.2) in one of the later rooms above the palace (Mackay 1924, 114) is seen as more positive evidence for ED IIIB occupation levels. Evidence from fabric analysis, however, is less clear. Whilst it was not possible to thin section this jar, the fabric was identified as Group Hi (Table 8.4, Sample no. 2694) on the basis of a visual examination. Grey wares from Kish (Section 8.3.4, Group H) generally occur amongst vessel types from the 'Y' sounding with a probable ED II context (Table 8.4, Sample nos. 2604, 2605, 2717) and Group Hi is a sandy fabric with a harsh texture typical of ED I and ED II fabrics. A similarly decorated vessel (Table 8.4, Sample no. 2694) from Mound 'A', however, was also manufactured from a sandy fabric (Group E) likewise characteristic of ED II vessel types, and it may be inferred that the firing properties of this fabric were more suitable for vessels designed with shell inlay decoration. A burnished bowl from Mound 'A' (Table 8.4, Sample no. 2590) with a possible ED III date has also been identified as Group Hi. Thus grey wares at Kish were not confined to an early (ED II) date.

A further four undecorated footed jars (Type 7.1) were analysed from Kish and all were of typically ED III fabrics (Table 8.4, Sample nos. 2689-2692). Moreover, there is no evidence for an early occurrence of this type. Similar footed jars exclusive to late ED III graves at Abu Salabikh (Postgate and Moorey 1976, 163) and spouted-footed jar variants from the Diyala (Delougaz 1952, pl. 185; c.587.682) indicate that these jars belong to the late ED IIIB and Akkadian periods. The only other example included in the corpus came from the Ur collections (Table 8.4, Sample no. 0302) and cannot be dated earlier than the ED III period on the basis of fabric type (Ai).

To summarise, the evidence from stylistic attributes and from the identification of fabric groups complements the proposed early ED IIIA date for construction of the palace (Moorey 1978, 64). Taking into account the rapid rate of mud-brick erosion, and the absence of pottery fabrics characteristic of late ED IIIB or Akkadian

periods in subsequent occupation levels, it is suggested that the destruction of the palace occurred either at the end of ED IIIA or early in ED IIIB.

5.2.3 Cemetery 'A'

Situated immediately below the surface of the mound and at varying depths, the graves of Cemetery 'A' are widely dispersed. Unlike the Royal Cemetery at Ur, the intra-mural burials at Abu Salabikh, or the earlier burials excavated in the 'Y' sounding on Tell Ingharra, they cannot be related to a stratigraphic sequence (Moorey 1978, 62). Thus cemetery 'A' presents a unique problem for archaeologists attempting to estimate its period of use. The chronology of the graves has been the subject of prolonged debate (Gibson 1972, 79; Harden 1934; Moon 1982, 44-46; Moorey 1966; 1970; 1978, 65-70; Whelan 1978), much of which has centred on the identification of a chronology for the occurrence of upright-handled jars (Table 8.1, Type 9; Fig. 8.12). It is appropriate, therefore, to consider first the dating evidence based on an examination of these funerary vessels.

A distinctive characteristic of upright handled jars is the decorated handle. This decoration ranges from simple incised geometric designs (e.g. Fig. 8.58, no. 1139 and Fig. 8.75, no. 2722) to applied plastic features (e.g. Fig. 8.58, no. 1140 and Fig. 8.76). The feminine features of such anthropomorphic handles have given rise to the name "mother-goddess" jars. Since this type of decoration is not universal, however, these jars are referred to as upright-handled jars in the pottery corpus (Table 8.1, Type 9).

The development of upright-handled jars has been traced by examining the variability in decorative styles amongst handles. This has suggested a transition from ED II through to ED IIIB and Akkadian jar types on the basis of a change from geometric designs to anthropomorphic decoration (Delougaz 1957, 87-91). The size and position of handles have also been used as chronological indicators (Moon 1981, 72-73; Whelan 1978, 96). Finally, Moorey (1978, 65) and Gibson (1972, 79) have inferred that tall necks and a high ring-base on narrower shaped upright-handled jars may be indicative of Akkadian date when compared with similar types from the Diyala (Delougaz and Lloyd 1967, 159-168).

Whilst there is broad agreement that developed anthropomorphic handles are generally a late ED III and Akkadian

phenomenon (Barrelet 1968, no.92; Delougaz 1952, 90; Moon 1982, 45-46; Moorey 1978, 67; Whelan 1978, 96) and that the presence of upright-handled jars of this type indicates a late date for Cemetery 'A', the time-scale for this evolution in decoration is more controversial. Consequently, dating the duration of Cemetery 'A' has become somewhat speculative.

Delougaz (1952, 144) initially suggested that Cemetery 'A' was occupied for only a short period of time, a notion accepted by Moon (1982, 46) and Moorey (1978, 74). By comparing a parallel development in the decoration of jar handles at Khafajah and inferring a similar time-scale, however, Whelan (1978, 96) has suggested that the graves span a much longer time-scale from ED II to late ED IIIB or Akkadian.

It is clear that such stylistic comparisons cannot be relied upon to evaluate chronological distinctions. Both Moon (1981, 72) and Whelan (1978, 96) agree that the variability in decoration of upright handled-jars cannot be considered as a purely chronological characteristic and that regional and intra-site variability is a crucial factor. An examination of upright handled jar fabrics may therefore serve to clarify the situation. Amongst the 26 examples from Kish included in the corpus (Table 8.4, Sample nos. 2720-2745, Figs 8.75 - 8.78) only one can be considered earlier than ED III. Sample no. 2722 (Table 8.4; Fig. 8.75) is the only example of a medium sandy ware (Section 8.3.4, Group Eiii) among this type of jar. This ware has been identified as characteristic of ED II fabrics at Abu Salabikh (Section 4.3.1, Table 8.4, Area A, Batch 4473, Sample nos. 1454-1537). The remaining fabrics range from fine sandy wares (Section 8.3.4, Group A) and green-buff wares (Section 8.3.4, Group B) through to fine wares (Section 8.3.4, Group C) and fine levigated wares (Section 8.3.4, Group I) and include one example of grog-tempered ware (Table 8.4, Sample no. 2729, Group Fii).

Although variability amongst upright-handled jars is not therefore confined to stylistic attributes, the majority of these jars are fine sandy wares or green buff wares and may be compared directly with a similar fabric range amongst upright-handled jars from Abu Salabikh (Table 8.4, Sample nos. 1138-1151). Moreover, the presence of fine wares (Group C) identified in two examples of detached handles from Kish (Table 8.4, Sample nos. 2741 and 2744; Fig. 8.78) may be taken as evidence of a late ED IIIB or Akkadian date. It should be noted, however, that the two handles are stylistically quite

different, since Sample no. 2741 is characterised by strongly defined anthropomorphic features whilst Sample no. 2744 is decorated by simple incised diagonal lines. This type of decoration is very rare and is paralleled only by similar decoration on the handle of a massive upright-handled jar discovered on the surface at Adab (Moon 1982, pl.2). The latter example, however, also displays incipient anthropomorphic features which are absent on the fragment from Kish.

The suggestion that geometric decoration precedes anthropomorphic motifs on jar handles appears to be equally open to question amongst the material from Abu Salabikh. Moon (1981, 72) has commented that this chronological criterion is unreliable, and analyses emphasise continuity of output. Two examples of typical late ED IIIB fabrics occur in upright-handled jars from Abu Salabikh (Table 8.4, Sample nos. 1138 and 1139; Fig. 8.58) which have handles with geometric decoration. It is clear therefore that this is a persistent style.

Fabric analyses of upright-handled jars from Kish confirm a terminal date for Cemetery 'A' in the late ED IIIB or early Akkadian period. Although the single example of an upright-handled jar with an ED II fabric should not be regarded as evidence for the longer use of the Cemetery advocated by Whelan (1978), it is, however, necessary to examine this possibility by comparing fabrics of other vessels recovered during excavation of the cemetery.

Stylistic comparisons between the wide range of vessel types from Cemetery 'A' and later ED III and early Akkadian vessels from the Diyala have again been regarded as evidence for only short term use of the cemetery (Moorey 1978, 66-70). The majority of fabrics from vessels provenanced to graves in Cemetery 'A' are typical of ED IIIA and ED IIIB fabrics from Abu Salabikh. A number of fine wares (Section 8.3.4, Group C) also occur amongst these vessels suggesting a late ED IIIB or Akkadian date. It is also noticeable that of the few examples from established Akkadian levels at Kish (Moorey 1978, 89), several pieces of pottery were fine wares (e.g. Table 8.4, Sample nos. 2606 and 2662). Apart from the upright-handled jar, however, no other ED II fabrics have been found amongst the pottery from grave assemblages.

Evidence for the foundation of the palace no earlier than ED IIIA has also been deduced from the presence of a 'Fara' tablet enclosed in the brick platform under Palace 'A' (Moorey 1970, 91). This, taken in conjunction not only with the fact that the majority of

cylinder seals cannot be dated before ED IIIA (Moorey 1970, 95-97; 1978, 66) but also with the evidence from fabric analyses, suggests that Cemetery 'A' is unlikely to date earlier than ED IIIA. The predominance of fabrics which may be dated to ED IIIA and possibly early ED IIIB, combined with a proportionally smaller number of specifically late ED IIB and Akkadian fabrics, however, suggests that the cemetery could have been used for a longer period during ED III than has been generally accepted.

5.2.4 Tell Ingharra: the 'Y' sounding

Excavations in the deep sounding 'Y' at Tell Ingharra revealed an urban settlement (Watelin 1934, 7, fig. 2) described as containing

> '... a building complex laid out on either side of a narrow street ...' (Moorey 1978, 99).

A number of burials were excavated in the eastern part of the building but the absence of graves in larger rooms to the west has been taken to imply a public function for this complex. Similar areas of urban settlement have been excavated at a number of Mesopotamian sites and Area A at Abu Salabikh shows a remarkably similar plan (Fig. 4.3). Moorey (1978, 100) has emphasised the significance of a close parallel with part of a settlement excavated in Pit F at Ur (Woolley 1955, pl. 75; 56-69). The occurrence of solid-footed goblets (Table 8.1, Type 1.3.1; Fig. 8.1) and reserve-slipped wares (Table 8.1, Type 8.9, see Fig. 8.72, no. 2660) in association with distinctive Jamdat Nasr painted wares (Woolley 1955, 64-65) is considered to illustrate continuity between the end of the protoliterate period (represented by the 'Jamdat Nasr' painted pottery) and Early Dynastic I (Moorey 1966, 34; 1978, 101).

Since solid-footed goblets and reserve-slipped wares are generally considered representative of ED I occupation levels (Adams 1972c, 100; Strommenger 1980, 483), the discovery of both these types in association with Jamdat Nasr painted wares amongst building levels constructed before the use of plano-convex bricks (an Early Dynastic architectural feature) is taken as evidence for similar continuity between the protoliterate and early Early Dynastic period at Kish (Moorey 1966, 34).

Fabric analyses of late Uruk and ED I pottery from the West Mound show that early ED I pottery fabrics share some of the characteristics of late Uruk wares (Section 4.4.1). This continuity

between early ED I and late Uruk at Abu Salabikh, however, is followed by a break in the chronological sequence, probably occurring late in the ED I period. On the basis of ceramic evidence Moorey (1966, 40) has suggested that ED II in the Diyala represents a period of transition. The examination of pottery fabrics from the West Mound at Abu Salabikh (Section 4.4.1) and from Ur (Section 5.3) indicates that this transitional period took place earlier, during the ED I period, at sites on the Mesopotamian plain, and that by ED II, ceramic traditions typical of both ED II and ED III periods were well established.

5.2.5 Chronology of the 'Y' sounding

The chronological sequence of grave groups at Tell Ingharra is thought to span the period from ED I to ED II and possibly even ED IIIA (Moorey 1970, 104; 1978; 106-108).

Burials contemporary with Mound 'A' were excavated by Watelin (1934, 49) on Tell Ingharra and are presumed to have been part of Cemetery 'A'. Several of these graves are represented in the pottery catalogue (Table 8.4) by vessels with characteristic ED III fabrics. Although only two fabrics among the Kish pottery can be identified with early ED I wares from Abu Salabikh a number of ED I pottery types with fabrics which are unique to this period are represented in the ceramic assemblages at Kish. Sherds of late Uruk and early ED I type (based on comparisons with Ur and Abu Salabikh material) are characterised by four principal fabrics: Group Av (Table 8.4, Sample nos. 2651, 2696 and 2702); Group Avi (Table 8.4, Sample nos. 2655, 2656, 2711 and 2712); Group Aviii (Table 8.4, Sample nos. 2678, 2687 and 2688 and Group Bvi (Table 8.4, Sample no. 2697).

Most of these sherds are from hole-mouthed jars and are heavily decorated with incised cross-hatching, triangular incisions and frequently with horizontal pierced lugs (e.g. Fig. 8.71, nos. 2652-2626).

Several fabrics identified as typical of the ED II period from the analyses of Abu Salabikh material occur amongst ED I sherd types from the 'Y' sounding. The shape and decoration of these sherds are more akin to late Uruk/early ED I pottery types than to ED II or even late ED I vessels (Table 8.4, Sample nos. 2652, 2653, 2657, 2660, 2698 and 2700; Figs 8.71, 8.72 and 8.73). There can be little doubt, therefore, that these sherds represent ED I and late Uruk occupation levels in the 'Y' sounding. It is clear, however, that the pottery

from Kish illustrates a different technological development compared with pottery fabrics from both Abu salabikh and Ur. One possible explanation may lie in the fact that the technological transition from late Uruk/ED I fabrics to ED I/ED II fabrics recorded at Abu Salabikh has occurred earlier in the pottery sequence from Kish, with an intervening phase at Kish represented by the 'Jamdat Nasr' painted pottery. Fabric analysis of a bevel-rim bowl from Kish (Table 8.4, Sample no. 2586) has identified a ware typical of early ED I fabrics at Abu Salabikh. This perhaps indicates that a technological change in pottery production occurred before the end of the Uruk period at Kish.

Pottery sampled from the neighbouring site of Jamdat Nasr (Table 8.4, Sample nos. 2787-2817) has yielded fabric groups similar to those from ED I levels at Kish. This may illustrate continuity between the end of the protoliterate period and the beginning of the Early Dynastic period described by Moorey (1978, 101), but without sufficient ceramic evidence in the form of sherds from late Uruk occupation levels at Kish and Jamdat Nasr it is not possible to speculate further about the period of transition in ceramic technology which is evidenced at Abu Salabikh and Ur. From an examination of pottery styles and fabrics it would appear that most of the pottery from Tell Ingharra belongs to the ED II and later ED I periods. Furthermore, the evidence from fabric analysis does not justify the suggested transitional period during ED II at Kish.

5.3 UR

5.3.1 Introduction

Excavations of the Uruk to Early Dynastic occupation levels at Ur (Woolley 1934; 1939, 7-39; 1955; Woolley and Moorey 1982) were dominated by the discovery of the Royal Cemetery (Woolley 1934) and relatively little of the Uruk and early ED I deposits was uncovered. Investigations of these levels were confined principally to the 'Flood-pit' in the Royal Cemetery area (Woolley 1934; Lloyd 1960), the building remains at Pit F (Woolley 1955, pl.71, 56-69) and to a deep sounding on the north-west corner of the Ur III ziggurat.

Excavations beneath the graves of the Royal Cemetery area revealed debris from burnt buildings, amongst which were retrieved the tablets and sealings dated to Uruk and 'Jamdat Nasr' periods (Legrain 1936). A number of pits was also dug in the Royal Cemetery, usually following the line of grave shafts. These also yielded Uruk and 'Jamdat Nasr' material which Woolley compared with similar finds from the sites of Warka and Jamdat Nasr (Al-Soof 1968; 1973; Woolley 1955, 23-31).

Woolley (Woolley and Moorey 1982, 36) identified early building levels in both the deep sounding under the ziggurat (Woolley 1939, 7-23) and in Pit F (Woolley 1955, 56-69). Traces of two successive buildings belonging to the Early Dynastic period were discovered in the deep sounding. The earliest phase appears to have been constructed on destruction debris from a temple complex dated to the 'Jamdat Nasr' period below which were traces of an even earlier Uruk building. Evidence for domestic housing dating to the early ED I period and possibly earlier (Moorey 1966, 34) revealed a plan of private houses dissected by a narrow street (Woolley 1955, 60) which may be compared with a similar settlement pattern at Abu Salabikh in Area A (Fig. 4.3) and in the 'Y' sounding area at Kish (Section 5.2.4).

5.3.2 Ceramic chronology of the Royal Cemetery and Early Dynastic occupation levels

Pottery from Uruk and Early Dynastic levels at Ur has been published in the report on the excavations of the Royal Cemetery (Woolley 1934, 387-391, pl.251-267) and in a discussion of the Uruk and 'Jamdat Nasr' periods at Ur (Woolley 1955, 23-85, fig. 8). It has not always been possible, however, to trace an exact provenance for

the pottery included in the catalogue (Table 8.4, Sample nos. 0001-0418). Whilst it has generally been assumed that whole vessels are derived from graves, the late Uruk and ED I material (Table 8.4, Sample nos. 0293-0353) is presumed to have been excavated from the building levels either in Pit F or the Flood-pit.

The Royal Cemetery collection comprises material from over 2000 burials covering a period of 500 years' continued use. The Royal Tombs, however, appear to date from the earliest period of burial in the mid third millennium.

An evaluation of the relative chronology of the Royal Tombs based on seriation techniques (Pollock 1985) has suggested a date range from ED IIIA to post Akkadian (Pollock 1985, 139). This chronology is reflected in the analysis of pottery fabrics from Ur and is well illustrated by an examination of stemmed-dishes (Table 8.4, Type 10, Sample nos. 0356-0392; Figs. 8.30-8.43) since these may be regarded as funerary vessels and are thus likely to have been recovered from grave groups alone. Most of these dishes are either fine sandy wares (Section 8.3.4, Group Ai - Group Aiv); green-buff wares (Section 8.3.4, Group Bi - Group Biv) or fine wares (Section 8.3.4, Group Ci - Group Ciii). With the possible exception of Sample no. 0382 (Table 8.4) there is no evidence for any fabrics earlier than ED IIIA. Almost 50% of these stemmed dishes were fine wares (Group C) indicating a late ED IIIB or early Akkadian date. Owing to the few instances where it has been possible to provenance pottery to specific graves comparisons cannot be made with the dating of graves by seriation techniques (Pollock 1985, 148-158). In one instance, however, a fine-ware stemmed dish, provenanced to Grave 87 (Table 8.4, Sample no. 0386), has been compared with the evidence of seriation (Pollock 1985, 148) and the ED IIIB/early Akkadian date matches Pollock's chronology.

Amongst other whole vessels the range of fabrics is similar to that of the stemmed dishes with vessels classified as fine sandy wares (Group A), green-buff wares (Group B) or fine wares (Group C). Thus most vessels are either ED IIIA, ED IIIB or Akkadian. Two conical bowls, however, may be assigned an earlier probable ED II date on the basis of their fabrics. Sample nos. 0003 and 0026 (Table 8.4) are medium sandy wares (Group Eiii). With the evidence for possible ED II fabrics limited to two conical bowls and a stemmed dish, however, it seems probable that these vessels were retained as heirlooms within a grave assemblage.

5.3.3 Uruk and Early ED I pottery

The catalogue of pottery samples from Ur is distinguished by a number of Uruk and early ED I vessels (Table 8.4, Sample nos. 0303-0353; Fig. 8.28). Sample nos. 0303-0310 are typical of middle to late Uruk pottery types. Their fabrics are similar to late Uruk and early ED I wares from the West Mound at Abu Salabikh ranging from coarse sandy wares (Section 8.3.4, Group G) and grey wares (Section 8.3.4, Group H) to medium sand-tempered buff wares (Section 8.3.4, Group J) and coarse sand-tempered buff wares (Section 8.3.4, Group K). Coarse sand-tempered wares at Abu Salabikh are specifically middle to late Uruk and this fabric is also confined to the Uruk pottery from Ur.

Amongst the late Uruk/ED I pottery from Ur, fabrics range from the typically early ED I wares identified at Abu Salabikh (e.g. Table 4.2), such as the medium sand-tempered buff wares (Group G), to fine wares with thick cream surface slips (Section 8.3.4, Group Ciii), also typical of late Uruk and early ED I fabrics. A number of medium sandy wares (Group E) also occur amongst these ED I sherds and may be compared with similar wares from Kish. Finally, several early ED I incised sherds are characterised by fine sandy wares (Group Aiii) and green-buff wares (Group Biii). Similar evidence for early ED I vessel types with fabrics generally characteristic of ED III pottery has also been noted among the assemblage from Kish (Section 5.2.5). This may reflect a parallel development in the ceramic technology of the two sites. The technological transition from predominantly tempered fabrics to untempered wares would thus have taken place earlier at Kish and Ur than at Abu Salabikh.

5.4 REGIONAL VARIABILITY

Kish and Ur are some 250km apart (Fig. 2.1) and it has been suggested that typological variations between the two assemblages reflect a difference in economic environment of third millennium sites in central Iraq and those of the southern seaboard (Moon 1985, 7).

The argument for regional variation between sites is based primarily on typological comparisons between vessels from grave groups and in particular the distribution of funerary vessels such as stemmed dishes and upright-handled jars (Moon 1982, 66). Clear regional distinctions between northern and southern pottery assemblages cannot, however, be made on the basis of stylistic differences alone, particularly when such inferences are based on limited publication of the relevant material. Moreover, whilst upright handled jars at Ur are represented by a single published example (Woolley 1934, 388, pl. 265, no.210), another detached handle, and a sherd discovered amongst the pottery at Birmingham City Museum and Art Gallery, their distribution is not sufficiently established justify the division of the southern Mesopotamian plain into two regions. Clearly, however, upright-handled jars are not represented in the Royal Cemetery to the same extent as, for example, in the Cemetery 'A' at Kish or the Main Mound at Abu Salabikh.

Differences between the grave group assemblages from all three sites indicate a degree of individuality in the production of funerary wares at each site. Despite the general technological similarity between ED III assemblages from Abu Salabikh, Kish and Ur, two fabric groups have been identified which are unique to the pottery from Kish. Neither the grey wares (Section 8.3.4, Group Hii-Hiv; Table 8.3) nor the grog-tempered wares (Section 8.3.4, Group I; Table 8.3) have been found among pottery from either Abu Salabikh or Ur. Grey wares have been found among early Early Dynastic vessel types from Kish and are usually confined to grey burnished bowls (Table 8.4, Sample nos. 2590, 2604, 2605 and 2717). Only two examples of grog-tempered wares have been identified (Table 8.4, Sample nos. 2663-2733). The recognition of these two distinctive wares confined to the Kish assemblages is further evidence for pottery production by a number of different potters or groups of potters. Variations observed from the typological classification of vessels from Abu Salabikh, Kish and Ur are thus also apparent from an examination of ceramic technology.

Differences between these three sites, however, may not be resolved into a clear distinction between north and south. Indeed the chronological changes observed in the pottery assemblages from Kish are more readily related to similar trends at Ur than to the neighbouring site of Abu Salabikh. Jamdat Nasr painted wares have been found in the intervening phase between Uruk and Early Dynastic occupation levels at Kish and Ur, yet this phenomenon has not been observed at Abu Salabikh. Instead, pottery from early ED I contexts on the West Mound appears to represent part of an uninterrupted ceramic sequence from the late Uruk period. In searching for parallels with ED I pottery from Kish and Ur it has been necessary to examine pottery from Area A on the Main Mound at Abu Salabikh. Not only is the type of settlement on Area A similar to the domestic housing in the earliest levels of Early Dynastic occupation at Kish and Ur (Section 5.2.4 and Section 5.3.1), but the fabrics of pottery from late ED I or possibly ED II levels from Area A are also similar to early ED I and Jamdat Nasr painted wares from Kish and Ur. Thus, whilst there is evidence for a technological change in pottery production amongst the assemblages from all three sites, this development appears to have taken place later at Abu Salabikh.

The affinity of forms and decoration between the ED I and ED III assemblages from Kish and the Diyala is taken to indicate continuity among sites in central Mesopotamia (Moorey 1966, 39-40). Scarlet ware is a distinctive ED I pottery type characteristic of the middle Euphrates and Diyala regions, and has been recorded not only from early levels at Kish, and at Tell Uquair but also as far north as Mari on the Euphrates (Lloyd and Safar 1943, 147; Moorey 1966, 36). Sherds with this type of decoration have also been found at Abu Salabikh (Postgate and Moon 1982, 119). A small but significant percentage of red, purple and black monochrome sherds and black-and-purple-on-white monochrome sherds have been consistently recorded among Uruk and ED I batches from the West Mound (Table 8.4, Sample nos. 2367-2387), but none has been recorded at Ur, Eridu or Tell al 'Ubaid (Hall and Woolley 1927, 157; Safar and Lloyd 1982, 152).

In the absence of diagnostic ED II pottery types at Kish and Ur it is not possible to make similar comparisons for the ED II period. Identification of an ED II period at Kish and Ur has not therefore been possible from an examination of grave assemblages. Confirmation of the existence of this period, however, has been obtained by fabric classification at Abu Salabikh. Characterisation

of ED II pottery has been achieved by the isolation of a fabric group (medium sandy wares; Section 8.3.4, Group E) attributable to this period on the basis of stratigraphic evidence and its association with tall hollow stands (Table 8.1, Type 11) which are typical of ED II pottery assemblages in the Diyala.

Martin (1982, 166-167) has identified several differences between ED II/ED IIIA pottery from southern Sumer (Ur, Tell al 'Ubaid and Fara) and vessel types which are characteristic of material from the Abu Salabikh/Kish area, stressing that similarities are found in only a few common shapes. Similar regional differences cannot be sustained from a study of ceramic technology. Instead there is a general continuity in the evolution of ceramic production. Despite the evidence for a technological transition from early assemblages characterised by a diversity of fabric groups to an increasingly standardised output this period of transition appears to have varied between sites. The evidence indicates that this may be partly linked to differences in settlement pattern. The nature of the ceramic evidence which has been confined to grave assemblages at Kish and Ur, however, precludes reliable evaluation of possible differences in the production of utilitarian wares at these two sites. Nevertheless, it is possible to conclude that third millennium sites in both central and southern Iraq shared similar methods of pottery production which transcend the apparent cultural distinctions between these two regions.

6: THIRD MILLENNIUM POTTERY: PRODUCTION AND DISTRIBUTION IN SOUTHERN IRAQ

6 THIRD MILLENNIUM POTTERY: PRODUCTION AND DISTRIBUTION IN SOUTHERN IRAQ

6.1 SETTLEMENT HIERARCHY

Attempts to explain the emergence of urban society in southern Mesopotamia have been based on the effects of intensified agricultural practices and a relatively restricted region of fertile land; the necessity for an organised system of irrigation, and disparity in wealth between the countryside and growing towns, all of which may have contributed to population pressures. Detailed studies of the cultural and historical background to Mesopotamian urbanisation may be found in a variety of epigraphic and archaeological sources (Adams 1966; 1972b; Gibson 1973; Flannery 1972; Redman 1978a; Wright 1972; 1977; Wright and Johnson 1975).

It is generally acknowledged that there is no single combination of administrative and economic factors by which the historical development of Mesopotamian society may be traced. The need for an organised administration, however, has been attributed to population growth accompanying the colonization of the alluvial plain in southern Iraq in the latter half of the fourth millennium, and the subsequent creation of an agricultural system which led to the emergence of large settlements (Adams 1981, 132; Redman 1978b, 337; Young 1977, 396).

Settlement data indicate a considerable increase in population from the prehistoric to historic periods (e.g. Burney 1977, 77; Gibson 1973; Oates 1980, 311). Population sizes, however, are difficult to estimate precisely and an increase in settlement size cannot necessarily be regarded as a direct measure of population growth. It has been suggested that the presence of ovens, hearths and storage bins may be a more accurate reflection of occupation density and consequently population size (Kramer 1980, 30; Nissen 1968). This is illustrated by the excavations at Abu Salabikh, where Area A with its numerous small house units each containing an oven indicates dense occupation compared with the large enclosures on the West Mound containing relatively few, albeit spacious, courtyard houses with individual hearths, ovens and also storage rooms (Postgate 1982, 59; 1983, 12-15).

Few large towns occur in isolation and patterns of settlement distribution are complex. By adopting a modified form of

Christaller's (1966) central place theory and by using nearest neighbour analysis, Johnson (1975) has suggested the existence of an already highly structured local exchange system in the Uruk period. This is reflected in a correlation between the size of each centre and the distance to its neighbours. There is a greater distance between large centres than the smaller ones, whilst the smallest rural sites appear to be situated closest together. The existence of a centralised hierarchical political system, however, remains unproven. The location of towns and villages was evidently related to communications as the sites occur at intervals along a network of interconnecting natural water courses (Adams 1965, 40-41; Johnson 1975, 216-217).

A settlement hierarchy had begun to emerge in the late Uruk period. This has been linked with possible economic, military, religious and administrative factors which would have required the existence of large residential populations (Adams and Nissen 1972, 11; Johnson 1975; ⌒ 1980; Kramer 1980, 327). The administration of rural crafts at Sakheri Sughir, in relation to the urban centre at Ur (Wright 1969), appears to indicate that the range of activities reflects the complexity of the administration. This may be accompanied by an increase in the size of the settlement. There may also be some evidence for functional specialisation among the villages (Johnson 1980, 247) with a settlement hierarchy comprising several centres within a subsystem. Thus there is a spatial and functional relationship between lower level centres and others which are at a higher level in the hierarchy, thereby facilitating the provision of goods and services to all types of settlement (Adams 1975a).

Local exchange both within the rural economy and as a part of the urban system cannot be understood properly without knowledge of land use and estimated levels of production and consumption for all goods which pass through a given centre (Wright 1969, 122). Moreover, the circumstantial evidence gleaned from textual sources in the ED I period offers little precise information about local exchange, whilst later third millennium and second millennium texts are preoccupied with the importance of contact between fairly distant centres (Adams 1981, 134).

The evidence for an organised administration in larger towns, with the likely persistent influence over outlying populations, might be anticipated to have resulted in a measure of stability within third millennium urban society. Textual sources, however, testify to

an apparently mobile urban population. Visitors to Fara, for example, coming from almost all the major cities of Sumer, appear in the accounts as working for the palace and receiving rations (Adams 1981, 132). An even greater number of individuals probably remain unidentified in the texts as they moved in and out of major centres from less well known localities in the hinterland.

Fluctuating fortunes of the settlements are also likely to have been affected by disputes. Moreover, textual evidence attests to foreign incursions (e.g. Postgate 1976b, 86) and rivalries between city states (Adams 1981, 134; Ali 1973, 29; Hunt and Hunt 1976, 395). Whilst irrigation improved short term prosperity, increasing salinization would have decreased productivity, with consequent pressure on the good agricultural land. Attempts to achieve security and stability, however, are illustrated by the numerous towns and cities with defensive walls and granaries: the former to mitigate external threats; the latter to safeguard against harvest fluctuations.

Pastoralism may also have contributed to fluctuations in settlement patterns. It is possible that nomadic and semi-nomadic tribes existed in the area of countryside on the fringes of cultivated land (Jacobsen 1957, 98; Nissen 1980, 287; Rowton 1980). This zone may have been used for grazing by semi-sedentary pastoralists moving along the Tigris and Euphrates valleys. The existence of such groups may have resulted in friction with permanent settlements, although studies of migrant pastoralists (e.g. Adams 1977, 330) suggest that they are more likely to have contributed to the fluctuations in settlement density with seasonal movements to exploit available grazing land.

Despite the complexity of the urban structure the most striking feature of third millennium settlement in southern Mesopotamia is the rapid growth of urban centres which took place during the Uruk period, culminating in the ED I period and resulting in a permanently, and in some cases densely, occupied alluvial plain. Urban centres had appeared throughout the region with an organised administration supporting specialists such as priests, officials and specialist craftsmen each displaying the attributes of a city state based on commercial enterprise. It is against this background that the changing technology apparent in ceramic production from the late Uruk/ED I period through to the ED III period is to be examined.

6.2 PRODUCTION

6.2.1 Introduction

The scale and organisation of pottery manufacture in the Early Dynastic period is determined largely by chronological and regional variations in demand. Complex factors such as the relationship between rural and urban communities may have influenced the number and location of potters' workshops. Johnson (1973; 1975, 297-298), for example, has provided ceramic evidence for local exchange between rural administrative centres with the possibility of two, presumably itinerant, workshop teams operating at three different sites. Ceramic production was clearly not confined to the major sites: surface collections indicate a diversity of wares suggesting numerous workshops (Adams 1981, 79, tb.5). Moreover, it has been suggested that evidence of pottery production may be an indication of status and specialisation (Wright et al. 1980). Jamdat Nasr painted pottery, for example, is an elusive ware probably representing a brief period of specialised pottery production. Moorey (1975, 101) has proposed that the site of Jamdat Nasr may therefore represent the seat of an important official with a sacred residence since none of the acknowledged Mesopotamian temples have yielded a comparable assemblage of pottery, seals and tablets.

In attempting to define and explain the organisation of production within a social and economic framework, the evidence from ceramic studies may be compared with theoretical modes of production. Peacock (1982, 8-10) has proposed a scheme of pottery manufacture in the Roman world with which the Early Dynastic pottery industry may be compared. He has identified four principal modes of production:

(i) Household production

(ii) Household industry

(iii) Workshop industry encompassing a range of discrete and nucleated workshops

(iv) Manufactory

While it is not possible to identify each of these modes of ceramic production in southern Iraq during the third millennium, the increasing standardisation which took place during the Early Dynastic period appears to reflect a change from individual rural workshops (Peacock 1982, 31) to organised production more akin to the concept of a manufactory.

The evidence for organisation of ceramic production is

derived largely from an examination of the pottery at Abu Salabikh. Comparisons are made with pottery from Kish and Ur, showing a similar evolution in ceramic technology, together with an analysis of pottery from the rural site of Tell Sakheri Sughir. Ethnoarchaeology and studies of ceramic technology contribute to an assessment of the organisation of ceramic production (Nicklin 1971-72; Peacock 1982, 13-46; Rye 1981; Section 4.4.1) providing an insight into the potters' methods and technical expertise. Reference to pottery production in textual sources is invariably confined to second millennium references or indirect evidence concerned with the distribution of goods (Section 6.3.2). Illustrations of vessels on sealings of the late Uruk, Jamdat Nasr and Early Dynastic periods contribute to the evaluation of possible modes of production (Section 9.3). Each of the four proposed modes of production is examined in the light of the evidence for chronological variations in pottery fabrics related to differences between urban and rural production. Increased standardisation in pottery production is also considered as a reflection of complex administrative organisation within an urban society.

6.2.2 Household production and household industries

Household production is defined by an output intended for consumption within the same household. Products of this the simplest mode of production are likely to be hand-made with the use of a domestic hearth taking the place of a kiln for firing the pottery, and with strictly functional vessel types (Peacock 1981, 8). While much of the pottery produced in this way is confined to use in the home, ethnographic evidence suggests that some is often destined for the market (Peacock 1981, 23) indicating a 'household industry'.

The archaeological evidence is rarely suitable for identifying household production as distinct from a household industry. Both types of production, however, may have been practiced by the inhabitants of the West Mound enclosures at Abu Salabikh. The late Uruk pottery assemblage contains hand-made and wheel-made vessels. Among the coarser vessel types (Section 8.3.4, Group H and Group M), however, hand-made vessels predominate and are usually confined to jars (Table 4.2) with a range of decorative styles (Table 8.4, Sample nos. 2169-2347, Batch nos. 5601, 5602, 5611; Fabrics G, H and M; Fig. 8.66 nos. 2152-2284) and a correspondingly wide range of fabrics. There are thirteen sub-divisions in the grey wares (Group H) alone and eight sub-divisions in the coarse red wares (Group M) each

of which is distinguished by the use of different combinations of temper ranging from vegetable material and shell fragments (Section 8.3.4, Group Hii) to coarse sand temper (Section 8.3.4, Group Hiv) and fragments of calcite, siltstone and shale used as tempering materials in Group Hvii (Section 8.3.4). Although four sub-divisions of Group H fabrics are identified as imported wares (Group Hv, Hvi, Hxii and Hxiii) the remainder appear to be local, illustrating considerable variability in local production. Most of the grey wares were either from strap-handled jugs (Type 2.1; 8.18.1, see Fig. 8.90, no. 2845) or hole-mouthed jars which in some cases exhibited signs of having been used as cooking pots. These vessel types were therefore strictly utilitarian.

The facilities for local production were available to each household in the enclosures on the West Mound. Local clays, shell, sand and sedimentary deposits were accessible to the potter (Section 3.2.2); the courtyard provided ample space for preparing the clay and making the pots, and firing could have been accomplished in the ashes of the large bread ovens situated within the courtyard of each household. In the eastern section of the West Mound several hearths and ovens were exposed indicating a working area (Postgate 1983, 13, fig. 354) and these may also have been used for 'communal firing'.

Similar vessel types and fabrics may be identified among the earliest sherds examined from Ur (Table 8.4, Sample nos. 308, 309; Fig. 8.28) and late Uruk pottery from Tell al Rubeidheh (Table 8.3, Group H and Group M; Table 8.4, Sample nos. 2841-2844, 2852, 2854; Fig. 8.90) and also possibly from Tell al 'Ubaid (Hall and Woolley 1927, pl.20). Decoration of the jars varies and, although the fabrics are broadly similar, most are local to each site. The existence of a few imported grey wares and a number of imported coarse red wares in the West Mound pottery assemblage from Abu Salabikh, however, indicates that exchange was taking place. Fabric analyses have identified the existence of several different sources for these imported coarse container vessels (Section 8.3.4), but it has not been possible to pinpoint individual production centres.

The diversity of local coarse utilitarian wares in the West Mound assemblage probably represents production by a number of different potters (Franken 1971, 245). The combination of hand-made vessels of similar design baked under variable firing conditions but manufactured from a range of different tempers implies household production. There is insufficient evidence available from

neighbouring sites to establish the extent of exchange which would identify a household industry. The presence of imported coarse utilitarian wares may imply a reciprocal household industry producing pottery elsewhere.

Households are unlikely to have met their entire ceramic requirements and it is probable that apart from the cooking wares, small jugs and storage jars and other utilitarian vessels were obtained either by exchange with other households or from specialist potters who used the wheel. The presence of wheel-made bowls and jars (Table 4.2, West Mound) among both late Uruk and ED I pottery assemblages on the West Mound suggests the existence of local ceramic workshops supplementing household production.

This mode of production may have continued throughout the Early Dynastic period since there is a continuing tradition of hand-made, shallow, very coarse sand and vegetable tempered wares (Table 4.1a; Section 8.3.4, Group Q; Fig. 8.4, Type 1.15). Some of these dishes have been interpreted as baking tins (Crawford 1981, 111) in which leavened bread was prepared. Large storage bins and sherds of large jars or vats (Fig. 8.10, Type 2.4.9) occur in levels representing each period on the West Mound and the Main Mound, Areas A and E. Storage bins are generally found in situ and have been built up in segments. It is unusual to find sufficient sherds from large very coarse ware jars to build up a complete profile but these vessels also appear to have been made in sections joined by applied ribs. Whilst it is possible that the shallow 'baking' bowls are the products of a household industry caution is needed concerning the source of large jars and vats. Modern Arab villages sometimes contain bread ovens constructed around the base of a large earthenware vessel, a practice which may have occurred also in hearths excavated at Abu Salabikh (Crawford 1981, 106-109), and it is customary to store water in hubs: coarse ware 'pithoi' placed in stands and constructed of a porous coarse vegetable tempered fabric. Similar pithoi were found at Abu Salabikh (Postgate 1984, 100, fig. 7). Neither of the modern equivalents appears to be made locally and they are generally bought from the markets in nearby towns. Local enquiries in 1981 failed to determine where either of these vessels had been produced but the hubs were apparently not obtained locally and were observed being transported in lorry loads for great distances. It would be misleading, however, to draw direct parallels between the coarse ware vessels used in Arab villages today and the very coarse wares found at Abu Salabikh. Firstly, the use of

pottery in modern Iraq has been replaced by aluminum utensils and pottery production is largely confined to tourist craft industries in northern Iraq. Secondly, without modern transport facilities the carriage of such huge vessels would have been both costly and impractical. In the ED II and ED III periods local workshops rather than households may therefore have supplied some very coarse wares, particularly where housing conditions were cramped and would have hindered the manufacture of such large vessels. Moreover, the domestic quarters which appear to be associated with administrative complexes in Area E and Area A at Abu Salabikh may have housed a class of full-time craftsmen including flint workers, who were employed directly or indirectly within the administrative hierarchy (Adams 1981, 134; Childe 1954a, 52-55) and were therefore less likely to have manufactured their own pottery.

It has been observed from ethnographic studies that household industry is invariably associated with poverty

> '... particularly with an inability to maintain a reasonable standard of living from farming alone ...'
> (Peacock 1981, 23)

It would be difficult to invoke similar circumstances for households on the West Mound at Abu Salabikh. Each enclosure is thought to represent an extended family unit (Postgate 1980, 99) which could indicate a subsistence economy but the presence of store rooms, presumably for an agricultural surplus, and the suggestion that the extended family included housing for servants and livestock (Postgate 1982, 59) precludes such an interpretation. Although some of the coarser wares among pottery from the West Mound probably do represent household production - and therefore potentially household industry - it would be premature to suggest the latter on the basis of analyses of pottery from Abu Salabikh alone. Verification would necessarily involve a study of late Uruk fabrics from nearby sites such as Kish, but insufficient early material is available for analysis.

6.2.3 Workshops

The model proposed for workshop production implies that pottery-making is the main source of subsistence and thus distinguishes it from household production (Peacock 1982, 9). Pottery-making, however, may be practiced for only part of the year perhaps in conjunction with cultivation. Workshop industries are therefore characterised by increased output and possibly an improved

quality of product achieved by the use of the wheel and a kiln. This therefore implies a considerable technological contrast between household and workshop production. Peacock (1982, 9) has also observed that once the craft had become economically important it would normally be practiced by men (c.f. Matson 1965b, 211).

Unlike the simple requirements for household production a variety of factors determine the location and development of workshop industries. Considerable fuel resources are required in addition to suitable raw materials and proximity to a potential market. Two types of workshop have been defined: the individual workshop in which the craftsman may work in isolation or with a small group of assistants; and nucleated workshops where individual workshops are grouped together working either independently or co-operatively.

Output confined to a few utilitarian vessel types produced by a small number of potters in numerous individual settlements during the Uruk period is likely to represent a network of workshop industries (Adams 1981, 124; Johnson 1973, 129-139; 1975, 297-298; Wright 1969). The restricted repertoire has often been cited as evidence for mass production in the case of bevel-rim bowls (Table 8.1, Type BRB; Fig. 8.1) and ceramic sickles (Fig. 4.8). Since production appears, however, to be confined to small enterprises rather than centralised workshops and since the manufacture of such vessels is not standardised either in terms of fabric or in size and shape, this type of mass-production must not be confused with production within a manufactory.

From the somewhat limited archaeological evidence available on third millennium sites it is difficult to distinguish between individual and nucleated workshops. Three Uruk kiln sites at Susa are situated just outside the main settlement area (Johnson 1975, 297) and may therefore represent the site of a nucleated workshop industry, but there is insufficient evidence to establish whether these were all in use simultaneously. The Uruk bowl kilns at Abu Salabikh (Section 4.3.5) showed evidence of having been used solely for firing bevel-rim bowls at the time of the last firing, but these did not form a coherent group of kilns and are more likely to have represented individual potters workshops.

Analyses of fabrics from the late Uruk and early ED I assemblages from the West Mound at Abu Salabikh indicate a transition in the early ED I period from predominantly hand-made coarse utilitarian wares to wheel-made wares, still using tempering materials

(Table 4.1a;Table 8.4, West Mound; compare Batch 5408 (early ED I) with Batch 5601 (late Uruk)) but with a narrower range of fabrics confined almost exclusively to the coarse and medium sand tempered wares (Section 8.3.4, Group G, Group H, Hiv, Group J and Group K). This suggests an alteration in the traditional methods of production, perhaps in response to changes in demand, culminating in the shift towards increasingly standardised production evident from ED II and ED III assemblages on the Main Mound.

This standardisation of production may also indicate a change from manufacture probably within individual workshops on the West Mound to a nucleated workshop industry on the Main Mound. The evidence for kiln sites on the Main Mound is confined to two ED I examples and it has been assumed therefore that an industrial quarter was set aside for pottery production outside the immediate settlement (Section 4.3.5). Indeed, evidence for just such an area in the Early Dynastic period has been found recently at Al Hiba (Killick and Black 1985, 22; Section 4.3.5). Whether this indicates a nucleated workshop industry or an even larger 'manufactory' remains undetermined.

Although the technological transition from household production to workshop industries is evidenced in the pottery assemblage from Abu Salabikh there can be less certainty about the change from production by women (anticipated by use of the term household) to workshop production by men. Numerous sealings from the 'Jamdat Nasr' and ED I period depict rows of squatting pig-tailed figures alternating with pots which may be interpreted as a group of female potters (Barrelet 1968, 18-20; Section 9.5).

The question of status and sex of the potter in third millennium society is complex. The first references to potters occur in late third millennium and second millennium texts (S. Dalley, pers. comm.). It appears that potters may have been excluded from craft specialisation even as late as the first millennium (Zaccagnini 1983). Although there is evidence from an Ur III text for potters identified with a specialised craft they also apparently worked on canals and in the fields (Waetzoldt 1971, 9-10), thus implying part-time potting. Reference to textual sources also suggests an increasing control of pottery production not only by the temple administration, where potters worked in groups of between two and ten under a supervisor (Waetzoldt 1971, 9), but also by private individuals who were training slaves as potters in the first millennium (Silver 1983, 808). There is no reason, however, to suppose that pottery production was

controlled to such an extent in the third millennium. Production within nucleated workshop industries seems possible by the ED II period when the move towards standardisation in vessel shape, size, fabric texture and colour suggests an increasingly organised output.

Workshop industries would have required easily accessible clay deposits and temper, but also sufficient fuel to maintain increased production. Among the possibilities suggested by Matson (1965b, 210), which range from dried grass, desert weeds and camel thorn to dung cakes, all would have been cheap and readily available on Early Dynastic sites. It would require considerable investment of labour, however, to provide sufficient fuel in the form of dried grass or camel thorn to maintain a kiln firing and it is therefore likely that dung cakes provided a suitable alternative (Section 4.3.5). Early Dynastic potters are thus unlikely to have experienced a shortage of fuel supplies.

6.2.4 Standardisation

Production within a 'manufactory' implies an integrated process with potters or artisans working together to produce the individual components of a single and highly specialised product (Peacock 1982, 9; 43-46). Whilst it is unlikely that such a system operated in the Early Dynastic period, it is instructive to compare the production of some ED III vessels with characteristics of the output from a manufactory.

The construction of vessels such as large ring-based jars (Table 8.1, Type 2.3.4), spouted jars (Table 8.1, Type 5), and upright handled jars (Table 8.1, Type 9) may have been carried out as a series of discrete operations involving the manufacture of individual hand-made components subsequently added to the main body of the vessel which was thrown on a wheel. It is important therefore to recognise cases where the principal ware type differs from the fabrics of applied features such as spouts (Table 8.1, Type 5.7), lugs (Table 8.1, Type 8.4.1), handles (Table 8.1, Type 8.18) and added ring-bases (Table 8.1, Type 14.3). Accordingly these fabrics have been recorded in addition to the principal ware in Column 7 of the pottery catalogue (Table 8.4).

Most of the added ring-bases have been identified among vessels from ED III contexts and these generally appear to be of a slightly coarser fabric than the rest of the vessel. Visual examination and petrographic analyses of added ring-base sherds from

ED III batches at Abu Salabikh (Table 8.4, Sample nos. 1423-1449) demonstrate that, whilst both the body of the vessel and the attached ring-base were manufactured from a similar clay, the ring-bases are invariably characterised by a coarser fabric sub-division of such wares. There are cases, for example, where both jar and ring-base may be fine sandy wares (Section 8.3.4, Group A), but whilst the body of the vessel may range from fabric Ai to fabric Aiv the added ring-base is usually a Group Aviii fabric which is distinguishable from other sub-divisions within the fine sandy wares by abundant medium sand and vegetable material. The same applies to green-buff wares (Section 8.3.4, Group B) where jars of Groups Bi to Biv contrast with the coarser fabrics of Group Bviii used in the construction of the ring-bases.

Analysis of detached spouts from ED III contexts at Abu Salabikh indicates that these too were frequently manufactured from coarser fabrics. Spouts often occur in medium sandy wares (Group E), compared with the principal wares used in the production of spouted jars which are usually fine sandy wares (Group A) or green-buff wares (Group B). In the case of spouted jars from probable ED II contexts, however, both spouts and jars were produced using the same fabric and, in common with other ED II vessels, they generally occur among the medium sandy wares (Group E).

Upright handled jars from Kish (Table 8.4, Sample nos. 2720-2732) also illustrate this method of production. Attached handles are again distinguished from the rest of the jar by the use of coarser fabrics: either medium sandy wares (Group E) or more usually fabrics containing abundant fine vegetable material (Groups Bviii and Aix).

Although the separate manufacture of specific ceramic components does not indicate the level of organisation implied by a 'manufactory' it does suggest that demand was sufficient to merit investment of time and labour in specialist production during the Early Dynastic period. The use of different fabrics for the components need not, however, denote the work of different craftsmen: it may be a technological expedient to ensure successful firing. With the possible exception of upright handled jars (Type 9) and stemmed dishes (Type 10), however, pottery appears to have been intended strictly for utilitarian use. Suggested functions for the principal vessel types are discussed in Section 9.2. Apart from the ubiquitous conical bowl (Type 1.1), large jars (Type 2.3) invariably form part of

grave assemblages and seem to dominate the sherd batches in the ED III assemblage from Abu Salabikh (Martin et al. 1985; Table 8.4, Main Mound, Area E) presumably illustrating the increasing demand for storage vessels and perhaps representing the production of agricultural surpluses destined for a local market. Furthermore, there is evidence for standardisation of sizes among some of the principal ED II and ED III vessel types, in particular large ring-based jars (e.g. Table 8.1, Type 2.3.4.1; Fig. 8.71, nos. 2636-2639; Type 2.3.4.2; Fig. 8.47, no. 468 and Fig. 8.71, no. 2641; Type 2.3.4.3; Fig. 8.21). Although some variation is apparent between vessel types from Abu Salabikh, Kish and Ur, there is a marked degree of standardisation achieved for specific jar types within individual assemblages (e.g. Fig. 8.21). Taken in conjunction with the lack of evidence for pottery distribution and exchange between these sites (Section 6.3.2; Section 8.3.4) this appears to confirm that pottery was produced principally for a local market.

The transition from the diversity of production **(Table 4.1a)** characteristic of Uruk pottery assemblages to an apparently standardised ceramic technology is perhaps the most striking feature of the trend towards an apparently more organised system of ceramic production. The implications of the technological transition which has been observed in the pottery assemblages from Abu Salabikh are discussed in Sections 4.4.1, 4.4.2 and 7.1. Judging from comparisons with the Kish and Ur assemblages (Section 5.4) it seems likely, however, that this is a common feature of Early Dynastic pottery in southern Iraq. It was a response to the demands of an expanding urban population accompanied by an organised administrative system.

6.2.5 Rural production

Analyses of pottery from rural sites have been confined to the examination of a small sample of ED I pottery from Tell Sakheri Sughir (Wright 1969; Table 8.4, Sample nos. 0419-0432). On the basis of this sample, however, it would be premature to suggest that rural production differed greatly from urban manufacture in the Early Dynastic period. Comparison with examples of late Uruk and ED I pottery from Ur indicate that despite the proximity of the two sites (Wright 1964, fig. 4) the pottery from Tell Sakheri Sughir is characterised by predominantly sandy wares contrasting with the fine silty clays used in the production of pottery at Ur. The fabrics from Tell Sakheri Sughir range from coarse sandy wares (Section 8.3.4,

Group G), to medium sand tempered buff wares (Section 8.3.4, Group J) and coarse sand-tempered buff wares (Section 8.3.4, Group K). By comparison only three examples of fabrics containing sand temper have been recorded among the early sherds from Ur (Table 8.4, Sample nos. 0304, 0306 and 0309, Fabrics Ji, Ki and Gii). Analyses demonstrate that manufacture of most of the Tell Sakheri Sughir wares involved production methods similar to techniques illustrated by several late Uruk and early ED I fabrics from the West Mound at Abu Salabikh. This is of particular interest since it seems probable that much of the pottery from the West Mound represents the output of household production and small individual workshops (Section 6.2.3). Even more striking, however, is the fact that the pottery assemblage from Tell Sakheri Sughir consists principally of Early Dynastic vessel types that are characteristic of late ED I and ED II assemblages from urban sites. Clearly therefore the production of the so-called 'mass-produced types' such as conical bowls (Type 1.1) and tab-rim jars (Type 2.4.8.8; Type 8.8.1) indicates that rural as well as urban ceramic production responded similarly to the influence of urbanisation, but the use of an earlier ceramic technology suggests that the mode of production may be different in rural and urban centres.

Thus, what appears to be a comparatively late transition from small household industries to a more organised system of ceramic workshops at Abu Salabikh is viewed as a reflection not only of chronological differences but also of the move from a semi-rural site on the West Mound to an urban site on the Main Mound (Section 4.4.1).

Before it is possible to evaluate the modes of production at rural sites and the relationship between rural and urban ceramic production, extensive fabric analyses are required based on sampling from rural sites as well as from neighbouring city states.

6.3 DISTRIBUTION

6.3.1 Distribution and trade in third millennium Mesopotamia

Reconstructions of ancient trade patterns, involving the use of both textual sources and the examination of artefact assemblages, testify to a vigorous trade in a wide range of commodities in Mesopotamia during the third millennium. Textiles and leather, wine, oil and barley were exchanged for raw materials such as gold, silver, copper, timber, ivory, lapis lazuli and stone (Collon 1977; Leemans 1977, 2-5; Maxwell-Hyslop 1977; Muhly 1977, 81; Silver 1983, 798-810). Long distance exchange took place between the city states of the southern alluvial plain and Iran; in the Susiana (Le Breton 1957, 113) and in the Deh Luran plain. Gold was obtained from north-east Turkey (Maxwell-Hyslop 1977, 84) and ivory may have been acquired via trade with India (Collon 1977, 221). Seal impressions have been cited as evidence for a trade with north Syria as early as the ED I period (Amiet 1975). Inter-regional exchange between city states is also documented by textual sources and the evidence from jar sealings (Moorey 1975, 104-105), the most notable examples of which are the seal impressions published from Ur (Legrain 1936) illustrating 'official deliveries' to Ur by groups of Sumerian cities (Jacobsen 1957, 109).

The methods by which such goods were exchanged, however, are less easily defined. The evidence for possible modes of transport illustrated on sealings is discussed in Section 9.4. Literary compositions also testify to marine trade-routes which may have been utilised by merchant ships as well as ancient caravans consisting of pack animals (Kramer 1977, 60-61). Marketing of commodities and the relationships between merchants and the central administration of city states is more complex. Early distribution may sometimes have been linked to the seasonal migration of sedentary pastoralists (Kramer 1977, 101). Texts from Mari form the earliest known coherent body of data concerning evidence for co-operation between a state level society and specialised nomadic pastoralists (Hamlin 1977, 48). By the end of the third millennium, however, textual sources refer to specialised craftsmen operating within the jurisdiction of administrative organisations. This can be cited as evidence for major urban sites acting as distribution centres for commodities and linked by the excursions of traders or merchants based within these cities (Sahlin 1972, 284). Dunn (1975) has proposed three levels of trader:

(i) primary trader or vendor

(ii) secondary trader: the middleman

(iii) tertiary trader or merchant

Street vendors appear in Babylonian texts (Silver 1983, 817) but it can be assumed that they also occurred much earlier. Indeed it is possible that itinerant potters were able to advertise their wares in this way. In his study of itinerant traders in lowland Iran, Thorpe (1978, 88) has demonstrated that such traders were based in town markets selling their wares on market days and spending the remainder of the week visiting markets in surrounding villages. Presumably a similar system of distribution could have been operated by potters in the third millennium. The two workshop teams identified by Johnson (1973; 1975) as possibly producing pottery from three different kiln sites may have been distributing their products through more than one market. Evidence for imported coarse wares in the late Uruk and early ED I pottery assemblage from the West Mound at Abu Salabikh may represent a similar system of distribution.

Ethnographic studies of periodic markets frequently identify a hierarchy of market centres. In southern Colombia, for example, markets operated on a weekly basis from large central distribution sites and on a daily basis at smaller sites (Symanski 1978). Whilst it would be difficult to identify a hierarchy of markets in the Early Dynastic period, the existence of a settlement hierarchy suggests that there may have been some form of distribution network possibly operating on similar lines. Urban sites acted as major centres for the collection and redistribution of agricultural produce which presumably could have been exchanged at a later stage in lower order markets.

Wright (1980, 281) has suggested the possibility of a seasonal distribution of products from rural sites en route to larger centres for consumption and storage, while the presence of sealed container vessels may indicate that commodities were imported, possibly from a major urban distribution centre.

The study of markets in Tanzania (Gezann 1978, 191) indicates that locally produced foodstuffs and manufactured goods were exchanged from larger centres to smaller ones by means of middlemen. The function of a middleman may well have been adopted in the larger administrative centres by the temple or palace officials, although there is no direct evidence for this until the second millennium (Saggs 1960). Documents from the second half of the second millennium

indicate that temple or palace officials were responsible for supervising the delivery and redistribution of goods and that two different types of merchant were concerned with incoming and outgoing commodities respectively (Zaccagnini 1977, 172). Whilst textual data may assist with a better understanding of the merchants' position in the framework of second and first millennium palace or temple organisation there is unfortunately insufficient evidence for the Early Dynastic period to determine the role of Sumerian merchants involved in long distance trade and whether they acted as individuals or corporate bodies for city states (Powell 1977, 27).

6.3.2 Pottery distribution

It has been demonstrated that much of the evidence for trade and distribution of commodities is derived from an interpretation of textual sources. Despite the evidence for trade in perishable goods such as wine or oil, which might have been transported in ceramic containers, references to the use of pottery as container vessels are confined to second millennium texts concerned with the wine trade (e.g. Birot 1960, 209; Finet 1977, 161; Kinnier Wilson 1972; Waetzoldt 1971, 17).

The export of pottery to Umm an Nar (Fig. 2.2) from sites in southern Iraq in the Early Dynastic period (possibly ED I), demonstrated by both petrographic and neutron activation analyses (Section 8.3.4 and Section 8.4.4), provides clear evidence for the use of pottery as containers in long distance trade. Ceramic analyses, however, have identified only limited intra-regional exchange of pottery between sites in the southern alluvial plain.

The Ur jar sealings demonstrate an extensive trade in commodities transported inside container vessels. It is perhaps surprising, therefore, that there is little evidence for active intra-regional exchange from analyses of pottery found at either Ur or Kish. There are two possible explanations. Firstly, it should be noted that the imported utilitarian wares may not necessarily be represented in grave groups and this would therefore preclude identification of imported wares in the analyses of pottery from Ur and Kish. Secondly, the presence of jar sealings at Ur, indicating the transport of imported commodities in ceramic containers, does not necessarily constitute a large proportion of traded goods. Although jars may have been suited to transport by ships, particularly where containers may have been required to protect perishable goods for long voyages (to

Umm an Nar, for example), such commodities may have been more frequently conveyed on overland routes, in lighter and larger containers such as the leather bags or woven reed baskets and nets mentioned in second millennium epic tales (Kramer 1977, 61). Thus pottery produced for export as container vessels was likely to have been a small percentage of all local production, and would consequently have resulted in only a small percentage of imported wares amongst most local assemblages on Early Dynastic sites in southern Iraq. Moreover, it is tempting to speculate that storage jars represented in wine lists may have been the products of local potters made for distributing wine which had been transported initially in less substantial containers.

The results of petrographic and neutron activation analyses demonstrate that there is very little evidence for a prolific trade in pottery either as prestigious wares or as utilitarian vessels (Section 4.4.3; Section 8.3.4; Section 8.8.4). It would appear therefore that distribution of pottery in the third millennium was generally confined to long distance export of perishable goods in ceramic containers and to incidental exchange. The former has been demonstrated by the export of a limited number of jars to Umm an Nar probably originating from several sites in southern Iraq. The latter is represented by the possible exchange of stemmed dishes (Table 8.1, Type 10) between Ur and Kish. Analyses have detected one stemmed dish at Ur which appears to have been manufactured at Kish (Table 8.4, Sample no. 0370) and another stemmed dish at Kish probably made at Ur (Table 8.4, Sample no. 2754). Unfortunately the possibility of an error in museum cataloging of these two finds cannot be ruled out. Chance exchange of pottery is, however, illustrated in the text of a letter which mentions a pot of herbs sent as a gift (Moon 1982, 67). The few examples of imported painted ware may illustrate this point.

Evidence for imported utilitarian wares such as storage jars in the West Mound assemblage at Abu Salabikh is also restricted. It is tempting to speculate that such wares are evidence for the movement of semi-sedentary pastoralists. Identification of the Diyala region as one possible source for these wares, taken in conjunction with the limited evidence for imports, suggests that these are also examples of intermittent exchange.

7: CONCLUSIONS

7 CONCLUSION

7.1 TECHNOLOGICAL INNOVATION AND CHANGE

Where one range of pottery fabrics within an assemblage is replaced in a later phase by a different one or where a whole new range of fabric types is added to the ceramic repertoire this is usually a reflection of technological innovation or change. Such trends may be considered not simply as chronological indicators but also as a possible reflection of social or economic change (Le Patourel 1976, 172). Two obvious examples of such a change have been identified from this present programme of petrographic analysis.

Firstly, there is a difference between the fabrics from the rural settlement at Sakheri Sughir and those of a similar date from Ur. The two sites are in close proximity but several of the sherds examined from Sakheri Sughir were evidently produced by an entirely different technique. This possibly indicates differences between rural and urban sites (Section 6.2.5).

The second example and by far the most important in the present study is the evidence for a technological change in pottery production taking place either just before or during the Early Dynastic period. Once wheel-made wares began to replace hand-made vessels in the Uruk period there was a gradual decline in the use of tempering materials which are characteristic of the Uruk pottery assemblages. At the end of the ED I period few examples of tempered fabrics remain. Instead, ED II pottery types are distinguished by very sandy fabrics, which whilst not apparently containing sand added deliberately as a tempering agent nevertheless appear to represent the relic of an earlier technology. By the ED III period all trace of such a technology had vanished with the exception of a few very large coarse hand-made vessels. This technological transition has been observed in the pottery assemblages from all three city states at Abu Salabikh, Kish and Ur, whilst the presence of very coarse rounded quartz grains and other coarse tempering materials in 'early' sherds from Tell al 'Ubaid illustrated by Hall and Woolley (1927, pl.20, no. 2301, 2463, 1453 and possibly 1462) indicates that a similar transition took place at that site.

The most striking feature of this technological transition, however, is the evidence for a radical change in production methods occurring at slightly different times at individual sites. Fabric

analyses indicate that the change is likely to have occurred earliest at Kish and Ur, probably during the middle to late Uruk period while at Abu Salabikh a changing ceramic technology is evident in pottery from early ED I levels on the West Mound and therefore took place after the transition at Kish and Ur.

Continuity between ED I and the preceding protoliterate period represented by 'Jamdat Nasr' painted wares at Kish (Moorey 1978, 101) is apparent both stylistically and in terms of ceramic technology. The presence of grey wares suggests a residual Uruk and early ED I ceramic technology. In general, however, early ED I sherds from Kish display no evidence of the transitional phases in ceramic technology witnessed in early ED I levels on the West Mound at Abu Salabikh. It must therefore be assumed that the apparent continuity of settlement from the late Uruk period, through the 'Jamdat Nasr' phase, to the Early Dynastic period is reflected in a ceramic technology which appears to represent stability rather than innovation in pottery production.

In the absence of material representing the painted 'Jamdat Nasr' pottery phase at Ur it is not possible to isolate evidence for technological transition at this period. A change in production techniques confined to Uruk pottery types demonstrates that the continuity of settlement from late Uruk/Jamdat Nasr painted pottery phase to ED I at Ur is likewise reflected in uniformity of pottery production.

Continuity has not been observed either in settlement or in ceramic technology at Abu Salabikh. Instead the break between excavated levels on the West Mound at Abu Salabikh and the earliest excavated levels in Area E on the Main Mound corresponds with a change in ceramic tradition. The early ED I period on the West Mound at Abu Salabikh retains many of the technological attributes of the preceding Uruk period whilst also demonstrating the first signs of innovation in production based on more standardised methods of manufacture apparent in ED II and ED III assemblages.

The absence of an intervening 'Jamdat Nasr' phase between late Uruk and early ED I levels on the West Mound at Abu Salabikh may represent a significant difference between sites where this phase has been identified and others where it is absent. It is possible that the chronological break indicated by a change in ceramic technology between the ED I period on the West Mound and the ED I levels in Area E on the Main Mound might correspond with the elusive 'Jamdat Nasr'

phase. This would imply that the early ED I vessels on the West Mound are very late in the Uruk sequence. Despite the chronological break, however, ED I vessel types such as solid footed goblets are present in large quantities among material from the West Mound (Table 8.4, West Mound, Type 1.3.2). Moreover, whilst single period 'Jamdat Nasr' sites have been distinguished by Adams (1981, 81) and whilst 'Jamdat Nasr' levels have been seen to overlie Uruk occupation, evidence for the so-called 'Jamdat Nasr' period is by no means ubiquitous: indeed it is absent from a number of sites distributed throughout the southern alluvial plain. 'Jamdat Nasr' painted wares, for example, occur at Kish and at Nippur in central Iraq but not at Abu Salabikh, whilst among third millennium sites in the south 'Jamdat Nasr' painted wares have been found at Ur and Lagash but not at Uruk (Warka).

Since the distribution of 'Jamdat Nasr' wares suggests that variable occurrences are not attributable to regional differences, it is tempting to speculate that the absence of 'Jamdat Nasr' pottery fabrics in the assemblage of a site may be related to the type of Uruk settlement which preceded it. Thus change in ceramic production techniques is unlikely to be observed where excavations such as those at Kish and Ur have revealed continuity in building levels for an administrative or temple complex, perhaps from as early as the late Uruk period, through to the Early Dynastic period. It might therefore be expected that the transition from production within small workshops and household industries occurred at an earlier stage in the Uruk period. If this were the case, 'Jamdat Nasr' pottery types and ED I wares might be expected to have fabrics which are more akin to ED II pottery, retaining only vestiges of the earlier sand tempering tradition.

A move from a rural site to an urban one, as presumably occurred at Abu Salabikh, or the amalgamation of several rural sites to form a single large urban centre, perhaps illustrated at Uruk (Adams 1972, 87), would account for the absence of 'Jamdat Nasr' pottery among the respective wares. Assuming that this pottery represented a type of specialist production, perhaps confined to temple or palace or similar large administrative complexes, it may not have been available for consumption in rural areas, where the repertoire of locally produced ceramics was dominated by coarse wares. On the West Mound at Abu Salabikh this trend continued into the early ED I period. Thus at rural sites there would have been a direct transition from Uruk to ED I vessel types with a technology still

determined by rural production techniques as demonstrated at Tell Sakheri Sughir.

The evidence for a chronological break at Abu Salabikh is related to the move from ED I settlement on the West Mound to late ED I occupation of the Main Mound. Similar discontinuity is apparent at Uruk and this may represent a similar change in the type of settlement accompanied by a change in ceramic technology.

It is evident that more excavation of well stratified material from sites in southern Iraq is needed before there can be conclusive proof. It is clear from the present programme of analysis, however, that pottery fabrics and changing ceramic traditions which are less apparent from stylistic variations may be used to clarify the chronology of Early Dynastic pottery assemblages. Moreover, differences in the type of settlement may retard or accelerate the technological transition from household industries and the small individual workshops, as exemplified by Uruk pottery, to increasingly standardised production which had been achieved by the ED III period. These trends in technological innovation and change transcend regional divisions identified in terms of stylistic evidence.

7.2 THE FUTURE OF NEAR EASTERN CERAMIC RESEARCH

Petrographic analysis used in conjunction with stylistic assessments of pottery form and function offers the most effective means of studying Early Dynastic pottery assemblages. The success of this method is attested by the conclusions concerning pottery production in the Early Dynastic period (Sections 4.4.1; Section 4.4.2; Section 6.2 and Section 9.3). Distribution studies are, however, hampered by the lack of analytical evidence for large scale ceramic exchange. It is likely, therefore, that the most fruitful approach to future Early Dynastic ceramic research will depend upon greater attention to intra-site studies with the emphasis on pottery production and local ceramic assemblages.

Current research indicates the need for a standardised method of processing excavated pottery from the initial stages of fieldwork, through post-excavation analyses, and finally to publication. The pottery corpus (Section 8) illustrates a potential method of cataloguing and presenting ceramic data for publication. It is particularly important, however, that an agreed technique of classifying pottery according to fabric type is adopted for all ceramic studies. The use of petrographic analysis to investigate technological changes in pottery production has introduced a potentially useful source of information for considering the organisation of a prolific manufacturing industry in the Early Dynastic period. The opportunity is now presented for assessing the possible economic and social context within which the pottery industry operated.

The outcome of further excavations at Abu Salabikh and renewed excavation at Al Hiba (Killick and Black 1985) and Nippur (Gibson 1980) will inevitably expand the study of Early Dynastic pottery assemblages from the southern Mesopotamian plain. Early investigations at Adab (Banks 1912) and an instructive, albeit brief, visit in 1981, during which a number of mounds representing kiln debris were identified, suggest another potentially rich site for Early Dynastic ceramic research. This will necessitate reappraisal of preliminary conclusions, but, providing a compatible methodology is adopted, it will be possible to develop a systematic programme of ceramic analysis. Above all it is necessary to establish a more broadly based approach to Near Eastern pottery studies than has been achieved hitherto and to integrate general conclusions within the

wider themes of archaeological research. A prerequisite for ceramic research must remain the approach advocated by Sir Leonard Woolley, of whom Mallowan (1960, 16) has written:

> '... whenever he found something produced by human hands he tried to visualise the process of creating it and to share the aspirations of its maker ...'