Settlement in the Diyala and Southern Mesopotamia: A Reassessment of Robert McCormick Adams' Sasanian and Early Islamic Ceramic 'Type Fossils'

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By Rebecca D. Wells

Robert McCormick Adams', considered to be a pioneer in Near Eastern archaeology, has been extremely influential in his surveys and hypotheses concerning the settlement, population and agricultural patterns of Mesopotamia. It is the aim of this discussion to examine his views concerning the Sasanian and Early Islamic periods by means of reassessing his correspondingly dated ceramic 'type fossils' (outlined in Adams' publication *Land Behind Baghdad* (1965)). More recent excavations in the area have suggested that some of these 'type fossils' should be dated later than originally considered. Therefore Adams' 'type fossils' and conclusions concerning the Mesopotamian region are in need of reviewing.

What follows is a reassessment and examination of Adams' surveys and excavations in the Diyala (Land Behind Baghdad (1965)) and at the site of Tell Abu Sarifa (1970). By reassessing his dating for the 'type fossils' it has been possible to reclassify some of his archaeological phases. In applying the new dating to Adams' survey data from *Land Behind Baghdad,* it has also been feasible to critically review how the settlement and economy changed in the Sasanian and Early Islamic periods in the Diyala and Southern Mesopotamia.

In this work, it has been concluded that some of Adams' 'type fossils' do need re-dating, the effects of which being that the dating of the site of Tell Abu Sarifa probably needs to shift by 100-150 years. In the application of this new dating to the settlement data collected by Adams in his surveys of the Diyala Plain, it is suggested that there was a massive boom in settlement in Early Islamic times. This therefore has implications for our current understanding of the history and development of that period, calling for a re-evaluation of how it is viewed.

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1. Introduction

This dissertation aims to examine the ceramic indicators used by Robert McC Adams in his surveys of the Diyala and Southern Mesopotamia in order to reassess the 'type fossils' he used, and compare them with the new archaeological sequences. By doing this, it is hoped that it will be possible to reclassify some of Adams' archaeological phases at the site Tell Abu Sarifa (henceforward referred to as TAS) and to review critically his conclusions relating to how the settlement and economy changed in the Sasanian and Early Islamic periods in Southern Mesopotamia.

It is anticipated that the dissertation will result in a clearer understanding of the ceramics of the Sasanian–Early Islamic transition in the region and a revision of the settlement patterns for the Sasanian and early Islamic periods of Mesopotamia and South-Western Iran.

The term 'type fossils' is used to describe the collection of ceramic indicators that were regarded as being definite types. Adams first introduced these 'type fossils' in his survey of the Diyala plain (in *Land Behind Baghdad* 1965), and further used them to date the site of TAS. These 'type fossils' included ceramics that were thought to be either both unambiguously recognizable and have limited duration, or to not have had as distinguishing features or be longer-lasting (Adams 1969, p127). The less specific ceramic indicators which lasted for longer periods could not always be distinguished from other types belonging to earlier or later periods, and so were deemed to be less reliable than those with a shorter life-span (Adams 1969, p126). It is the time span and dating of these 'type fossils' that will be discussed.

Such is their importance that any re-dating of these 'type fossils' (culminating in a new ceramic chronology at TAS) would be significant, as it could potentially change when the transition between the Sasanian period and Early Islamic period at the site was originally thought to have occurred by Adams. This would in turn have implications for his conclusions made concerning how settlement and agricultural patterns changed in the Diyala region and Southern Mesopotamia.

Research Questions:

1. To what extent is Robert McC Adams' ceramic chronology at TAS accurate?
   In order to answer this, it is necessary to assess which of Adams' dates for his 'type fossils' and other ceramics can or cannot be revised, as well as what evidence there is from more recent archaeological sequences that could support the re-dating of the individual ceramic types.

2. Do the trends in more recent surveys and other fieldwork in Mesopotamia and the surrounding regions (e.g. the Gulf area) conform to Adams' conclusions?
   This will require the comparison of Adams' conclusions concerning the chronologies and settlement patterns of the Sasanian and Early Islamic periods from TAS (1970) and *Land Behind Baghdad* (1965), with the more current hypotheses which use more recently discovered evidence.

3. When applied to current theories, to what extent would the new ceramic chronology at TAS affect the current interpretation of Sasanian and Early Islamic settlement, economic, and agricultural patterns. These new views can then be compared with Adams' original conclusions, and the more current ones.

Aims and Objectives:

1. The accuracy of Adams' ceramic chronology at TAS can be approached by firstly reviewing the literature of Robert McC Adams (specifically *Land Behind Baghdad* 1969 and *TAS* 1970), in which Adams presents his ceramic analysis and 'type fossils' he used for dating in the Diyala and Southern Mesopotamia. This work will focus on his Sasanian and Early Islamic 'type fossils'. In order to determine what archaeological phases of Adams' can be reclassified, a detailed critique of the TAS sequence, which will involve a consideration of stratigraphic problems and contamination, will be included. This will also require an examination of the content of Adams' ceramic assemblages, possibly including a quantitative analysis, for example, in terms of which of the Sasanian and Early Islamic 'type fossils' are reliable. A review of more recent evidence and archaeological sequences for each

'type fossil' is also necessary in order to update Adams' work. Through comparison, the more recent evidence must then be applied to the TAS ceramic sequence. In this way it will be possible to test Adams' original methodology and evidence for his conclusions concerning the dating of the sites in the Diyala, and his chronological sequence at TAS.

2. In order to determine how the trends of more recent surveys compare with Adams' conclusions an examination of the more recent archaeological sequences is needed. This will require reading the literature on current research and surveys of Iraq in the Sasanian and Early Islamic periods, in order to understand, summarize, and analyse them, specifically assessing what information they convey in relation to Sasanian settlement.

3. In order to critically review how settlement, economic, and agricultural patterns changed in the Sasanian and Early Islamic Periods, it will be necessary to examine Adams' original conclusions (drawn from his work at TAS and the Diyala region). Using the new TAS ceramic sequence, Adams' conclusions can be re-assessed and suggested changes made. It is planned that the Sasanian and Early Islamic sites surveyed by Adams in the Diyala could then be re-dated according to the new evidence. Using this new data, a graphical model by Lawrence et.al will then be used with the objective of being able to see the effect this re-dating has on the patterns of settlement size and population through the two periods. Comparisons between these results and more recent views can also be made.

Literature Review: An Introduction to Adams' Work:

Professor Robert McCormick Adams is considered to be one of America's foremost archaeologists, and has held the position of Director of the Oriental Institute of Chicago, served as Dean and Provost of the University of Chicago, as a Councillor of the National Academy of Sciences, and as Secretary of the Smithsonian Institute. He has worked in both the Near East and Mesoamerica, and is considered to be a pioneer in his research in Iraq. Adams' surveys in Iraq not only saved a vast amount of otherwise unexamined

data from irretrievable loss, but also remained one of his more significant concerns well into the 1970's, and had it not been for the Iran-Iraq war, other surveys would have probably been carried out in the 1980's. Adams has emphasised throughout his career the importance of social interaction and cultural ecology in the evolution of civilizations, in particular, he has focused on exploring the relevance of cultural ecology as an explanation for the rise of civilisations as a cross-cultural phenomenon (American Institute of America, http://www.archaeological.org). Due to his ability to absorb new directions in archaeological thinking, and his welcome diversity of philosophies and directions, his research has meant that scholars have profited from his studies. Thus, he has been influential in work concerning Mesopotamian urbanism and cultural ecology, and the controlled comparisons of the evolution of ancient states, as well as in the support he gives in his involvement with projects (Yoffee 1997, p400). The accuracy of Adams' survey, in terms of its archaeological details, has repeatedly withstood challenges. This shows the thoroughness and respected status of Adams' work, and also that the cumulative picture he gives is persuasive and leads to a testable hypothesis (Whitcomb 2007, p257).

Adams studied material ranging from the Chalcolithic Ubaid period to Islamic times, producing publications including *Land Behind Baghdad* (1965), *The Uruk Countryside* (1972 with Hans Nissen), and *Heartland of Cities* (1981). Landmark articles include “Ideologies: Unity and Diversity” (1992), and “Anthropological Perspectives on Ancient Trade” (1974) (American Institute of America, http://www.archaeological.org). As Whitcomb notes, the detailed study of Islamic periods in *Land Behind Baghdad* (1965) has been cited by Islamic historians with amazing frequency, showing that Adams' research resonates not only with archaeologists, but also with historians who normally only look to archaeology for images (Whitcomb 2007, p256).

This dissertation will specifically focus on Adams' research of the Sasanian and Early Islamic periods in three of his publications, namely *Land Behind Baghdad* (1965), *Tell Abu Sarifa* (1970), and *Heartland of Cities* (1981). *Land Behind Baghdad* is a result of Adams' surveys of the Diyala plain to the north of Baghdad, and TAS is a site to the south of Baghdad between the Tigris and the Euphrates chosen by Adams with the express motive of clarifying the Sasanian and Islamic ceramic sequence (see map 1 for locations).

Adams' research in *Land Behind Baghdad* involved field reconnaissance in 1957-1958, and mapping and collecting sherds from 867 sites. The identification of chronological phases of the irrigation system and associated settlements was based on the research design of Thorkild Jacobsen (Whitcomb 2007, p256-257; Adams 1965, p119-125). In proposing the 'type fossils', Adams commented that it was possible to supplement the Diyala sequence with the results of numerous other excavations, especially for the earlier part of his record which was the most well-established. This was due to the fact that the Oriental Institute had carried out excavations in the Diyala prior to World War II, and there was apparent contemporaneity and close similarity of subsequent changes in ceramics and other artefacts all across the Southern Mesopotamian plain (Adams 1965, p121). Therefore, the evidence which Adams himself used is clearly even more outdated than his own works, and so further supports the need for a review in contrast with more recent evidence that is being found in current surveys and excavations.

Heartland will not be focused upon in as much detail as the previous two, but it is included because in it Adams does discuss his research in the Diyala and TAS, and being a later publication may offer an insight into how his own opinions may have either changed or stayed the same, as well as indicating possible solutions to issues or problems he could not solve at the time of surveying.

Concerning the history of archaeological surveys and excavations in Mesopotamia and the Near East, in the 1950s and 60s a growing number of projects were dedicated to surface artifact surveys, with ceramics forming the material basis, and serving as the main chronological indicator. Adams conducted a series of surveys with projects in Khuzestan and Asoristan in the 1950s to 1970s. These surveys, like those also carried out in Khuzestan by Wenke (1978), helped it become clear that for the later periods, especially the Sasanian, a valid ceramic sequence was absent (Puschnigg 2006, p7). Specifically, there was the lack of long, accurately dated sequences of 'type fossils' that would be useful for domestic surface remains (Adams 2012, p8). Adams attempted to fill this gap with his surveys and excavations at TAS.

As well as his work with ceramic 'type fossils' which were themselves influential in how sites were dated for later excavations and work, which will be

discussed later in this paper, Adams' methodology and other aspects of his work in the Near East were also valuable in the progression of Near Eastern archaeology. The 'type fossils' used by Adams were a part of his overall surveying methodology, and so looking at how influential he and his methods were as a whole will be beneficial in understanding how Near Eastern archaeology has been affected, and will give a background to the extent of his influence and why his 'type fossils' have been used further.

In Mesopotamia, the aim in surveying was to localize settlements. This was under the presumption that the settlements would align themselves along extinct irrigation canals or watercourses. However, in surveying regions, Adams comments that in trying to answer questions regarding the alluvium plain, he encountered problems in using traditional methods alone. He recognised that the land surface was built up irregularly. This was caused by processes such as irrigation, plough cultivation, periodic flooding, and ongoing aeolian erosion and deposition. This led him to realise that as a result, most of the relevant evidence was likely to be obscure and also deeply buried, especially for earlier remains. Relying on digging deeper into earlier levels would lead to the destruction of later remains, providing an argument for a comprehensive surface reconnaissance (Adams 2012, p7). There would also be a need to place a higher emphasis on widening the geographic frame of study (Adams 2012, p8). This called for changes to be made in physical surveying techniques. This meant that different ways in which a site could be approached in terms of how its role was viewed as part of the landscape needed to be addressed.

Adams' work in 1962 and 1965, which involved the reconstruction of irrigation systems in Southern Iraq and South-Western Iran very much depended upon aerial photographs. These were needed in order to support suggested links between disparate ground observations. Other archaeologists soon followed suite in using these revolutionary methods with developing graphical theories of regional structure and processes, enabling them to produce evidence from a new perspective for past changes in social systems. Archaeologists in the Near East began to look more closely at site locations, their environmental contexts, their sizes, functions and how they interconnected (Kouchoukos 2001, p82). There was therefore a shift from site-based projects to regional research projects. This was a fundamental change in the way in which

archaeologists approached and viewed Near Eastern landscapes and their past (Kouchoukos 2001, p83).

Since Adams' preliminary work, in 1979 archaeological activities by foreign teams in Iran have been considerably reduced, followed by all archaeological investigations in the western and south-western regions being suspended in 1980 with the outbreak of the Iran-Iraq war (Mousavi 2008, p2). This led to research on Sasanian pottery stagnating over much of the next two decades. Despite attempts to define anchor points for a Sasanian ceramic sequence, there were problems, such as Islamic material being introduced into Sasanian layers through material reuse and recycling processes, and Islamic activities contaminating assemblages (Puschnigg 2006, p8). Puschnigg concludes that ultimately the understanding of Sasanian pottery is still poor (Puschnigg 2006, p9), and so a review of the ceramic indicators and 'type fossils' used by Robert McC Adams' would continue to help our understanding. The fact that Adams' survey of the Diyala region (1965), which includes his 'type fossils', became the seminal work amongst the research designs for the investigation of the question concerning the origins of urbanism in Mesopotamia, themselves being primarily constructed around survey (Masry 1981, p133), shows the influence Adams had, and the need for his work to be re-assessed. Many methods for improving the detail for chronologies may be available, but studies in which these methods are used are extremely rare (Whitcomb 1999, p213).

The next chapters will therefore examine the current settlement and population theories, and critique Adams' seminal works for the region. This will specifically involve the re-assessment of the Sasanian and Early Islamic 'type fossils' given by Adams in *Land Behind Baghdad* (1968) and his excavations at TAS (1970), as well as examining the conclusions drawn from them concerning the settlement and population patterns of the area. After comparing Adams' evidence for the dating of his 'type fossils' with evidence from more recent excavations, it will be possible to test any proposed changes made to the ceramic sequence. If any new data is available and is in the correct format, Adams' conclusions relating to the settlement and population (again, provided in *Land Behind Baghdad*) can then be reassessed.

2. Settlement, Population, and Agricultural Research and Patterns

Introduction:

It is the aim of this thesis to re-examine the dating of Adams' 'type fossils' and the ceramic sequence of TAS, and to determine how any revisions resulting from this re-examination might affect the conclusions made by Adams related to the population, settlement, and agricultural patterns in the Diyala in the Sasanian and Early Islamic periods. However, before this can be done, it is necessary to justify the reasons why the 'type fossils' need to be examined, why the TAS sequence needs to be re-assessed and what the implications of any revisions in the dating of the 'type fossils' will be. This means that the issues concerning the area, and the relationship between these three items, need to be explained.

This chapter will discuss and outline, firstly: the methods of survey and estimating population trends, especially in relation to Adams' work. Their limitations and strengths will be discussed, as will the relationship between Adams' 'type fossils' and their use at TAS and in the Diyala. Following this, there will then be a discussion of the current views of the population and settlement in the Sasanian and Early Islamic periods, with the hope of detailing Adams' influence on this subject, and to give a background to the theories on the settlement history of the area and how these compare with other regions.

In this way, it is hoped that it will be made clearer how changes to the dating of the TAS ceramic sequence might affect the interpretation of settlement and population patterns, of both agricultural and urban populations, and why it is necessary. Therefore, The aim of this chapter will be to discuss the conclusions concerning settlement, population, and agricultural patterns, specifically comparing Adams' interpretations and those that are more recent. The timing of these patterns, such as a significant decrease or increase in settlement, will also be examined, as well as the reasons why these changes may have occurred. This underscores the importance of the work at TAS.

Methods of Survey and Estimating Population Trends:

Before discussing the interpretations of settlement and population patterns in Mesopotamia, it is necessary to consider the limitations of the general methods of survey used by archaeologists, which may or may not affect the conclusions drawn from them. The method that will be used in order to determine settlement density in this paper for the application of any new dating to the data of the Diyala will also be introduced. There are differences between analysing settlement density and the methods used in estimating population numbers that need to be addressed.

In Mesopotamia and Iran it can be said that the most productive time for archaeological survey was during the 1960s and 1970s. Many new techniques and theoretical approaches were used in order to analyse settlement patterns and regional economic systems (Wilkinson 2000, p219). Researchers have been able to revitalise old data through new approaches towards archaeological sites and landscapes with the use of satellite imagery, remote sensing, and spatial analysis (Lawrence et.al. 2012, p1007).

Most survey methods depend on two assumptions. The first is a systematic, probabilistic approach that allows the collection of statistically valid data. The second relies on the ability of the archaeologist to define and to count "sites". It has been pointed out that the concept of a "site" was developed in the relatively flat fields of northern Europe, the Mediterranean, and Mesopotamia. The concept is fairly easily applicable in these areas. However, because of regional differences, it is not universally applicable, and it is worth mentioning this in regards to Arabia (Al-Jahwari and Kennet 2008, p203-204). This illustrates that the choice in method for an area may have certain effects in terms of usefulness. As with any source, it is therefore advisable to use survey data with caution, despite it being a valuable proxy for demographic trends (Wilkinson 2000, p247). Indeed, Mesopotamian archaeologists and historians who deal primarily with historical periods (Akkadian and later) have been reluctant to use the findings of the ceramic surveys. This is shown in that in most histories or general books on archaeology, survey data are, if briefly referred to, dismissed as being unusable or irrelevant, or are completely ignored (Brinkman 1984, p170).

The limitations of survey are further outlined by Brinkman, who deems

that ceramic survey to be by definition superficial, and not yielding a high degree of accuracy. This is due to the estimates made from surface remains for not only the various periods represented in the whole underlying mound, but also the extent of lower occupations, which is described as educated guesswork (Brinkman 1984, p170). As well as this, as methodology has changed and advanced over time, some of the earlier surveys have been rendered almost obsolete (Brinkman 1984, p171). This perhaps stresses the need to review methods used in a survey before passing judgement on its conclusions.

Sampling has also been inadequate for many settlement pattern studies. Parsons stresses that it is crucial for structures, settlements, and regions to be described and subdivided for programs of surface survey, survey pickup, test excavation, and large-scale excavations. It is only then that inferences can be drawn from correlations and associations between variables and be confident and assured that they are representative (Parsons 1972, p146). As well as this, regional settlement pattern study and archaeological surface survey are not equivalent. Kowalewski points out that there are regional studies that do not depend much on survey, and surveys that produce no regional study. However, typically, regional settlement pattern studies do depend on survey fieldwork. This usually means systematic walking survey (Kowalewski 2008, p227).

When using using survey data to estimate long-term population trends, it is necessary to use appropriate classes of data. Wilkinson states that if the quantity of sites through time is employed as a proxy and there were many small sites, this may result in the overestimation of population. If there were a few large sites, this may result in the underestimation of population (Wilkinson 200, p47). A similar scenario is mentioned by Adams in his own population and settlement research, as he notes that the procedure he used to determine population assumed, in effect, that there were virtually no new settlements in the Diyala basin during the 9th century. Adams comments that by attributing Umayyad or Early Abbasid origins to all sites found to have been occupied in Samarran times, this has probably exaggerated the extent of Early Islamic settlement, and so inevitably shows too sharply drawn a picture of declining population afterwards (Adams 1965, p97). Both Wilkinson and Adams therefore reveal that it is often the case that results may be over-exaggerated or under-

exaggerated due to ways in which the data is used. However, it is difficult to avoid this problem, and so it is necessary to be aware of this issue when interpreting the data presented concerning the settlement patterns of the Diyala later in this paper, especially as it is based on Adams' own data.

In general, the total settlement area (the sum of all the areas of all the sites of a given phase, generally termed as the aggregate settlement area) is more accurate in the estimates of population than the number of sites alone (Wilkinson 2000, p247). Despite this, Brinkman notes that even when one has the full statistics about size and site location for each individual period, converting the figures which represent gross occupied area into reliable statistics for population is not a simple matter (Brinkman 1984, p171). In addition, the accuracy of estimates may be reduced by factors such as assumptions of uniform on-site population densities, lack of recognition of certain ceramic types that have low “visibility”, and burial of sites below later occupation of levels or alluvium (Wilkinson 2000, p247). In the case of Adams' work, it is difficult to determine how the 'visibility' of ceramic types in his surface-surveys may have affected his results. This is due to the fact that he does not mention the specific types he found at sites, choosing instead to simply group the sites as, for example 'Sasanian' or 'Early Islamic'.

Inaccuracy in population estimates may be due to the fact that the aggregate settlement area method assumes that all the components of each ceramic phase are contemporary. This is not necessarily the case, as ceramic periods are usually different lengths, meaning that long periods may contain more sites than were actually occupied at one time (Wilkinson 2000, p247). Brinkman also finds problems with the varying lengths of ceramic periods and the dynamics of settlement foundation. With the periods being generally presented in three or four century blocks, this makes it difficult to focus on smaller periods of time, such as decades. With each of the large periods there is no present means of distinguishing concurrent from consecutive settlement. Therefore, all occupied sites from a single period must be treated as being loosely synchronic. As a result of this, what is recorded from each period is the maximum extent of settlement without chronological articulation. It is also not possible to know how much of a region may have been simultaneously inhabited (Brinkman 1984, p171). A way to adjust for these varying lengths of

ceramic periods and changes in settlement, such as its decline or continuity, has been suggested by Dewar. He points out that probabilistic models now exist for the estimation of the abandonment and establishment rate of sites as well as the number of sites that continued in use in adjacent periods (Dewar 1991).

Another new model that has been proposed is by Lawrence, Bradbury, and Dunford, and aims to deal with at least some of the problems with archaeological surveys. Specifically, the problem to be solved concerns the issues that arise from periodisation. Surveys often deal with different ceramic chronologies differently, and archaeological features or forms of material culture may be more accurately dated by others. As well as this, there can be inconsistencies across regions in the terminology used (Lawrence et.al. 2012, p1009). The solution proposed involves using published chronologies to relate each phase to calendar date years, and presenting the attributes of sites in hundred year blocks, which allows for the modelling of trends in settlement in a way in which direct comparison between surveys can be made. This method also permits the examination of diachronic trends in settlement to be assessed across wide regions (Lawrence et.al. 2012, p1009), which is useful when analysing regions as a whole and understanding how they relate to each other. However, a limitation in using this method is that it is only as accurate as the ceramic chronologies will allow, meaning that any error in these will have a compounding effect (Lawrence et.al. 2012, p1009).

It is the intention to use approach by Lawrence, Bradbury and Dunford, in applying any new dating from the reassessment of Adams' 'type fossils' to Adams' survey data from the Diyala. The distinction therefore should be made between the former approach and the estimation of population numbers. Whilst Adams attempted to calculate the population figures for a particular period, Lawrence et.al's approach attempts to establish a comparative density of settlement between two or more periods. Absolute population numbers are difficult to calculate, but it is not as difficult to make statements about the reliability of periods in relation to one another. In assessing the results of any new 'type fossil' dating applied to the Diyala, it is therefore necessary to bear in mind these points, especially when trying to draw comparisons between Adams' methods and conclusions.

No matter how imperfect the techniques and methods used for study may be, the surface survey often provides the only systematically collected evidence for dealing with vast rural areas (Brinkman 1984, p171). Indeed, with the surface surveys in the Diyala region, and excavation work for seven years, the University of Chicago provided a measure for integrating historical, archaeological, and architectural evidence into a unified framework. It was the first time in Mesopotamia that a common archaeological scheme had been agreed upon for the region. It is this scheme that is more or less used today (Masry 1981, p227). It is perhaps a result of this that Adams' conclusions have had a strong influence on the interpretations of settlement and population patterns in Mesopotamia.

General Settlement and Population Theories For the Sasanian Period:

In this section, the conclusions drawn from research concerning the settlement and population in the Sasanian period, and earlier periods, will be introduced and discussed. Specifically, the factors that affect population and settlement growth, such as irrigation, will be looked at in order to understand the mechanisms behind any perceived patterns. In terms of the Sasanian period this will help to explain how it is thought that the central importance of Iraq in Sasanian times has caused more typical features of Late Sasanian culture to be present (Whitcomb 1999, p211), as well as the idea that there was a peak in the Sasanian period.

Adams describes evident settlement and population patterns for several phases in the Diyala region and Southern Mesopotamia, and describes several phases. Before the Sasanian period, Adams describes what he designates as the 'second phase'. Adams suggests that this second phase of urbanisation in the Diyala region may have originated in the Achaemenid or Neo-Babylonian times, but notes that these periods have more in common with preceding periods in comparison to those that followed them, such as the Sasanian period (Adams 1965, p113). By the end of the Parthian period Adams remarks that the potential supplies of water from the Diyala appear to have approached being fully used, and that cultivation led to the gradual extension of branch-canal networks, and to previous enclaves being widened into continuous zones and

the bifurcating networks of natural streams being altered (Adams 1965, p113). Simpson further elaborates on these networks, stating that during the Sasanian period, as an extension of water-control works north of the Jebel Hamrin and further downstream, the economy of this section of the river valley was revolutionised. This was as a result of the engineering works associated with the cutting of a series of offtakes from the bank through Pleistocene conglomerate terraces (Simpson 1992, p146). It is worth noting here that Simpson states that this 'revolution' was also present in the Early Islamic period (Simpson 1992, p147), stressing the fact that the idea of continuation of irrigation being solely attributed to the Sasanians may be incorrect. The Early Islamic irrigation and patterns will be looked at further in the next section, but it is clear here from Simpson's statement that the success of the Sasanians may have been exaggerated at the cost of the Early Islamic period.

This 'revolutionised' scenario for irrigation for the Sasanian period is further discussed by Adams. The second phase ended with the Sasanian period, and according to Adams, during this time in the Diyala Basin nearly all of the cultivable area was brought simultaneously under cultivation. It is suggested that the perceived peak in settlements during the Sasanian period may have been due to the Sasanian agricultural policy (Whitcomb 2014, p210). Adams stresses the importance of water in the changes seen during this phase (changes also noted by Simpson above). An example can be seen in the construction of the Nahrawan canal in the 6th century AD, which supplemented the now inadequate supplies of the Diyala by using the feeder currently known by the name Katul al-Kisrawi, an important reshaping of the landscape and its water sources is evident. The new regime relied primarily upon these huge artificial canals that intersected the agricultural landscape (Adams 1965, p113), although according to Sasanian sources the rivers went violently out of control on two occasions, once at the end of the 5th century, and another time in the early 7th century (Gibson 1972, p24), indicating that not all ran smoothly all the time. As a consequence, the new regime of land-use was dependent on the central government which had initiated and controlled the canal construction, and therefore was in control of the maintenance (Adams 1965, p113-114). Daryaee supports this, stating that a study of the Sasanian period demonstrated that agriculture was the main mode of production in Late Antiquity, and that as a

result the state invested in the building of canals and other means in order to improve the agricultural productivity. One can assume that the upkeep of roads and communication were other preoccupations of the state (Daryaee 2003, p3). This is not surprising, as the upkeep of these factors would be of the utmost importance of any state. The key question is how successful the state is in its methods in the up-keep of these vital supports for its survival. For example, Adams suggests that the very scale of some of the largest of the undertakings, such as canal systems, imposed under Anushirwan in the Sasanian period, could not have had their management requirements consistently met. This, he suggests, was a recurring problem that contributed to the serious, periodic failures that might have had an affect on the ultimate ineffectiveness of the dynasty's resistance to the Arab onslaught (Adams 2006, p23).

In order to further explain the increase in population and the peak in the Sasanian period, Daryaee explains that the urbanization project by the Parthians and then followed by the Sasanian brought an influx of population from other regions of the Iranian plateau, as well as forced migration from the Near East, which also helped to increase the population. The Later Islamic sources would appear to indicate that these periods saw an intense interest in the city-building projects of the Persian kings (Daryaee 2003, p2). Priestman also notes that historical sources appear to give evidence for the forced settlement in certain rural and urban areas of large populations. The aim was to increase the economic output, both in terms of primary agricultural produce and also by increasing the production of other items through the work of artisans moving to urban centres (Priestman 2005, p78-79). This would cause decline in other regions, such as after the Islamic conquest, when there is the impression of a general shift in population from the districts east of the Tigris to new urban concentrations around the garrison cities of Basra and Kufa in lower Iraq (Morony 1976, p47).

However, despite these possible explanations for a peak, it is Simpson's opinion that although Adams correctly regarded the phase of canal building and irrigation schemes as the apogee of irrigation agriculture in Mesopotamia, Adams over-emphasised short-term thinking and the ecological fragility of these systems in his studies of the Diyala (Simpson 2014, p22). Indeed, the fact that

Adams' reliance on pottery independently recorded at Umayyad sites in the Iraqi Western Desert to date some of his own 'type fossils' to the Sasanian period does clearly imply that all or some of the Sasanian canal network which connected settlements continued for at least a century and a half after the Islamic conquest (Simpson 2014, p22).

This above brings into question how prolific the Sasanian period actually was compared to the Early Islamic, suggesting that the latter was actually more successful than has been previously thought. It is therefore necessary to further examine the current theories about the Islamic period.

General Settlement and Population Theories For the Early Islamic Period:

The idea that the Early Islamic period was more successful than first thought and that there was a 'continuation' rather than a decline is being supported by evidence in other areas, such as the fact that there is increasing archaeological evidence from the Persian Gulf that the 8th century was a period in which there was a 'boom' rather than decline. However, this does not necessarily mean that continuity was evident for all regions, and so there may be cases where former Sasanian regions did decline (Simpson 2014, p22). In fact, one might suggest a pattern in the Persian Gulf that represents a consolidation and expansion of existing economic patterns (Whitcomb 1999, p215). Similarly, Kervran noted for Samarra (1994, p339) that there is little evidence for a 7th century decline, and the notion of a dramatic break in the economy and culture is misleading (Whitcomb 1999, p214). According to Northedge, at this time the site was not ideal for a large imperial city as water was lacking, and there was not much agriculture in the region (Northedge 2012, p51). Historical evidence may seem to support this idea that there was a decline in the Early Islamic period, as Gibson points out that Islamic sources make it clear that in the early centuries after Muhammed there was a westward shift of trade, population and probably agriculture. Gibson states that this may have been a result of the draw from holy cities such as Mecca, but is inclined to think that this change may have also been due to the destruction or neglect of the Sasanian canal system before and after the Arab conquest (Gibson 1972, p25). However, one should be cautious in comparing regions, as regional differences

as well as external factors would have had influences on growth.

In terms of ceramic evidence, Adams further notes that for the Early Islamic period, the flourishing of several notable ceramic types, such as those found in the brief span of occupation at the Samarra palaces, is defined, but fixes neither the beginning nor the end of their periods of use. As a result, the Umayyads and early Abbasids are “lumped together” and the Samarran period is little more than half a century in the Early Islamic period (Adams 1965, p97). This reflects back to Simpson's comment that Adams underestimated the longevity of the systems in place. Indeed, Adams acknowledges that by using this procedure, an assumption is made that there were virtually no new settlements established during the 9th century in the Diyala Basin. However, by attributing all sites occupied during Samarran-Abbasid times with origins in the Umayyad or Early Abbasid periods, Adams warns that the extent of Early Islamic settlement is likely to have been exaggerated and that this will lead to a too sharply drawn picture of declining population afterwards.

However, in terms of whether the economic climate supports his theory, Adams notes that evidence such as the tax revenues from the Sawad do indicate a decline in collections of possibly 30 per cent between the Umayyad period (661-750 AD) and the time of Ibn Khurradadhbah (c.820-912 AD) (Adams 1965, p97), suggesting that there is also textual evidence to support his model. The importance of tax in relation to agriculture is also stated by Mas'udi, who said that the royal power rested upon the army, which in turn rested upon money, which rested upon land-tax, which rested upon agriculture (Adams 2006, p22). Indeed, an integral part of Anushirwan's improvement of the agricultural base was an accompanying cadastral survey and tax reform (Adams 2006, p23). Whitcomb suggests that this perspective of Adams (as well as Morony) emphasises the cultural continuity, rather than the decline, from Sasanian to Early Islamic times (Whitcomb 1999, p212).

The issue of 'continuity' does seem to have been an important driving force behind the economic development of the Early Islamic period, and is mirrored in the impact of Late Sasanian technologies and customs on later Abbasid practices (Simpson 2014, p22). Therefore, as a key issue in the debate

as to how the Early Islamic period fared after the Sasanian, it is therefore necessary to discuss the transition in more detail.

The Transition to the Early Islamic Period in the Diyala:

The transition between the Sasanian and Early Islamic period appears to be key in understanding the settlement and population patterns outlined above for the two periods. It is therefore necessary to discuss the hypothesis of a peak in the Sasanian period, rather than the Islamic, in more detail, and how influential Adams' theories on the subject are.

Overall, from the settlement data Adams collected, he concluded that the peak in the Sasanian period fell more abruptly to the lowest level in almost five millennia in the Early Islamic period (Adams 1981, p185; Adams 1965, p115). At TAS, support for this, at least for the later Islamic periods, can perhaps be found in the pattern of the refuse pits that are present throughout the sequence. The pits at TAS tend to be larger and in greater numbers in the later levels. Adams suggested that these pits could be evidence that a village, as population declined, had become less organized, less compact, and less prosperous. From Level II, Adams notes that there are no indications of intervening periods of abandonment, such as weathering horizons in the sections or discontinuities in the seriation curves (Adams 1970, p89).

Others, such as Jacobsen, appear to agree with this view of a peak in Sasanian times in the Diyala. Jacobsen, whose work Adams used, states that with end of the Sasanian occupation in the Diyala Basin there was an almost complete abandonment of towns and villages, which was general for the country and not just confined to the Diyala region. Jacobsen suggests that the following Islamic reoccupation resumed the previous Sasanian pattern, something which is not unusual in other earlier cases of abandonment (Jacobsen 1982, p.80).

Although a later peak than the Sasanian period may be be hypothesised, there are cases where it is thought that the peak in settlement was earlier. For example, Mitchell, citing Jacobsen, puts the date of the peak slightly earlier than the Late Sasanian period, suggesting the middle of the Sasanian period. However, in areas such as Kish this is not particularly supported as Reitlinger

says that between the 6th century BC and the 11th century AD at Kish there did not appear to be any occupation on the mounds, which would indicate there having been an influx of population into the Djazirah at the latter period (Reitlinger 1935, p200). This may be compared to other areas that may indicate a similar increase, as by the 12th century there appears to have been a dramatic revival in the density and size of settlements in the North Jazira and in the Euphrates Valley north of Urfa (Simpson and Watkins 1995, p181).

Mitchell goes on to state that in no other period, before or after the Sasanian, has the Diyala region been so extensively cultivated and so populous, agreeing with the idea that it saw a decline during the Early Islamic period. Again, he uses the building of the Nahrwan canal, which brought water from the Tigris above Samarra to the middle of the Diyala region as evidence to explain and support the extensive cultivation. Mitchell claims that after the Islamic conquests, recovery was intermittent, and the worsening political situations caused more decline, leaving little of the earlier prosperity, and therefore little for the Mongols to destroy when they invaded Iraq under Hulagu Khan in AD 1258 (Mitchell 1959, p391). From this date until the present century, little advance was made." (Mitchell 1959, p392). In other areas, Priestman also comments that there is some evidence to suggest that after the Sasanian period the number of settlements decreased in the Shah Maran-Daulatabad basin in south-eastern Iran, in the Kerman region, the eastern Bardasir plain and the Diyala Basin (Priestman 2005, p79).

It is clear from the above that the importance and strength of the Sasanian period in terms of settlement, and in comparison with the other periods, is unclear. The role of the Diyala in the transitions between the Sasanian and Early Islamic period therefore is ambiguous, showing that it is in need of clarification.

Settlement and Population Continuing into Later Islamic Times:

In order to gain as thorough a view as possible of the Near East and the issues concerned, later periods extending beyond the 8th century will now be briefly discussed. This is so that any continuation, and the effects of any changes in view of the Early Islamic period, can be more fully understood in

terms of the long term effects.

Kennedy states that the decay of all these agricultural and settlement systems can be seen in the 10th century (Kennedy 2011, p197). Additionally, Wilkinson comments that although one can argue about the precise date of the onset of settlement decline, it was during the mid-9th to the mid-10th centuries AD that fiscal crises affected both the rain-fed north and the irrigated south of Mesopotamia (Wilkinson 2000, p246). It appears that the problems were perhaps extended further, as due to the problems concerning the Early Islamic era, the years after the 10th century also appear to be under debate, especially in other areas such as the possible economic decline of the Gulf from the mid 11th to the 13th century. Here, most of the evidence – the numismatic evidence in particular – indicates that there was less trade during this period (Kennet 1994, p173). Similarly, at Kush, the rarity of 10th century pottery suggests that there was a decline or abandonment of the site at this time. However, the distribution of pottery of this period found at Hulaylah suggests that the settlement had moved north, away from the earlier southern Early Islamic site. This emphasises the fact that settlement, whilst it can be declining in some areas, may be subject to growth in others, drawing attention to the need for care in comparing patterns between different regions. One region may be affected by another's decline for better or worse, as well as having other different external factors affecting it.

Despite this evidence at Hulayla, and continuing in giving evidence for decline at this time in regions, at Khatt, the Sasanian and Early Islamic mounds have not yielded any evidence to suggest that there was occupation in the 9th century, although high-quality Mesopotamian pottery has been discovered in the flat area to the south-west. Without any evidence for hierarchy in this late period (as no sites are clearly larger or more visible than any other) occupation appears to have been dispersed in small, possibly seasonal, encampments, with many being located along the coast which seems to have been an important focus for settlement. Kennet suggests that during this period of decline for settled communities, it is possible that nomadic or semi-nomadic groups began to predominate. An explanation for this in comparison with the growth of Hulayla is given in that differences in settlement may be due to trading activities, as at Hulayla trade appears to have continued, whatever the

situation of the local economy. Evidence for this is seen in the high proportion of glazed Islamic ceramics in coastal assemblages and the imported Mesopotamian glazed pottery found there (Kennet and Priestman 2002, p160).

Highlighted here is the fact that regions may have different influences that affect the settlement trends, whether they be long-term or purely regional. This is necessary to take into account when examining the Diyala survey data. The next section will look at explaining the evidence for changing trends and opinions in terms of what affects them. The above discussion therefore, if anything, shows that the issues are not simply confined to the Early Islamic period, and that any results from changes in the data may also affect the problems discussed above.

Explanations for the Changing Trends and Continuity:

In this section, general explanations for the trends and ways of dealing with them in Sasanian and Early Islamic settlement and population will be discussed, with a particular view to understand the transfer between the two empires. Corresponding historical accounts of the time will also be commented upon in an attempt to understand the evidence available besides the archaeological, perhaps in so doing clarifying the confusion with this period.

One problem of continuity is the need for an explanation as to why the Sasanians, if so expansive in terms of settlement and agricultural success, were so easily deposed by the Arabs. The seeming ease with which the Islamic empire took over is suggested by Adams to be a result of, or at least connected to, the decrease in population in the Sasanian period. Puzzled by the apparent magnitude of achievements made by the Sasanian Empire, but relatively ineffective resistance offered to the Arab invasion, Adams suggests that the Sasanian Empire faced several problems. However, he notes that surviving accounts of the struggle are often written by the victors, and so must be used with caution (Adams 1978, p333). It is perhaps worth noting that other sources, such as Greek and Syriac, and if contemporary with the Late Sasanian and Early Islamic periods, may provide a control on the information and evidence in Arabic sources (Morony 1982, p1). Howard-Johnston also suggests this, saying that when looking for corroboration for Sasanian sources from independent

sources, the east Roman empire is useful. Its literary culture was more widespread than Iran, and history was a long-established genre of writing (Howard-Johnston 1995, p172). Additionally, sources from Ammianus, Procopius, and other Roman historians make it possible to observe the interactions between the two Sasanian and Islamic powers almost continuously form the third century, thus providing a copious amount of material to asses the worth of sources such as al-Tabari's account of the foreign history of Sasanian Iran (Howard-Johnston 1995, p173).

As well as this, Howard-Johnston notes some problems with Roman sources, such as the fact that Late Roman historians fail to give any usable information on the social ordering and institutional framework of the Sasanian empire, and that the only Roman historian to have made a serious attempt to understand the Sasanian world was Agathias. However, Agathias had little or no contact at all with Sasanians, being a member of the Constantinopolitan intelligentsia, and so relied on written sources, rather than first-hand experience (Howard-Johnston 1995, p177). This again shows the unreliability that can affect historical sources, as second-hand experience is considered to be not as reliable as first-hand.

Howard-Johnston continues to state that it is necessary to seek corroboration for historical sources as although, for example, the *Annals* of al-Tabari (AD 839-923) have long been recognised as the principal source for the Sasanians' own history of their past (Howard-Johnston 1995, p169), its Sasanian material has tended not to be critically challenged, with its apparently sober historical material being seen as trust-worthy (Howard-Johnston 1995, p170). However, the *Annals* were written 300-600 years after the events it was describing, showing that there can be unreliability in historical sources. Howard-Johnston also notes that Sasanian readers and listeners tended to have a penchant for anecdotes, which ensured that the political record was already altered with less trust-worthy material before it entered the Islamic historical sources (Howard-Johnston 1995, p170). An example of the potential destructive effect of this on the Iranian historical tradition is illustrated in the *Shahnama*, “Book of Kings”, of Firdawsi, where it is clear that anecdote has run wild. The work of Firdawsi was based on one of the three collections of historical and legendary material produces in the course of the 10th century when interest was

reviving in the Iranian past. These were modelled on a late Sasanian *Shahnama*, which was translated into Arabic at roughly the same time. It is therefore impossible to determine how far Firdawarsi may have reworked and embellished the material he worked with (Howard-Johnston 1995, p171). Howard-Johnston therefore shows that it is necessary, when dealing with the accounts of the Islamic and Sasanian empires, to understand these problems with the historical tradition, and to also take into account other contemporary cultures' opinions on the situation when seeking corroboration, whilst always practising caution.

However, despite the uncertainties when it comes to the evidence in historical sources concerning the Sasanian to Early Islamic transition, Adams suggests several problems the Sasanians faced. According to Adams, the problems faced by the Sasanian Empire towards its end included overcrowding, dietary insufficiency, and the prospect of famine, all of which go hand in hand with material achievements. As well as this, the plague swept across the Middle East in the mid-6th century, and returned in the early 7th century with increasing frequency. Adams concludes that faced with problems such as these, it is no real surprise that the Sasanian Empire struggled to meet even the moderate external challenge at the time of the rise of Islam. Therefore, the lack of defence on the Sasanian Empire's part is made less perplexing (Adams 1978, p333). A shift in the dating, however, may help to explain this. It is necessary to note, however, that despite these apparent weaknesses, the Sasanian state was still able to expand the empire to western Turkey and Egypt, as well as maintain its northern and eastern frontiers. This is despite the pressure that the Sasanian empire faced from Roman armies. In order to survive as it did, the Sasanian empire would have had to have fighting power and agility, and the ability to be effective on the part of the governmental system (Howard-Johnston 2014, p145)

It would therefore seem that political causes are likely to have had a large part to play in the history of the Sasanian Empires' decline. These causes include elements of disastrous disruption of government functions, internal unrest, and serious economic difficulties. All of these factors are not uncommon as reasons for similar examples of abandonment in other regions (Jacobsen 1982, pp80). However, other more natural reasons may have had an impact as well. For example, in the area of Kish, the explanation for the striking

abandonment pattern of settlements is probably connected to the flooding of both the Tigris and the Euphrates in the Late Sasanian period, during the time of Chosroes II (Gibson 1972, pp52-53).

Adams states that the population itself was mostly occupied in agriculture and that settlement must have grown in a similar proportion to agricultural area during the Sasanian period. It is possible that administrators, craftsmen, and other non-primary producers may have increased in number by an even higher factor, at least after finances were stabilized by the improvement of the tax structure in the 6th century. The unprecedented surface area covered by the ruins of Sasanian settlements once again confirms the breadth and size of the dynasty's impact through the results of archaeological survey. As well as this, Adams points out that there is also a relatively large amount of surface evidence of large-scale, specialized production and trade in items such as glass, pottery, baked brick, and iron tools. Adams concludes that under these circumstances uncultivated lands for additional irrigation expansion must have virtually all been used, although there is little to imply that this new problem was present long enough to encourage more intensive land use (Adams 1978, p332). With this, the conclusion that the Early Islamic period did not see a 'boom' is perhaps understandable, for the picture created for the Sasanian period would be hard to expand upon, considering the comment that all the uncultivated lands were virtually all used.

Whilst there may seem to be areas that in the transition there was a drastic change, other areas suggest more continuity. For example, in the case of Samarra, an important point suggested by the material culture is the survival of Sasanian material and practices (Northedge 2011, p41), implying that there was a certain amount of continuity between the Sasanian and Early Islamic periods. As well as this, a large area of land that had formerly been on the east bank of the Tigris, which included canals and perhaps settlement, ended up on the west bank of the new river, or was destroyed entirely. It is unclear whether this lost land represents an area of Samarra's agricultural hinterland, but it appears that Samarra did not really depend upon its immediate hinterland for agricultural produce. Indeed, it was said that food was brought from Mosul and the Jazira, and the only cultivated area that has been mentioned was the west

bank opposite the city (Northedge et.al 1990, p128). The impact of the cities therefore does seem an important factor to note for the Diyala in the Early Islamic period.

Further discussion of the need for agriculture in the Diyala by cities such as Baghdad and Samarra is given by Adams. He states that in terms of the occupants of the cities of Baghdad and Samarra, it is apparent that the population was mostly made up of officials, service and military personnel, merchants, and artisans. These people where completely dependent on the agricultural production of food carried out by others in the rural areas (Adams 1965, p99), but were themselves not directly engaged with agriculture as they were more occupied with administrative, religious, military, entrepreneurial, or service activities. The inhabitants of the urban areas therefore did not exhibit much concern for agricultural advancement (Adams 1965, p115). However, the evidence suggests that there was a new emphasis on facilities for transport of commodities in bulk in order to attend to this demand for food, and a highly efficient tax system to sustain the regular flow of wealth to the cities. This also suggests that both Baghdad and Samarra drew their support from an immense agricultural hinterland, of which the Diyala Basin played only a minor part (Adams 1965, p99). However, the later attempts to maintain or enlarge tax revenues through corrupt and predatory tax-farming practices whilst stagnation and decline began meant that this short-sighted practice only further aggravated the conditions. This ultimately made Baghdad and its hinterlands impoverished, divided, and virtually defenceless for the Mongol onslaught in the mid-thirteenth century (Adams 1965, p115). Therefore, with the expansion of newly-found capitals that increased to a size unparalleled by anything seen previously, the conditions of settlement deteriorated in the countryside (Adams 1965, p99).

Overall, the main original concept appears to be that the Diyala Basin had a minor role to play in the Islamic period. Kennedy supports this by stating that the massive increase in urban population caused by cities such as Baghdad does not appear to have been matched with a concurrent expansion of agricultural land in the Diyala plains. This is unusual as it is the immediate hinterland of Baghdad. Indeed, Kennedy suggests that the present evidence implies that the total area under cultivation actually decreased in the Early

Islamic period from around eight thousand square kilometres in Late Sasanian times (Kennedy 2011, p189), although there are problems with the ceramic sequence used, in turn affecting the differentiation between Sasanian and Early Islamic pottery (Moghaddam and Miri 2007, p48).

However, this scenario need not have been the case for all areas in the case of settlement, as the slow decline of settlement in the post-Sasanian periods in the Diyala region is not closely paralleled in the Kish area (Gibson 1972, p57). Yet Adams further emphasises the decline in settlement in areas by pointing out that even around Baghdad the immediate impact of the Islamic conquest saw a considerable disruption of settlement pattern and an associated decline in the population (Adams 1981, p184-5). Adams concludes that having reached a maximum in the Sasanian period, over-all density of settlement on the Diyala plains declined sharply (Adams 1965, p99). It is necessary to note, however, that this conclusion is drawn from a chronology with potential problems, which have been pointed out by Simpson (1992), and Kennet (2002).

Adams suggests that the siphoning off of the population from provincial towns into the capital cities may be reflected partly by this decline. However, he also notes that for the most part the decline on the Diyala region antedates the construction of the large cities, as the total built-up area (excluding Baghdad and Samarra) in Early Islamic times is only 64 per cent of the same total for the Sasanian period. Therefore, the greatest degree of urbanization came not as commitment of the greatest intensity of land usage but to a sequel to a decline in irrigation, agricultural production, and provincial settlement. As a result, for Adams overall, a broad contrast emerges even within the confines of this relatively small region between the predominantly agrarian-based Sasanian civilisation and the orientation of Islam that was increasingly urban and mercantile (Adams 1965, p99).

However, these conclusions are drawn from the idea that the Early Islamic times settlement was only 64 per cent of the same total of the Sasanian period. As has been discussed, this is up for debate, and any changes to this figure will have repercussions for theories concerning the role of the Diyala and Mesopotamia during the Sasanian and Early Islamic periods.

Conclusion:

In conclusion, the view that there was dense occupation in the Sasanian period (Kennet 2007, p95), and that there was a sharp decline in population during the Early Islamic period are under debate, as is the relationship between agricultural expansion and population increase. As Priestman notes, the Islamic period has in the past tended to be dealt with very “crudely”, implying that perhaps the evidence is not entirely reliable (Priestman 2005, p79). The fact that the issues are to some extent reliant upon the ceramic chronology calls further for the need to reassess Adams dating, whose conclusions as introduced above, have not only had influence but are currently being questioned. It is therefore possible that the conclusions Adams drew from his ceramic sequence concerning settlement, agricultural, and population patterns, may be incorrect to a certain extent. This would be due to the fact that there are some problems such as the possibility that Sasanian ceramic 'type fossils' may in fact be Early Islamic (Wilkinson 2000, p246). The implications of this would be that any dates in the ceramic sequence that need to shift would possibly change the interpretation of population and settlement patterns outlined above. By what margin any estimates are incorrect depends upon how much the ceramic sequence needs to be changed. As well as the estimates of settlement size or population numbers themselves, when they occurred may need to be analysed. It may be a case that the timings of, for example, the decrease or increase of settlement that have been discussed, may be subject to change, although at this stage it is difficult to say to what degree they need to shift. The general uncertainties stress the need to revise the ceramic chronology via TAS, a chronology that has been used by other academics.

It is therefore hoped that the following critique and assessment of the dating of the 'type fossils' and TAS will help to clarify and define the issues of the patterns in the region for the Sasanian and Islamic periods. The hypothesis that the Early Islamic period witnessed a 'boom' rather than a decline, as discussed in this chapter, will be particularly focused upon.

3.Tell Abu Sarifa 1970: A Critique of the Methodology and Problems

Introduction:

In order to examine each of Adams' 'type fossils' individually (which are outlined in *Land Behind Baghdad* 1965) it is necessary to look first at the publication by Adams of TAS. This will enable the relationship between the and how they were used at TAS to be more clearly understood when I look at the evidence for their dating in the next chapter.

This chapter therefore discusses the survey and excavation of TAS. The focus will firstly concern a description of the excavation and the presentation of the data, and secondly the levels at TAS and the dates assigned to them by Adams. In anticipation that there will be changes to revisions to the ceramic chronology in this paper, I will examine the evidence given by Adams which led him to the conclusions he made, in order to make a preliminary assessment as to how reliable the evidence was and if the dates are in fact reasonable.

The reliability of the evidence and final dates given for TAS is crucial in the re-examination of Adams' 'type fossils' (which are outlined by him in his earlier publication *Land Behind Baghdad* 1965), as their relation to each other means that any errors or changes that need to be made to the dating may have an effect on Adams' other conclusions. These conclusions specifically include the work he did concerning possible population trends in the Sasanian and Early Islamic period in the Diyala region, work that has had great influence, but needs to be reassessed in terms of its relationship to more recent theories that have been put forward.

The Importance of TAS:

The soundings at TAS were specifically intended to clarify the ceramic sequence (Adams 1982, p232) for the area that could provide reliable dating evidence, in order that recognition of sequences and patterns of irrigation and settlement could be permitted. It was also intended to provide a quantitative

study of the full ceramic inventory of a representative small mound that was occupied from Sasanian times until the post-Samarran period (Adams 1970, p87). The initial compiling of a list of Sasanian and Early Islamic ceramic markers did provide a basis for some refinement in dating (Adams 1982, p46).

The excavation was a small-scale sounding, and so the site had limited exposure (Adams 1970, p87). Despite this, Adams' results, particularly his ceramic 'type fossils', have since been influential in later archaeological research in the Near East. However, since the excavation of TAS, aspects of the dating for certain wares that were previously used as “index fossils”, for example honeycomb ware, have been brought into question, and problems with the acknowledged ceramic sequences have arisen. For example, it has been suggested that many of the 'type fossils' that Adams chose as representations of the 7th – 8th centuries actually belong to the 9th-10th centuries (Priestman 2005, p105).

Problems differentiating Sasanian from Early Islamic pottery have already been highlighted (Moghaddam and Miri 2007, p48) and the problems are made more complicated by the fact that with Sasanian pottery, there are fewer distinctive types and the lifespan of different types varies from region to region (Trinkaus 1986, p49). There are also major differences in ceramic tradition across the Sasanian Empire, dividing Mesopotamia from the Iranian plateau and the north-eastern frontier of the empire. R. Boucharlat's and E. Hendrick's first comprehensive study of Sasanian pottery in 1991 shows that there is a clear difference between the regions (Mousavi and Daryee 2012, p1091). One example of a case of a particular ware is that Sasanian 'coarse brittle ware' forms are part of a local north Mesopotamian regional ceramic tradition not found in central or southern Mesopotamia (Simpson 1996, p99).

It cannot be maintained now that the soundings at TAS, which were limited, are as reliable and useful as they were first hoped to be (Adams 1982, p237). The fact that Adams acknowledges this shows that the work at TAS has been in need of a review for some time. A review would assess how much of the information gained from TAS is reliable in the light of more recent surveys and excavations that are bringing doubt to some of the conclusions.

The Excavation:

The location of TAS is in ‘Afak Qadha of Diwaniya Liwa, and is approximately 17 kilometres north-northwest of Nippur and 4.5 kilometres east-southwest of Zibliyat (Adams 1970, p87). The mound itself is thought not to exceed three hectares (Adams 1970, p88) (see figure 1 for site plan; see map 1 for location – found using Hausleiter et.al).

The main reason for this site being chosen was for the longevity of its occupation. Numerous Sasanian and Early Islamic sites lie around TAS, with the site itself reaching a peak of settlement intensity in the region in the Sasanian period. By the post-Samarran period, TAS had become one of the last surviving communities in the district, which was being progressively abandoned (Adams 1970, p88).

The excavations were carried out for 31 days in January and February 1969 (Adams 1970, p88). This in itself could cause concern for the quality of the work. With such a hurried excavation it would be understandable if aspects of the stratigraphy and its complexity were overlooked, as well as the fact that it would not have been possible for material to be investigated thoroughly.

Several trenches were excavated at the site (see figure 1 for trench locations; see figures 2a and 2b for stratigraphic sections for west faces of main trench and step-trench). The main excavations were situated at the top of the mound and consisted of 10x5 meter soundings (Adams 1970, p88). Five meters west of the main trench, a second trench that was 10x5 meters was laid out towards the end of the excavation period. The objective for this trench was to increase the Islamic sherd sample, particularly the glazed pottery which constituted an unexpectedly small collection (Adams 1970, p89). A third step-trench (in three 5x15 meter sections without intervening baulks) was carried to the full depth of the mound, and lay 15 meters north of the main trench. Again, this trench was completed quickly during the earlier stages. The primary purpose was to provide a small initial sampling of the entire sequence in order to create suitable typological categories (Adams 1970, p89). Finally, two 5x1.5 meter stratitests were placed on the west flank at the foot of the mound. Surface inspection suggested that Sasanian pottery predominated in the area, however, the outcome was disappointing, as sherds were extremely sparse (Adams 1970, p90).

Presentation of the Data:

In critiquing the conclusions drawn from this work, it is necessary to take into account how the data is presented, particularly in the case of the presentation of pottery drawings and images, and stratigraphic diagrams, as these are crucial when examining the ceramic sequence and evidence given by Adams for the dating. There are a few things that should be noted concerning how accessible this data is as it reflects how easily Adams' conclusions can be corroborated. Things that could have been done to make it easier for the reader will also be suggested. It is worth noting that many aspects of the presentation of the archaeological results may have been beyond Adams' control. The presentation most likely would have been at the discretion of the journal in which the results were published.

For many of the drawings referenced, they have been resized for this paper, and in some cases redrawn.

In the case of the pottery drawings, especially for figures 6 and 10, the layout makes it difficult to locate specific pieces as the drawings are cramped onto half a page for each figure. As a result, the text for the labels is small and is quite hard to read. The map of the site of TAS (Adams 1970, Plate 1: Figure 1) although quite clearly drawn, also suffers from small text and could have been improved by being a full page rather than half. In addition, the measurements of the radius for the pottery drawings do not appear to have been consistently labelled for all the drawings, for example, the radius appears to be not included for the pots in figure 7, and some in figure 6, such as bu, bv and cc. The drawings being larger in size and given more space on the page would have been an improvement. This would have enabled them to be more easily used. The need for better spacing is also shown by the fact that in figures 10 and 11 arrows have been drawn to connect drawings of pottery with their sections, for example: 'p' and 'd' in figure 11. It would also have been useful to have drawn a cross-section for the sherds, or if not all of them, perhaps just some of the larger ones, as it may not be beneficial for all.

Although the pottery's corresponding levels are labelled beneath the figures, in the case of figures 6, 10, and 11, it would have been useful if the drawings were grouped more clearly (see fig (to be inserted) to view these drawings at a larger scale, and sorted into their levels). It would have made the

chronology of the pottery clearer to see if they had been grouped into the levels in which they were found, like in figures 8 and 9, or at least distinguished between the Sasanian and Islamic periods. On the other hand, the groupings according to levels for the handles in figure 8 are not always entirely clear. The groups for Levels VI-IV are a little too close together, as at first it is not easy to be immediately sure of the boundaries between the levels, with the handle drawings running close together. Overall, spacing the drawings out more would help make it easier to locate specific objects, and to be able to understand where they are placed in terms of chronology, which would enable the reader to make comparisons more easily.

In the photographs of the objects, the coins found at Abu Sarifa have not been included. This may have been due to the fact that there was only one identifiable coin, and the other few were in very poor condition (Adams 1970, p116). It depends on how poor their condition was as to how useful images of them would be in gleaning more information from them than what Adams already tells us. Their absence makes it impossible to judge. Drawings of them, or photographs, would have given something to help visualise them in terms of being able to see what details could be seen and their dimensions at the very least.

The scale has been stated for all the figures, but scale bars have not always been included. In order to aid with the visualisation of scale it would have been useful to be consistent and include scale bars on all the figures, though it is possible this was not done in the case of a couple of the pottery figures due to lack of space.

Apart from the incantation bowls (Adams 1970, fig 17, Plate 8; see figures 3a and 3b), the other objects (Adams 1970, figure 16, Plate 8; see figures 4a-l), have not all been identified, and have only been classified under the rather general title of 'miscellaneous objects'. It would have been helpful if they had been individually labelled, making referencing between the image and the corresponding text easier.

Finally, in the case of the section drawings (see figures 2a and 2b), in figures 2 and 4 (Adams 1970, Plate 1) the individual strata are not numbered. In addition, in figure 2b (Adams 1970, Plate 1), the levels that Adams has assigned for the sequence cross-cut through the stratigraphic layers. This gives

the impression that the beginning and end of levels are rather vague, if not a bit arbitrary. Indeed, it has been commented upon that TAS is poorly stratified (Simpson 1996, p100).

Adams' Dates For the TAS Levels:

Below is a table Adams produced as a brief outline of his conclusions concerning the dating of levels at TAS.

Level	**Date (AD)**
Surface	1100-1150
Level VI	950-1100
Level V	800-950
Level IV	650-800
Level III	500-650
Level II	Before 500
Probable stratigraphic disconformity	
Level I	1st– 2ndcentury

Table 1: Adams' Dates for Levels at TAS (Adams 1970, p119)

Adams specifically mentioned equating some of the levels with periods, stating that these few points can be fixed with reasonable precision. The remainder of the sequence would have to be more vaguely allotted to intervening intervals of time (Adams 1970, p118). The first ‘fixed point’ occurred in Level III (assigned to the Late Sasanian period), and the second in Level V, which was approximately equated with the Early Samarran period. Level IV is tentatively ascribed to the Early Islamic period (Adams 1970, p118).

In order to determine whether these dates are in fact appropriate, it is necessary to re-examine the evidence used by Adams for dating each level. A discussion of the reliability of the evidence from TAS and from external sites in Mesopotamia used by Adams will in turn shed light on how Adams' 'type fossils' relate to the dating of the site. It will then be possible to look in depth into the reliability of the 'type fossils' themselves, and review how their use by Adams and by later excavators may affect the sequence at TAS, as well as Adams' conclusions in *Land Behind Baghdad* and *Heartland of Cities*.

Problems With Dating at TAS:

There were several major problems that hindered the secure dating of the levels at TAS:

Lack of Numismatic Evidence:

One of these problems was that throughout all the levels there was an absence of numismatic evidence that would have given more reliable evidence for the dating. Adams notes that as a result of this (and the lack of securely dated and comprehensively described sequences of material from other sites), the TAS sequence should remain a relative one in many essentials (Adams 1970, p117-118).

The numismatic evidence consisted of one probable Sasanian coin, with indeterminate dating; several illegible, thin, small copper coins or tokens, found on the surface of the site; three Parthian coins, found on the surface of the site with one probably ascribable to the 2nd century AD; and finally the only datable coin, an Abbasid silver dirham found in Level VI, minted in Baghdad in 328 AH/939 AD (Adams 1970, p116).

The lack of low-denomination Sasanian coinage found at the site could be due to the fact that they do not survive well as they were struck on very thin flans. This could also lead to these small copper coins being mistaken for being Parthian. As well as this, the doubtful context for the probable Sasanian coin could be explained by the fact it was found only 40cm below the surface (Adams 1970, p116) which, looking at the depths of the levels, appears to be too close to the surface for a Sasanian level; although Adams does not comment on this. The Abbasid coin (939 AD) corroborates the assumption that Level IV must have begun by the mid-10th century. This coin indicates that this level was deposited either in, or at the time of 939 AD. However, Adams comments that alone it does not carry much weight as evidence (Adams 1970, p118).

In addition to this, this coin, being an example of an Abbasid *fals*, introduces another problem to the numismatics. *Fals* derived from the Byzantium copper coinage named '*follis*', which was organised by the Emperor Anastasius I (491-518 AD). The Byzantine *follis*' weight was originally one ounce, but it decreased rapidly. Therefore, by the time the

Arabs conquered Syria, its value had sunk further to 6 grammes. The smaller Byzantine copper coins were in a state of confusion by the 7th century AD, and the Arabs did not adopt them. However, the Arabs did continue to strike the Byzantine *follis* with the weight considerably reduced. By the beginning of the 10th century, the Arab *fals* underwent a development, namely the striking of copper coins becoming a privilege of larger towns (Zambaur 1960-2009, p47). This stopping of circulation of the lower denomination of coin has an effect. Being that it was quite common before, this means that a mid-9th century layer might have coins in it that are residual, making it appear to be 8th century in date.

From the above, it is clear that the collection of numismatic evidence at TAS is not particularly useful due to there being too few coins in number. What coins there are also cannot be reliably dated, and so only tentative hypotheses can be made.

Pitting:

The problem of residuality and intrusive material is highlighted at TAS by the problem of pitting evident there. In order to identify intrusive pottery, there are two approaches in direct inspection. The first possibility is the recognition of a well-defined style or type of known source, the second is the tentative classification of unfamiliar sherds as intrusive because of their rarity and distinctness from the principal types of a site. Without the knowledge of how they were distributed, rare or unique sherds can only be considered to be unknowns or possibly intrusive (Shepard 1965, p336).There is also the factor that clever imitations of pottery may also be mistakenly considered to be intrusive. It is difficult to estimate how serious these sources of error are because these identifications of intrusions are not as a rule checked by independent means (Shepard 1965, p336). Unfortunately, the extent of the pitting at TAS appears to have made it all the more difficult to make solid determinations regarding this issue.

TAS is no exception when it comes to normal residuality caused by pitting. An example being the fragmentary glazed plate found, which is illustrative of the upward scattering effect that pits also produced. The excavation of pits through earlier strata results in earlier pottery from those

strata being introduced into later strata. As a result, if these pits are not recognized during excavations, the excavator is likely to overlook and potential mixing of the ceramic inventory. Again the bulk of the recovered pieces of the plate occurred in the area of a very large pit, in this case near the north end of Level IV and adjoining its west face. This pit was detected only subsequent to their finding, and was not traced during the scraping of Level V and hence is somewhat more likely to have been dug during the terminal, upper phases of Level IV rather than at a later time. On the other hand, three additional fragments of the plate were found in separate loci in Level V. Perhaps the most reasonable reconstruction is that most of the plate, presumably discarded in a pit after breakage, thus found its way to a somewhat greater depth than its level of origin. But then some of its pieces subsequently were removed to a higher level by still later, smaller pits (Adams 1970, p91). This example therefore demonstrates clearly the problem that TAS had with intrusive material due to stratigraphic problems.

However, it is possible that the pitting in the area could have had more serious effects on the results of TAS and adds considerably to the uncertainty of the pottery dating. The deep pits in which rubbish accumulated caused disturbance to the stratigraphy. It is wise therefore to be cautious in assigning a date to individual fragments of a single glazed vessel of key types that are found distributed over at least 1.25 meters deep (Adams 1982, p237). Similarly, the penetration of glazed ware types from the Early Islamic period into what seems conclusively a level mainly occupied during the Sasanian period suggests that the TAS evidence does not add much to the knowledge of the fine-grained temporal distribution of these types (Adams 1982, p237).

Adams notes that pitting was widespread. This led to difficulties in the formation of contemporaneous collection units, and especially affected the Islamic levels. As well as this, due to the increasing compaction of the soil, locating pits in the earlier levels was more successful than in the later ones (Adams 1970, p91). Adams acknowledges that smaller pits may have not been noticed, but that the larger, deep pits that might have lead to serious stratigraphic inversions were detected fairly readily, and that with the fact that sherds were generally less numerous in pit refuse than in other deposits

(Adams 1970, p91) their failure to be recognised would probably only have had a small effect in comparison. However, the speed at which the excavation was carried out may suggest otherwise, as the likelihood of aspects being missed at the time is increased by this acknowledged fact. There is also no guarantee, despite Adams apparent confidence of easy detection, that no stratigraphic inversions were missed. It is impossible to know. As well as this, it is unusual that sherds were generally less numerous in pit deposits. Adams is fully aware of the effects the pits may have had on the results at TAS, noting that the effect of pits on ceramic seriation was two-fold. Although Simpson does seem to suggest that despite this awareness the corpus of site pottery is poorly stratified owing to the excavator's crude use of artificial spits that ignored the natural stratigraphy of the floors (Simpson 1996, p94).

Some sherds undoubtedly found their way as refuse into deeper level than that from which they came (Adams 1970, p91). Secondly, difficulties in securing sherd collection units that were as contemporaneous as possible involved the practice that was followed in the removal of mud-brick walls (Adams 1970, p91, 94). The walls were mapped and left in place until a particular level had been finished, and then they were broken up and removed separately. Sherd inclusions that had been retained within them were not kept. Although these sherds were never numerous, they might have come from whatever the parent material the mud-bricks walls were made from, and almost certainly would have been earlier in date than the debris in the buildings formed from the walls (Adams 1970, p94).

Therefore, the numerous pits at TAS had the effect of temporarily extending the span of particular ceramic types and features both backwards and forwards in time beyond the original limits of their popularity. Herein lay the importance of clearing them with the level from which they were sunk whenever they could be detected (Adams 1970, p91). Indeed, it is possible that the one hundred glazed sherds of Islamic type found below Level V may be intrusive (Adams 1970, p118).

Canal Levee:

The canal levee appears to have affected the presence of Parthian

sherds. Level I contained sparse Parthian sherds but no traces of architecture or debris that would indicate a genuine occupation in the immediate area. Parthian mounds occur about 200 meters east, and a greater distance west. Adams came to the conclusion that it was likely that these sherds are only accidental discards along an ancient canal levee, approaching the present mound from the west and presumably continuing under and beyond it. By 1.6 meters below floor surface, Level II, the deposit is entirely sterile (Adams 1970, p88). On the map (see figure 1), the canal can be clearly seen approaching the mound, and appears to stop at a kiln. Where it continues on after that can only be speculated. Evidence suggested that it passed not far to the west of the trench on the west flank of the mound near its foot. Evidence included a slope of deposits near the trench's westernmost, lower end, and the presence of some coarse sand and silt with shell inclusions (Adams 1970, p90). It is possible therefore that this trench may have been affected by the presence of the canal levee, but it is cannot be known the exact route it takes, so how it could affect the other trenches remains questionable.

"Ancient canals are a hindrance with their towering heaps of silt" (Ionides 1938, p354): although Ionides was referring to the problems faced by modern engineers, this does have some bearing on the problems that could be faced in the archaeology. As well as carrying sherds by the water, deposits being left after the clearing of the canals could cause problems for the archaeological record in terms of contamination. How much the presence of the canal levee could have affected the trench findings such as the ceramic inventory is difficult to determine, but it can be said with confidence that the trenches further up the mound are less likely to have been affected.

Culling of Sherds:

In analysing the collection of sherds, a gross separation was made between body sherds lacking surface decoration as well as features diagnostic as to vessel form, and all other categories. The body sherds were recorded on the basis of paste or preparation criteria, and then discarded. Early on in the work many of the form and surface decoration categories had

not yet been established. After culling fragments that were apparently too small to be classified later, the remaining sherds were kept. Adams acknowledges that discrepancies may have occurred due to the practice of culling sherds (Adams 1970, p90).

In the trench on the west flank of the mound specific wares may have been affected by the culling of small sherds, particularly those of the more fragile wares that would have broken into smaller pieces. A particular category that could have been affected is the Islamic thin, vertical jar collars that may have been disproportionately reduced. However, Adams does not appear to be too concerned by this, as he appears to have been aware of the possible effects of culling the sherds as the discarded portion of sherds was kept to a minimum. As well as this precaution, before undertaking this trench the Islamic typology had been determined (Adams 1970, p90). Therefore it seems unlikely that this culling of fragments had a significant effect on Adams' interpretation of the dating of the levels.

TAS Dating of Levels: Adams' Evidence:

Before there can be a discussion for each of Adams' individual 'type fossils' and their presence at TAS, an examination of other materials, artefacts, and ceramics will be needed. These items will be those that Adams highlighted as being useful in his dating of each level, and so are important when considering his conclusions. This will help to give a wider understanding of the contexts in which the 'type fossils' were found. For section drawings of the levels at TAS, see figures 2a and 2b.

Pre-Sasanian Levels:

Level I:

This level probably dates to somewhere in the late first or second century AD (Adams 1970, p118). The assemblage itself provides little evidence that a definitive date (Adams 1970, p116). However, there are distinctive categories, such as 'Eggshell' ware, that provide an

approximate date range. This ware has a yellowish buff fabric and appears in Parthian levels at Nippur according to Adams (Adams 1970, p116-117). Additional categories of wares that are also apparently known from Parthian sites and are found in this level are types J-I (double-indented plain ware jar rims), and carinated bowls. The latter is associated with a thin, greenish-white glaze forming in beads on the lip, which occurs as early as the Neo-Babylonian period. However, the plain variant continues into Parthian times, and perhaps later (Adams 1970, p117). As the focus of this paper is the Sasanian and Early Islamic periods, the dating evidence for these earlier sherds will not be discussed in detail, although a study may be worth doing n the future.

The amount of Parthian sherds in this level was small. There were no traces of architecture or debris indicating a genuine occupation in the area. Parthian mounds occur about 200 meters to the east and a somewhat greater distance to the south. Adams suggests that it is likely that these sherds were accidental discards along an ancient canal levee that approaches the mound of TAS from the west, presumably continuing under and beyond it. The cultural material thins out imperceptibly with greater depth. By 1.6 meters below the floor of Level II the deposit was entirely sterile (Adams 1970, p88).

Hiatus:

Adams makes the comment that Level I is probably separated from Level II by a hiatus, and judging by the dates assigned to Levels I and II, this can most likely be dated in the late first or second century AD (Adams 1970, p118).

Sasanian Levels:

Level II:

On the basis of the supporting evidence for the Late Sasanian date of Level III, Adams determines that Level II must antedate the 6th century. However, Adams suggests that as there is an absence of Parthian coins,

this level began no earlier than the third century (Adams 170, p118).

One of the objects used to date this level was one of the incantation bowls (see figure 3a) (these are generally reused bowls of TAS Type E, and are rounded or flaring thin ware bowls), found in the north wall of a large room (Adams 1970, p115). Incantation bowls are widespread in Mesopotamia from the Sasanian to the Early Islamic period (Cordera 2001, p229), and have been said to be useful in illustrating the Jewish, Christian, and polytheistic traditions, especially those that were evident in late Sasanian Mesopotamia (Walker 2007, p800). In northern Mesopotamia, incantation bowls have been found at T. Ajaja – Arban, Nineveh, and Nimrud (Simpson 1996, p103), with other examples being found buried in a courtyard at Tell Baruda at Choche (Hunter 2000, p139, footnote 5). Another example of a bowl found is that found at Tell Khafaje during the 1935-1936 excavation season – the first found at this site. It is noted that the language of the inscription, whilst brief, is typical Jewish Babylonian Aramaic of the Sasanian period (3rd-7th century AD) (Cook 1992, p79).However, in general, Nippur appears to be the best known settlement for the presence of incantation bowls (Al-Khamis 1990, p113). The layout of the bowls is very characteristic, generally consisting of a central single figure surrounded by incantations, with various Aramaic dialects that originate from early Islamic times (Al-Khamis 1990, p113). The incantation bowls at TAS (especially bowl b, as the image is clearer: see figure 3b) seem to be typical examples of this particular layout. The writing itself occasionally consists only of scratches made with a pen, as the priests were not always literate. At Nippur, the bowls are generally found in levels near the surface of the mound (Kaufman 1973, p170), or on the slopes and in the gullies where rain has left them exposed and so visible. They are always found upside-down (Gibson 2001-2002, p84), as was the case with the two bowls at TAS (Adams 1970, p115). Bowls have been found at Nippur in a similar context to the ones found at TAS, as some of the Aramaic bowls, in the excavation of Area WG, were found buried under the floors of houses. However, the majority of the Nippur bowls were found in an early Islamic context (Gibson 2001-2002, p84) contrasting with the Sasanian date that has been allocated to Levels II and III in which the two incantation bowls

were found at TAS. Though Gibson does describe this as being an example of a “cultural lag” (Gibson 2001-2002, p84) occurring at Nippur, with objects of the earlier period lasting for some time into the later one (Gibson 2001-2002, p83).

It does seem unlikely that this level can be Early Islamic, and is probably Sasanian. However, due to the problems with pitting at TAS, this Early Islamic dating for these bowls may have more of an implication for Level III, which being dated by Adams as being the last Sasanian level may be more likely to be in need of a change in date.

Level III:

This level is assigned to the Sasanian period on the basis of the ceramic inventory (Adams 1970, p88). Adams refers to this level as being “a fixed point”, and specifically mentions honeycomb decoration (which, as mentioned earlier, is a ware who’s dating is now considered to be different) and impressed patterns. He also mentions the maximal popularity of rounded or flaring flat-bottomed bowls (TAS type E, some of which bear Aramaic incantations), and glazed carinated flat-bottomed bowls. All these types he views as being indicators of the Late Sasanian period (Adams 1970, p118).

Objects found at TAS that helped give evidence for the date of this level included the incantation bowls. One of two incantation bowls was found in this level (see figure 3b), and was the best preserved (Adams 1970, p115).

Islamic Levels:

One point to note that Adams also comments upon is that throughout Levels IV-VI there is a decline in architectural scale and quality. Rooms become smaller, and unlike in the previous levels are no longer uniformly orientated. The walls also become more thinly and irregularly constructed (Adams 1970, p88). Combined with the apparent increased pitting in these levels, Adams comments that these architectural

characteristics suggest a village that has become less well-ordered, compact and prosperous as population declined (Adams 1970, p88). He does not comment whether these differences necessarily distinguish Sasanian occupation from Early Islamic occupation, but it is an interesting factor to note for later discussion concerning the dating of the levels how it may reflect any conclusions drawn later concerning the settlement patterns of the Diyala region, especially since disorganisation may indicate a less prosperous settlement or region.

Level IV:

Adams notes that in this level, styles of surface treatment that are mainly associated with the Sasanian period (according to his dating Level III and his "type fossils") abruptly decline. Stamped decorations, incised patterns, and new types of glazes that are associated with the Islamic period significantly take their place (Adams 1970, p118). However, Adams is aware of the problems of pitting, and mentions that many of the one hundred glazed sherds found below Level V may be intrusive. He concludes that this level is Early Islamic in date, probably centred on the 7th and later 8th centuries, although he cautions that the earlier and later limits were difficult to establish (Adams 1970, p118).

Adams, when further reflecting upon TAS in his later work *Heartland*, notes that a series of entirely new glazed styles, otherwise known as the 'Samarra horizon wares' spread over much of central and southern Iraq, at some ill-defined period after the Arab conquest (Adams 1982, p237). Evidence for this dating will be discussed in the assessment of the 'type fossils'. He comments that these appear to be absent in Level III at Susa and at Tulul al-Ukhayder, apparently abandoned only at around the middle of the 8th century. This suggests that most of these wares were introduced during the second century AD following the Islamic conquest. At TAS, in Level IV more than sixty of these sherd types can be found, which Adams comments is either due to intrusion resulting from extensive pitting, or whether the date of the primary construction in the level should be raised from the mid-7th century to the mid-8th century? (Adams 1982,

p237). This highlights again the uncertainty of the dating of the sequence at TAS, and also draws attention to the fact that it was being questioned by the excavator quite soon after the work.

Level V:

The approximate equation of this level with the Samarran period is regarded by Adams as a second “relatively fixed point”. Connections with Samarra can evidently be seen in specific styles of incised decoration, motifs of luster glazes, and imitation T'ang splash with and without underglaze incising. These can also be linked with numismatically dated 8th and 9th century levels at Hira (Adams 1970, p118).

It is important to mention the effect that the change in use of *fals* had, as it may have been that Hira was similarly affected by the misdating they cause. Similarly, the fact that date of the Samarra horizon wares has since been clarified, with the first ware stating in the early 9th century, and splashed ware at least before 861 AD (Kennet 2004, p32). This would suggest that an 8th century date in unlikely.

Adams continues to suggest that this level may have continued for a time after Samarra's political demise, and says that the presence of “early” types among the splash glazed wares in this level provide a *terminus ante quem* for it before the re-settlement of Kish, which occurred in the late 10th or early 11th century (Adams 1970, p119).

At the top of this level, in addition to ceramics, a figurine was found (see figure 4f). This was a mould-made representation of a girl wearing a necklace with long, hanging pendants and possibly earrings. Her arms hung directly at her sides, but the position of her hands is uncertain since they and the lower body were broken away. Also missing were the details of her upper face and coiffure (Adams 1970, p115). Adams notes that whilst the position of the arms and hands was somewhat different, parallels between the dress can be drawn with the figurines found in an apparent toy shop in Wasit. Adams uses the dating that at the time was accepted – that although the figurines at Wasit were reportedly of Ilkhanid date, they were attributed to the Saljuk revival of the 12th and 13th centuries on stylistic grounds (Adams 1970, p116). However, based on the

dating of the 'early' splash glaze, he later suggests that it may be intrusive (Adams 1970, p119).

Level VI and Surface:

Level VI contained the single identifiable coin at TAS. The coin was minted in 939 AD, suggesting that this level can be dated to 939 AD or later. This could therefore indicate that this level could potentially have an earlier beginning date than Adams' original 950 AD date. However, as there is only one coin, Adams suggests that it does not carry much weight (Adams 1970, p119). Both Level VI and the surface had a complete absence of classes of glazed pottery that elsewhere become numerous by the last century before the Mongol conquest. In comparison with Level IV at Wasit, which Adams references (Safar 1945), these missing wares in the TAS sequence include black linear or reserved decorations under dark green or blue lead glaze, and floral designs in blue or black beneath a white or pinkish glaze. From this it is surmised that this level must have ended prior to 1150 (Adams 1970, p119). In addition, judging by the frequency of glazed and unglazed wares on the surface, Adams believes it to be likely that the surface remains reflect an uppermost level that had almost entirely eroded away, and once represented a significant phase of occupation. Hence Adams believes that Level VI probably terminated before the end of the 11th century (Adams 1970, p119).

Miscellaneous Objects:

Below is mentioned other miscellaneous objects that Adams noted in the levels at TAS. However, the complete selection of objects found at TAS does not give much in terms of helping to date the levels and 'type fossils'. Many were found in poor condition, and it seems to be uncertain how many can be considered as being intrusive.

Firstly, four spindle whorls were found (see figures 4a-c), spanning both Sasanian and Islamic levels. The earliest was found in Level III and made of undecorated bone. Two made of ivory were found in Level IV, one of which having the addition of black pigment filling the incised designs. The fourth

spindle whorl was found in Level VI, with the incised design filled in with white pigment. Adams was of the opinion that this treatment was intentionally connected with its manufacture (Adams 1970, p115).

Even including the numismatic evidence, metal objects were not numerous at TAS. In Level III a fragmentary iron tool was found in the step-trench, and a badly corroded copper ring and an iron nail occurred in the main trench in the same level (Adams 1970, p115). The dating for these objects is difficult to assess as no image was provided by Adams, probably due to their poor condition.

Continuing with metal objects, one curved iron dagger was found in Level IV, and another in Level V (Adams 1970, p115; see figure 4i). Heavily rusted iron nails and fragments of iron tools were found in Level IV, and possibly what could be an iron buckle in Level V (Adams 1970, p115).

Adams commented that copper objects appeared to become more frequent in later levels at TAS (Adams 1970, p115). These included an adjustable ring and a small, long handled spatula that were found in Level V, as well as a needle and small, incomplete pair of tongues or tweezers occurred in Level VI (Adams 1970, p115-116).

Finally, there was a selection of four other miscellaneous objects. In Level IV, a broken set of dual pan pipes made of baked clay was found (Adams 1970, p116). Again, Adams did not include an image of the item. The second object was found near the bottom of Level V, and was a baked clay model of a stylized horse. The legs were slightly outspread, and it bore traces of decorative bands of red paint. Most of the head and one leg were broken away, but the saddle was well preserved (Adams 1970, p116; see figure 4e). Rahmani comments that such figurines (described as toys) are commented upon in the Greco-Roman world. Although Rahmani discusses ones found in 6th – 7th centuries AD (although these are in contexts in Gaza), Rahmani points out that finds from Susa shows that they were present in the mid-third to mid-second millennia BC (Rahmani 1981, pp72-74). Therefore, in the case of this horse figurine, a more detailed analysis into the specific styling would be necessary in order to determine its exact dating, as it seems to be part of a long tradition.

Lastly, there was a stamp seal in Level V. It was pierced for carrying, and had been carved from a white, semi-translucent stone (Adams 1970, p116).

Again, there is no image provided by Adams.

Glass:

Finally, and briefly, Adams commented that as a dating tool, the glass at TAS proved to be much less useful than the pottery, especially for the purposes of a study aimed primarily at typological seriation, as was the case (Adams 1970, p114). The condition of the glass was generally poor, with Adams noting that with very few exceptions, all of the glass was found in a heavily patinated condition. Moreover, the surfaces were flaky, discoloured, and badly decomposed. Most of the sherds were also too small and fragile to be of any worth in analysing, much less classification (Adams 1970, p114).

Throughout the entire sequence, only three complete vessels were found, and even then, fully reconstructible profiles were rare (Adams 1970, p114). In addition, Adams was disappointed by the conservative nature of the glass industry in the Islamic and Sasanian levels, noting that easily identifiable luxury vessels were entirely absent, and the range of forms extremely limited (Adams 1970, p114). The only surface decoration of note was the “honeycomb” form and applied rope ornaments, which Adams describes as being typical for the time (Adams 1970, p115). He appears to be correct in this assertion, as a Sasanian date does appear to be agreed upon. Specifically, Aruz and Fino note that these faceted bowls represent the most widespread type of Sasanian glass vessel, and is generally found in Iran and Mesopotamia in excavations dating to the 5th, 6th and 7th centuries AD (Aruz and Fino 2001, p10). Although the date may be agreed upon, it is unknown in which levels this type appeared, though it is probably safe to assume it was present in Levels II and III, considering they are dated Sasanian by Adams. However, this glass ware has too long a life-span to aid significantly in the dating.

The glass at TAS, by Adams' own admission, does not seem to have been particularly useful in helping to date the levels. The poor condition of most of the glass, and the lack of well-recognised specimens that could refine the dating significantly appear to have not been present at the site.

Conclusion:

Problems concerning the dating of the ceramic inventory and 'type fossils' at TAS are evident. This is attributable to several reasons, such as the speed at which the work took place, the nature of the site which exhibited extensive pitting which caused confusion as to what types and amount of sherds are intrusive, and the lack of evidence such as coins and C14 dates which could have been used to corroborate the proposed dating as well as the weak evidence provided by parallels from other sites and the general ambiguity about much of the evidence. These things made dating difficult, and cast doubt on the results; especially as new evidence has been unearthed through the following decades. Indeed, Whitcomb comments that of the evidence used by Adams to date the Tell Abu Sarifa sequence, the tying of the relative chronology to Samarra and Wasit on Adams' part was necessary for the ceramics to become meaningful (Whitcomb 2007, p258; Adams 1970, p118-119).

With a focus on the area of Southern Mesopotamia, more recent publications on sites and assemblages may help identify some of the problems. This in turn would help improve the accuracy of the dating in comparison with Abu Sarifa. Sites and assemblages that would be useful for this include Samarra, Kish, the area of Wasit, Hira, and Nippur. The first four sites were referred to by Adams (though Samarra and Kish were more frequent), and he used them to cross-reference the dates for some of the wares at Abu Sarifa. Importantly, however, Samarra is a site of note as the entire site can, in theory, be dated to a single, clearly defined period. It is neither superimposed upon remains of an earlier era, nor overlaid with the remains of later occupations (Iraq Government 1940, p2). This means that the dating will be more easily defined. Sites in the Persian Gulf, such as Kush, (with excavations by Kennet), Sir Bani Yas (Carter), Sohar (with excavations by Kervran), and Siraf (Whitehouse and Priestman) may also be useful in establishing a more precise chronology.

With this examination of how Adams' came to his conclusions at TAS in mind, it is now possible to examine other evidence for the 'type fossils' he used. These 'type fossils' can be found in his earlier publication *Land Behind Baghdad* 1965. It is therefore necessary to, in the next chapter, examine the 'type fossils' given by Adams in more detail by evaluating them individually.

4. Adams' Land Behind Baghdad 'Type Fossils': Dating and Tell Abu Sarifa

Introduction:

The purpose of this chapter is to re-assess the 'type fossils' Adams gives in *Land Behind Baghdad* for the Sasanian and Early Islamic periods (Adams 1965, pp131-133 and figure 14; see figures 5 and 6). It will be necessary to examine the references Adams himself used for these 'type fossils' in order to grasp how he dated them individually. As well as this, an examination of whether each 'type fossil' appeared at or was used at TAS is needed in order to further understand the evidence for the dating of the levels at this site.

An assessment of other excavators who use or have used Adams' 'type fossils' will also be required in order to identify the limits of their use and follow how influential they have been, and how any changes made to the 'type fossils' dating may affect other areas. This will also help in assessing the reliability of the 'type fossils' when compared to more recent evidence regarding their dating. One problem to bear in mind concerning the classification of ceramics, in this case Sasanian, is pointed out by Priestman. He notes that because the material can be defined as non-distinctive, it encourages constant reinvention in terms of the basic classificatory approach taken. This can mean that a lack of consensus continues and the comparison of Sasanian ceramics from different sites and areas can be hindered (Priestman 2009, p169).

Below is a list of the Sasanian and Early Islamic 'type fossils' given by Adams, with comments made by Adams in *Land Behind Baghdad* noted, as well as uses by other excavators. The dating for each 'type fossil', when enough evidence is available, is then discussed and its reliability evaluated. Where possible a new dating will be proposed, and some 'type fossils' may be deemed more useful than others. The appearance of the 'type fossils' at TAS is also discussed for each, in order to determine how any new dating affects the levels at the site. The next chapter will deal with the ramifications of any date changes, specifically how any re-dating in the 'type fossils' may affect the conclusions

made in the Diyala survey regarding the population, settlement, and agricultural patterns in the Sasanian and Early Islamic periods.

In *Land Behind Baghdad*, Adams does not give references for every type fossil. 'type fossils' with lower case bracketed letters indicate that Adams believed this to be a long-lasting type, and so its status as a valuable chronological indicator is vague, whilst upper case letters indicate that the type is of limited duration and so more restricted (Adams 1965, p127).

Adams provides drawings of his 'type fossils' in *Land Behind Baghdad*, However, drawings for types 12.F, 12. (k), 12.(l), 13.(g) are absent, for which no reason is given. See figures 5 and 6 for the *Land Behind Baghdad* images of the Sasanian and Early Islamic 'type fossils' respectively.

For appearances of 'type fossils' at TAS see figures 8a-8l.

Adams' Sasanian 'Type Fossils' in Land Behind Baghdad 1965:

Type 12.A:

Adams' 1965 Description:

This is a flaring cup or bowl with a carinated base and whitish-blue glaze. The rim is sometimes beaded, and it is usual for it to be slightly bevelled on the inner side (Adams 1965, p131; see figure 5a).

Adams' Land Behind Baghdad References:

Kish: Harden. 1934. Fig.2B: 2, 4:

2B: 2 (see figure 7a): A bowl. K 2306. SS 7-3m. H. 0.0t4m. This bowl is of buff pottery, and has iridescent blue-green glaze. There is carination near top side (Harden 1934, p128).

2B: 4 (see figure 7b): Bowl. K 2077. SS 7-2m. H. 0.054m. This bowl is of buff pottery, and has a faded, pale green to whitish glaze. There is carination near base.

According to Harden, it is most probable that this pottery belongs to the 5th and 6th centuries A.D. The latest coin found with the pots is one of Justinian I (A.D. 527-65) (Harden 1934, p124). A curious feature of

most of these bowls is that they have small knobs or excrescences placed at irregular intervals on the rims (Harden 1934, p124).

Type Fossil Use and Dating Evidence:

This type is used by Gibson at Kish 1972, is known as Type A, and is considered to be Sasanian. The ware is mustard yellow in most instances (p166).

At TAS 1970:

This type is known as Type M at TAS, described as being small, flaring, flat-based cups or bowls with thin, whitish-blue glaze. The yellowish, soft fabric is considered to be almost exclusively Sasanian. In addition, because of the softness of the fabric, generally only small fragments are found, and at TAS no reconstructible examples exist (Adams 1970, p106). At both TAS and the Diyala, this type was extremely common, and also constituted the predominant profile in late Sasanian levels at Kish, where it was securely dated to the 5th and 6th centuries AD on numismatic grounds (Adams 1970, p106).

However, Adams comments on the possible problems in correctly identifying this coloured glaze, as it can sometimes look more bluish-white than whitish-blue, and can even appear almost pure white. Some also have fine crazing patterns. The pure white glaze can be indistinguishable from a later glaze, which Adams calls 'pseudo-celadon' (Adams 1970, p107). In Levels II and III, he notes that a clear separation can be made between whitish-blue and blue-green glaze primarily on the basis of its colour. However, he points out that in Level IV, many body sherds could not be assigned to one category or the other. He claims that the former ware definitely is the more dominant in Level III, whilst blue-green ware appears to have become a more major ware by Level IV. It eventually supersedes the whitish-blue in Level V (Adams 1970, p107). The numbers in Level III for whitish-blue glaze total 121 sherds, whilst blue-green only totals 4 (Adams 1970, p93). However, given that he states that whitish-blue glaze can be difficult to determine from 'pseudo-celadon', one wonders how much the data may be affected by this factor, considering

that the evidence for intrusion and displacement at TAS has been noted.

Type 12.B:

Adams' 1965 Description:

This type includes Sasanian stamp impressions on the bodies of large plainware jars. They are normally in horizontal bands, and consist of rosettes, geometric designs, and animal representations. They are generally in a rectangular or circular field (Adams 1965, p131: see figure 5b).

Adams'' Land Behind Baghdad References:

Samarra: Sarre 1925, pp.8-11, Taf.3. (see figure 7c).

Animal figures such as Aries, Capricorn, deer, antelope, buffalo ox, lamb, and Trappe are found on the prehistoric pottery of Susa and Samarra. They frequently occur as motifs on ancient Near Eastern and Sasanian seal-cylinders (Sarre 1925, p10).

Ettinghausen 1938. 4:186 A. (see figure 7d)).

A jar with animal stamped relief in a rectangular field. British Museum. H.33cm.

Type Fossil Use and Dating Evidence:

This type fossil is used by Gibson and is known as Type B (1972, p166), and Wilkinson and Tucker as Type 78, consisting of animal and geometric stamps (1995, p105). Wilkinson and Tucker consider it to be Late Sasanian, although noted that there are a few Early Islamic examples (1995, p105).

In terms of the dating evidence, the area of Mesopotamia in which they are found may be a factor. Simpson comments that square or rectangular stamps are less common in the northern regions, and appear to be more a characteristic of the Diyala Basin. As well as this, in the Diyala Basin there is a marked absence of some of the characteristic Sasanian motifs, such

as the boar's head or composite mythological features (Simpson 1992, p287).

Across central and northern Mesopotamia, it was in the 6th and 7th centuries that large or medium-sized jars were produced and impressed around the exterior with wooden stamps (Simpson 1997, p79). Later in his examination of a class of Late Sasanian pottery in northern Mesopotamia, Simpson makes the observation that the central design on Late Sasanian stamps was often enclosed by a border, which could be linear, toothed, or ladder-like, or consist of a row of blobs (Simpson 2013, p102). These designs include crosses, monograms, or geometric "Catherine wheels", and also animals such as rams, stags, bulls, and horses with or without riders (Simpson 2013, p102). The stamped pottery discussed probably dates to the 6th – 7th centuries (Simpson 2013, p109).

At Kharabeh Shattani, two periods are identified by the ceramics: Late Sasanian (5th – 7th centuries AD) and Late Islamic (post-Ilkhanid – Ottoman/post-Ottoman) (Simpson and Watkins 1995, p178). The most distinctive of the Sasanian ceramics at Kharabeh Shattani are two sherds that belonged to medium sized jars. On the exterior they were impressed with circular die stamps – recognised as Late Sasanian in date, and characteristic of sites in northern and central Mesopotamia (Simpson and Watkins 1995, p179). Both of the stamps represented a stag facing to the left. Similar stamped pottery has been found at Khirbet 'Aqar Babira (Surenhagen 1987 a,b), Babneet, Tell Fisna (Numoto 1988, Fig.34:398-9), Tell Jambur (Toma 1987), Tell Jigan (Ii and Kawamata 1985, Fig. 11:180-3, Pl.34: 207-8), Khirbet Deir Situn (Curtis 1989) and Qara Dere (Roaf 1983) (Simpson and Watkins 1995, p179).

At TAS 1970:

At TAS, this ware preponderates in Level III (500-650 AD) (Adams 1970, p107). Figure 9 in Adams 1970 (see figure 8a) does not appear to show any animal representations, except for one in Level IV in a rectangular field (which Adams believes to be probably out of context). The remainder of stamps in the Islamic levels consist of geometric symbols in a circular field. This would seem to suggest that there are few examples of the

Sasanian types, namely rectangular, or with animals as a part of the design. Meanwhile, there are many more geometric examples, showing a little more complexity and variation through the levels, and perhaps suggesting greater Islamic influence considering the designs.

A possible sub-type is also present at TAS, described as being a “bull's eye” of concentric rings. It appears to have been the first type introduced, with one example being found in Level II, and following this, declining in the uppermost levels (Adams 1970, p101).

It is noted by Adams that in both the Sasanian and Early Islamic periods stamp impressions seem to occur almost uniformly on body sherds of large plain ware, and to increase in popularity during the Islamic occupation at TAS. As to their purpose, Adams suggests that the wide variety evident at TAS implies that they were decorative rather than a form of showing ownership (Adams 1970, p101).

Stamp impressions were relatively few in the early levels at TAS. It was also noted during the survey of the Nippur area that they were strikingly more rare on the Sasanian sites, than on corresponding sites in the Diyala region (Adams 1970, p101). Whilst it is difficult to be certain of the characteristics of the fragmented stamp impressions found in Level III at TAS, it is perhaps of note that the animal stamp in Level III could be intrusive from later or earlier levels.

Type 12.C:

Adams' 1965 Description:

This type is similar to type 12.B, and is called the Sasanian 'royal symbol' (see figure 5c) (Adams 1965, p131).

Adams' Land Behind Baghdad References:

Adams does not give any reference for this type fossil.

Type Fossil Use and Dating Evidence:

This type fossil is used by Gibson, and is known as Type C and is in

agreement with Adams that it is Sasanian in date (1972, p166). It appears to be the type that Brunner describes as a clan 'device'. He comments that Sasanian devices are apparent elaborations of the simpler emblems used in the Arsacid period. A Sasanian example can be seen in the symbol used by Ardasir I on his Firuzabad relief, which displays the sun-moon standard (Brunner 1978, 123). Brunner goes on to note that Late Sasanian devices showed an increasing tendency to have monographic elements to them (Brunner 1978, p123). This is something that this Diyala 'type fossil' does not appear to have, which could suggest it is earlier, however, Brunner does say that it became a tendency, not a rule.

This 'type fossil' does fit the description of what Brunner considers to be Sasanian: a crescent, with a standard branch. This branch can end in a variety of ways, such as a reverse crescent base or single or double line forms (Brunner 1978, p123-124). This 'type fossil' does appear to be an example of one of the lesser elaborate Sasanian 'devices'.

At TAS 1970:

It is unclear whether this type appears at Tell Abu Sarifa. There is no comment on it, however, one stamp does bear a crude resemblance to this type (see figure 8a, Level III). It may suggest a Sasanian date, however, as it is a lone example, it is not very useful when it comes to dating the levels.

Type 12.D:

Adams' Description:

A stamp impression, being a representation of a “net”, or double-x symbol (see figure 5d).

Adams' Land Behind Baghdad References:

Adams' does not give any references for this type fossil.

Type Fossil Use and Dating Evidence:

This type fossil is used by Gibson, known as Type D, and is in agreement

with Adams that it is Sasanian in date (1972, p166).

At TAS 1970:

This type is does not appear to be present at TAS, and Adams does not make any comment about it. However, as Simpson pointed out concerning the Diyala stamps, the fact that square bordered stamps seem to be more popular in that region than others, makes its absence at TAS less of a surprise.

Type 12.E:

Adams' 1965 Description:

These are low-ring bases of very large plainware jars or bowls. Deep finger indentations are widely spaced on the exterior surface at the junction between the base and vessel (see figure 5e) (Adams 1965, p131).

Adams' Land Behind Baghdad References:

Adams does not give any reference for this type fossil.

Type Fossil Use and Dating Evidence:

This type fossil is used by Gibson, is known as Type E and is considered to be Sasanian, as Adams suggests (1972, p166).

At TAS 1970:

Finger indentations corresponding to this description are mentioned to appear on high-ring bases, but not on low-ring bases, and are thought to have emerged as a Sasanian characteristic. However, even in Levels II and III, not many examples were found, specifically only seven out of a total of eight sherds (Adams 1970, p97).

Type 12.F:

Adams' 1965 Description:

Large, coarse jars with slash decoration on the low neck and shoulder. Rows of diagonal slashes are separated by concentric grooves (Adams 1965, p132).

Adams' Land Behind Baghdad References:

Adams does not give any reference for this type fossil.

Type Fossil Use and Dating Evidence:

This type fossil is commented on by Gibson 1972, is known as Type F, and is considered to be Sasanian in date. However, Gibson says that he has not used this type since because Adams does not provide references or illustration (p166). Indeed, it has been difficult to draw comparisons with pottery with absolute certainty concerning this type, especially since Adams does not give a reference either.

At TAS 1970:

At TAS this decoration was considered to be mainly Sasanian, but it did persist into the Islamic period (Adams 1970, p103). This type of decoration is applied horizontally to plain ware globular jar shoulders, and cut across by somewhat wider and deeper vertical incisions (Adams 1970, p103). In addition to the conclusions made about this type in *Land Behind Baghdad*, Adams comments that this Sasanian type continued into the Islamic period, with examples pointing to a peak in popularity in both Late Sasanian and Early Islamic times. Adams further notes that in surface collections in the Diyala region this type was more common than it was on the Nippur survey and TAS excavations (Adams 1970, p103).

Type 12.G:

Adams' 1965 Description:

A crudely made crescent handle attached to the simple rim of a very large

coarse bowl (see figure 5g) (Adams 1965, p132).

Adams' Land Behind Baghdad References:

Adams does not give any reference for this type fossil.

Type Fossil Use and Dating Evidence:

This type fossil is used by Gibson 1972, is known as Type G, and is considered to be Sasanian in date (p166).

At TAS 1970:

Adams does not make any specific comments on these crescent handles, however he does say that handles at TAS were virtually never placed on bowls (Adams 1970, p112), perhaps suggesting an absence of them at this site.

Type 12.H:

Adams' 1965 Description:

A lug in the shape of an inverted 'v' attached to the shoulder of large, well-made jar with a low neck. The ware is reddish-grey, polished, and has a large white grit temper (see figure 5h) (Adams 1965, p132).

Adams' Land Behind Baghdad References:

Adams does not give any reference for this type fossil.

Type Fossil Use and Dating Evidence:

Gibson 1972. This is known as Type H (Sasanian) at Kish, but is not used as a type fossil (p166), presumably again because Adams gave no reference.

At TAS 1970:

Lugs are described only as appearing on imported black stone vessels. On these black vessels, Adams does say that this type is probably limited

to the Late Sasanian period, and that it is rarer at TAS than on the Diyala plains (Adams 1970, p96).

Type 12.I:

Adams' 1965 Description:

The thickened rim of a large bowl. The entire interior and exterior of the rim is covered with a thin, bluish glaze (see figure 5i) (Adams 1965, p132).

Adams' Land Behind Baghdad References:

Adams does not give any reference for this type fossil.

Type Fossil Use and Dating Evidence:

This type is used by Gibson 1972, is known as Type I, and is thought to be Sasanian in date, though Gibson comments that he did not find it particularly useful as a type fossil (p166). However, evidence for dating this blue glaze could be found at the Deh Luran Plain. The OSL dating for a blue glaze sherd sample on the Deh Luran Plain (sample number OxL-1349) was 680±150, dating it and the mill in which it was found to a period between 530 AD and 830 AD (Hill 2006, p20). Unfortunately, that is quite a large time span to be dealing with. However, another Blue glazed sherd found at site DL-36 (Central) (sample OxL-1351) has an OSL date of 1290±150, putting it into a time frame of the Medieval Islamic period. This would suggest that on the Deh Luran Plain, the production of blue glazed monochrome pottery may have lasted into a later date than at, for example, Kish (Hill 2006, p20), or suggests that the OSL dating is not accurate enough to define the dating of this type further.

At TAS 1970:

This type fossil does not appear to have been present at TAS, and is not not commented on by Adams.

Type 12.J:

Adams' 1965 Description:

The base of a thick-sided, flaring bowl, unevenly finished. It has pronounced spiral corrugations, and is thickly covered with a dark, bluish-green glaze on the interior and exterior (see figure 5j) (Adams 1965, p132).

Adams' Land Behind Baghdad References:

Adams does not give any reference for this type fossil.

Type Fossil Use and Dating Evidence:

This type fossil is used by Gibson 1972, is known as Type J, and is considered to be Sasanian in date. However, Gibson comments that he did not find this ware to be particularly distinctive (p167).

At TAS 1970:

This type fossil does not appear to have been present at TAS. However, he does mention three examples of a pseudospiral motif, two of which occurred in Level V (Adams 1970, p110). However, the spirals do not appear to be as pronounced, as Adams also comments it is only noticeable on closer inspection that the motif consists of a series of concentric arcs rather than a continuous line, suggesting a more delicate form (Adams 1970, p110). There enough detail to be able to tell, and Adams believes that it is possible it could be related to the sgraffiato category (Adams 1970, p110).

Type 12.(k):

Adams' 1965 Description:

Truncated base of large “torpedo” storage jar. Frequently coated with bitumen on the interior, it is found at Samarra in large quantities (Adams 1965, p132).

Adams' Land Behind Baghdad References:

Samarra: Government of Iraq, Department of Antiquities, 1940. Pl. 12, 14, 20, 29 (Excavations at Samarra 1936-39 Baghdad) (see figures 7e-h respectively). There are no specific comments regarding this type.

Type Fossil Use and Dating Evidence:

Simpson notes that Sasanian torpedo jars have been found throughout Mesopotamia and the Gulf. They have been found at Tell Abbas, 'Ana, Coche, and Hamediyat (Simpson 1992, p292). Concentrations of torpedo jars were found at NS.1192, 1211, 1263, 1278 and 1628 (Adams 1981, p276-77, 278, 279-92). These concentrations may represent work shops, such as those excavated at Hamediyat (Simpson 1996, p292). Simpson comments that the Late Sasasian types do include Torpedo jars, however, he offers no indication as to how long it may have continued (Simpson 1996, p79).

This type fossil is used by Gibson 1972, is known as Type K, and is considered to be Sasanian in date. Gibson comments that it seems to have been introduced much earlier than Sasanian times, agreeing with Adams conclusions as to its longevity. Gibson makes the observation that the Parthian types are buff, whilst the Sasanian types are dark red and gritty. Jars found at Islamic sites are similar, but they do not have a small, plug-like ball inside the base (p167). This may seem useful, however, it is difficult to define the jars using these attributes with absolute confidence.

With Carter considering torpedo ware to be 7^{th}- 8^{th} century in date (Carter 2011).

Therefore, as Simpson states, these jars have a lengthy typological development from the Parthian to the Early Abbasid period and are found throughout Mesopotamia and the Gulf (Simpson 1992, p292). Indeed, over time, the view is that the dating range for Torpedo jars appears to have extended, and in so doing only agrees further with Adams that this type is long-lived. The more globular appearances, and slight difference in shape between the Islamic and the earlier periods may help in dating slightly, but these differences are not always visible, especially when dealing with

fragments. As a result, this attribute does not particularly aid in defining the Sasanian – Early Islamic change at TAS.

At TAS 1970:

These bases occur at TAS, described as “torpedo” and are either blunt-pointed or button bases (see figures 4j, 4k, and 8b), and are noted to often have a coating of bitumen on the interior. A distinction can also be seen between the Sasanian and Early Islamic forms, as the Early Islamic jars tend to be more globular in shape and have wider body diameters (Adams 1970, p100). However, this distinction would be difficult to detect on body sherds from a surface survey, due to the inability to see the jars in their entirety.

At TAS this type is called Type G, and is described as consisting of very large, elongated storage jars with club rims. Adams comments that it is a long lived type, an opinion not changed from that in *Land Behind Baghdad*. Adams believes that it is possible that it was present at the outset of the Sasanian period. As to the time of its demise at TAS, the frequency declines in Early Islamic times, and even more sharply during the latest occupied level. However, it is present in all levels from Level II (Adams 1970, p100). This would indicate that it is not a particularly useful type fossil in identifying where the Sasanian and Early Islamic change began. Although there may be marginally more examples of rims and bases in Level III, it is difficult to determine whether these examples are Sasanian or Islamic, as although the distinction between the different period's bases is acknowledged, it is not clearly shown. Without much detail of the material, it is also not possible to use the four sub-classes outlined by Priestman (Priestman 2005).

Type 12.(I):

Adams' 1965 Description:

The rope-rim of torpedo jar, and is at best a vague chronological indicator

as it began at least as early as the Parthian period (Adams 1965, p132).

Adams' Land Behind Baghdad References:

Samarra: Government of Iraq, Department of Antiquities, 1940. Pl. 12, 14, 20, 29 (Excavations at Samarra 1936-39 Baghdad). (see figures 7e-h). There are no specific comments regarding this type.

Seleucia: Debevoise. 1934. Figs. 95-96.

Fig 95: (see figure7i)): A storage jar with a buff body, coarse texture, and is well made. H. 80, D. 16, 37. Its primary purpose was for storage (Debevoise 1934, p60).

Fig 96: (see figure 7i): A storage jar with a buff body, coarse texture, and is well made. H. 101, D. 18, 38 (Debevoise 1934, p60).

This type of jar was found in every level, although there were some changes in their form in the different periods. Many were lined with bitumen (Debevoise 1934, p18). The fact that this type was found in every level suggests that it is a long-lived type.

Type Fossil Use and Dating Evidence:

This type fossil was used by Gibson 1972, is known as Type L, and is considered to be Sasanian (p167).This feature has not been noted as being present in the Gulf (Kush: Kennet 2004, Kadhima: Kennet et.al 2011), and is therefore impossible to evaluate at this stage.

At TAS 1970:

At TAS this is known as Type G. Approximately ten per cent of the rims have a notched appliquéd ridge applied below the rim on the exterior (see figure 8c). This feature disappeared at TAS after Level III (Adams 1970, p100). At TAS, this type appears to have been more prevalent in the earlier levels, specifically Levels II, III, and IV.

Type 12.(m):

Adams' 1965 Description:

This type is generally called “Honeycomb ware”. This surface treatment appears on globular bowls or jars. It antedates the Sasanian period and may also continue for a longer period (see figure 5m) (Adams 1965, p132).

Adams' Land Behind Baghdad References:

Assur: Andrae and Lenzen 1933. Taf. 56 h-k, n.

Type Fossil Use and Dating Evidence:

Honeycomb ware has long been regarded as a type fossil of the Sasanian period, and a date range in the late Sasanian and Early Islamic periods generally has been accepted (de Cardi et.al 1994, p58). Northedge, in his 1985 report for the years 1983-4 excavations at Samarra, also names honeycomb ware as being Late Sasanian/Umayyad. Evidence apparently supporting this included that at the excavations at Ana, where honeycomb ware appeared only in the third of three Sasanian strata, being introduced in the late phases of the Sasanian period and continuing in use into the Umayyad period (Wilkinson and Tucker 1995, p106), thus supporting the supposition that honeycomb ware was introduced in Sasanian times (Northedge 1985, p121). Examples of similar date also came from Tulul al-Ukhaidir, Nuzi, and Samarra (Wilkinson and Tucker 1995, p106).

However, since Adams' excavations at TAS, the dating and distinctions of honeycomb ware have been called into question. For example, Simpson pointed out that honeycomb ware has not yet occurred in a well-dated Sasanian context and that it is absent from the Choche sequence, which suggests that it should rather be used as a diagnostic type of the Early Islamic period (Kennet 2004, p59).

Similarly, Kennet notes that the only dated context (at the time of writing in 2004) where honeycomb has occurred is at Tulul al-Ukhaydir where is was associated on a single phase site, with three coins dated from the late 7th to the early 8th century (Kennet 2004, p59). Similar dating can also be

attributed to honeycomb ware found in all areas of Samarra suggesting that it was continued to be used into the 9th century, as well as one sherd occurring in the phase sequence at Kush, specifically Phase E-05, dated to the late 8th/9th century (Kennet 2004, p59), and several sherds at Ras al-Khaimah that can probably be dated somewhere in the 7th-8th centuries (Kennet 1997, p295). The situation appears to be that there is a general agreement that honeycomb ware has been demonstrated to be predominantly 8th or possibly 9th century in date (Kennet 2007, p97), and possibly the 7th century, with it being mainly manufactured in southern Iraq (Priestman 2005, p11).

In addition to this possible re-dating of honeycomb ware, the category itself may not be as straightforward as at first thought, as the appearance of late Sasanian 'smeared ware' makes the identification slightly more difficult. This would also have an effect on its dating. It is regarded as being related to honeycomb ware, but in some cases is earlier (Wilkinson and Tucker 1995, p105). The fact that there are distinctions between the two wares is pointed out by St John Simpson. In comparison with “smeared ware”, true “honeycomb ware” (being more geometric and defined than smeared ware) was apparently rare and limited to primarily Early Islamic assemblages from Babneet and Bir Hami in the north (Simpson 1996, p100).

For the dating of smeared ware, which also appears to be present at TAS, in the area of Saddam Dam it is regarded as Sasanian, a date supported by surface associations in the north Jazira (Wilkinson and Tucker 1995, p106). In support of this dating, it should be noted that smeared ware occurs at other Sasanian sites in southern Mesopotamia (for example, at Kish) whereas regular honeycomb impressions are found as an all-over surface treatment on Early Islamic jars from Samarra and other Early Islamic sites (Simpson 1996, p100). Smeared and finger trailed examples have been found at Batas, Kh. Deir Situn, Hamediyat, Kish, Qara Dere, and elsewhere. Corresponding evidence for an Early Sasanian date is lacking (Simpson 1992, p295).

Another location where the distinctions between smeared ware and honeycomb ware are relevant is at Ras al-Khaimah. A number of sherds

occurred in a fabric identical to honeycomb ware – named 'honeycomb fabric'. However, this honeycomb fabric lacked the distinctive surface decoration. It was commented upon that it seems that 'honeycomb' decoration does not necessarily cover the entirety of the vessel these sherds could equally be honeycomb or late Sasanian smeared ware (Kennet 2004, p59).

This could have implications for the dates of the levels in which the ware is found, but overall the changes could suggest that there are regional differences regarding when the different wares were used, or if this is not the case, at the very least supports the suspicions that the class of honeycomb ware is perhaps less straightforward than originally thought. Although it does seem to be fairly agreed upon that it is Islamic rather than Sasanian, the precise span of it is not clear, with it being “predominantly 8th or possibly 9th century” in date (Kennet 2007, p97), and “possibly” the 7th century (Priestman 2005, p11).

At TAS 1970:

“Honeycomb' is described as a textural modification made to large plain ware storage jars, though at TAS no reconstructible examples were found. This technique was usually only applied to the lower portion of vessels, making it more difficult to associate these sherds with corresponding rim profiles. The honeycomb effect in earlier examples is more geometric in appearance (Adams 1970, p102). The earlier, less geometric-looking honeycomb ware is known as “Fingerdrunkmuster (Adams 1965, p132, 181, 234) (see figures 8d and 8e).

In terms of dating, it first appears in Level II, and abruptly vanishes in Level IV, and so is concluded to be a useful indicator of the Late Sasanian period (Adams 1970, p102). In regards to the distinction between the more geometric examples of Honeycomb and smeared ware, it may be significant that Adams does comment that whilst some sherds with "honeycomb" surface treatment were found in Level II, in general the earlier examples seem to have been more geometric in arrangement and more carefully executed than the great abundance of this fabric that appears only in Level III (Adams 1970, p102).

Adams is also clearly aware that barbotine wares were intensely developed at sites in northern Mesopotamia coeval with Levels IV-VI at TAS (Adams 1970, p105) and does not appear to make a connection between barbotine ware and honeycomb decoration. However, there was not much evidence of barbotine evidence to work with due to the scarceness of it in the south: only two or three sherds found in surface reconnaissance of several hundred Islamic sites in the Nippur region around Abu Sarifa, and at Abu Sarifa itself there was only one possible example of a barbotine plain ware handle (Adams 1970, p105).

Overall, the example of possible smeared ware at TAS seems uncertain in how it should be dated as it appears after the more geometric examples of Honeycomb ware. It is possible that it is intrusive. However, to make a dating conclusion based on one sherd would be tenuous. If Honeycomb ware proper is an indicator of the Early Islamic period, this would suggest that the Early Islamic period could extend as far back as Level II at TAS. However, with the overlapping of other Sasanian wares, especially in Level II, it is probably more likely the change in period occurs in Level III.

Adams' Early Islamic 'Type Fossils' in Land Behind Baghdad 1965:

Type 13.A:

Adams' 1965 Description:

These are large decorated jars of soft buffware. The exterior is covered with a greenish glaze. The decoration consists of broad line incisions in an “advancing wave” pattern, appliquéd wavy lines and dots, and rosettes of smaller appliquéd dots. The glaze is of an uneven thickness. According to Adams, it was probably introduced in the Late Sasanian period (see figure 6a) (Adams 1965, p132).

Adams' Land Behind Baghdad References:

Susa: Lane. 1947. Pl. 3: (see figure 7j):

A blue-green glaze jar from Susa. Sasanian or Early Islamic. 7Th – 8th

century AD. Ht. 22.5 in. Louvre Museum.

This glazed ware is a long-term type. It was used in Parthian times, and continued in use through the Sasanian period (AD. 226-641). It went on to still be used in the Islamic period. Often, the coarse pottery has characteristic decoration in the form of chip-carved triangular necks. The Sasanian vessels have been known to be in human and animal form, although the majority were the large storage jars that have ever been a standard in the Near East (Lane 1947, p9).

Sarre and Herzfeld. 1920. Vol. 4, Taf. 143. (see figure 7k)).

A large green-glazed jug with relief decoration.

Baghdad: Sarre, F. 1925. Taf. 6. (see figure 7l).

A large ovoid vase with internal and external green glaze. On the upper part of the body there are three half circles with spiral tendrils and leak motifs. H.70cm. Acquired in Baghdad (Sarre 1925, p29).

The glaze on these vessels in the interior appears to be thinner, with the glaze itself containing alkaline ingredients and sometimes zinc oxide (Ibid, p28).

Type Fossil Use and Dating Evidence:

This type fossil is used by Gibson 1972, is known as Type A, and is considered to be Early Islamic. The glaze is also described as being uneven (p167-8). Other excavators and studies that support an Early Islamic date include Carter 2011. Turquoise Glaze Ware (sometimes referred to as Alkaline Glaze) is also suggested to have an Early Islamic date at North Jazira by Wilkinson and Tucker 1995, where it is known as Type 74, and is described as being Early Islamic. However, Northedge suggests a later date (Northedge 2005 p57). The buff yellow fabric, blue-green glaze over incised and barbotine decoration (“Sasano-Islamic” ware) is categorised by him as being in the pottery dated to the 'Abbasid medieval eras from Area D, Shaykh Wali. Another example of a late date would be at Sohar, where quantities of sherds of blue-green glazed ware were found and were believed by Cleveland to be dated from the 11th-13th

centuries. However, there was nothing uncovered that suggested a pre-Islamic occupation (Cleveland 1959, p15), thus not providing evidence for blue-green glaze to being started in the Late Sasanian period.

These variations in date highlight a problem with the identification of this type, and the necessity to make a distinction when it come to the appliqué decoration. It is confusingly termed “Sasano-Islamic ware” sometimes. The type is also known as TURQ, TGP, or alkaline glazed ware, and is part of a long tradition of alkaline glazed wares that became common in the Parthian period and continued to the 10th century AD. When the tradition of turquoise glazed ware continued into the Sasanian period, it is noted that it possibly became more thickly glazed (Kennet 1994, p193; Simpson 1992, p299-301).

Examples of appliqué decoration turquoise glazed ware can be found on a number of Islamic-period sites such as, Siraf, Al-Qusur, Ali, and Susa, where the sequence shows clearly that this type of ware was used until the end of the 9th century (Kennet 1994, p193-194). At Susa, Phase I includes the 10th century and possibly the beginning of the 11th. Phase II begins at the end of the 8th century and continues over the 9th century. Phase III sees the start of the Islamic periods, beginning with the first half of the 7th century and going into the second half of the 8th (Rosen-Ayalon 1971, p205).

According to Simpson, Adams' Type 13 A is “So-called Sasano-Islamic Blue Glazed ware” (Simpson 1996, p79) and there is no archaeological evidence from Mesopotamia, or indeed elsewhere, to support a Sasanian date for it (1996, p308). This would appear to be supported by the evidence above. As Mason an Keall point out, the alkaline turquoise glaze tradition itself can be traced back to the Parthian period at least, but if one does not distinguish between the sub-types and is specific, this type could equally be called “Partho-Sasanian-Islamic” (Mason and Keall 1991, p52). It is therefore necessary to keep these distinctions in mind. For example, on the Deh Luran Plain, a Blue-green glazed sherd found at site DL-34 (sample OxL-1350) was given an OSL date of 490±180. This date is consistent with a Parthian or Early Sasanian date (Hill 2006, p20), meaning that it is unlikely that this glazed piece is Adams' Type 13A, as it

has a Sasanian date.

Blue-green applique decoration glazed ware is also found at Samarra, in a presumably 9th century context (Adams 1970, p106). That this blue-green glaze predominates in the Islamic periods does appear to be strongly indicated by many sites. Other convincing evidence is given by Carter, who as Sir Bani Yas shows that C14 dates confirm the time in which barbotine is present confirm a mid-7th and mid-8th century date range (Carter 2008, p90).

It is therefore important to note that whilst there is a long tradition of blue glaze, this type, although a part of the tradition, it does have its own date range that will not extend as long as the tradition itself. This tradition was caused because during the Sasanian period, glazed ceramics were produced using alkaline-based fluxes. This is a technology that had been practised for nearly 1700 years (Hill 2006, p1). There is therefore some difficulty in dating turquoise glazed ware because this tradition stretches back so long – as long as to the 7rd century BC (Kennet 1994, p193).

In conclusion, the term 'Sasano-Islamic' has proved to be an ambiguous one. There is a definitive distinction between general turquoise glaze and appliqué decoration. These two glazes are part of a long term tradition, but they each have different time spans. This type refers to the appliqué decoration. So, whilst overall, it is generally agreed that blue-green glaze tradition started before the Sasanian period and continued to the 10th century, this this type, which is a part of the tradition that panned s long, is actually post-Sasanian, ranging form the 8th to 10th centuries. The use of it as a terminus ante quem at Jazirat al-Hulayla does seem sensible. Here, in Period I, an 8th century terminus ante quem was deemed appropriate, supported by the absence of the “Sasanian Islamic turquoise-glazed ware with applied decoration and is dated to the 8th or 9th centuries (Kennet 1994, p169).

At TAS 1970:

These large, soft buffware jars have strap handles and a deep blue or blue-green all-over glaze. The blue-green glaze is dense and uneven,

applied to a soft yellow, flaky fabric, and most characteristically applied to large strap-handles jars of type N(see figure 8f). It is occasionally see with bowl forms under type D. The appearance of unevenness is caused by the low horizontal corrugations in the fabric, changing the hue of the glaze. The glaze on the interior is often lighter (Adams 1970, p107). Adams says this type is also found in Early Islamic-Samarran levels at Wasit, (where it is described as “a survival of the Sasanian technique” - evidence Adams uses for further supporting the idea that it is a transitional ware (Adams 1970, p106)) and also in 8th century levels at Hira and Susa, and presumably 9th century levels at Samarra (Adams 1970, p106). Adams comments that all-over glaze is applied to jars in all cases, but on some Islamic bowls it covers the interior but stops just below the exterior rim. In terms of its dating, Adams suggests that although it predominates over all the other glazes in the Islamic levels, blue-green glaze probably began in the late Sasanian period (Adams 1970, p108). Indeed, Adams notes that blue-green glaze was profuse in the Diyala region, and was used during surface reconnaissance as an identifier of the Early Islamic period (Adams 1970, p106).

Indeed, in comparison with its common appearance in the Diyala, at TAS this type is scarce (Adams 1970, p106). In addition, the appliquéd underglaze decoration that is normally associated with this form is virtually absent at TAS (Adams 1970, p07). The blue-green glaze is suggested to have been probably begun in the Late Sasanian period, but at TAS it does predominate over all the other glazes in all of the Islamic levels (Adams 1970, p108).

However, type N is not a particularly common type at Abu Sarifa, even in Islamic levels, and only one sherd can be attributed to a Sasanian level (Adams 1970, p107). It Is possible that this sherd is actually in a level that should be dated as Islamic.

Type 13.B:

Adams' 1965 Description:

The rims of Type 13A. They have a low vertical neck with multiple grooves

and a flattened ledge-lip, and have a greenish glaze, as well as a crescent lug-handle alongside the neck (see figure 6b) (Adams 1965, p132).

Adams' Land Behind Baghdad References:

Samarra: Lane, A. 1947. Pl. 3. (see figure 7j).
Also see type 13.A.

Samarra: Sarre, F., Herzfeld, E. 1920. Vol. 4, Taf. 143. (see figure 7k).
Also see type 13.A.

Sarre, F. 1925. Taf. 6. (see figure 7l).
Also see type 13.A.

Type Fossil Use and Dating Evidence:

This type fossil is used by Gibson 1972, is known as Type B, and is considered to be Early Islamic (p168). See type 13. A.

At TAS 1970:

See Type 13.A.

Type 13.C:

Adams' 1965 Description:

A flaring, slightly rounded bowl. Crude, blue-glaze splashes form a radiating pattern against a white glazed background on the interior (see figure 6c) (Adams 1965, p132).

Adams' Land Behind Baghdad References:

Samarra: Sarre, F. 1925. Abb. 142. (see figure 7m).

Type Fossil Use and Dating Evidence:

This type was used by Gibson 1972, known as Type C, and considered to be Early Islamic (p168). At Hulaya, it is Ware 20 (Kennet 1994), and at

Kush, this glaze is known as COBALT, where eighteen examples were found in Phases E-06 to E-08, with E-06 being of early 9th century in date (Kennet 2004, p3). Fourteen sherds of cobalt blue glaze on white glaze were discovered on the Deh Luran Plain, all of which have a light yellow-coloured paste, which is a common feature in the ceramics from Samarra, and indicates that they have a common source (Hill 2006, p12: Northedge and Kennet 1995, p25). Cobalt ware occurs at Samarra, but not at all sites, and not in great quantities, implying that it may have gone out of use very soon after the founding of Samarra in AD 836 (Kennet 1994, p192). White glazed ware with cobalt decoration is generally agreed to be one of the earliest wares of the so-called "Samarra horizon", which Kervran suggests appeared at Susa in the mid-8th century (Kennet 1994, p192). It is suggested that this cobalt ware should be dated to the early 9th century AD, and possibly out of use by 838 AD (the founding of Samarra) at the latest (Kennet 2004, p32; Northedge and Kennet 1995, p25). Whitehouse has placed cobalt ware to appearing at Siraf after 825, and Tampoe also places it to the end of the 9th century (Kennet 1994, p192).

In conclusion, a 9th century date seems to be the consensus.

At TAS 1970:

At TAS, and an addition to the description is made, as Adams comments that the fabric is fairly hard, and that the blue colour of the glaze is occasionally dark violet. Adams notes that whilst this type was common in the Diyala region, not many examples were found at TAS. Adams noted that it seems to to be very rare at Nippur as well (Adams 1970, p110). Only one typical sherd was found on the surface and in Level IV (Adams 1970, p110).

Type 13.D:

Adams' 1965 Description:

A splash-glazed ware in imitation of T'ang imports, with long splashes of green or green and yellow over white slip on a reddish, well-levigated

ware. The splashes generally form radiating patterns (see figure 6d) (Adams 1965, p132).

Adams' Land Behind Baghdad References:

Samarra: Government of Iraq, Department of Antiquities. 1940. Pls. 61-64 (see figures 7n-q).

Samarra: Hobson, R. L. 1932. Fig. 13. (see figure 7r). A basin found in fragments of Samarra.

Susa: Lane, A. 1947. Pl. 7B. (see figure 7s).

A lead-glazed, mottled green, brown and purple bowl, from Susa. Mesopotamia, dating to the 9th century. D. 9 7/8 in. Sir Alan Barlow.

In appearance this type has similarities with the mottled Chinese stoneware from which they were first copied. Designs painted using the glaze was also attempted, although the colours tended to run, so the simple spots and stripes pattern was more successful, and as a result more common. T'ang mottled wares have been found at Fustat in Egypt; Samarra, Samarkand, and Nishapur in Eastern Iran (Lane 1947, p12).

Pope, A. U. 1938. Vol. 5, Pls. 568B, 570. 2:1446-1666; 5 (see figures 7t and 7u)): Pls. 555-811:

Pl.568B: T'ang splash glazed plate. D.23cm. Collection J.A. Barlow. 8th or 9th century.

Pl.570: T'ang splash glazed bowl. D.25cm. Collection Eumorfopoulos. 8th or 9th century.

The most common shapes for this type are large flat plates, large deep bowls with flaring sides, and some small saucers and trays. They usually have a red body, are fairly hard, with relatively fine grain. This type is directly copied from T'ang pottery, and has been found at Rayy, Susa, Tiz, Qasr Abu Nasr and Istakhr. The dating was made on the basis of finds at Samarra, Susa and Ctesiphon, where the evidence indicated that this style belongs to the 8th and 9th centuries, and by the

11th century the splash glazes seem to have been replaced by new techniques and colours (Pope 1938, p1500).

Sarre, F. 1925. Taf. 32: 4. (see figure 7v).

Type Fossil Use and Dating Evidence:

This type is in imitation of the Chinese ware of the T'ang dynasty, which is also known as “egg and spinach” ware (Wilkinson 1947, p100). It is used by Gibson 1972, who refers to it as Type D, and it is considered to be Early Islamic (p168). Kervran refers to this class as *glacure jaspee* at Susa (Kervran 1977,p152), and Northedge 2005 (Fig 20.3. DP68.) also uses this type, calling it Splash Glaze. It is found in Area L (al Matira). This example bowel from Northedge has a straight flaring rim, with a pinkish buff surface and core, and yellow and green splash glaze. It is considered to be 10th century/ Early Islamic/ Post Sasanian in date.

Evidence to support the dating an Early Islamic date for imitation T'ang splashed glaze pottery appears at Ab-i-Bid. Quantities of imitation T'ang splash-glazed pottery, alongside other Islamic wares were found in the fallen debris filling the excavated rooms and corridor (Adams and Hansen 1968, p68) at Ab-i-Bid (Adams and Hansen 1968, p63). As well as this, at Tabl Khaneh, within Jundi Shapur: it is suggested that the imitation T'ang splash glazes are Early Islamic (Adams and Hansen 1968, p55). These two places would seem to support the view that the imitation T'ang splash glazed ware is within a correct date at Abu Sarifa.

Ultimately, this type is a splashed ware, and so is a part of the Samarran class SPLASH at Ras al-Khaimah. This class consists of thin-walled bowls with a pure, off-white to buff body, glazed on both the interior and exterior. Making this class even more complex is the fact that the decoration is extremely variable and infinitely sub-divided. It mainly consists of undefined areas of green, brown and yellow splashes, with green often being the predominant colour (Kennet 2004, p33).

Splash glazes first appear in Mesopotamia during the occupation of Samarra (836-893 AD) (Northedge and Kennet 1995). On the Deh Luran Plain, splash glazes were discovered at twenty-one sites. Hill notes that as

evident at Susa, splash glazes have their origin in the Sasanian period, and did not reach a high level of stylistic diversity until the 9th century AD (Hill 2006, p10).

This ware can also have underglaze incising, an attribute which makes it more valuable as dating evidence. Splash glazes that do not have incising are thought to have been a precursor to the later sgraffiato types (Hill 2006, p11). The later patterns for this incising have more dense and more complex incisions, in contrast to the earlier more fluid and hurried improvisations (Adams 1970, p109).

The earliest example of T'ang splashed ware comes from Antioch or Tarsus, dated to either the late Umayyad period or early Abbasid (Day 1941, p29). Other evidence for this date is the fact that this ware was common in the Abbasid areas of Hulayla (Kennet 2004, p33; Kennet 1994: ware 24).These both fit with the dating of the imitation of the ware beginning around this time. Further supporting this dating is the fact that the earliest products of the Baghdad kilns were attempts made to imitate Chinese T'ang porcelains, dated at least after the end of the 8th century after the contact with the Chinese stoneware and porcelain (Grube 1965, p209). However, a later date is put forward by Kervran, who suggests that splashed ware is to be dated to the early 9th century (Kennet 1994, p193).

The above evidence would suggest that the dating for imitation T'ang splash glazed ware appears to be fairly firm, and that it seems reasonable to think that the imitation T'ang ware at TAS is probably fairly correct. It is clear that this ware is common in Iraq and has been found along the shores of both the Gulf and Arabian Sea. Kennet comments that surface collections at Samarra have demonstrated that SPLASH is not found at al-Qatul which was occupied in 835-6 AD, but it has been found at the site of al-Mutawakkiliyya which was occupied between 859 and 861 AD (Kennet 2004, p33). Kennet therefore concludes that this ware was introduced after 835-6 and before 861, with no certainty as to when this ware went out of use (Kennet 2004, p32).

At TAS 1970:

This technique was mostly found on open, ring-based bowls or dishes, as

well as on miniature vessels. The number of sherds found were deemed too small to justify a conclusive decision, Adams brings attention to the fact that there are significant typological shifts within this category (Adams 1970, p108). For example, dense, all-over colour patterns with closely grouped streaks or splashes with long tails appears to be the earlier design (Ibid). (see figures 8f-8i).

Adams notes that the splash glazes appear to be the group most sensitive to change, particularly when associated with under-glazed incised decorations. With these decorations, they represent an artistic medium that because of its complexities is susceptible to innovation, which means that it is predisposed towards chronological shifts (Adams 1970, p113-114).

It occurs with and without underglaze incising, and is also numismatically dated to the 8th and 9th century levels at Hira (Adams 1970, p108). Adams dates this imitation ware to being 800-950 AD in accordance with it being equated with Level V (Adams 1970, p118). This would appear to fit with Hall's comments that T'ang ware in general is regarded as having been made well before the 10th century, but there is the possibility that it was a provincial type and was its manufacture continued much later (Hall 1934, p59).

Type 13.E:

Adams' 1965 Description:

This type is similar to type 13.D but also has simple sgraffito decoration incised through slip under glaze. The decoration consists of loosely drawn curvilinear motifs. This type is not always distinguishable from “classic” graffiato, and probably overlaps with it in time (see figure 6e) (Adams 1965, p132).

Adams' Land Behind Baghdad References:

Samarra: Lane, A. 1947. Pl. 6B. (see figure 7w).

Lead-glazed sgraffiato ware, mottled green and brown. From Nishapur.

Persia. 9th century. D.10 ¼ in. New York, Metropolitan Museum.

Islamic pieces, such as this example, were more likely to have scratched patterns (sgraffiato) through the white slip to the underlying clay with he glaze applied on top. From the 9th century to the 12th century, or even later, these pseudo-Chinese mottled sgraffiato wares were made nearly everywhere in the Eastern Caliphate (Lane 1947, p12).

Pope, A. U. 1938. Vol.5, Pl. 568A, 569 A and B. (see figures 7x-z respectively)):

Pl.568A: T'ang splash glazed bowl, incised. D.21.7cm.

Pl.569A: T'ang splash glazed bowl, incised. D.32cm. 8th or 9th century.

Pl.569B: T'ang splash glazed bowl, incised. D.29.5cm. 8th or 9h century.

These bowls represent the T'ang splash glaze becoming more complex, such as the radial schemes in Pl.568A. Similarly, a secondary theme in the incised designs becomes present, as seen in Pl.569, as intersecting circles creating 'peals' radiating from the centre (Pope 1938, p1500).

Samarra: Government of Iraq, Department of Antiquities, 1940. Pl. 76, 81, 83-85. (see figures 7aa, 7ab, 7ac-ae).

The incised patterns on this ware are various, either thick or thick, straight, wavy, broken, parallel or intersected, and are grouped to form a design that generally creates foliage or animal patterns (1940, p7).

Type Fossil Use and Dating Evidence:

This type fossil is used by Gibson 1972, is known as Type E, and is considered to be Early Islamic (p168). At Ras al-Khaimah, this ware is part of a class called EGRAF, or Early Sgraffiato, and is part of the Samarra Horizon wares. The ware is described as being nearly always bowls that are thin-walled, with the clay being of varying composition. The glaze is usually thin and evenly applied and can vary from monochrome green to a colourless glaze splashed with green, yellow, and brown. It is sometimes glazed on both the exterior and interior, and sometimes only the interior (Kennet 2004, p34).

At Susa, this type appears to be most present in Level VI. The following examples were all found in this level: a white slipped bowl with incised sgraffiato decoration, with green, white and yellow spots under a transparent glaze; a bowl with an everted rim, fine buff fabric, and opaque white glaze with cobalt oxide decoration on the interior (Kervran 2004, p316, Fig. 29.12, Fig. 29.13); a bowl fragment with fine pinkish fragment, incised sgraffiato pattern, and a creamy slip under uncoloured transparent glaze with green spots; a bowl fragment with fine pinkish fragment, incised sgraffiato pattern, and creamy slip under an uncoloured transparent glaze (Kervran 2004, p322, Fig. 33.1,Fig. 33.2).

In must be noted that there is a distinction in sgraffiato ware, mainly made between the earlier and later representations. However, Kervran's conclusion of a mid-8th century date for the introduction of the Samarra horizon could possibly be slightly too early (Kennet 1994, p169). The earliest context, that is also well-dated, which contains the relevant wares for the Samarra horizon is the platform fill of the period I Mosque at Siraf. This also contains lead coins, with the latest dated to AD 803/4 (Kennet 1994, p169). At Siraf Period 3 is dated to the 11th century onwards, Period 2 c.825-50 to c.977-1055, and Period I before c.825-50, perhaps beginning c.800 (Whitehouse 1968, p9). A lot of the Islamic pottery found in Periods I and 2 at Siraf in the sounding and other contemporary deposits elsewhere closely resembles pottery from sites such as at Susa and Samarra (Whitehouse 1968, p14). Overall, the introduction of sgraffiato ware appears to date to the 10th century, based on the material from these sites (Kennet 1994, ware 18).

Early Sgraffatio wares' introduction has been suggested to be after 885-895 AD (Kennet 2004, p32: citing Northedge and Kennet 1994 and Northedge 1996). Earlier dates have been put forward, such as at Wadi Beni Kharus, where Early Sgraffiato is considered to be Early Islamic (630-1055 AD) (Whitcomb 1975, p125: Fig.2. u). At this same site, the dating for late sgraffiato is the Late Islamic period (Whitcomb 1975, p125: Fig.2. o, t). In general, the sgraffiato decoration appears to be considered Late Islamic, as is the case at Jundi Shapur (Adams and Hansan 1968). At Khatt it is dated to 9th – 10th centuries (Cardi et.al 1994), at Jazirat al-

Hulaya 1000-1200 AD (Kennet 1994), at Samarra (al-Matira) 11th century (Northedge 2005), Kush/al-Mataf 950-1150 AD (Priestman 2005, p67), and finally at North Jazira 1000-1300 AD (Wilkinson and Tucker 1995). Early sgraffiato ware at Siraf occur in most of the larger 9th and 10th century deposits, and belong to one single type that has a smooth pale pink fabric, as well as only being fragments of plates and dishes. These often have a broad rim, decorated on the inside with lightly incised floral and abstract motifs. A yellowish glaze with streaks and splashes of green and yellowish brown form the glaze. It is noted that this type closely resembles the sgraffiato ware from Samarra (Whitehouse 1968, p15).

Early sgraffiato ware at Siraf occurs throughout Period 2 and also occurs in Period 3. However, Whitcomb notes that it is likely that these Period 3 sherds are actually residual due to the unusually abraded condition and that the ware in fact went out of use at the end of Period 2 (Whitehouse 1968, p15). On the Iranian side of the Gulf later sgraffiato sherds also appear at Bushire, Bibi Khatun, Qal'at-i Sarawan, and Leshtan (Whitehouse 1968, p15).

At Siraf, later sgraffiato sherds rarely appear in Site A in deposits associated with the latest occupation. The majority of the sherds are present in Period 3, which started no earlier than 977 and almost certainly no later than 1055 (Whitehouse 1968, p15). Recognisable patterns of sgraffiato can be identified as part of later sgaffiato, such as hatched sgraffiato. Hatched sgraffiato has incised decoration that form floral motifs or pseudo-knife inscriptions with hatching. Only one sherd of this ware was found at Jazirat al-Hulayla (Kennet 1994, p191). At Siraf the introduction of hatched sgraffiato appears to post-date a coin hoard dated to 1026/7, and at Arja it did not occur in contexts which pre-date a radio-carbon date of AD 1030 (Kennet 1994, p192)). Hatched sgraffiato (Kennet 1994, ware 18g) also appeared in the 11th century at Jazirat al-Hulayla (Kennet 1994, p170, p191), which would appear to support this date. Whilst the style of hatched sgraffiato was possibly introduced during or after the second quarter of the 11th century, with Williamson placing it into the period of 1025-1050 to 1125-1150. However, he did not clarify the evidence for this (Kennet 1994, p191-192).

Other forms include other motifs. For example, the commonest forms of later sgraffiato ware at Siraf are bowls with slip on the inside and decorated with Kufic and pseudo-Kufic texts, leaves and geometric motifs, arranged in concentric zones, with the background often hatched. The glaze on the inside of the bowl is typically yellowish with splashes of green, purple and yellow (Whitehouse 1968, p15).

For the ending date of this ware, Sgraffiato had a very wide distribution and becomes very common until the 13th when it begins to decline, with the possibility cheap celadon imports eventually forced it out of the market (Kennet 1994, p191). However, the focus here is on the Early Sgraffiato. Therefore, Kennet comments that overall, the Samarran evidence for the dating of this ware is stronger. This means that whilst earlier thoughts on the dating of this ware placed it as one of the earlier Samarran classes (such as by Sarre 1925), surface collection at Samarra has demonstrated that it was introduced after the main occupation of the city. This would place the ware to either the very late 9th century, or the early in the 10th century (Kennet 2004, p34; Northedge 1985, p124; Northedge and Kennet 1994, p33-34).

At TAS 1970:

For this ware there is evidence that the incising conveys typological transitions between the styles that predominate in the Early Islamic sequence and those that were used at the point of its termination. The earlier patterns were fine-line and often barely visible, generally made up of simple horizontal bands and isolated curves and thin, unconnected, non-representational motifs are often visible. Splashes of colour may be thought to be dominating in these cases ((Adams 1970, p108, 109). The incised decoration on the later patterns is more dense and complex, with a variety of motifs and variability in the width of the lines. A genuine sgraffiato category is not well represented (Adams 1970, p109). (see figures 8h: Adams 11i, and 8i: Adams 11j).

It is noted by Kennet that Adams' use of evidence at Hira is not presently useful in clarifying the dating of TAS, as no description of the stratigraphy of Hira was published from this excavation. Given this, it is not possible to

check the evidence's validity, and considering the dating evidence for sgraffiato ware, it is unlikely to be reliable (Kennet 1994, p169).

At TAS, twenty-five sherds can be described, including fifteen from a single plate. All were from Levels V and VI (800-1100), with accompanying splash glazes of the later pattern (Adams 1970, p109).

Type 13.F:

Adams 1965 Description:

Flaring or rounded buffware bowls with all-over white glaze apparently designed in imitation of Chinese celadon (see figure 8f). These bowls often have pronounced vertical ribs or fluting. It persists at least through the Samarran period (Adams 1965, p132).

Adams' Land Behind Baghdad References:

Government of Iraq, Department of Antiquities. 1940. Pls. 99-102 (see figures 7af-ai).

Plate 100 shows the interior and exterior of a plate with spur-marks inside the rim, and Plates 101 and 102 show other fragments. The colour of celadon is generally lavender grey, but there are cases when the celadon is brownish, greenish, or whitish (1940, p7).

Sarre, F. 1925. Taf. 23-25. (see figures 7aj-al)

Pope, A. U. 1938. Vol. 5, Pl. 589A. (see figure 7am).

Pl.589A: Imitation T'ang white ware bowl. D.18.5cm. Collection J.A.Barlow. 10th century.

Specifically, this is an imitation of plain white *Sung Ting yao*. The pieces in this group tend to betray close connections with the cobalt-painted ware (Pope 1938, p1504).

Type Fossil Use and Dating Evidence:

This type fossil is used by Gibson 1972, and is known as Type F, and is considered to be Early Islamic by Gibson(p168). This ware is also known

as, in the case of at Ras al-Khaimah, YBTIN (plain opaque white glaze), and Ware 23 at Hulayla (Kennet 1994). It is noted that it is closely related to COBALT, to which it is identical except for the cobalt decoration. YBTIN is thought to have been introduced between 835-6 and 861 AD (Kennet 2004, p32). In the Kush sequence, COBALT appears after YBTIN. It is worth noting this as although this may agree with the Siraf sequence, it differs from the sequences at Susa and Samarra. An explanation for this could be regional variations, but could also be due to the fact that YBTIN, being considerately more abundant at Kush, is more likely to occur in relatively small assemblages, thereby skewing the picture (Kennet 2004, p32). At Kush, ninety-one sherds were found from Phase E-05 onwards, and is most common between Phases E-05 and E-07. YBTIN was used to date Phase E-05 to the 9th century (Kennet 2004, p32).

In the cases of Susa and Samarra, wares which appear to be imitations of Chinese ceramics were common enough. White tin-glazed pottery appears to imitate Chinese white ware and is well known from finds at both of these places. The pottery has a soft buff or creamy fabric, and vessels may be decorated in cobalt blue, turquoise or brown, and epigraphical and floral motifs. At Siraf, the earliest tin glazed pottery occurs in Area A, Period 2A. The first fragments with turquoise or brown do not appear until Period 2C, and fragments with a mixture of the two only occur in Period 2D (Whitehouse 1968, p15). Indeed, in an attempt to imitate Chinese porcelain, the evidence at Samarra suggests that a combination of tin oxide and clear lead glaze, that was used much earlier by the Egyptians, was rediscovered (Jenkins 1983, p5). This resulted in pottery with an opaque white glaze, which is thought to have become dominant in the 9th and 10th centuries in Islamic ceramics (Mason and Keall 1991, p172). However, the common occurrence of sherds from Hira of this type (Priestman 2005, p203) are important, though most of them were found near the surface, since a whole series were collected which served as proof, when seen together, that the idea of this type of glaze might well have been arrived at locally, independently of foreign examples (Rice 1934, p69). Indeed, Rousset, in her re-analysis of the site based on her own work, also notes that this type of production probably derived from

Sassanian antecedents, and so is not an imitation of Eastern imports (Rousset 1994, p48). However, as they were found near the surface they are probably much later than the example found at TAS, being probably from the 10th century (Priestman 2005, p203).

At Siraf, the early white wares (9th and 10th century) fall into two categories. The fist category is stoneware with a harsh opaque fabric, and does not appear to be considered a type fossil, and the second is porcelain of a dense translucent fabric and a conchoidal fracture. The porcelain form is rarer at Siraf, and has a fine white fabric and a clear glaze which may sometimes have a blue tint. Its commonest form is the bowl, which has a ring base, a curving side and a plain, thickened or foliate rim. The white wares at Siraf appear in Period 2 (c.825-50 to c.977-1055), the stoneware in Phase A and the porcelain in Phase B. Whitehouse mentions that it is important to note that the porcelain bowls with a thickened rim did not occur until Period 3 (Whitehouse 1968, p17).

In general, Chinese wares appear to be a recurrent feature of almost all Islamic sites on the Iranian coast (Whitehouse and Williamson 1973, p48), the major sites being ports such as Siraf, Kish, and Old Hormuz. The glazed pottery from Siraf probably contains a higher percentage of Chinese wares than the material from either Samarra or pre-Fatimid Fustat (Day 1941, p20), although the early enclosures at Siraf yielded only one Chinese fragment, found beneath a floor of the latest phase, and datable to the 8th century (Whitehouse and Williamson 1973, p49. However, it is clear that these imports have a distinct chronological range. In 1941, Day wrote that the earliest actual importations are still of the 9th century, and no pre-Islamic pottery shows any trace of Chinese influence (Day 1941, p20). This would seem to be what is still being thought. According to Whitehouse and Williamson, Sasanian sites do not yield Chinese fragments, as is also the case for the earlier Islamic sites making it likely that the ware found at Abu Sarifa is more likely to be imitation celadon, perhaps intrusive from later levels, unless it is merely an example of a Sasanian whitish blue glazed ware.

During the time of the Ummayad dynasty (661-750), the ceramics produced in the Islamic cultural areas were predominantly pottery for

everyday use, and decorative pottery was seldom made. This changed with the Abbasid period (Klooster 2011, p75). The demand for Chinese ceramic was probably greater than the supply and from the 9th century onwards this prompted the Islamic potters to produce ceramics inspired by the Chinese exports (Klooster 2011, p75).

However, the study of relatively low quality export wares or 'trade ceramics' is much less developed compared to the study of Imperial production. This means that there is difficulty in dating these Chinese ceramics, especially the earlier classes, which are typified by a relatively conservative stylistic development and securely dated examples are rare. Kennet also notes that there is no generally accepted classification system, with some Eastern scholars having objections to terms such as 'celadon' (Kennet 2004, p60).

As can been seen, the original idea, based on Adams' dating for this ware needs to be challenged. In a now out of date paper, Whitehouse and Williamson stated that in terms of the introduction of Celadon and interactions with China, it appears that the third century saw the establishment of Sasanian authority in the Persian Gulf; the 6th century saw Sasanian merchants dominating the trade with India and Ceylon; and the end of the 8th century saw the inception of regular trade with China (Whitehouse and Williamson 1973, p49). This seems less likely, considering that this ware appears to be 9th century in date. Evidence of influence during the 9th century can be seen at place such as Samarra (Reitlinger 1938, p164).

At TAS 1970:

At TAS, Adams describes this type as imitation white celadon all-over glaze (see figure 8j). This pottery is described as being open, flaring, ring-based bowls and dishes, usually with out-curling lips, and has a soft yellow fabric (Adams 1970, p110). These sherds were sometimes almost undistinguishable from the *Land Behind Baghdad* Type 12.A, and so it is possible that some of the 'pseudo-celadon' sherds have been incorrectly identified. On the basis of the work at TAS, Adams suggests that it is possible to argue that 'pseudo-celadon' was of Sasanian derivation and

was not an imitation of the Chinese product, and possibly only modified at a later stage to resemble it (Adams 1970, p110). Celadon itself (and other luxury imports from great distances) is entirely absent from the sequence (Adams 1970, p105).

Sherds classified as pseudo-celadon were found in Levels II and III, and Adams comments that the dating would imply that these sherds are intrusive (Adams 1970, p107). The examples found at TAS would appear to be too early for imitation celadon. It is possible that they have been confused with the Sasanian ware, Type 12.A. However, it could be likely that the reason 'pseudo-celadon' appears early, in Level II, is that it is an effect of the pitting at TAS.

Type 13.(g):

Adams' 1965 Description:

High-necked jars with horizontal corrugations, flattened rope-rims, and strap handles under light blue glaze (Adams 1965, p133).

Type Fossil Use and Dating Evidence:

This type is used by Gibson 1972, is known as Type G, and is considered to be Early Islamic. Gibson comments that this type is not a reliable indicator and that its range extends much later (p168).

Adams' Land Behind Baghdad References:

Adams gives no references for this type fossil.

At TAS 1970:

Adams comments that strap-handles seem to to occur on type N at TAS, where horizontal corrugations are present. However, type N is of blue-green glazed jars, rather than a light blue glaze (Adams 1970, p107). Strap handles also occur on dark-faced orange ware that Adams says was in vogue in the Early Islamic period (according to TAS dating). Therefore, whilst the feature of strap handles was present, there does not appear to

have been any accompaniment with light blue glaze at TAS.

Adams 'Type Fossils' and TAS Levels Re-dated:

Below is a table summarising the possible revised dating for Adams' 'type fossils':

'Type Fossil' Dating Summary	
Adams' Sasanian 'Type Fossils'	
12.A	Seems reliably Sasanian based on evidence from Kish
12.B	Date uncertain, but possibly ends by end of 7th century. No clear evidence. Likely to be Early Islamic
12.C	Sasanian. No clear date or evidence.
12.D	Sasanian. No clear date or evidence.
12.E	Sasanian. No clear date or evidence.
12.F	Sasanian. No clear date or evidence.
12.G	Sasanian. No clear date or evidence.
12.H	Sasanian. No clear date or evidence.
12.I	Sasanian. No clear date or evidence.
12.J	Sasanian. No clear date or evidence.
12.(k)	Is long-lived, spanning from Parthian to Islamic times.
12.(l)	Is long-lived, spanning from Parthian to Islamic times.
12.(m)	8th century, may occur in 9th century, and possibly 7th.
Adams' Early Islamic Type Fossils	
13.A	Barbotine is post Sasanian. Late 8th – 9th/10th century
13.B	Rim of Type. A. Late 8th – 9th/10th century
13.C	9th century. Introduced after 803-4/before 835-6 (Kennet 2004, p32)
13.D	9th century. Introduced after 835-6/before 861 (Kennet 2004, p32)
13.E	Late 9th century. Introduced after 885-895 (Kennet 2004, p32)
13.F	Introduced after 835-6/before 861 (Kennet 2004, p32)
13.(g)	Early Islamic. Possibly has a later range.

Table 2: Re-dated 'Type Fossils'

Before proposing new dates from the above changes for the levels at TAS, it may be useful to briefly look at other ceramic evidence that has not been discussed which may also serve to test the new type fossil dating. At the moment only Sasanian and Early Islamic 'type fossils' have been looked at, but there were examples of some later 'type fossils' at TAS that may help in pinpointing where the shifts in the sequence lie, as well as other types of pottery that alone may not be strong indicators of any specific date, but used in conjunction could aid in clarifying the stratigraphy.

Dark Violet Glaze:

The first of the later ceramics is described by Adams as dark violet glaze. This dark violet glaze is evenly applied to the interior and upper exterior of large, soft buff ware dishes and bowls with ring bases (Adams 1970, p111). In the Diyala, this is Type 14.G, was used as a Samarran ceramic indicator, and was thought to continue well into the post-Samarran period (Adams 1965, p137). Whilst purple glaze (the colour being due to manganese) is characteristic of some types of Parthian and Islamic pottery (Bowen et.al 1959, p61), this is clearly a late type at Abu Sarifa, and is proportionally more common in the surface (1100-1150 AD) collection than any other level (Adams 1970, p111).

Deep Green All-Over Glaze:

This ware has the same range of forms as splash glazes, and appears with and without incising (Adams 1970, p110). The one example at TAS seems to date to Level IV (650-800 AD). An Islamic date does seem to be likely, as at Kish it is considered to be an Early Islamic ware (Gibson 1972). It is also thought to be Islamic at Qalat-Qobad Fort, where the sherds have an inner and outer green glaze, but with a cordage pattern (Ghasami et.al. 2013, p12). In addition, work in Northern Iraq, as well as north-east Syria and eastern Turkey, demonstrate that Late Islamic sites are typically characterised by dark green monochrome glazed wares, often with minor firing defects It is noted however that there does need to be more research done before sites can be more specifically dated using this ware (Simpson and Watkins 1995, p180).

At TAS there is also a sherd in Level III, but Adams believes that this is probably intrusive due to pitting (Adams 1970, p110). However, if the new dating is correct and Level III is an Islamic level, then this may not be the case.

Gold or Olive Luster Ware:

This ware has mainly geometric, and mainly representational, designs painted on white or grey background beneath a transparent overglaze. Thin, small, uniformly well-made bowls of a soft buff fabric (type D.) (Adams 1970, p110-111). In the Diyala survey, this ware is Type 14.D, described as being thin buffware bowls with well-executed geometric designs. It was considered to be an indicator of the Samarran period (Adams 1965, p137). The majority of sherds at TAS occur in Level IV (Adams 1970, p111). The majority of sherds at the Abu Sarifa therefore occur slightly earlier than Level V, which was equated to the Samarran period by Adams.

Gold lustre ware is known as LUSTRE at Ras al-Khaimah, and one of the 'Samarra horizon' types. It is similar to YBTIN in form, fabric, and technique (Kennet 2004, p33). Kennet comments that LUSTRE does not appear at Kush, yet has been found at Hulaylah, which probably reflects a lack of settlement at Kush between the 9th/early 10th century (Kennet 2004, p34). This supports the thought that the introduction of this monochrome lustre should probably be dated to after the depopulation of Samarra, which took place between 885 and 895 (Northedge and Kennet 1994, p29-33).

Greyish-White Lead Glaze:

This glaze is “soapy” to the touch, and frequently has a very mottled or pitted surface. The glaze is on interior and upper exterior of large bowls of a soft fabric (Adams 1970, p111). At TAS this ware appears in Levels V and VI, and increases on surface collection, making it appear in the dates 800-1150 AD (Adams 1970, p111). Again, evidence could suggest that the levels should be later in date, as from the beginning of the 8th century AD, high lead glazes were introduced (Pace et al 2008, p593), examples of which can be observed in Islamic pottery at Dura Europas (Bowen et.al 1950, p61).

Turquoise Glaze:

Adams describes this glaze as being an apparently rare finish which leaves a very even hard, porcelain-like surface (Adams 1970, p111). In the Diyala Survey, this ware is considered to be an indicator of the Late Abbasid period by Adams (Adams 1965, p137; Type 15.E). At TAS, five examples were found on the surface and in Level VI (950-1150 AD), in each case the glaze being confined to the interior surface (Adams 1970, p111).

Crosshatching:

At TAS, crosshatching generally occurred on light buff thin ware jars (Type K), although there were examples on possible antecedent Sasanian jar handles (Adams 1970, p104). The technique was present mainly, or exclusively, in Islamic levels at TAS (Adams 1970, p104). More recent dating evidence is present at Sohar, where it is dated to 1025-1150 AD (Williamson 1974, p91). A slightly earlier date is proposed at Khirbet al-Mafjar, as the decoration appears on wares dated to 800-850 AD (Whitcomb 1988, p84). However, at Ras al-Khaimah, the later date is supported, as the date put forward for this ware is 1000-1100 AD (Kennet 2004, p84). However, there is no independent dating.

'Turban' and 'Knob' Handles:

Turban handles (see figure 8k) are decorated or embellished knobs, and are sometimes associated with rows of stamp impressions applied to the lower body of vessels (Adams 1970, p98). In the Diyala surveys turban handles were considered to be from the Late Abbasid period (Adams 1965, p137: Type 15.B), and at TAS, all examples of turban handles occurred in Levels IV-VI (650 AD – 900AD), and so only occurred during Islamic dates (Adams 1970, p98).Knob handles are described as being unadorned protuberances (Adams 1970, p98).

In the Diyala surveys, Adams regarded knob handles as being an indicator of the Samarran period (Adams 1965, p133: Type 14.F). At TAS, two examples of knob handles were found in Level III (Late Sasanian), and one in

Level I. Adams believed that the knob handle found in Level I was unlikely to be intrusive, as it was slightly different in design. Being more pointed in shape, Adams was inclined to think that it was indeed Parthian (Adams 1970, p98).

More recent dating evidence for turban handles would also appear to indicate an Islamic date. At Jundi Shapur, these handles occur in 800-950 AD contexts (Adams and Hansan 1968). However, more recent evidence possibly suggests a sightly later date, as at Khirbet al-Mafjar, turban handles appear at this site on large jars, with circle incised appliqué, and are dated to 900-1000 AD (Whitcomb 1988, p198). Overall, it does seem that these turban handles are predominantly Early Islamic, i.e. can be dated to the Samarran period. Again, this would support a shift in the dating at TAS, as this more recent evidence suggests that the appearance of turban handles in the dates 650AD-900AD does not completely correspond. Adams also points out that there is some evidence that the proportion of both simple knobs and turbans to any other handle fragments gradually increases during the Islamic levels. again possibly indicating that these levels are later in their Islamic date.

Discussion:

It does appear to be the case that there is little change in the Sasanian 'type fossils', with many remaining the same date or being too long-lived to be useful in refining the dating. However, there is a definite trend in the Islamic 'type fossils', with most of them needing to be placed around the 8th century or later. Type 13.(g) is an exception to this, as Gibson did state that he suspected that this type could have been longer-lived.

The issue of being too long-lived is especially the case for the latter three Sasanian 'type fossils': 12.(k), 12.(l) and 12.(m). Each have long time spans, with Types 12(k) and (l) being exceptionally unhelpful. However, 'honeycomb' (Type 12.(m), may be more useful in determining when the Islamic occupation at TAS began, with its beginning date in the 8th century.

In contrast to the Sasanian wares, the Islamic wares on the other hand, appear to be much more useful. They appear to have more definite changes in date that are more precise, especially those that are part of the Samarra horizon group.

Indeed, most of the Early Islamic 'type fossils' that Adams selected tend to belong to the 9th – 10th centuries (the Samarra Horizon) rather than the 7th – 8th as he suggests (Priestman 2005, p105). Several of the 'type fossils' that Adams provided have over time proved to be more useful as more evidence has enabled the dating to be pinpointed more accurately. However, others are more scarce in their appearance at sites, and more difficult to give a more definite date.

The key ceramics, as stated, that seem to be the most useful in dating are those grouped into the 'Samarra horizon'. This group was manufactured in southern Iraq and was traded widely over the Indian Ocean. Their name derives from the fact that they came into use approximately at the same time that Samarra became the capital of Abassid Iraq in the early 9th century. They were all inspired by imported Chinese ceramics and reflect the increasing contact with China during this period (Kennet 2011, p29). These wares include, of course, lustre ware, splashed ware, and cobalt-decorated white wares(Kennet 2011, p29). Therefore, in contrast to the earlier centuries, the 9th century is easier for archaeologists to recognise as it's marked by the introduction of these newly styled glazed ceramics (Kennet 2011, p29). These Samarran wares are therefore key in the re-dating of TAS.

This concentration of 'type fossils shifting to the 8th – 9th centuries would therefore suggest that the dating at TAS is in need of a shift of approximately 100-150 years. Although it is only later type fossils that suggest the need for a change in dating, the shift will be applied to the whole of the TAS sequence, including the earlier Parthian level. This is because the issues mentioned earlier, such as the pitting and lack of time in excavation, may have created displacement in all the levels.

Below is a table representing the hypothesis:

100-150 year Shift Applied to TAS Levels			
Level	**Adams' Dating (AD)**	**100 year shift (AD)**	**150 year shift (AD)**
Surface	1100-1150	1200-1250	1250-1400
VI	950-1100	1050-1200	1100-1250
V	800-950	900-1050	950-1100
IV	650-800	750-900	800-950
III	500-650	600-750	650-800
II	Before 500	Before 600	Before 650
Probable stratigraphic disconformity			
I	1st- 2nd century	2nd – 3rd century	Mid 2nd- mid- 3rd

Table 4:100-150 year Shift Applied to TAS Levels

The following 'type fossils' are the ones that appear to have been present at TAS: 12.A, 12.B, a possible example of 12.C, 12.F, 12.(k), 12.(l), 12.(m), 13.A, 13.C, 13.D, 13.E, and 13.F.

Looking at each of these 'type fossils', with their new dating in mind, and in comparing them with some of Adams' conclusions about them in general and when using his seriation diagrams, it will be possible to see how each ceramic type may affect, or be affected by, the ceramic sequence individually. This will be done in correspondence with Diagrams 1 and 2, that are Adams' original seriation diagrams. Not all the 'type fossils' are represented in these diagrams, but their relationships with other classes and types can still be explored. Below are the relevant seriation diagrams.

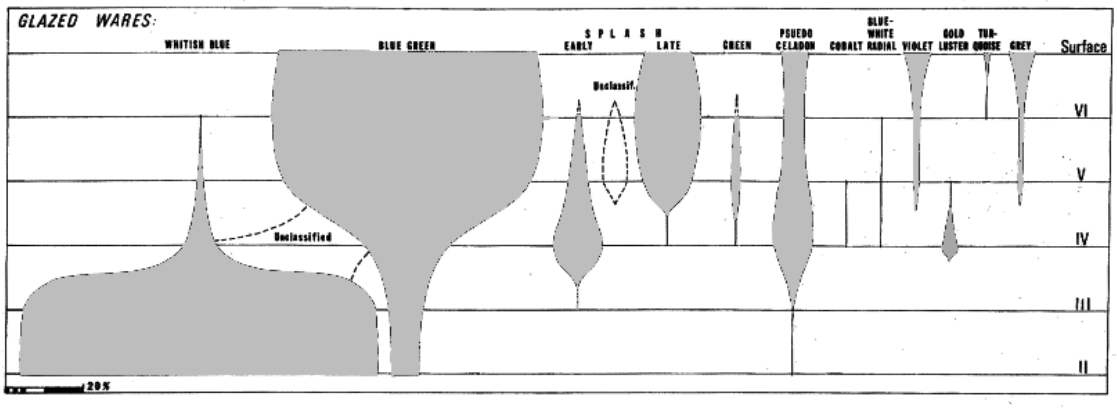


Diagram 1: Seriation of Glazed Wares at TAS (Adams 1970, Plate 7)

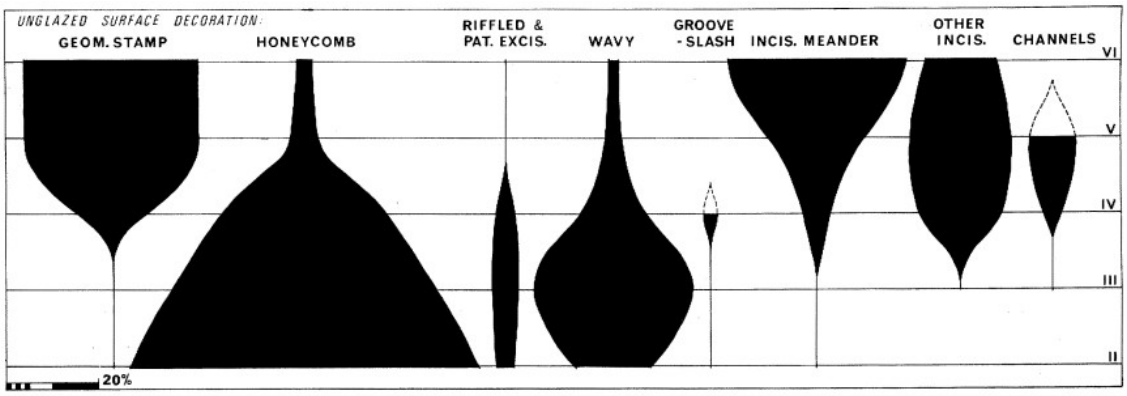


Diagram 2: Seriation of Unglazed Wares at TAS (Adams 1970, Plate 7)

Before discussing the individual 'type fossils', in regards to the seriation diagrams, Adams points out that whilst the seriation diagrams are convenient for purposes of summarising, there are a couple of factors that one must be aware of whilst interpreting them. For example, the actual numbers of sherds may show that there was more than a seven-fold increase in the number of unglazed sherds with surface decoration between Levels II and III. In contrast, the proportion of the entire glazed category that has such decoration may seem to have almost doubled (Adams 1970, p111). Seen in this context, the diagram that deals with surface decoration would be open to some re-interpretation (Adams 1970, p111).

Problems with the seriation diagrams perhaps has more bearing for this discussion when it comes to 'honeycomb' ware. Adams comments that the 'honeycomb' pattern (Diagram 2) appears to decline in popularity between Levels II and Level III. Adams says that if it were actually calculated as a proportion of the entire unglazed sherd population, rather than as a proportion of the formerly mentioned decorated category, it would instead be seen to have increased in frequency by almost fifty per cent (Adams 1970, p111).

Adams also adds that in the seriation diagrams there is little quantitative change in many categories from level to level, on occasion throughout the entire sequence. He states that together with the virtual absence of abrupt, disjunctive changes in major categories, this could argue for the essential continuity of the sequence. However, he states that in the case of the more numerous unglazed ceramics, some significant subtypes may be distinguished within the larger categories (Adams 1970, p112).

Therefore, although seriation diagrams are highly useful in determining trends and patterns in the use of a ware over a given period, there are weaknesses that mean that the interpretation may be slightly skewed by the data if not aware of the causes. It is therefore necessary to bear in mind how the data may be thus affected, and that any conclusions drawn in comparing the 'type fossil' with others may also be similarly affected, if the 'type fossil' is represented. The interpretation of the seriation and corresponding issues of these 'type fossils' will now be discussed, with the understanding that it is possible that there may be exaggerations in the data. Not all 'type fossils' were specifically represented in Adams' seriation diagrams, however, this may be an indication of how useful he found them in dating, and so they still cannot be ignored.

Firstly, Type 12.A is shown in Diagram 1. It is white-blue glaze, and as can be seen, it predominately existed in Level II, and mid-way through Level III it gradually declined. The new dating suggests that it is highly likely to be a Sasanian ware. In terms of the seriation of this ware at TAS, the new dating for this ware still fits its presence in Level II, as this is probably a Sasanian level. The fact that Level III could possibly be Early Islamic would help to explain the decline of this ware during this period. The patterns in the seriation therefore could be said to fit the new dating.

Types 12.B and 12.C, on the other hand, are more difficult to determine in what affect they can have on the sequence and whether their new date is corroborated by the seriation. This is due to the fact that there appears to be only one example of each. The latter is probably Sasanian, if it be a representation of the 'royal symbol' at all. It was found in Level III (see figure 8a), which according to the new dating would be an Islamic level. This either casts doubt on the identification of it, which would suggest it is not Type 12.C at all, or it could be yet another intrusive example.

The Type 12.B stamp is perhaps more promising, as it was located in Level IV, which again is Early Islamic in date, most probably corresponding to the Abbasid period. Having said this, the type possibly ended by the end of the 7th century, which would mean that with the new dating, this type should have

ended at least fifty years before the beginning of Level IV. A shift as great as 150 years for this level therefore looks less likely, with a smaller shift of roughly 50 years being more suitable.

Not quite so useful in analysing the possible shifts at TAS are Types 12.F, and 12.(m) and (l). Type 12.F is jars with slashed decoration, and is probably Sasanian in date. In terms of its distribution through the TAS sequence, Adams notes, from the few examples, that this style appeared to be more popular in Late Sasanian and Early Islamic times (Adams 1970,103). With the shift, it may be however, that this peak actually occurred in Early Islamic times.

Types 12.(k) and (l), as previously stated, are not particularly useful as they have too broad a reach over the periods/levels to give any real meaning. Overall, it is not a very distinguished feature, and any patterns in its presence at TAS would be subtle as it is such a continuously used ware.

Type 12.(m), 'honeycomb ware', is one of the 'type fossils' that Adams draws particular attention to at TAS. Adams notes that in actual practice, it is the coincidence of particular forms with particular styles of surface decoration that is the most useful chronological indicator when it comes to pottery. He goes on to describe those that he found most striking about the sequence, one of which was the Sasanian storage jars with honeycomb decoration (Adams 1970, p113). As can be seen in Diagram 1, this ware primarily popular in Levels II and III, decreasing until Level V. The new dating for 'honeycomb' suggests that it is 8th century, with the possibility of appearing in 9th century contexts, and maybe even 7th century contexts. The seriation evident on the diagram therefore does fit with the new dating as Level II could be dated to part of the 7th century, and 'honeycomb' has appeared in these contexts. As for Levels III and IV, an Islamic date is definitely supported in 'honeycombs'' presence.

Type 13.A, which is blue-green glazed ware with barbotine can now be considered as being post Sasanian, specifically, the late 8th – 9th/10th centuries. In Diagram 1, it can be seen that the seriation for this ware does show a presence in Levels II and III, followed by a large increase in popularity in Level

IV, continuing to be present in large numbers up to the end of Level VI. This does support a date for Level IV towards the end of the new suggested time span. The fact that it was found in Level III is not concerning either, given that this Level should probably no longer be dated as being Sasanian.

Type 13.C is COBALT ware. This is represented in the seriation Diagram 1. However, it only appears to have had an impact in Level IV. The new dating for this cobalt ware recommends a 9th century date, probably introduced after 803-4 and before 835-6 AD. This date lands quite neatly between the 100-150 year shift.

When looking at the ware Type 13. C, it is worth remembering that the Siraf sequence suggests that the introduction of the Samarra horizon could be split into three stages: Stage 1: opaque white-glazed ware (Kennet 1994, ware 23), white-glazed ware with cobalt decoration (Kennet 1994, ware 20); Stage 2: splashed ware (Kennet 1994, ware 24), lustre ware (Kennet 1994, ware 41); Stage 3: sgraffiato ware (Kennet 1994, ware 18; Kennet 1994, p170). In the case of TAS, it is therefore interesting to note that Early Splash appears to have been introduced into the sequence slightly earlier than COBALT.

Type 13.D's (T'ang)) new dating places this ware in the 9th century. There is no seriation diagram to draw from for it specifically, probably due to the fact that there were so few sherd numbers (Adams 1970, p108). However, as a SPLASH ware, it can be seen from Diagram 1 that there were two types that Adams defined, namely Early and Late Splash. T'ang would be an Early Splash ware, and so looking at the seriation for this type it can be seen that it was introduced in Level III, and gradually declined through to Level VI. In this case it would appear that the ware leans towards supporting a shift as great as 150 years, rather than only 100.

Type 13.E is Early Sgraffiato, and all examples from TAS were from Levels V and VI, with accompanying splash glazes (Adams 1970, p109). The new dating for this ware, being late 9th century in date, introduced after 885-859 AD would indicate that in the case of Levels V and VI, again, the shift falls quite neatly for the appearance of this ware.

Lastly, Type 13.F is imitation celadon at TAS, seen in Diagram 1. The seriation graph shows that this ware became into fruition in Level III, saw a slight increase in Level IV, and then declined slightly through the following years. According to its new dating, which is that it was introduced after 835-6/before 861, this might suggest that the 150 year shift is more suitable for TAS than the 100 years, although even the end of the 150 year shift does not completely reach the beginning date of 835 AD. However, It is probably safe to say that Level III s 9th century in date.

Overall, those 'type fossils' that appear at TAS, and have also proved more useful in dating, in terms of there distribution in the levels, appear to generally support and fit the proposed new dating. However, to try to refine the shift in how exact it is proves to be slightly more problematic. The presence of mudbrick walls in the levels highlights the need for more precision and the problems that need to be overcome, as these are not likely to have existed for 50 years, and definitely not 150. Either mudbrick walls can survive longer than is generally accepted, or a smaller shift, no more than 50 years, is more likely in the TAS sequence. However, it may also be that each level requires a different amount of shifting in the date. This would be extremely difficult to determine, and so in analysing the TAS sequence, the approach taken will be uniform, and each level shall be given a shift of 50-150 years.

Conclusion:

On the basis of these conclusions regarding the dates of Adams' ceramic 'type fossils' in *Land Behind Baghdad*, it would seem to be reasonable that the dating of the levels needs to be shifted back by one hundred, possibly one hundred and fifty years.

The complexity of compositional and cultural aspects of ceramics provides archaeologists with an almost endless number of attributes, any number of which can be selected for analysis (Arnold 1981, p31). This was demonstrated by Adams' points earlier regarding seriation, especially when studying the patterns of subtypes. However, it is extremely clear in some cases

which are the more effective in using for analysis. This is reflected in the role of the Samarran horizon wares. These had particular influence on this new dating, as the Samarran horizon wares have emerged since Adams' work. Indeed, it would seem that in dating, currently Samarra is taken as the archetype, especially of Abbasid culture (Whitcomb 1985, p86).

The need for changes to the dating of the TAS sequence has been supported by other archaeologists. One is also forced to conclude that most of the pottery presented from the sequence (Level IV upwards) is post-Sasanian (Early Islamic) (Simpson 1996, p94), even as far back as Level III. Also, Moorey's opinion that the Kish evidence now suggests that the TAS evidence should be revised by up to a century and a half (Moorey 1978: 123, 143), appears to be an accurate assessment.

Using this shift, the data collected and used by Adams in the Diyala will now be able to be assessed. How the shift affects the Diyala region will have implications for Adams' original theories, and also help understand how they compare with the more current ones that are emerging. The fact that the theories generally appear to be changing the original views means that the results will hopefully help in giving more answers, and also serve as a gauge for them.

5. Land Behind Baghdad: A Critique and Implementation of the New 'Type Fossil' Dating

Introduction:

With the analysis of Adams' 'type fossils' used in his work in the Diyala and at TAS, it is now possible to re-examine his conclusions concerning Sasanian and Early Islamic agricultural and population trends.

This chapter will focus specifically on Chapter 9 in *Land Behind Baghdad*, as it is a final and compact summary of broad conclusions made by Adams (Young 1966, p341). In conjunction with this chapter, those earlier chapters that correspond to the Sasanian and Early Islamic periods will be focused on, as Adams does also consider the earlier and later periods, with the dates ranging from 4000 BC – 1900 AD.

Firstly, there will be a brief critique and explanation of Adams' methodological approach to the Diyala survey, and the general presentation of the data used by Adams. Secondly, a summary and critique of the reasoning behind Adams' conclusions, specifically in relation to his population graph (Adams 1965, p115; Graph 1) and how these conclusions may be expected to be affected by the changes in the 'type fossil' dates as discussed previously. The relevant work in Adams' later 1981 publication *Heartland of Cities* will also be compared when suitable. *Heartland of Cities* is more a grand synthesis than simply a geographical extension of his research, as he reviews and reinterprets most of the data from his earlier surveys in the Diyala plains (Wenke 1982, p174), and so cannot be excluded. Therefore changes in Adams' opinions, or further evidence for confirmation of them, can be noted.

Following this, an attempt to apply the changes to the type fossil dating will be made by using Adams' site data, so far as is possible, and a new population graph created in order to see more clearly how justified any results are or how they relate to Adams' work and more recent evidence and theories.

Adams' Data and Methodology:

General Methodological Approach:

One of main questions of importance to the archaeologist in the Near East is how and why the alluvial plains in Mesopotamia allow the world's first cities, states and empires, encompassing the first complex societies, to exist (Wenke 1982, p174)? Adams work in Mesopotamia is a perfect case study for the examination of how this question has been approached, as it is a work that spans twenty years of research, and is focused on Mesopotamia's heartland (Redman 1982, p375).

The method of ceramic surface survey was still very new when Adams began work in 1956. The basic technique involved collecting and dating the surface sherds on the ancient site of a region, then plotting the dated sites on period maps (Jacobsen 1981, pxiii).

In order to find the site in the first place, Adams developed and refined the archaeological techniques that were being implemented by using aerial photographs. These were highly useful as they tend to show in greater detail the shifting courses of ancient canals that could be dated, but only approximately located, by data collected in ground survey (Jacobsen 1981, pxiv). Adams also attempted to tighten the coverage in the search for ancient sites to a narrow grid so that he might not miss the most subtle traces of occupation (Jacobsen 1981, pxiv).

Once the site were found, Adams assessed the discovered mounds in detail. He comments that in the Near Eastern landscape, it is not often that there is a clear demarcation between an ancient mound and the surrounding plain. As well as uncertainties regarding the extent of the presence of outlying habitations and the amount of refuse that has accumulated around the foot of the mound, there is the problem that erosion transports slope material outward for considerable distances, especially if a mound's elevation is substantial (Adams 1981, p44). Adams noted that without the aid of excavations, the measurement of a mound's dimensions is useful for relocating it and as an index to its approximate size, but should not be taken as an accurate gauge of the area of original settlement (Adams 1981, p44).

Adams aimed to maximize the extent of coverage, and so only prepared

sketch maps of mounds or mound complexes in exceptional cases. In the case of elliptically shaped single mounds, Adams paced the longer axis and estimated the shorter one as a proportion to this. He also estimated the heights from a position on the plain that was far enough from the foot of the mound so that it's elevation could be scaled against the horizon (Adams 1981, p44) In the case of higher mounds, Adams took the lines of sight toward an intersection of the horizon with the outer slope. He then walked to this point, repeating the process if it was deemed necessary, until the summit lay below the horizon. He does comment that while he often relied on vertical and horizontal estimates of this kind, he did check them at frequent intervals in order to ensure the best possible reliability and to minimize the results of any unconscious biases (Adams 1981, p44).

Reflecting on the reliability and accuracy of the methods he used in the case of finding and recording the mounds, Adams states that he could have obviously used techniques that would have given greater precision. However, his opinion is that the fundamental uncertainties would have remained the same even if he did use other techniques, and that ultimately any substantial investment of time in these other techniques would have produced a largely untrustworthy accuracy (Adams 1981, p44). He does also note that there is a limitation in his list of sites as there is an omission of a number of smaller and less important sites. These were generally Sasanian and Islamic village settlements clustering uniformly around the canal systems, whose date and location of occupation was noted, but the descriptions for them are unavailable (Adams 1965, p135). Adams also comments that the drawings of mounds had to made rapidly under variable field conditions, and so their accuracy varies (Adams 1965, p135).

In interpreting the site data collected in Mesopotamia, Adams shifted emphasis to data on the size of the sites studied Jacobsen 1981, (Jacobse 1981, pxiv). Adams often discusses the contrast between the city and country, showing a keen awareness that survey data may miss very important factors in the created picture of population, such as the nomadic herders that were semi-settled whilst not necessarily being groups that were considered to be aliens or enemies of the settled population (Jacobsen 1981, pxiv).

Although the use of regional survey and techniques that Adams used

provided a fresh approach to the Near East, the problems with regional survey strategies must be born in mind when discussing Adams' work. Survey strategies must be a result of a careful evaluation of the interpretative objects of the project, the nature of the material to be investigated, and the material available (Redman 1982, p376). Field investigations at these huge scales creates the necessity to use methods of analysis and to focus on interpretative topics that are compatible. However, some processes have been repeatedly shown to extend beyond the reach of a single community. There are advantages to regional surveys over site-focused work, but at the same time they glaze over a variety of processes that can only be observed at a lower, more intermediate level. Adams did recognise this potential problem, and does attempt to treat some enclaves separately, especially in *Heartland*. Unfortunately, regional survey projects by nature inhibit the detailed investigation of selected enclaves when one investigates an entire area (Redman 1982, p376).

In Adams' discussions, he used a 'three-pronged approach' to understanding the past. These three points included an examination of the environmental variables, a reliance on texts for insights into institutions and broad political and economic patterns, and an increasingly detailed study of the distribution of irrigation canals and settlement across the landscape (Redman 1982, p379). However, through his works, that to some extent correspond with and build upon each other (*Land Behind Baghdad* and *Heartland*), in what could be viewed as major advances in analytical approaches to the Near East there was disappointingly little progress in the improving of the population estimates for the region's time periods. Although Adams' work towards the problem was rigorous, his population estimates remained largely based on settlement size multiplied by a constant factor of people per hectare (Redman 1982, p379). Adams does review these problems. For example, Adams does acknowledge the unrepresentative nature of the data (Adams 1982, p185); however, he is not forthcoming in the solutions to these. Improvements were made in refining the measurement of site size, but they remain crude measures (Redman 1982, p379). However, there is some value in these measure, despite them being 'crude'. Being able to compare the different periods within the data presented is still useful. Considering that the problems stated by Redman will affect all the

data for all the periods, it would still be possible to recognise patterns within the data. It is just necessary to be aware that the population estimate cannot be absolute.

In regards to administrative systems, Adams argued that many aspects were not recoverable with the current archaeological techniques. As well as this, he suggested that the evidence did not support the theory of hierarchically arranged political institutions being at the heart of Mesopotamian cultural evolution. In general, although Adams emphasised the importance and central role of cities, he argued that economically orientated views underestimate the complexity and instability of the relationship the cities had with their peripheral associations. Adams therefore took a different view concerning the stress on the importance of administrative institutions, and the thought that cities were not necessarily a correlating factor in cultural complexity (Wenke 1982, p175).

Overall, Adams' approach to the history of settlement on the Diyala Plain (and thus also the associated issues of agriculture, irrigation and urbanism) meant that he viewed it as one long term change and development that dissolved not only the various historical boundaries that have been created to divide the time of the ancient Near East, but also between the artificial separation between the ancient and Islamic Near East (Young 1966, p341). Therefore, through the Diyala survey and how it approached the question of researching the ancient Near East, support was given to what was then a rarely used technique of viewing the overall developments of complex ancient civilizations through the study of one particular region whilst taking into account the sphere of influence the civilization had (Dales 1966, p518). However, the issue of population estimates in the ancient Near East, although very thoroughly assessed by Adams in *Land Behind Baghdad*, was not particularly improved upon in his later work, and still remains an issue of debate.

Approach to Ceramic Surface Survey and Site Dating:

In terms of the foundation of the method of ceramic surface survey, Thorkild Jacobsen was the first to establish the importance of the ceramic surface technique (Kramer 1966, p75). One contribution that Adams made was that his work made clear that a systematic excavation program was needed in the Diyala region. Adams effectively made the first steps towards this whilst

highlighting some of the gaps in the archaeological record (Young 1966, p342).

Wenke comments that Adams' examination of such topics as population estimates from site areas and the use of index fossil pottery types in *Heartland* reveals the limitations of his and similarly retrieved data (Wenke 1982, p175). Indeed, according to Young, there are several problems that come hand in hand with archaeological survey. To begin with, although one can be fairly certain about what is found, it is not possible to be certain about what is not discovered. Secondly, changes in pottery do not necessarily correspond with historical periods established on the basis of written records, and thirdly, archaeologists have not dug accurately enough to fully understand the ceramic shifts between periods that occur (Young 1966, p341-342). This last problem particularly was something that Adams tried to address at TAS.

In terms of the relationship between ceramic surface collections and the dating of sites, the definition of a site can cause problems. The basic definition of a site has only become harder to determine as surveys have covered the landscape more intensively and the results being treated in a quantitative manner. In general, site definition is not a problem for sites that have discrete topographical features covered with dense, delimitable scatters of artefacts. However, it is often discovered that not all artefact scatters are associated with topographic rises, not all artefact scatters are dense after all, and that discrete boundaries can be difficult to assign to some distributions of artefacts and topographic features. These complications are often related to the context of the archaeological site and the density of material remains from a site (Redman 1982, p378). Off-site artefact scatters are also a problem, as they tend to merge into the scatters of sites. The issue of the scatters was addressed by Bintliff and Snodgrass. They highlighted questions that are important to ask when considering these scatters, such as: how the original horizontal distribution across the landscape occurred; how far the displacement had taken place in the vertical dimension and by what processes; what relationship there is between the surface scatter and the sub-surface concentrations (Bintliff and Snodgrass 1988, p507).

There is also the question as to how to describe the sites that have been discovered. Adams was concerned with improving the means of dating the sites and recording their varying actual size through time. The continual expansion in

number and refinement of diagnostic ceramic sherds has aided in the accurate identification of chronology in single-and multiple-component sites, although multi-component sites continue to be an uncertainty. These sites raise the question as to whether one should assume continuity of occupation when it comes to dating, or should one only recognize the periods represented by the surface sherds? In response to these questions, Adams recommends the introduction of intensive surface collecting to extend the range of quantitative information derived from discovered sites (Redman 1982, p379).

Another problem faced by a survey archaeologist is the question as to how to estimate the size of a site for any given occupation period. It is nearly always impossible, except in rare instances, to estimate the total area of the site for the earlier period when late deposits overlie the earlier material. This issue has its effects, which is what Adams attempted to overcome. As Young points out, however, Adams is well aware of this, as he does state that much of the absolute detail, such as the total number of sites and their population estimates, will not stand the test of time. At the point of writing, only the relative dating could be solidly trusted (Young 1966, p342). Absolute data itself will greatly affect the apparent relationships between historical periods that are close together in time and quite similar statistically (Young 1966, p342). As the population estimates are related to how the sites were dated through sherd surface collections and the 'type fossils', it will be interesting to see how much the variations in any new data affect the population estimates.

There is also the problem in Mesopotamia of deciding where some sites end and others begin, especially when the remains are clustered. This has the effect of creating a large continuous scatter, which has the potential of ‘hiding’ some sites that are merged. There is no simple solution to this as the problem is tied to a limited, nominative, definition of what an archaeological site should be that does not take into account the vast range of its past behaviour (Redman 1982, p378).

The problem of identifying and dating sites seems to be unavoidable, and the effects these problems may have on the data do need to be born in mind. It is pointed out by Redman that in Adams' discussions, he shows concern about the rate of alluvial deposits in the area and the sites that may be missing (Redman 1982, p377). This seems to be a result of his decision to not employ

the more intensive and sophisticated methods so that a first approximation could be provided. This would address in a more comprehensive way the major historical and anthropological problems (Redman 1982, p376).

Despite the problems in Adams' methods, it is necessary to point out that they were in themselves ground-breaking and pioneering in that they made a large contribution to seeing the value of survey and its usefulness as a tool in the region. His methods are as a result still useful, and also provided data that gives important insights. In terms of textual records, Adams' work also provided a context for them and opened up a world upon which the texts were conspicuously silent (Yoffee 1997, p399).

Presentation of Data Used:

The presentation of Adams' data must also be commented upon as this aspect does have an effect on its accessibility. In its favour, *Land Behind Baghdad* is unusual in that Adams gives an abundance of quantitative or empirical data. Whether intentional or not, this in itself gives effective protection against criticism, for the critic can interpret the existing data in other ways if he so wishes (Raikes 1966, p1304). In other words, the scope of the data does not restrict the reader, and so is open to being reassessed.

However, there are several problems with its presentation, and there is in some instances a lack of data that would have been useful if it could have been accessed. One problem with the presentation of data in *Land Behind Baghdad* is the cataloguing of the sites and relevant information. It has been suggested that instead of only listing the sites numerically it would have been useful to give all the known site names (Dales 1966, p519). This would have helped in being able to not only give a more informed sense of environmental context for the sites, but also would have aided in later comparisons as site sizes may be debated over time. In addition to the names of the sites, a quantified list of the index fossils found at each site would have been highly useful. As Adams dated the sites on sherd surface collections, knowing the exact "type fossils" found at each, or even only the main ones, would have given the reader the ability to reassess the dating more effectively (Young 1966, p341). This would have particularly been useful for this reassessment of Adams' "type fossils", as any change in date of any particular ceramic may have affected specific sites. As

such, seeing that the data is not presented or recorded in this way, a reassessment relying on a sherd-by-sherd analysis for each individual site is not possible.

In terms of the maps, tables, and other images, the tables showing the sites for each period are small and difficult to read (Dales 1966, p519). The maps themselves are clear, if not “excellent” (Raikes 1966, p1304), although some may beg to differ (Dales 1966, p519), and the images of the 'type fossils' could perhaps have been improved with the addition of cross section diagrams as could their descriptions and presentation of the evidence that supports their dating. Although the drawings are detailed, they are not as useful alone as a section diagram would be, especially for the less elaborate sherds. This would assist comparison with pottery from other archaeological sites. Although Adams does supply more tabular data in his 1981 publication, this data still does not allow the field records to be re-assessed.

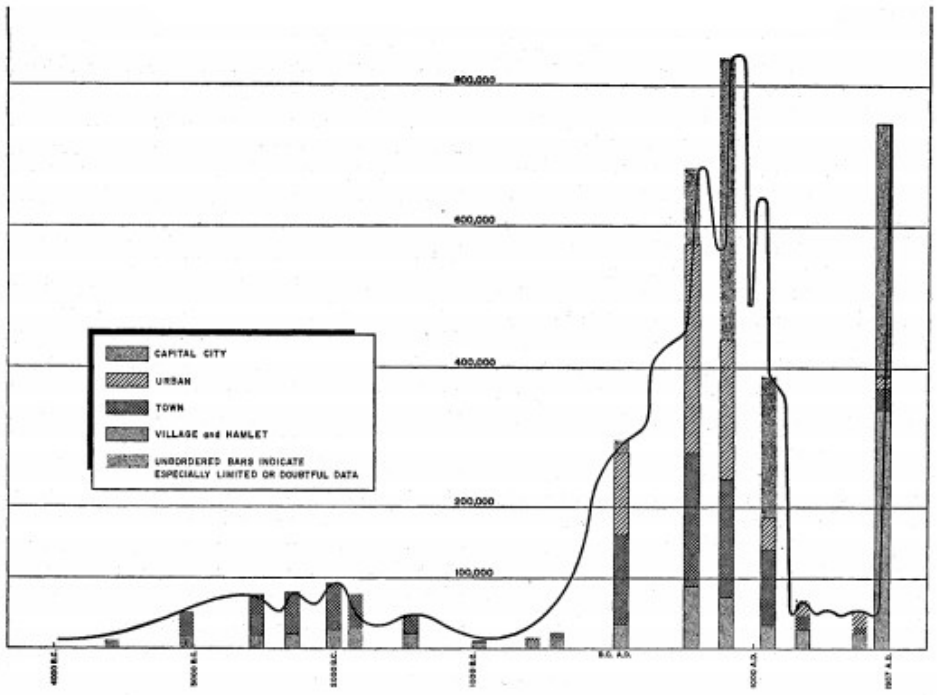
Summary and Critique of Adams' Conclusions in *Land Behind Baghdad*:

There are a couple of minor points that affect the ease with which Adams’ population graph (Adams 1965, p115) can be read. Due to a lack of numerical values on the y axis, with only several population numbers interspersed at selected points across the graph, it is difficult to draw accurate numbers for population. Considering the large numbers involved, and perhaps limitations in the size of graph that could be used, some difficulty in reading specific numbers from this format may have been unavoidable, however a table could have been provided.

In addition, it can be difficult to tell exactly where the peaks in population are in time, making exact dates difficult to determine. For this paper, this is especially important for the Sasanian and Early Islamic peaks in determining the population estimates. Below is a table with the population estimates from the graph for the periods between around AD 500 and AD 1500, these specifically being chosen as these patterns in the Sasanian and Early Islamic times are the focus of this paper. In order to read the estimates, the size of the graph was increased and the periods between Adams' values measured and split into equal intervals. From this, an estimation from the graph was read.

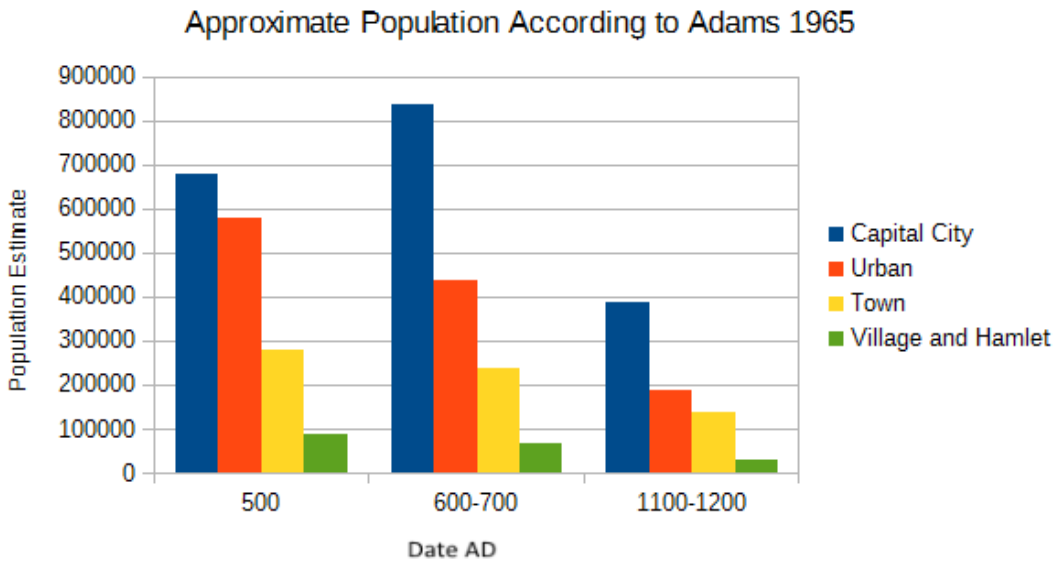
Adams' Population Estimates 500 AD – 1100/200 AD		
Date AD (approx.)	**Settlement Type**	**Population estimate (approx.)**
500	Capital City	680,000
	Urban	580,000
	Town	280,000
	Village and Hamlet	90,000
600/700	Capital City	840,000
	Urban	440,000
	Town	240,000
	Village and Hamlet	70,000
1100/200	Capital City	390,000
	Urban	190,000
	Town	140,000
	Village and Hamlet	30,000

Table 4: Adams' Population Estimates 500-1100/200 AD



Graph 1: Population Estimates and Settlement Types in the Lower Diyala Region (Adams 1965, p115)

Below is a graph using Adams data from the population graph above focusing on the Sasanian and Islamic periods, in attempt to present the data more clearly.



Graph 2: Representation of Adams' LBB Graph Data

Adams' Irrigation Conclusions:

Adams concludes that there were three successive and contrasting configurations of irrigation patterns that can be identified in the region (Adams 1970, p113).

The first configuration Adams describes extends from the beginnings of cultivation of the area in the late 5th millennium BC, or even earlier until its near-abandonment in the early 1st millennium. There was comparatively little alteration made in the natural environment, and cultivation was limited to strips or enclaves that were irrigated through breaches in natural stream levees or by small, locally maintained branch canals. Raikes notes that Adams' rejection of anything in the order of irrigation canals until about the time of the Seleucids and Parthians, or anything in the nature of permanent structures until Sasanian times is seen as being well-founded, with the first canals appearing to have been cut mainly for the purpose of extending and interconnecting back-swamp areas. This may have been the pattern of most arid-zone irrigation development (Raikes 1966, p1305). However, essentially the same network of watercourses created in this period is traced at the end of its epoch as at its beginning (Adams 1970, p113).

The second stage of irrigation may have begun in the Achaemenid or Neo-Babylonian times, and culminated in the Sasanian period. During this

period virtually the entire cultivable area available in the Diyala basin was brought simultaneously under cultivation. There is nothing to suggest the introduction of more intensive systems of cultivation than the original (and still prevailing) rotations of alternate years in fallow, the measures taken to extend the zone of cultivation imply that land and not merely water was in short supply. A reshaping of the landscape and its water sources did occur, with the best example being the construction of the Nahrawan canal in the 6th century AD (Adams 1970, p113). Indeed, Adams in an earlier publication concerning south-western Iran, demonstrates that elements of the Sasanian program have been known for a long time. An example given is the weirs constructed across the Karkheh River at what is now called Pa-i-Pol, the Karun River at Shustar and Ahwaz, and the River at Dizful (Adams 1962, p116).

By connecting the study of aerial photographs with ground reconnaissance Adams draws attention to several aspects of the Sasanian program in south-western Iran. For example, the readiness of the Sasanian engineers to cut through ridges and other natural obstacles can easily be seen in the landscape. Evidence shows that the Sasanians enforced a unified canal system upon a broken topography, which had until then always been irrigated in relatively small and unrelated sections (Adams 1962, p116). At the very least, the major canals in south-western Iran were also designed and executed through a series of well designed, thorough and actions. This is clear from the presence of the regularly branching patterns of even minor distributary canals and from the directness of the larger channels. Due to this sense of order, the presence of central planning is evident (Adams 1962, p117). When operating at its full extent, the new regime depended primarily on great artificial canals. As a consequence, the new regime of land-use was dependent on central government which had undertaken the program of construction (Adams 1965, p113). The extent of the success of the Late Sasanian period in terms of economy can be seen in this example: that in Khuzestan, tax receipts reached fifty million dirhams. Receipts never again reached this figure, and in fact, during the Islamic period they had been reduced to forty per cent of it. These figures in this case and the corroborative archaeological data further support the situation of progressive economic decline. Although only a local case, this reflects the processes that were at work though much of the Islamic world at the

time. Additionally, declining agriculture and commerce were an integral part of a series of interdependent changes affecting the whole fabric of society (Adams 1962, p119).

Adams suggests that with the collapse of Sasanian rule there was a slow, irregular, but decisive, process of dissolution in the rural economy. Indeed, Christiansen adds to this by commenting that the weakness of the Parthian and Sasanian large-scale colonization and expansion was that it was an ecological system that was extremely sensitive to the smallest disturbances. It may even have been self-destructive in the long-term because of the inevitable salinity build-up and siltation (Christensen 1993, p104). Christensen comments that it was the progressing environmental collapse in Mesopotamia that drained away the strength of the Persian Empires (Christensen 1993, p248).

Adams continues in stating that by Ottoman times, this dissolution in the rural economy may have been reduced to a similar cultivable level found in the Middle Babylonian abandonment. Both political control and ecological changes have been put forward as being contributors to this decline, with the Mongol invasion, in the long run, probably not being as important (Adams 1965, p114). The conquest made by the invading Arab armies in AD 639 had relatively mild effects. Important fortified towns were really the only places where resistance was confined, and whilst some defenders were put to the sword they were more often allowed to live and resumed a life that was not much different from what it had been before. Adams concludes that despite this, from archaeological and documentary sources it is evident that the agricultural economy was not restored quickly to its previous state, and as a consequence it went into a discontinuous but cumulative decline (Adams 1962, p119).

The scope and organisation of the Sasanian regime is further described by Adams, and although the following are comments are mostly regarding south-western Iran, it is interesting to compare the patterns in each region that occurred with the beginning of the Early Islamic period. However, there are problems with directly comparing the Sasanian and Islamic periods. Often they are obscured by the changes in the breadth of application of the land and poll taxes as a result of religious conversion. Also during the Islamic period collections probably decreased more rapidly than economic well-being, as the central government’s means of coercion went in hand with unsettled conditions.

However, as the Muslims took over the Sasanian tax system and for the most part left it as they found it, it does not seem unwarranted, on the one hand, to assume that at least some degree of correspondence held in the long run between the volume of tax receipts, and the volume of agricultural produce and activity from which those revenues had been derived on the other (Adams 1962, p119).

In discussing the idea of decline over the periods, Christensen tests the hypothesis of instability as a key factor in decline for the Sasanian period by examining developments in Iranshahr (Iran) where physical conditions differed more or less from those in Mesopotamia (Christensen 1993, p104). He concludes that in the case of Iranshahr, the patterns are not altogether consistent with the notion of general decline in the Middle East. From the 2nd century BC through to the 6th century AD there appears to have been considerable settlement and irrigation expansion, being for the Sasanians largely due to a royal policy of colonization (Christensen 1993, p247). In Mesopotamia, the end of the expansion was marked by a series of linked disasters, namely: floods, plagues, and wars of the 6th and 7th centuries. Despite the Sasanian successor states seeking to repair the damage to the irrigation-works caused by these disasters, in the long run their effects were in vain and the crisis became a continuous decline. Christensen suggests that by no later than the 16th century, Mesopotamia was reduced to a virtual wasteland (Christensen 1993, p247).

In regards to the Islamic period, Christensen discusses the hypothesis of the continual decline of Mesopotamia, and does note that the long-term decline was a complex process, and cannot be explained by a single factor. Christensen also notes that Adams emphasised the interaction between the environmental risks and effects of large-scale irrigation, the distorted relations between town and country due to the enormous growth of Baghdad, the burden of taxation of the peasants, and the political instability in the late 9th century (Christensen 1993, p100). This is described as a catalogue of key influences rather than a hypothesis, and Christensen continues to point out that David Waines had provided one. Christensen explains that Waines emphasises the weakness of the Abbasid state itself. These weaknesses include the inability to suppress internal struggles for power, and its short-sighted fiscal policies, and

most importantly, the lack of understanding on the states' part of the fragility of large-scale irrigation agriculture (Christensen 1993, p100). Christensen finds this convincing, but by no means an adequate explanation, as land had gone out of cultivation and canals had stopped operating before the Abbasids', and well after them (Christensen 1993, p100). With the Abbasid victory in 750, there came the revival of Persian imperial traditions, and the political centre of the Muslim Empire was moved to Mesopotamia. Due to the political status of the city, Baghdad rapidly grew. Christiensen states that by the 9th century Baghdad covered 7000 hectares and may have had 500,000 inhabitants. However, Baghdad did have competition in the period 836-892 with Samarra, the other imperial centre.(Christensen 1993, p93).

Overall, Christensen outlines what he believes to be the three most important stages of decline of Mesopotamia through the Sasanian and Islamic periods. The first is the abandonment of large parts of the southern plain between the 7th and 9th centuries, with the decisive factor being the plague. After the plague disappeared in the 8th century, demographic growth and agrarian regeneration were hindered as a lack of maintenance had caused irreparably damage to the irrigation works. The second stage of decline is the destruction of the Nahrawan and the abandonment of the Tigris in the period from the 10th to the mid-12th centuries; the third (which s beyond the scope of discussion for this paper, but by no means unaffected by any effects the change in dating may have) is the abandonment of the transverse canals in the central plain between 1350 and 1550 (Christensen 1993, p110-101).

These conclusions regarding the irrigation of Mesopotamia during these periods may need to be reassessed in light of the new dating. The new dating may not be able to bring evidence for specific reasons for changes in settlement and irrigation patterns, but it will help to highlight issues and problems with current theories as to the timing of events.

Adams' Population Conclusions:

Adams acknowledges that the quality and quantity of the evidence used is variable depending on the period, and that the uniformity of the columns in the graph should not suggest that the assessments upon which the graph is based are all accurate and unambiguous. In fact, he stresses that there is little

doubt that the numerical values given in the table are not impervious to substantial error (Adams 1965, p114). Indeed, his survey data being dependent on pottery is not an ideal proxy for population trends (Butzer 2012, p3635)

It is with these points in mind that an assessment of Adams' conclusions regarding population is now made.

Adams states that during the first epoch of settlement, which was also the longest, being from the 4th or 5th millennium BC to the last third of the fourth or 5thmillennium, there were several cycles of resettlement and abandonment (Adams 1965, p114). The larger communities covered only around thirty hectares and probably did not house more than 5000 inhabitants (Adams 1965, p115). Based on this, it is probably a correct assumption that for much of Mesopotamia's history during this first epoch of settlement, the Euphrates was one of the only significant source of water for irrigation, which in turn sustained a dense population. It is perhaps true that the pattern of settlement attributed to the third millennium BC indicates that one of the means by which the state sometimes sought to extend its control over the countryside was through irrigation. It is therefore possible that the Sasanian complex schemes, which witnessed the integration of the Tigris waters into the system, presuppose state involvement (Vita-Finzi 1982, p353).

Adams comments that during the Middle Babylonian period, town life virtually ceased, no doubt because of the other empires such as the Assyrian, contesting for territory. The Neo-Babylonian and Achaemenid period saw the slow reappearance of towns, which was coincident with general cultivation and settlement (Adams 1965, p115).

With the placement of Ctesiphon as the capital for the Parthians and Sasanians, Adams suggests that the Diyala plains became part of a great empire, and urban growth occurred which was associated with the appearance of bureaucracy and the proliferation of court life (Adams 1965, p115).Indeed, this could be supported in other areas, as Moghaddam and Miri suggest that in the Mianab Plain of Lowland Susiana, south-western Iran after an abrupt population increase in the Parthian period, there followed continuous population increases in those that followed (Moghaddam and Miri 2003, p105). The Sasanian phase (AD 226- AD687) witnessed the highest point for the region in terms of settlement growth (determined by the number and size of the occupied

sites), in urban construction, and in engineering irrigation. Using Adams' data, Kramer further suggests (suggestions that may be affected by any changes in the dating) that during this period the Diyala plains reached their maximal territorial expansion possible within the limits of the available technology (Kramer 1966, p74-5). In terms of the quantitative results Young (commenting on Adams' results) claims that the evidence for a Sasanian urban increase is overwhelming. The density of settlement in Sasanian times was thirty-five times that of the Achaemenid period. This is significant in that even when Sasanian urbanism is compared with the largest cities or earlier antiquity, regardless of whether they are in the Diyala Basin or not, similar distinctions are apparent. Qualitatively, the increased government centralisation, the massive capital investment in the land on a planned basis, state irrigation works, road building, maintenance, and “industrialisation” – all of which were factors supporting the Sasanian city – and their cultural and historical implications can only be appreciated if one understands that they were not existence in earlier times (Young 1966, p342). However, this peak could not last, and towards the end of the Sasanian era the central government collapsed (Kramer 1966, p75). Nearly half of the total settlement area was abandoned, and it was not until after the Arab conquest that the recovery of the agricultural and economic development of the region began again. This recovery continued for several centuries during the earlier years of the Abbasid caliphate (Kramer 1966, p75).

Adams suggests, (and is supported by Kennedy (2011)) that after the Sasanian era, the settlement during the Islamic period increased to being far greater than that of previous periods. The Islamic cities Baghdad and Samarra could be described as being not merely urban but metropolitan, especially as Baghdad swelled to house from a minimum of several hundred thousand people to a maximum of one million. In contrast, the rural economy began to decline, causing stagnation in towns. This can perhaps be explained by the fact that the inhabitants of the cities were not involved with agriculture (Adams 1965, p116). Indeed, the growth in the systems that supported the Sasanian city could not be reversed in the Early Islamic period, resulting in the Arabs accepting the Sasanian city and corresponding networks as a cultural necessity. However, Adams suggests that they were unable to maintain the prosperity that had resulted from the cities and their supporting land. This reveals in part an

explanation for the following decline in Near Eastern civilisation (Young 1966, p342-343). In contrast, however, Langdon and Harden comment that whilst the Parthians and Sasanians always built over older older Sumerian and Babylonian sites, the Arabs rarely did so, tending to choose new sites (Langdon and Harden 1934, p118).

As well as the decline that came with the Islamic conquest, other reasons for decline, which began for the Sasanian Empire, have been identified by Adams. Conditions that were associated with it include, for example, overcrowding which led to salinization and a managerially cumbersome irrigation regime, the overemphasis of cereal production which led to dietary insufficiency, and the increased prospect of famine from the diminution of marginal lands and herds that occupied them. In other words, the increased intensification of cultivation resulted in the violation of fallow and salinization (Redman 1982, p380).

The above conclusions made by Adams, and those conclusions made by others based on the work of Adams, may not be entirely correct in light of the suggested shift in the dating. This is why it is necessary to apply the new dating shift of 100-150 years to Adams' work on the Diyala Plain in order to observe any possible changes.

Application of TAS Dating Changes to the Diyala Survey:

In this section I have used the model created by Lawrence, Bradbury and Dunford, in order to recreate Adams' population graph using the new ceramic sequence at TAS. However, it will be settlement size, rather than population numbers, that will be represented. This is in an attempt to provide a way of showing how these changes in the dating of the 'type fossils' at TAS can have an effect on the population trends.

The new method was created as a result of the observation that different ceramic and lithic chronologies are used in different ways by different surveys, and even within individual projects some site, archaeological features or forms of material culture can be more accurately dated than others. As well as this, inconsistencies in terminology used across regions may also cause problems

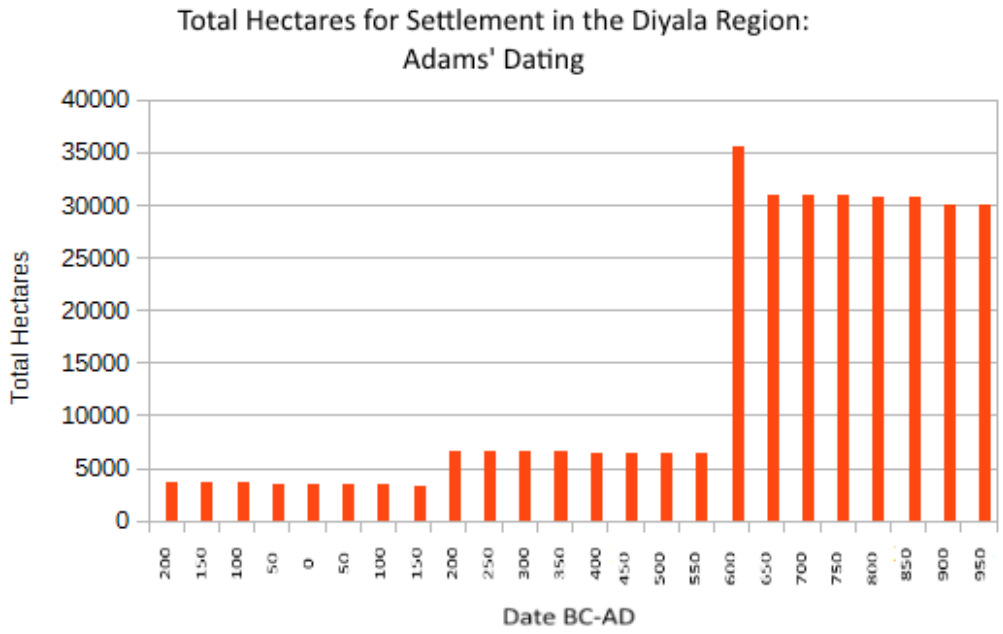
(Lawrence, Bradford, and Dunford 2012, p1007). As a result, it is pointed out that when comparing surveys, a single phase cannot be chosen because the time periods under discussion would be of different lengths. In order to counteract this, the solution is to use published chronologies to relate each phase to calendar dates in years. The period between the start and end dates is considered to be the maximum length of time in which a site could be occupied. As a result, one may decide to present, for example, the data in one hundred year blocks (Lawrence and Dunford 2012, p1009).

I have attempted to do this for the data concerning the Sasanian period through to the Late Islamic period. Considering that this paper has only focused on the Sasanian and Early Islamic 'type fossils', it has only been possible to focus on the Sasanian and Islamic sites identified by Adams in *Land Behind Baghdad*. However, in *Land Behind Baghdad,* Adams does not give examples of pottery types that he found for the surface collection he used to date sites.

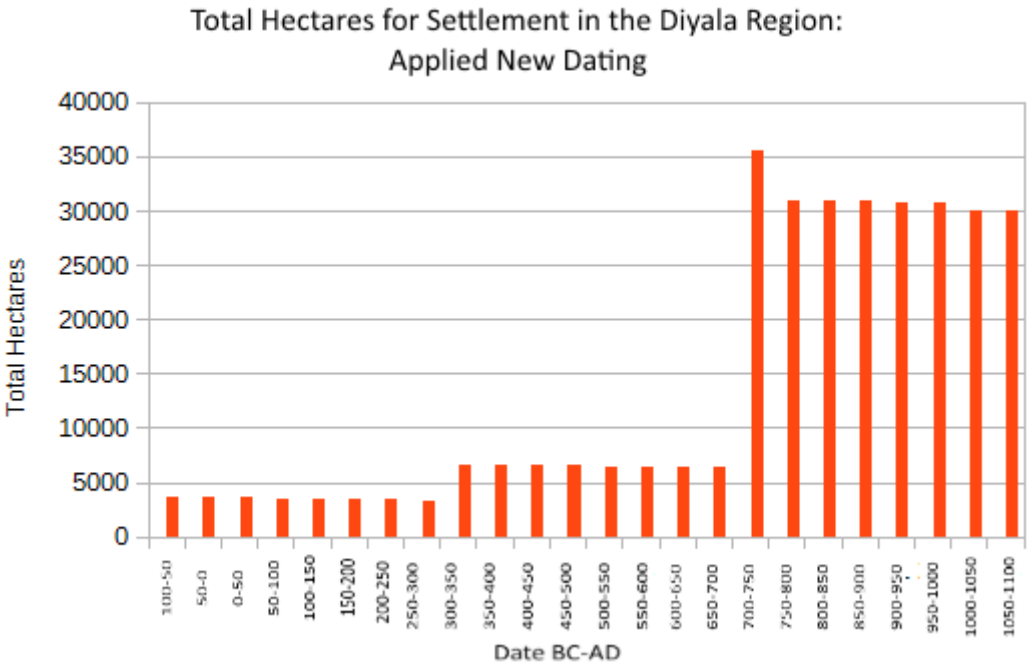
Therefore, in order to assign dates to the periods it has been necessary to make assumptions about the ceramic 'type fossils' found.

Results:

Below is Adams data concerning settlement sizes in hectares presented in two graphs using Lawrence et.al technique. The data used is from Tables 19 and 20 in *Land Behind Baghdad* (1965) (see figure 9), with the total hectares for sites presented in fifty year increments. Due to the fact that it is impossible to known exactly which 'type fossils' were found at which sites, it was not possible to look at the evidence for each site individually and re-date on the basis of sherds found there. Therefore, in discussing the graph a general and perhaps more rudimentary approach has been chosen. Specifically, the assumption has been made that the Diyala region is in need of a similar change in dating as at TAS: a one hundred to one hundred and fifty year shift.



Graph 3: Settlement according to Adams' dating



Graph 4: The new shift in dating applied to Adams' Diyala survey settlement data

Analysis of Results:

In examining these results, it is necessary to bear in mind the weaknesses there may be in this data. Firstly, the new chronological resolution of the new TAS sequence is rather coarse. The graphical results can therefore only be considered to be a rough depiction of the settlement over time. This

means that any subtleties there may have been in the original data will have most likely been lost, and as a result the changes in the different time periods may appear to be more drastic than they actually were. Changes over extended periods of time may also not be depicted well, as the relatively large sections of time may have had an effect of levelling the results. Secondly, as has already been discussed, the total settlement in each time block may be exaggerated. This could be due to a number of factors, such as the fact that the dating of the individual sites was fairly roughly assigned to them. This was because it was not possible to do a sherd-by-sherd analysis of each individual site, which would have been a much more accurate method. As well as this, Adams himself notes that due to improvements in method and theory over time, there are many sites that would have been assigned different dates had they been visited later in 1975 instead of 1968 or 1973. An example of one change in methodology that may have had an effect on his dating of sites includes approaches to locational theory that was not fully-formed in 1968 – a time before his surveys of the Diyala (Adams 1981, p38).

In addition, the assumption was made that all of the sites needed their dating to be shifted by 100-150 years, meaning that those that may have been originally correctly dated would not have been accounted for. Without knowing the exact 'type fossils' found at each site however, it was not possible to avoid this issue. In addition, it is impossible to account for any sites Adams missed in his surveys, and impossible to tell what impact they might have had.

However, the graphs do show the total settlement area for the periods, and whether or not the amounts of hectares are exaggerated in the blocks of time, it is still possible to see distinctions. As can be seen comparing the two graphs, the peak in settlement area in Graph 4 occurs at 700-750 AD, previously situated at 600 AD (Graph 3). Not only does the peak move forward in time, it is also a significantly large jump in settlement hectares, roughly amounting to a seven-fold increase. With the new dating it would indicate that it is the Islamic period, rather than the Sasanian period, that has a significant increase in settlement. Specifically, the increase in settlement corresponds to the Late Umayyad period, approximately 50 years before the Abbasid revolution. Indeed, this does seem to support the idea that settlement did not decline much into the Islamic period. This slight decrease in settlement after the

Late Umayyad period also appears to correspond with the Abbasid revolution. Similarly, before the peak, in the years of the Sasanian period in the run up to it, there appears to have been a very slight decrease in settlement. This can perhaps be viewed as an indicator of the empire weakening in terms of economy and irrigation.

In addition, the peaks' placement in 700-750 AD is also interesting in that it does not correspond with the founding of Baghdad (762 AD), a new capital that was deliberately established outside of Syria due to the fact that it harboured many Umayyad supporters in addition to being alarmingly close to the Byzantine frontier (Whitcomb 2009, p102). Baghdad is also a factor that is sometimes used to explain increases in population and settlement area in this time. For example, Schick suggests that a peak in population and agricultural activity in the Islamic period may be explained by the founding of Baghdad in 762 by the Abbasids (Schick 1998, p76), which resulted in Baghdad becoming the driving force of economic growth in Mesopotamia. By the 9th century Baghdad may well have grown to a size of 7000ha with a population of half a million (Kennedy 2011, p XIV), being of the order of eleven times the size of the Sasanian capital of Ctesiphon (Lassner 1967, p54). It is thought that both the new cities of Samarra and Baghdad were an unprecedented size. Each substantially exceeded the entire area of built-up settlement in the Diyala region during the Sasanian period (Adams 1965, p98). In the 3rd/9th century Baghdad, and its huge population, therefore generated a massive demand for agricultural products. This demand was felt throughout the area of Greater Mesopotamia and beyond (Kennedy 2011, p181). Indeed, Heidmann goes on to say that Al-Raqqa, being a river port, probably served as the main hub for industrial and agricultural products from northern Syria and the Diyar Mudar. From here, foodstuffs and goods were shipped downstream to Baghdad and Iraq (Heidemann 2011, p49).

In contrast, the growth of Baghdad can also be seen to have had adverse effects as well as encouraging ones, suggesting that it is not a certainty that cities would necessarily encourage immediately surrounding areas to grow. Indeed, the return of the caliphal court from the formal imperial centre of Samarra to Baghdad resulted in the steady decline of population in Samarra. The demand for food also decreased as a result of this (Heidemann 2011, p56).

As Priestman notes, even though the hinterlands may have been used by the cities, there would seem to be an indication that the cities were not always solely dependent on them for food. Although these cities may have had a larger demand for food and a dependence on other rural areas, these areas need not have necessarily been located in the cities' hinterland, as the transport network could bring commodities from other regions. For example, at Ras al-Khaimah, although it is clear that radical changes in the nature of settlement and orientation occurred during the later periods, with a reorientation towards the coast and an increase in the nomadic population, at the same time, fine ceramic imports continued to be received from Iraq (Priestman 2005, p117).

It is the effects of these cities that have aided in the conclusion that this third epoch of settlement thus transcended the limits of earlier urbanization, persuading Adams that it is possible to give the term metropolitan to the new centres of Baghdad and Samarra. According to Adams, as the capital increased in size, housing numbers of several hundred thousand to perhaps a million people, the rural economy faltered and began to decline, and stagnation and decline began in most provincial towns (Adams 1965, p115).

Similarly, Wilkinson comments that the decline in the southern areas was probably counterbalanced by the rise of cities such as Baghdad and Samarra in Iraq, and Raqqa in Syria. This urban increase and expansion in turn may have caused or encouraged the development of dense scatters of rural settlements in the regions near to these cities such as, for example, Bartl in the Balikh and along the Syrian Euphrates (Wilkinson 2000, p246).

However, looking at these views in comparison with Graph 4, assuming it is correct, it would appear that this increase in settlement cannot be necessarily attributed with confidence to the founding of these large cities, as the peak occurs before their foundation, and so the cities do not suitably explain the increase in settlement size.

Whether or not Baghdad had an effect, in comparison to Adams' conclusions, it is clear according to these results that the Early Islamic period flourished. This is contrary to Adams' statements concerning the area. Adams states that “a comparison of Sasanian with Early Islamic settlement makes clear that a substantial retraction occurred before the Islamic period, both in the

extent and density of occupation" in the Diyala. Around 58 per cent of the occupied part of the Diyala region, after the fall of the Sasanians, was not soon reoccupied (Morony 1976, p47). It is claimed that in the Early Islamic period, the amount of settlement amounted to only 64 per cent of what it had been before the end of the Sasanian period. Morony notes that there is a general impression of a shift in population from the districts to the east of the Tigris to new urban areas around the garrison cities such as Basra and Kufa in lower Iraq. Indeed, historical observations indicate that there were great trans-locations of populations during the 1st millennium AD (Wilkinson 2000, p246). The depopulation of these districts east of the Tigris, and along the Diyala river and the Nahrawan canal system, appear to have started before the Arab conquest (Morony 1976, p47).

However, the new dating in Graph 4 simply does not support the idea that only 64 per cent of what it had been in the Sasanian period existed in the Early Islamic period. It instead fits with the view outlined by Kennedy, that the area of the Euphrates does seem to have evidence that indicates significant activity, probably agricultural, in the Early Islamic period. Kennedy states that whilst most of the settlements during the Early Islamic period in this region were very small, settlement was twice as dense as it had been during Byzantine rule. Indeed, he goes on to say that the developments in the Euphrates began in the Late Umayyad period and continued into the Abbasid period (Kennedy 2011, p197). He goes on to say that both the textual and archaeological sources indicate a huge amount of agricultural development in the Tigris and Euphrates valleys and in the Sawad of Iraq in the Early Islamic period, suggesting that there is more evidence for cultivation in the Ummayad and Abbasid periods than Adams suggests. Heidemann would also seem to agree with the idea of increasing cultivation in the Early Islamic period, as he states that the Sasanian patterns were also used by the Ummayads, who invested in irrigation. This, he argues, laid the foundations for the economy to blossom (Heidemann 2011, p47).

Similarly contrasting with the view of a decline after the Late Sasanian period, according to the surface survey carried out by Gibson, the area of Kish saw a great revival in the Late Abbasid period, with the number of settlements approaching the Sasanian high (Gibson 1972, p55). At North Jazira, since the

area appears to have functioned as an area of rural occupation between districts dominated by the cities of Nusaybin, Singara and Balad, it is perhaps surprising that the results of the North Jazira Project survey suggest a low density of Sasanian settlement (Simpson 1992, p130-131). Kennedy, however, would perhaps not find this so surprising, as he states that in the case of Jazira, it was not until the Umayyad period in the first half of the 8th century that the expansion of settlement and agricultural got under-way and grew until the beginning of the 10th century (Kennedy 2011, pXII). The peak in settlement in Graph 4 corresponds to the Late Umayyad period, with a decrease in the Abbasid period, further supporting Kennedy's comments for both the North Jazira region and the Diyala.

In terms of the settlement in the Sasanian period only, it is worth commenting on Wilkinson's notes. Wilkinson, drawing upon the work of Adams, states that in the late first millennium BC and the early first millennium AD, in the south of Mesopotamia there was an increase in population so that both the total settlement area and the scale of urban settlements were higher than at any previous time. This increase peaked in either the Parthian or Sasanian period when imperial projects, particularly those regarding canal constructions and irrigation systems, attained a maximum in the alluvial plains, much of south-western Iran, the Diyala, and the Hamrin. Settlement increase was also evident in parts of the Euphrates Valley in Syria (Wilkinson 2000, p246). Whilst in Graph 4 there does appear to be a rise in these early periods, the settlement does not seem to peak, staying at relatively the same level.

In the next section, a discussion of possible evidence from other areas supporting these results (specifically the peak in the Late Umayyad period) and possible scenarios to explain them will be discussed. This will aid in determining how likely this data is to be correct. As will be discussed, the peak is not wholly unprecedented, as work in other areas does appear to support the patterns from the new Diyala dating and settlement patterns, such as the fact that in the later 7th and 8th centuries, across Eastern Arabia, there was a notable increase in settlement and activity. Settlements, (such as Kadhima in Kuwait) reflect this in that there is evidence of new occupation (Kennet 2011, 29).

Further Evidence:

In discussing the evidence, it is worth explaining why this period is so debated. In terms of the history of the Islamic period, it does seem that historical documentation is not always clear, making the exact conditions of the Islamic period hard to determine. Historical sources for the 8th century are not very detailed and are unreliable, and there are many historiographical uncertainties, making it unlikely for them to ever provide a fully rounded picture of the developments during this time (Kennet 2009, p136). In addition, the Islamic sources were based on oral traditions that were only beginning to be written down approximately 150 years after the events that they described. By this time the Islamic state had already begun and had become well developed in its cultural identity and political ideology. The history of Islam was therefore, unsurprisingly, written with a certain bias, specifically with an aim to please vested interests (Kennet 2005, p107). As Vernoit points out, although archaeology originally derived its significance through the historical evidence, for Islamic archaeology in recent times the study of history has become more dependent on archaeology (Vernoit 1997, p8).

Bearing this in mind, the effects the results have in regards to the Sasanian period will be now be discussed, followed by an examination of the effects on the Umayyad period up to the Abbasid revolution.

The idea that there was an Islamic collapse in Mesopotamia after the wake of the Arab Conquest in approximately 640 AD (Butzer 2012, p3635), seems to be challenged by the above results. Butzer goes on to say that this supposed collapse spanned approximately a century (Butzer 2012, p3635). As can be seen in Graph 3, this would correspond with Adams' dating, as by 650 AD there is a decrease in settlement. However, looking at Graph 4, there is little change at this time. Graph 4 appears to show a rather steady and almost imperceptible decrease in settlement area from 300-350 AD to 650-700 AD. A decline does have supporting evidence in other areas, such as in Eastern Arabia at Kush. Here, there are signs that there was a long period of economic decline which began after the 1st or 2nd centuries AD and continued until at least the 7th century AD. This appears to have involved transformations in settlement patterns, social structures, and possibly the nature of the elites. This decline is well attested in Eastern Arabia, and may also have occurred elsewhere in the

Oman peninsula (Kennet 2005, p116). This statement would be apparently supported in Graph 4. As noted earlier, there does appear to be a very gradual decline in the lead up to 700-750 AD, although it is difficult to say that it starts as early as the 1st or 2nd centuries.

On the other hand, decline is not necessarily always apparent. For example, during the 5th-7th centuries, or perhaps earlier, it appears that nomadic groups began to interact regularly with maritime traders frequenting the Kuwait coastline. This trade is likely to have been small at first, and may have developed into a more systematic and larger-scale operation as time went on (Blair et.al 2012, p23). The evidence for this is the sites with torpedo jars. It is however, impossible to determine the exact duration of this period, but between the 5th-7th centuries has been suggested (Blair et.al 2012, p24). The presence of trade suggests growth, rather than decline.

Morony argues that in order to understand the economy of the Early Islamic period it is necessary to understand the differences between its own associated economies and the economy of the Sasanians and Late Antiquity across Western Asia (Morony 2004, p166). Therefore, it is necessary to note, as Morony points out, that the Sasanians helped to destroy the Late Antiquity economy in Anatolia, and helped undermine the economy in Syria (Morony 2004, p189). This suggests strengths on their part, but what he goes on to say may support the idea of an Early Islamic 'boom'. As a possible result, rather than being incorporated into Anatolia, it was into the Early Islamic Empire that the Late Antiquity economies of Syria, Palestine, Egypt, and North Africa, were incorporated (Morony 2004, p189), suggesting that the situation in Sasanian times played to the Umayyad advantage. Similarly, Morony describes the Sasanian economic behaviour toward the Late Roman Empire as taking the form of massive looting and the forced deportation of farmers and artisans, particularly during the 6th and early 7th centuries when the Sasanian economy was expanding. This continued under the Muslims with the importation of war captives and slaves (Morony 2004, p189). This may suggest that the stance towards competitive empires may also help to give background to the possible enormous settlement expansion in the Early Islamic period suggested in the results of the 100-150 year shift. Whilst there may have been perceived weakness in the irrigation system of the Sasanian Empire, economic

approaches and tactics as outlined by Morony may have had an impact on the Islamic approach, which in turn may have encouraged growth. In the earlier years of the Umayyad period, Kennedy states that Ali-Walid's reign (705-15 AD) was in many ways a continuation of his father's ('Abd al-Malik) and a period of prosperity and peace in in many parts of the empire. He instituted a system of poor relief and public charity in Syria, and also began many building projects (Kennedy 1986, 103). Ali-Walid's reign also witnessed the furthest extension of the geographical frontiers of the Umayyad state, for example, the invasion of Spain occurred in 711 AD and was almost entirely taken in 716 AD (Kennedy 1986, p104). Whether the peak comes at the beginning or end of the time span (700-750 AD), a case for strength in the Early Islamic period does not seem to be implausible, and resources for the possibility of this are being demonstrated in the ability of the empire to expand. The issue of continuation seems to be key, as outlined by Avery, and who noted that when the Arabs overthrew the Sasanian Empire in the 7th century, the conquest was primarily political in character. The Arabs readily assimilated the Iranian culture of the now subject Persians and disseminated it throughout Europe (Avery 1922, p137).

Continuing in discussing the economy of the Early Islamic Empire, in 724 AD, Hisham became the ruler of the Umayyad caliphate (until 743 AD). His main problems were external invasion and the finances of the government (Kennedy 1986, p108). Whilst the financial administration of the Umayyad caliphate remains obscure, Kennedy notes that Agapius of Manbij, a Christian commentator, believed that Hisham's profits from his landed estates exceeded the profits from taxation of the empire (Kennedy 1986, p110-111). Having said this, however, Hisham appears to have left the caliphate prosperous and secure (Kennedy 1986, p112). These points concerning the strength of the economy only further support the hypothesis that the Early Islamic period flourished. In support of Early Islamic strength, in this case in the form of increased cultivation, it is noted that at Siraf, in spite of the desolate region, has evidence of Early Islamic agriculture in considerable quantities (Wilkinson 1974, p127), with an estimated 630ha of cultivated land being used in the 9th and 10th centuries (Wilkinson 2009, p75).

Further support for the increase in settlement at the broader regional level, during the 8th century is reflected in new occupation at Kadhima and

Suhar, and Christian sites such as Akkaz and al-Qusur in Kuwait and Thaj; Jubail; Hinnah and Jabel Berri in eastern Saudi Arabia; Muharraq in Bahrain; and Sir Bani Yas in Abu Dabi, as well as others (Kennet 2013, p193). Other areas that increased in activity during this time include Kush, where occupation continued. Although this was on a small scale occasional finds of 8th century pottery wares were found at rural sites, indicating that there was some activity in the countryside as well during this time (Kennet 2011, p29)

Another area that could support the view of an Early Islamic peak is al-Raqqa, where during the Early Islamic period there was a peak in settlement in the region (Decker 2011, p4). Similarly, an evident peak in settlement is Kuwait. The 8th century appears to show a clear peak in settlement and activity in the area of the Kuwait Bay. Kennet comments that although the reasons for this are likely to be local, it is notable that the pattern is a regional one with the 8th century witnessing a revival of settlement and activity across much of eastern Arabia, with new foundations at sites such as Hulaylah, Suhar, Bahraim, Sir Bani Yas, and elsewhere (Blair et.al 2012, p24). Furthermore, in the late 7th or early 8th centuries in Kuwait, it is possible that the past trading activity increased to a point when it encouraged the establishment of a number of small settlements, either semi-permanent or permanent, along the coast in viable locations. There is a scarcity of resources in the region, so it is likely that these settlements based their economy on the maritime and land-based transport routes between southern Iraq and Arabia (Blair et.al 2012, p24). In addition, there are at least two examples of settlements that appear to have had varying degrees of expansion. One of which is the settlement of Mughayrah, with larger and more substantial buildings indicating the emergence of a site that is experiencing an increasingly sophisticated social and economic structure (Blair et.al 2012, p24). By the mid-9th century these settlements were abandoned (Blair et.al 2012, p24). Although a reason for abandonment may not be reflected in Graph 4 due to a still quite high area of settlement, the peak definitely appears to be agreed upon in other areas of the Islamic empire.

If the economy of southern Iraq and other areas such as the Gulf were successful at this time, it may help to explain why the centre of power eventually moved from Damascus to Iraq, ending with Baghdad. This was through a revolution in 750 AD. It is possible that the revolution was reflecting the realities

of economic power being enacted politically. The effects of the Abbasid revolution is therefore also worth discussing.

In terms of the end of the peak in Graph 4, it is of note that the collapse of the Umayyad caliphate is dated from 743-750 AD (Kennedy 1986, p112). Indeed, Arjomand comments that there are Late Umayyad translations that include a number of tracts that are especially concerned with overcoming anarchy. Arjomand states that it is not unlikely that these tracts can be dated to the last years of the Umayyad period as they show every indication that they were written during a revolutionary crisis (Arjomand 1994, p18-19). Kennedy suggests that the Umayyad caliphate failed for the following reasons: it failed because it could not offer the sort of leadership many Muslims wanted (Kennedy suggests that the need for an authority from the Family of the Prophet Muhammad was becoming popular among Muslims), and there were also regional problems. Kennedy states that it would be wrong to judge that the collapse of the Umayyad regime was inevitable. He points out that the Umayyad regime had never been as strong as it had been under Hisham only a decade before the final collapse. The collapse was therefore mainly a result of the failure of leadership and murderous conflicts which followed Hisham's death which led to disaster (Kennedy 1986, p116). The Abbasid revolution marked the beginning of an integrated Islamic society (Arjomand 1994, p9). A major outcome of the Abbasid revolution was the centralization of power and administration, and indeed, secretaries who survived the destruction of the Umayyad state joined the new revolutionary administration and in the long run were among the main beneficiaries of the Abbasid regime (Arjomand 1994, p12).

Later, in the years around 800, the explosive growth in maritime trade can be viewed as a by-product of the Abbasid revolution (Whitcomb 2009, p102). The 10th century only continued to see the development of further trade links between south-east Asia and the Middle East through the ports of the Indian subcontinent (Wade 2009, p232), perhaps supporting the rather steady settlement in Graph 4 after the main peak. Indeed, in the Gulf, during the 9th and 10th centuries, there were some marked changes, namely that new settlements emerged along the shores of Eastern Arabia. As well as this, two major trading emporia emerged in the regions: Siraf in Iran and Suhar in Oman (Kennet 2011,

p29). It is therefore concluded that in this region, the 9th-10th centuries clearly represents a very significant regional boom in trade settlement and urbanisation, reflected by the evidence of the flourishing of Basra in Iraq, Siraf in Iran and Suhar in Oman (Kennet 2011, p30). This is slightly later than the boom reflected in the Diyala above, and may reflect why there is a decrease in settlement after 750 AD in Graph 4, as the development of other regions, especially in trade, may have diminished the Diyala's influence.

This peak in settlement in the Early Islamic period perhaps reflects what other scholars suggest: that the irrigated expansion of Sasanian Iraq that belonged to the 6th century, not only survived well into the Islamic period but also continued to develop (Morony 2004, p184). According to Morony, at least six trends had their roots in Late Antiquity and had long trajectories into the Islamic period. These trends helped to define it. Morony lists them as being: 1) the development and spread of large estates with tenant labour, 2) the monetization of the economy, 3) the development and spread of irrigated agriculture, 4) the revival of mining, 5) the formation and spread of merchant diasporas and 6) the domination of Indian commerce by Persian shipping and the eclipse of Byzantine shipping in the Red Sea by the end of the 6th century (Morony 2004, p188). It appears that the Early Islamic period transition from the Sasanian was more successful than was once thought. As Kennedy comments, whilst there may have been systems that continued from Late Antiquity, the establishment of the culture and civilization in the region owed everything to the Umayyad caliphs. It held together the political unity and its cultural and religious identity. The Umayyads made Islam the religion of a cultured court and an imperial administration, and they made Arabic the language of literature and commerce (Kennedy 1986, p119).

Conclusion:

It is possible to draw the conclusion that the peak in settlement between the years 700-750 AD in the Diyala and Mesopotamia is a viable theory, as there is evidence in other areas that a similar pattern occurred.

As Decker notes, although it is evident that the Sasanians and Parthians initiated agricultural programs in Mesopotamia, there is evidence to support the

view that both the Umayyad and Abbasid dynasties in the Early Islamic period took a particular interest in Mesopotamia and also initiated agricultural programs there (Decker 2011, p4) due to the increase in settlement. Such an increase needs a means of support to sustain it.

It is therefore likely that contrary to previous beliefs, the Early Islamic period did flourish, particularly under Hisham, perhaps due to economic strengths, or the continuity of factors laid out by Morony from Late Antiquity. This has highlighted and reinforced further that Adams' work with ceramic 'type fossils' and his surveys has needed to be reassessed. Rather than Adams' work in itself, and the methods he used, it is simply due to time and more current research that has brought to attention the increasing problems and discontinuities his original theories have with currently emerging ones. As Kennet points out, it was only not until recently that the 8th century began to be less problematic for archaeologists in terms of ceramics. The pottery types used in this period were not well known, and it was therefore difficult to distinguish 8th century occupation (Kennet 2011, p29). This has been supported earlier in the paper, as these 'type fossils' proved to be an indication that the dating needed to shift. On the other hand, the 9th century has been easier for archaeologists to recognise as it marked the introduction of a well-known, new style of glazed ceramics known as the 'Samarra horizon'.

It appears to be the case that such concerns voiced by, for example Wilkinson (who drew attention to the fact that the possibility that some of the ceramics that are described as Sasanian may in fact be of an Early Islamic date, and would have repercussions) (Wilkinson 2006, p246) are correct. Overall, there is sufficient evidence to question Adams' original views regarding the settlement and economic patterns of the Sasanian and Early Islamic periods that have also been put forward, supported, and expanded upon in the intervening years. The idea that the Arabs did not know how to look after the agriculture in the region, an idea that influenced Adams, is similarly challenged, as agriculture is needed to support settlement. However, the settlement could have been supplemented by an increase in maritime trade during this period.
Overall, due to the apparent change in dating and shift of settlement increase from the Sasanian to the Early Islamic period, this time in Mesopotamia needs to be more carefully considered simultaneously with the historical record.

6. Conclusion

In the case of Adams' work on the Diyala Plain as outlined in *Land Behind Baghdad*, a sherd-by-sherd study for each individual site that Adams identified was not possible. This was due to the nature and presentation of the data that Adams used, a specific issue being that it was impossible to know the exact 'type fossils' found at each site. A detailed re-dating and re-calibration of Adams' work therefore could not be done.

However, the analysis of Adams' Sasanian and Early Islamic 'type fossils' has demonstrated that there is a significant problem with the dating of both his 'type fossils' and the TAS sequence. The analysis therefore confirms the suspicions voiced by scholars such as Simpson and Kennet, and also reinforces Moorey's suggestion that Adams' dates for the levels at TAS need to be shifted forward around 100 to 150 years. Indeed, it does seem to be correct that in the past, many of the key forms and wares of the 8th century have been misdated, and have been incorrectly attributed to the Sasanian period (Kennet 2013, p193), aiding in causing misconceptions in terms of the way in which the characteristics of the eras are perceived.

By using the method devised by Lawrence et.al, this shift has been applied to the site data collected by Adams in his survey of the Diyala. Rather than a decline in the Early Islamic era of the Mesopotamian agricultural economy, it is possible that it did in fact flourish, with the growth being dramatic. Such growth patterns may be given more credence by evidence that is emerging from other parts of the region, specifically at sites such as sites Hulaylah, Suhar, Bahraim and Sir Bani Yas (Blair et.al 2012, p24): all in areas ranging from Kuwait, Saudi Arabia, Bahrain, to Abu Dabi (Kennet 2013, p193).

Overall, a major re-assessment of this period is necessary. If it were indeed the case that there was a massive boom in the Umayyad period, this could have huge implications for our understanding of the history of the time. Not only does the beginning of the Islamic period need to be looked at again, but key events that followed, namely events such as the Abbasid revolution (750 AD), the foundation and growth of Baghdad (762+ AD), and the development of the Abbasid empire during the 8th and 9th centuries would have

to be re-examined and more carefully considered by historians.

Since Adams' pioneering and influential work in the Diyala and at TAS, the doubts that have been cast upon his dating of the ceramic evidence, which has in turn been used by others in later excavations, appear to have been confirmed. For example, since the work at the Diyala, the site of Samarra has set a very visible model of Islamic archaeology for both archaeologists and historians (Whitcomb 2007, p256), and so in terms of ceramic dating, has been highly useful and effective in correcting misconceptions of the Sasanian-Islamic sequence. However, in fairness, whilst the growth of the discipline of Islamic archaeology owes much to Samarra, more is owed to *Land Behind Baghdad* (Whitcomb 2007, p259).

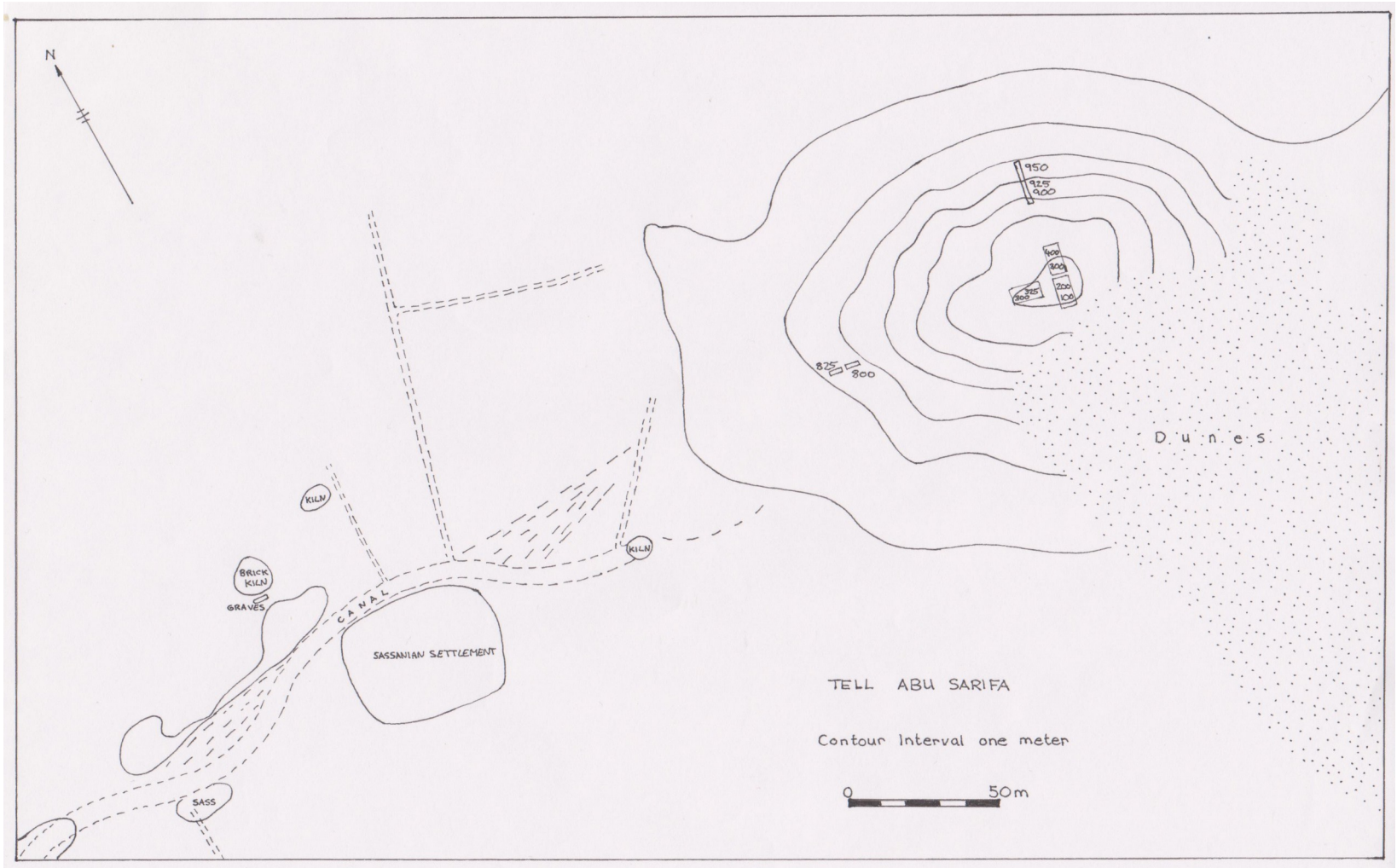
Areas for Future Study:

As mentioned before, when considering the review of the Sasanian and Early Islamic 'type fossils', it could be argued that re-assessing Adams' Parthian and Late Islamic 'type fossils' would also be useful. This was beyond the scope of this dissertation, but the dating of the TAS sequence could be clarified further if all the 'type fossils' that occurred at the site for each period in which the site was occupied were studied, especially for Level I, Level VI and the Surface. More reliable evidence could probably be gained from the Late Islamic 'type fossils' that occur at the site than the Parthian 'type fossils' as they appear to be more numerous. An examination of the 'type fossils' for the entire sequence would give a complete picture of the newly dated history of the site.

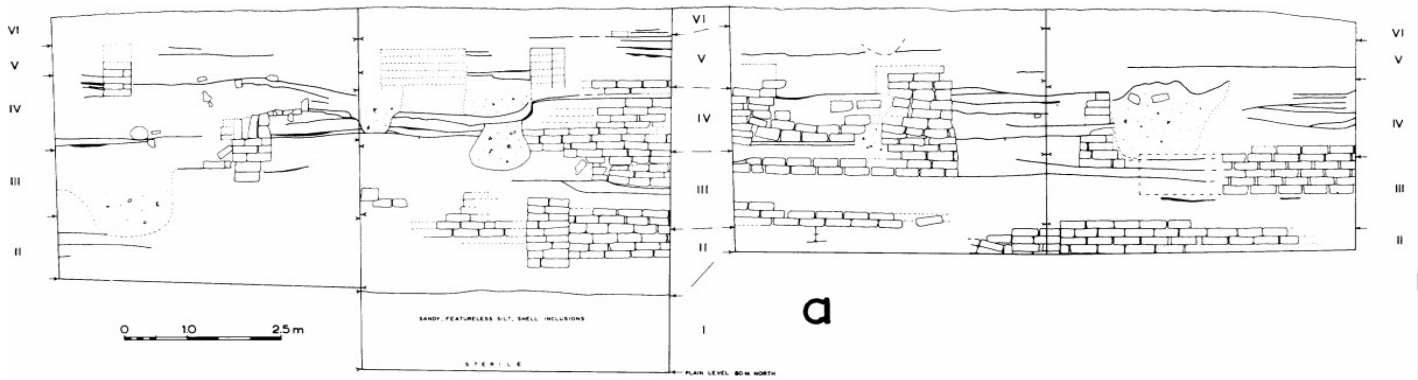
Further research that would serve to test this thesis would be to apply the new fossil dating to more regions, preferably with sites that have more information regarding exactly what 'type fossils' were found at sites so that a sherd-by-sherd analysis could be possible. This would enable the effectiveness and accuracy of the 'type fossils' to be further verified, as well as the comparison of settlement and population patterns in the different regions. For example, it has been noticed, as Simpson (1992) has sometimes commented, that there appears to be differences between northern and southern Mesopotamia. Perhaps modifications to Adams' 'type fossils' could still be

made, especially in cases such as smeared and Honeycomb ware, where it appears that in the northern regions smeared ware is generally present before its more geometric counterpart.

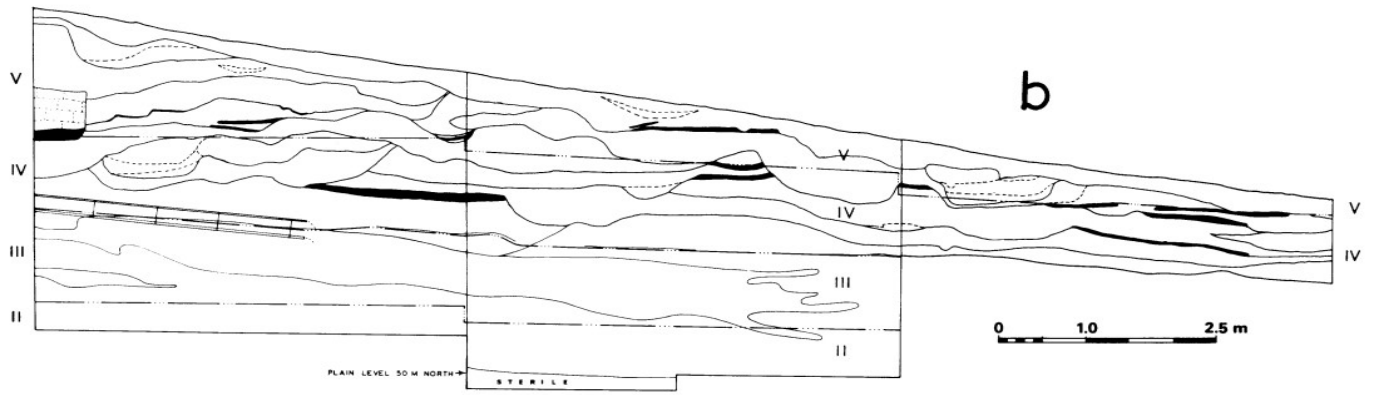
APPENDIX 1: FIGURES



1. Site Plan of Tell Abu Sarifa (redrawn) (Adams 1970, Plate 1: Figure 1).

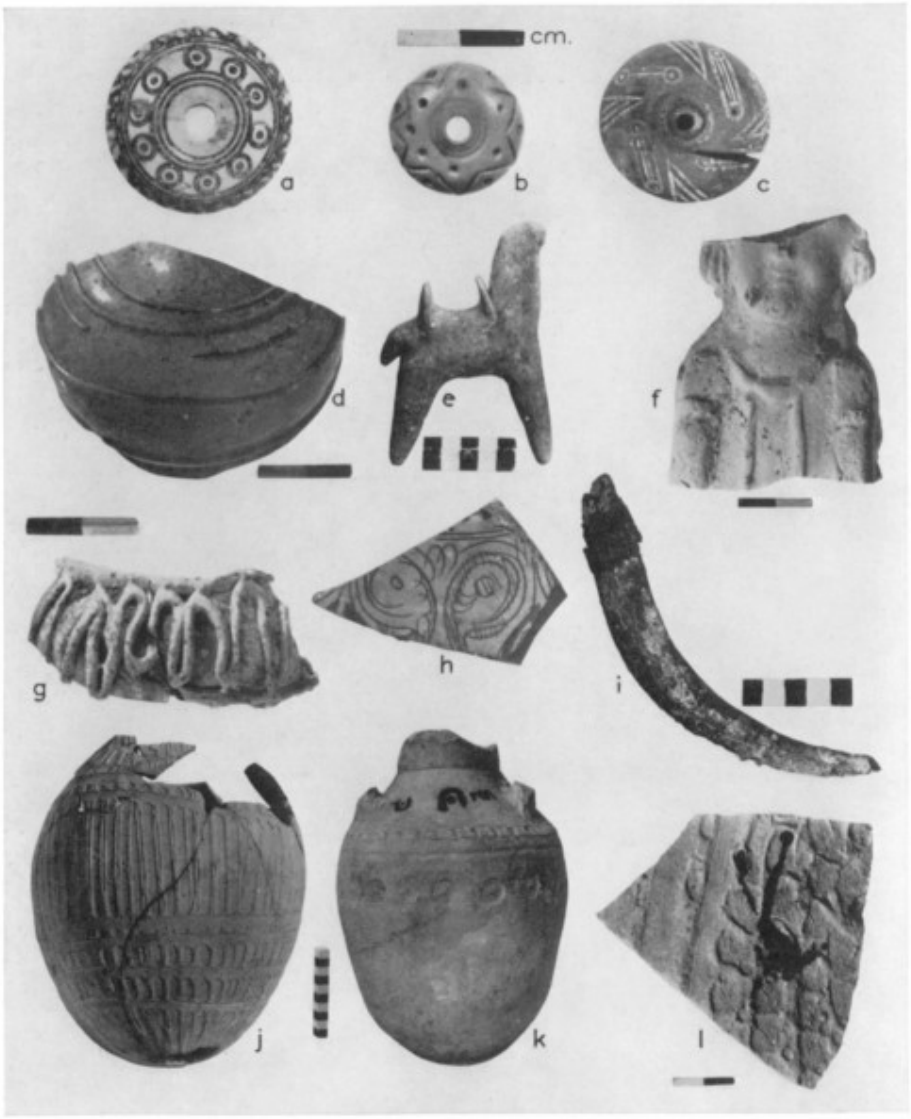


2a. Stratigraphic section of west face of main trench at Tell Abu Sarifa.
(Adams 1970, Plate 1: Figure 2a).



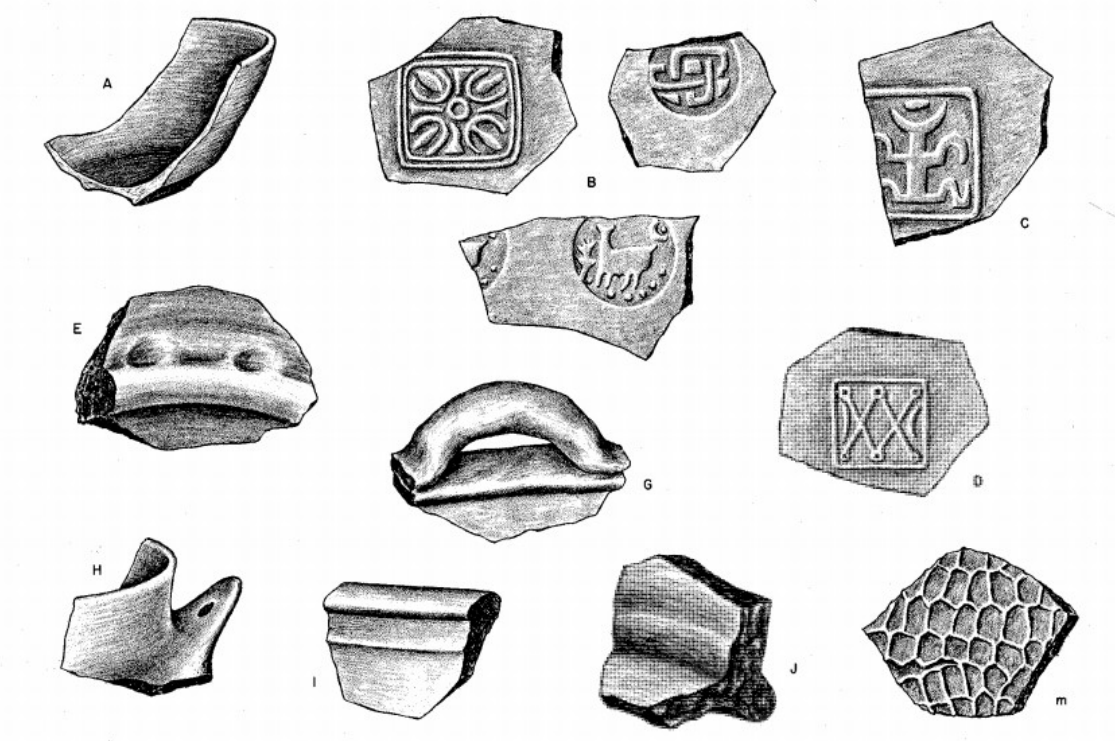
2b. Stratigraphic section of west face of step-tench at Tell Abu Sarifa.
(Adams 1970, Plate1: Figure 2b).

3a. Incantation bowel from Tell Abu Sarifa, Level II
3b. Incantation bowl from Tell Abu Sarifa, Level III.
(Adams 1970, Figure 17, Plate 8)

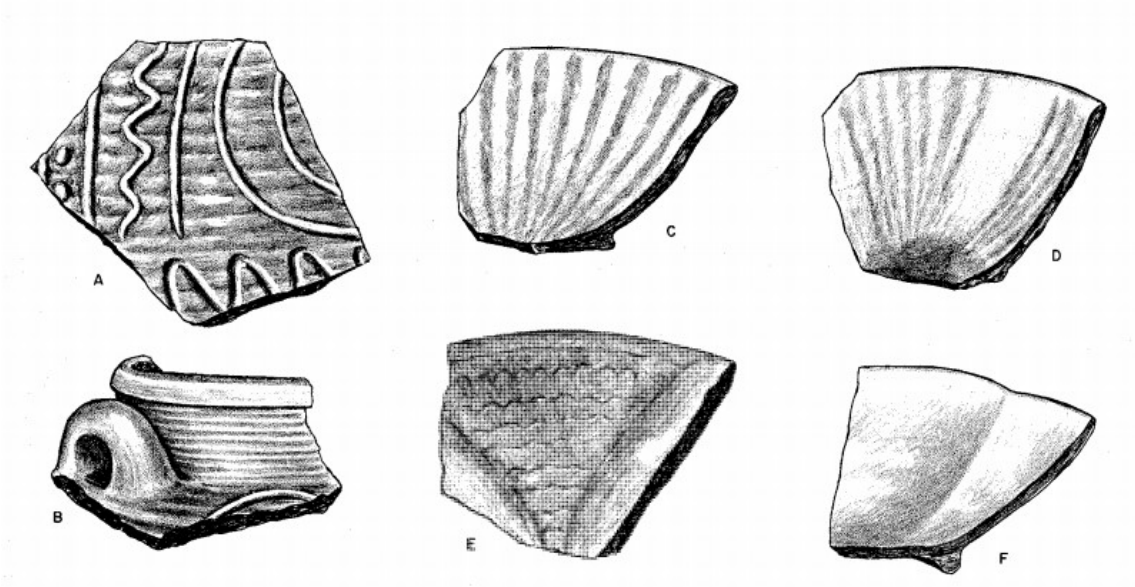


Miscellaneous objects from Tell Abu Sarifa
4a. Spindle whorl, filled with black pigment, Level IV.
4b. Spindle whorl, filled with black pigment, Level IV.
4c. Spindle whorl, darkened through possible burning, filled with white pigment, Level VI.
4e. Horse figurine, bottom of Level V.
4f. Female figurine, top of Level V.
4i. Curved iron dagger, Level V.
4j. Unknown type.
4k. Unknown type.

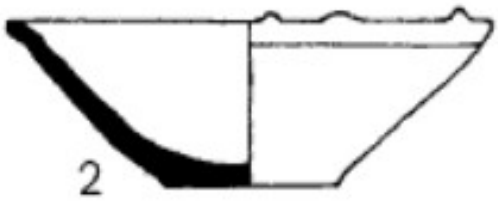
(Adams 1970, Plate 8: Figure 16)



5a-e, g-j, m. Adams' Sasanian 'Type 12 Fossils': Types 12A – 12E, 12G-J, 12m. (Adams 1965, Figure 14).



6a-f. Adams' Early Islamic 'Type 13 Fossils': Types 13A-F. (Adams 1965, Figure 14).

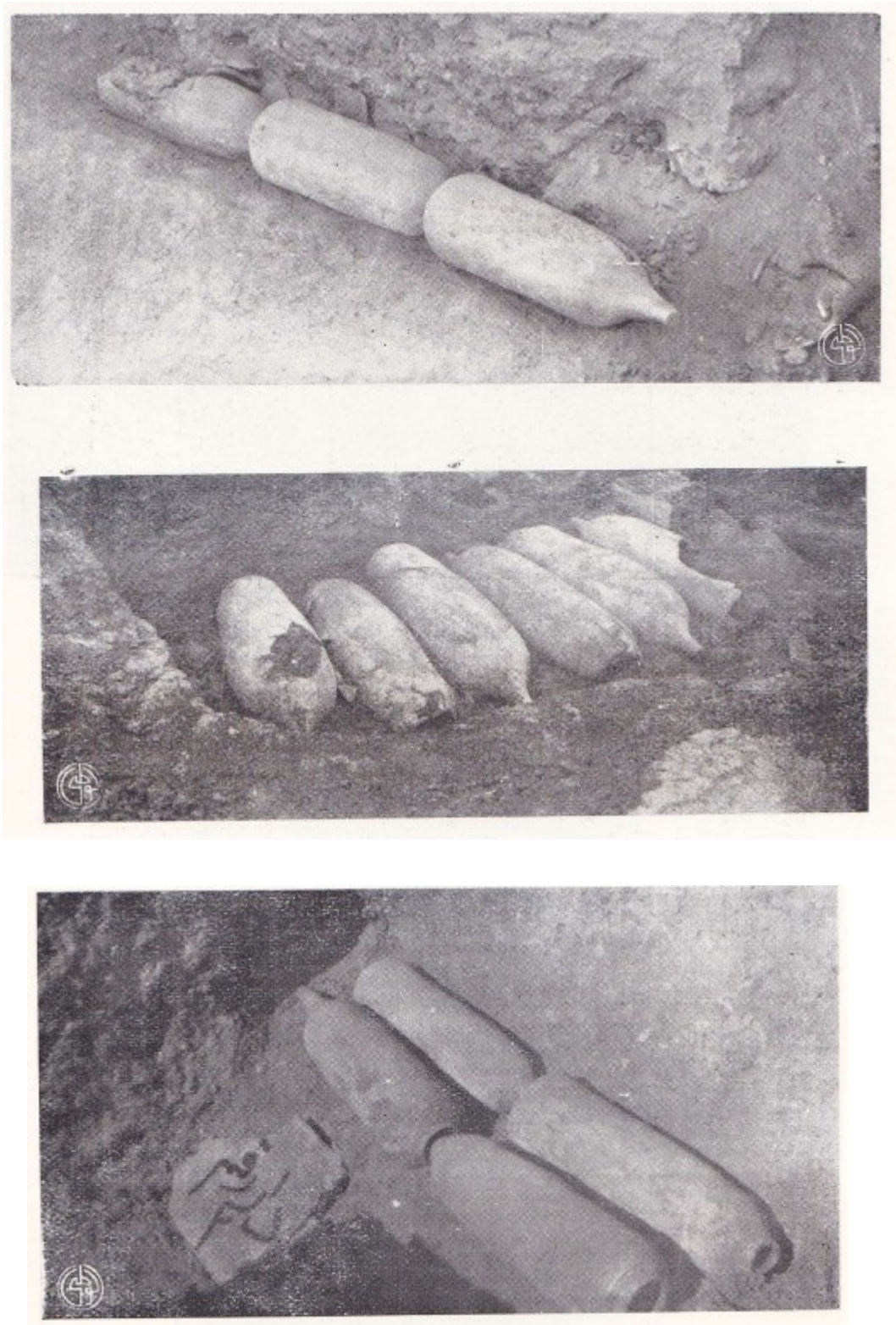


7a. Adams 1965 Type 12.A. (Harden 1934, Figure 2B:2)

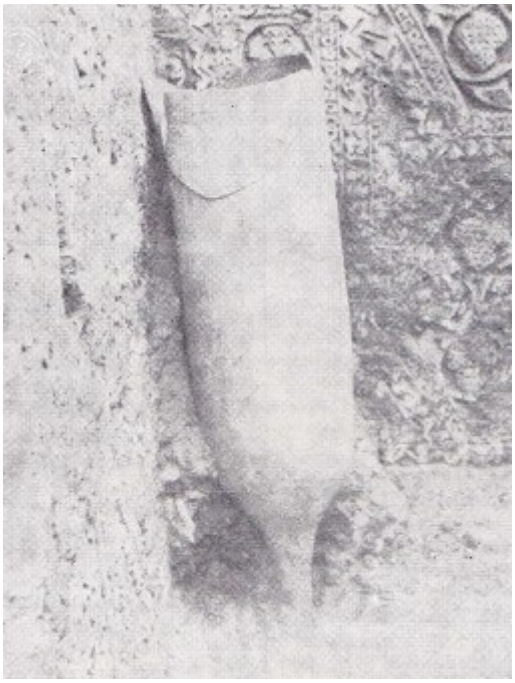
7b. Adams 1965 Type 12.A. (Harden 1934, Figure 2B:4)

7c. Adams 1965 Type 12.B. (Sarre 1925, Taf.3)

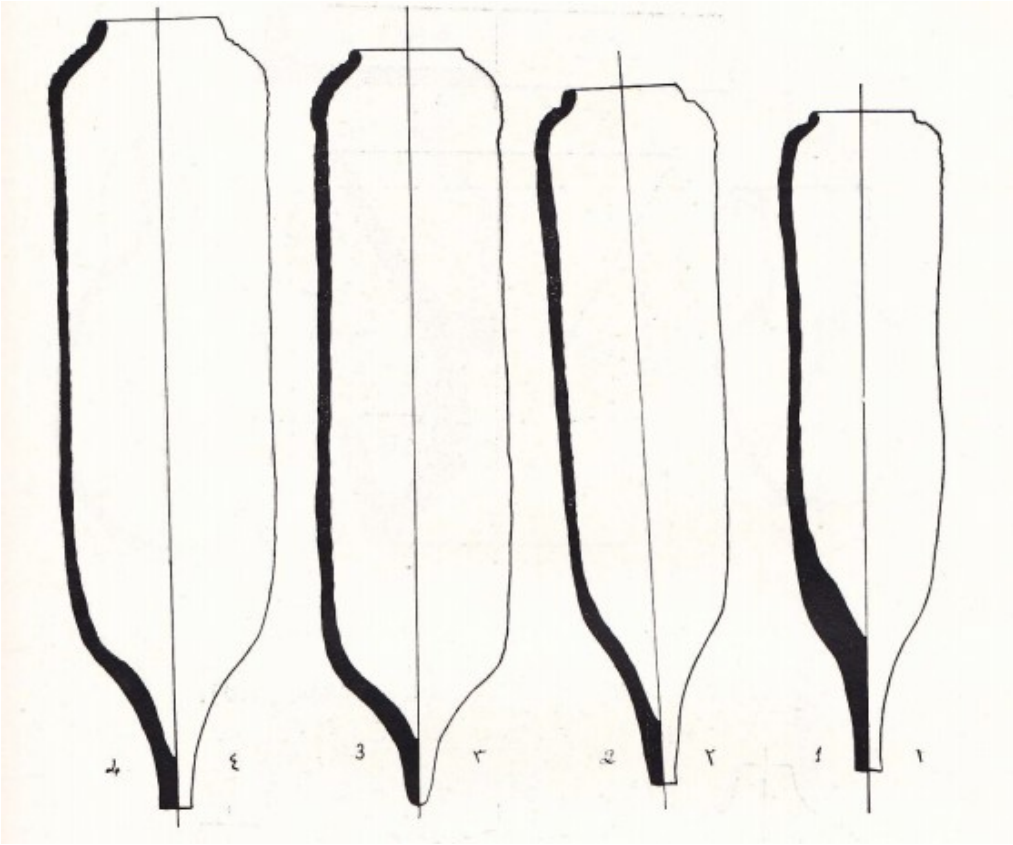
7d. Adams 1965 Type 12.B. (Ettinghausen 1938, 4:186A)



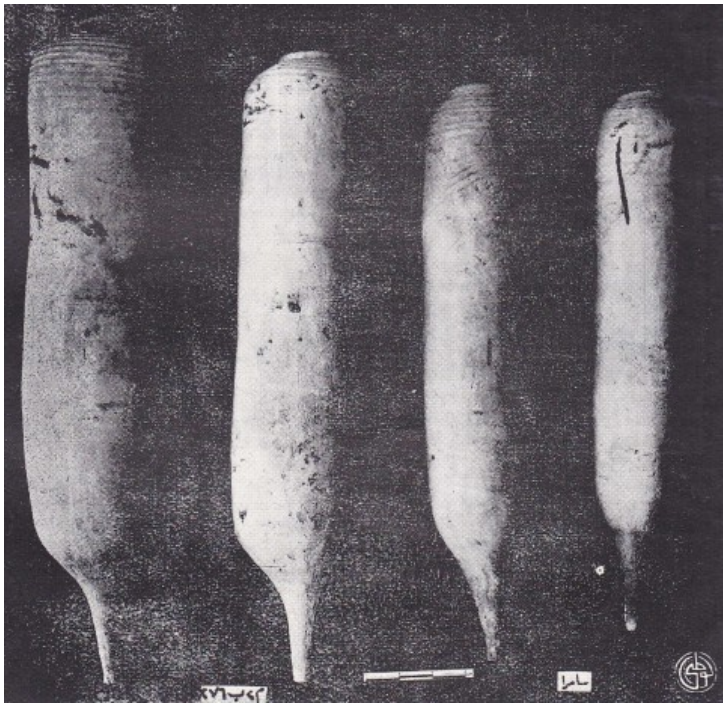
7e. Adams 1965 Type 12.(k). (Government of Iraq, Dept. of Antiquities 1940, Pl. 12)



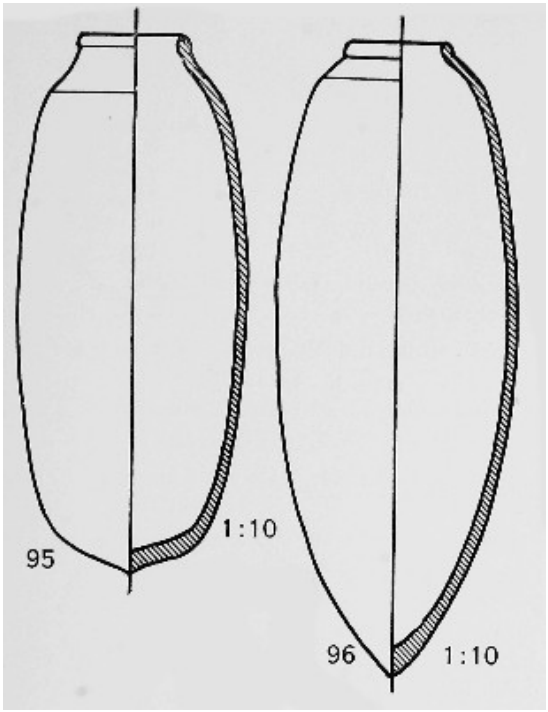
7f. Adams 1965 Type 12.(k). (Government of Iraq, Dept. of Antiquities 1940, Pl. 14).



7g. Adams 1965 Type 12.(k). (Government of Iraq, Dept. of Antiquities 1940, Pl. 20)



7h. Adams 1965 Types 12.(k) and 12.(l). (Government of Iraq, Dept. of Antiquities 1940, Pl. 29).



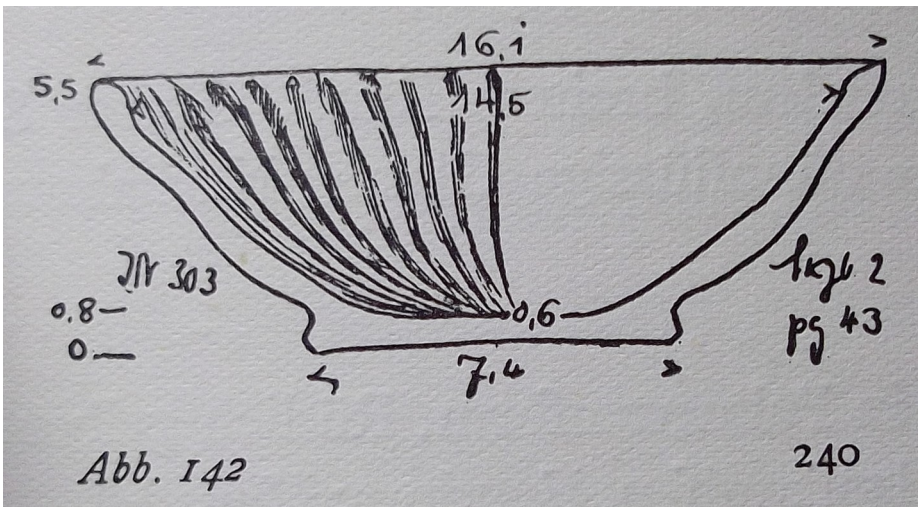
7i. Adams 1965 Type 12.(l). (Debevoise 1934, Figures 95 and 96)

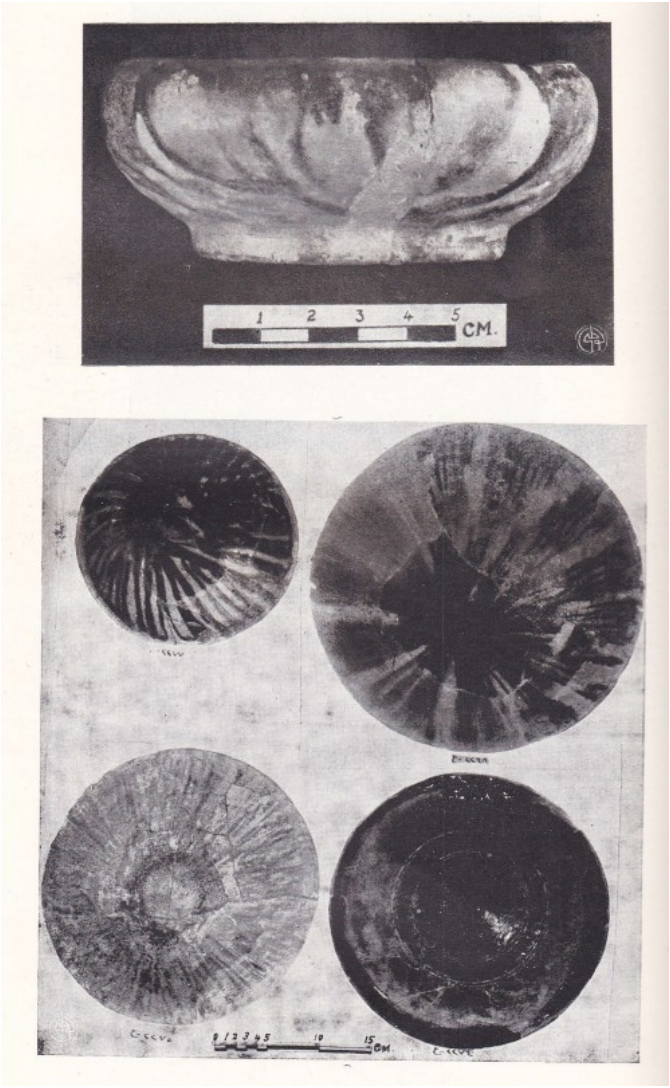
7j. Adams 1965 Type 13.A. (Lane 1947, Pl. 3)

7k. Adams Type 13.A. (Sarre and Herzfeld 1920, Vol. 4, Taf 143)

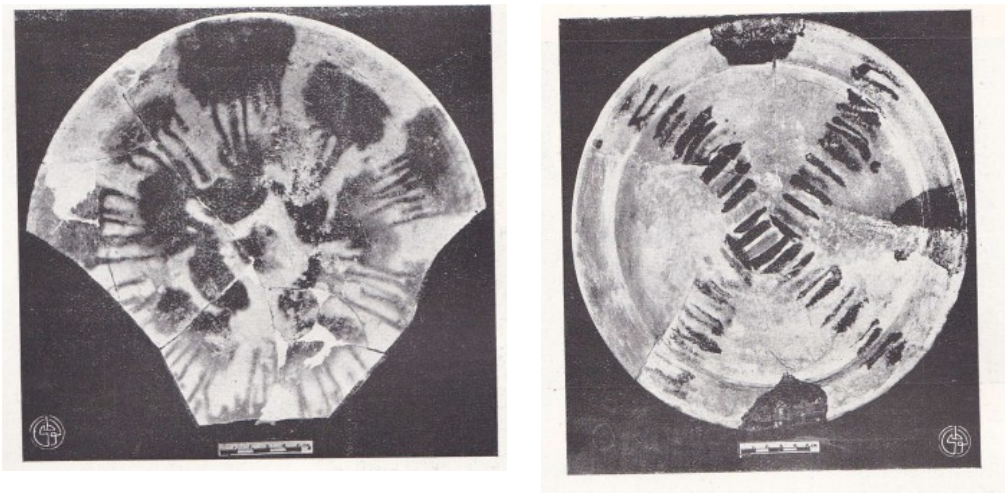
7l. Adams 1965 Type 13.A. (Sarre 1925, Taf. 6)

7m. Adams 1965 Type 13.C. (Sarre 1925, Abb. 142)

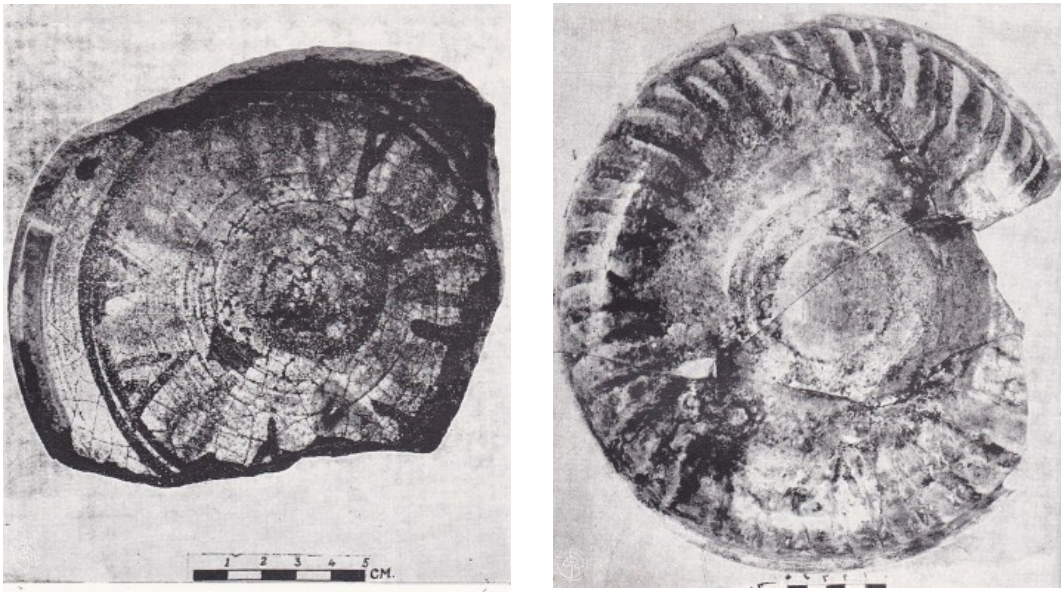




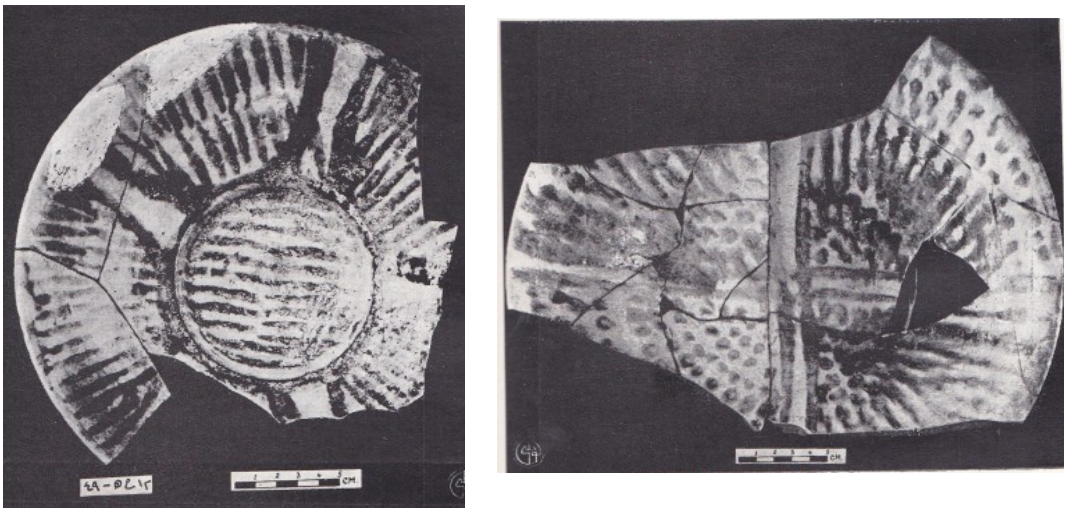
7n. Adams 1965 Type 13.D. (Government of Iraq, Dept. of Antiquities 1940, Pl. 61)



7o. Adams 1965 Type 13.D (Government of Iraq, Dept. of Antiquities 1940, Pl. 62)

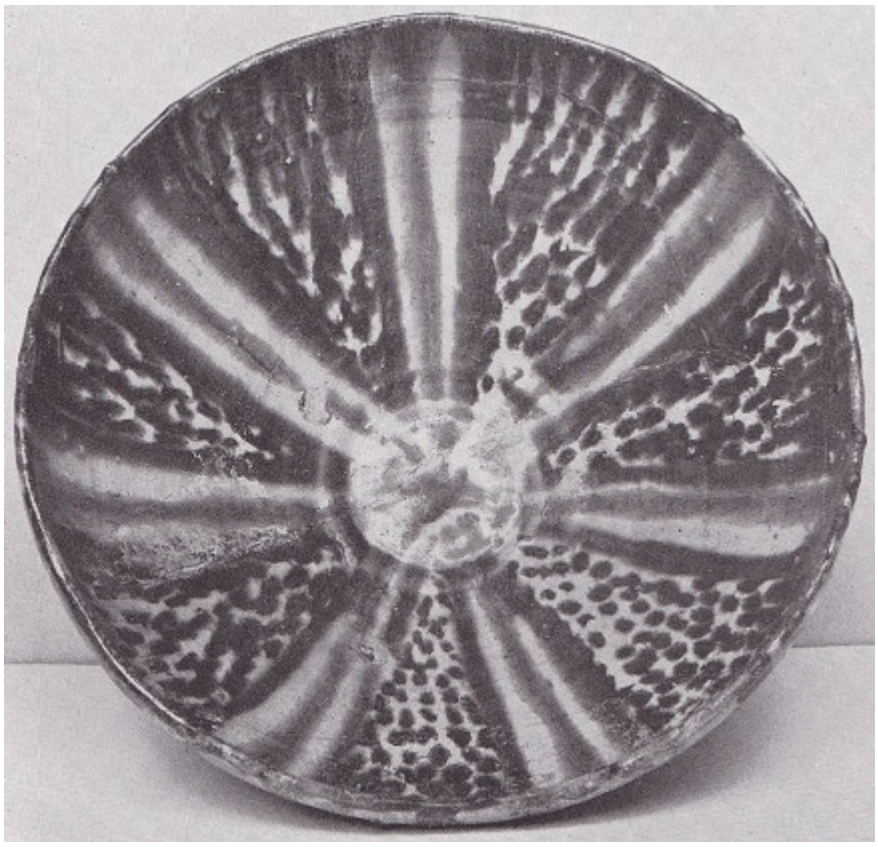


7p. Adams 1965 Type 13.D. (Government of Iraq, Dept. of Antiquities 1940, Pl. 63)

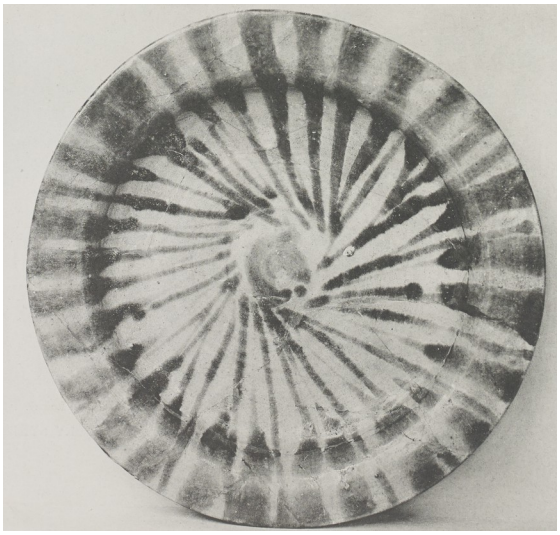


7q. Adams 1965 Type 13.D. (Government of Iraq, Dept. of Antiquities 1940, Pl. 64)

7r. Adams 1965 Type 13.D. (Hobson 1932, Figure 13)



7s. Adams 1965 Type 13.D. (Lane 1947, Pl. 7B)

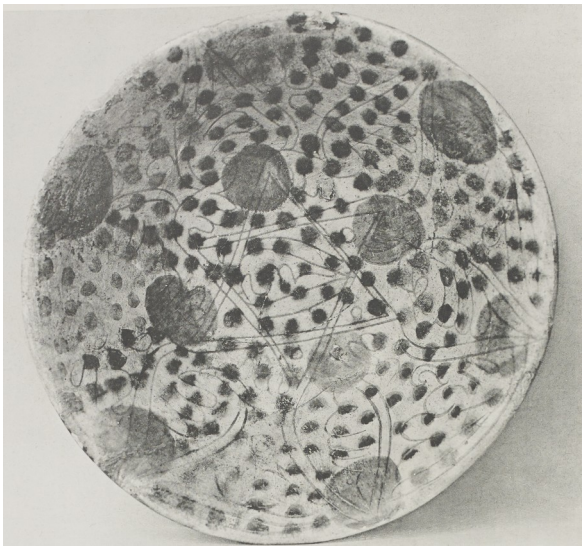


7t. Adams 1965 Type 13.D.
(Pope 1938, Vol. 5, Pl. 568B)

7u. Adams 1965 Type 13.D.
(Pope 1938, Vol. 5, Pl. 570)

7v. Adams 1965 Type 13.D.
(Sarre 1925, Taf. 32:4)

7w. Adams 1965 Type 13.E. (Lane 1947, Pl. 6B)



7x. Adams 1965 Type 13.E.
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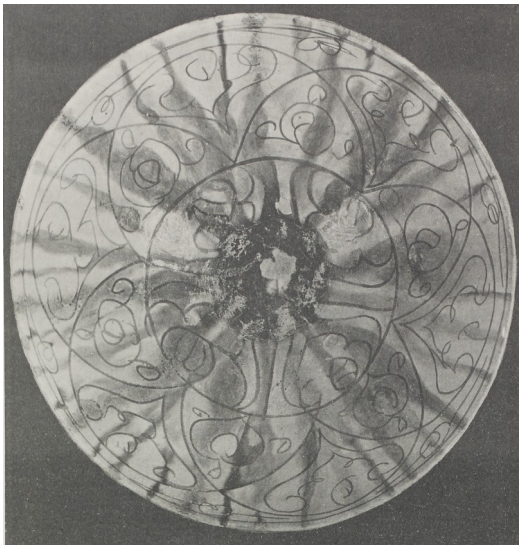

7y. Adams 1965 Type 13.E.
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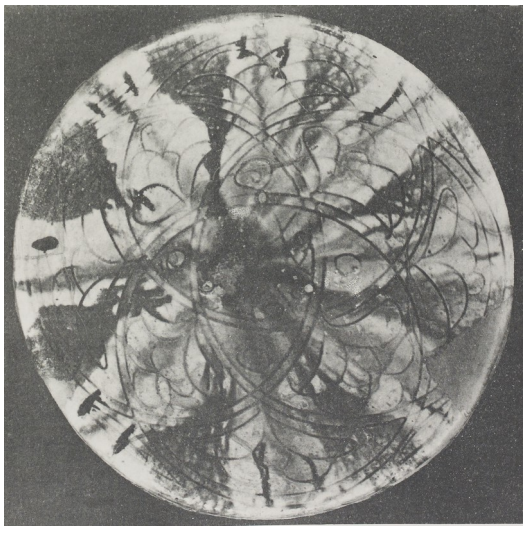
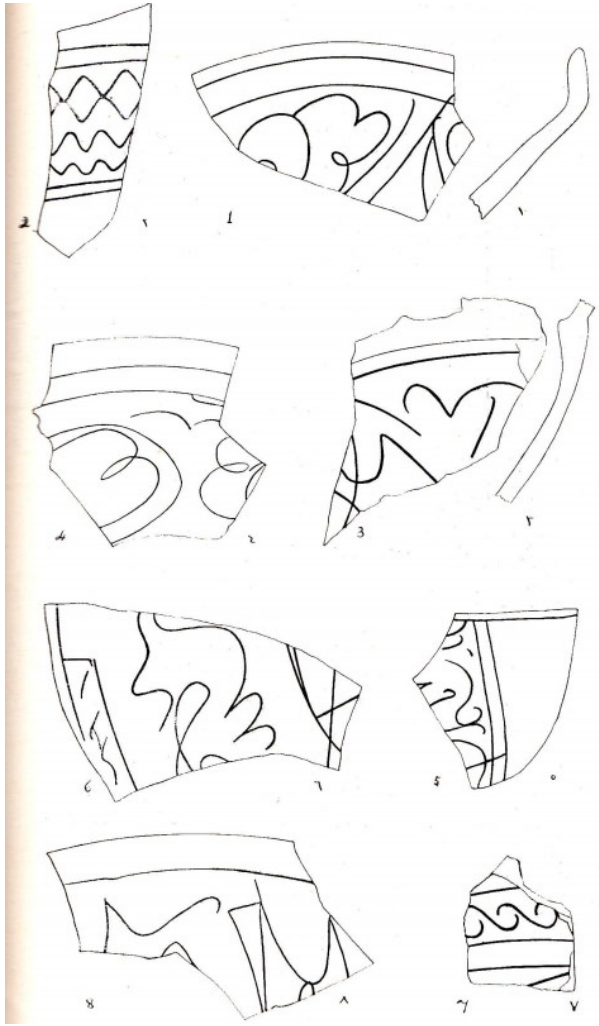


7z. Adams 1965 Type 13.E. (Pope 1938, Pl. 569B)



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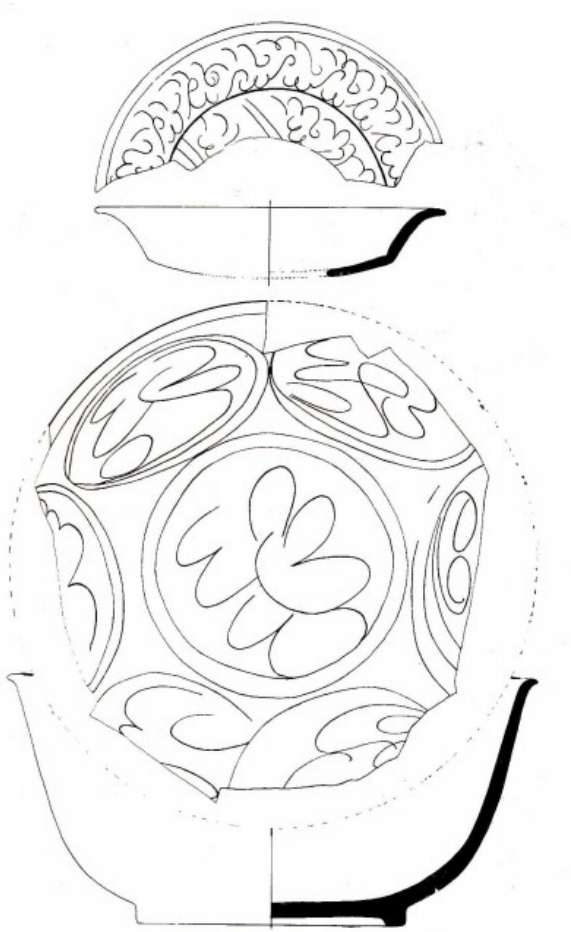

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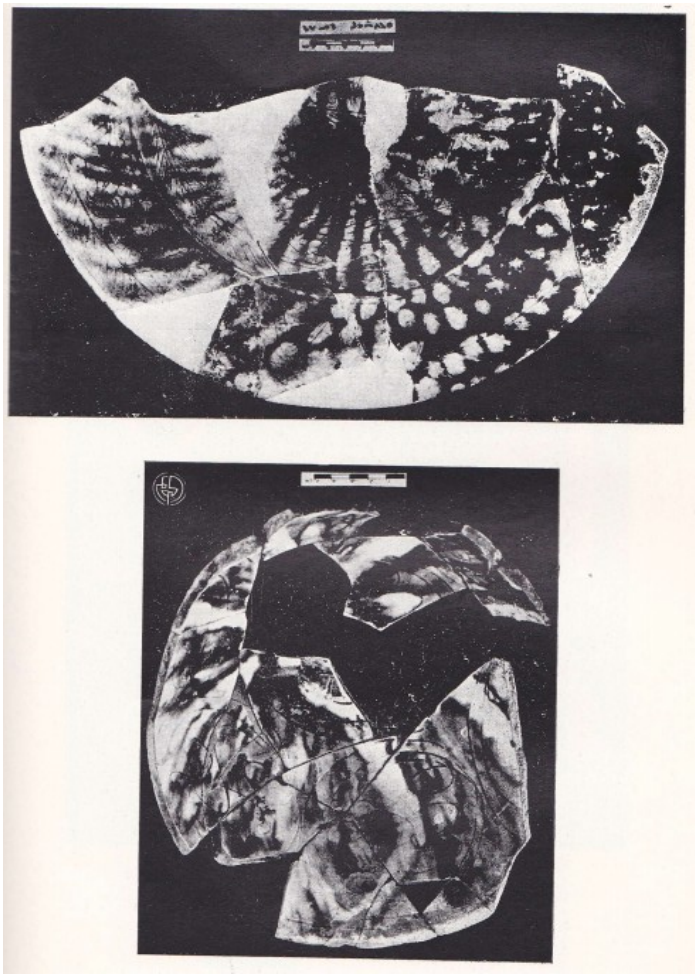
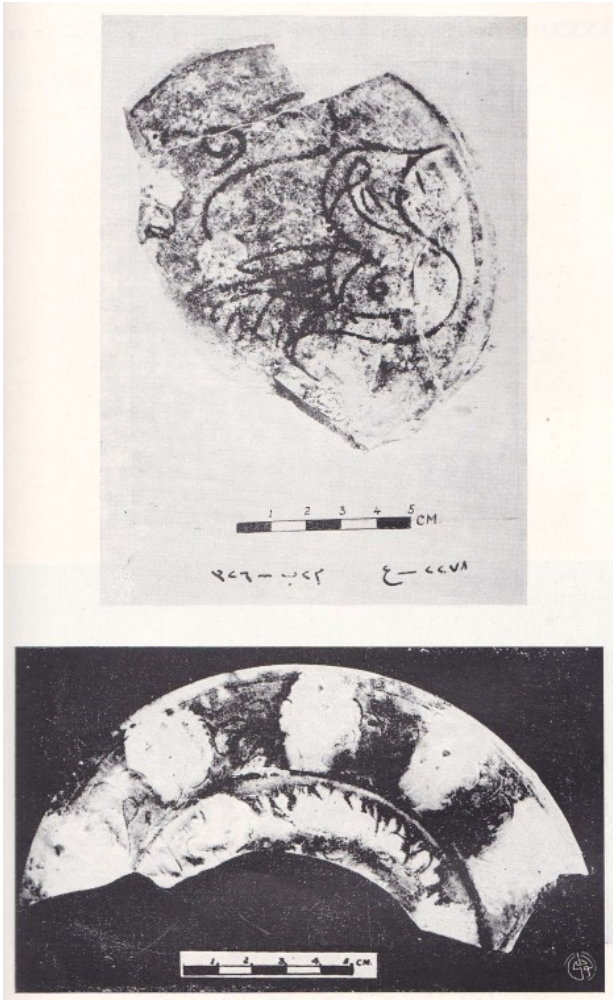
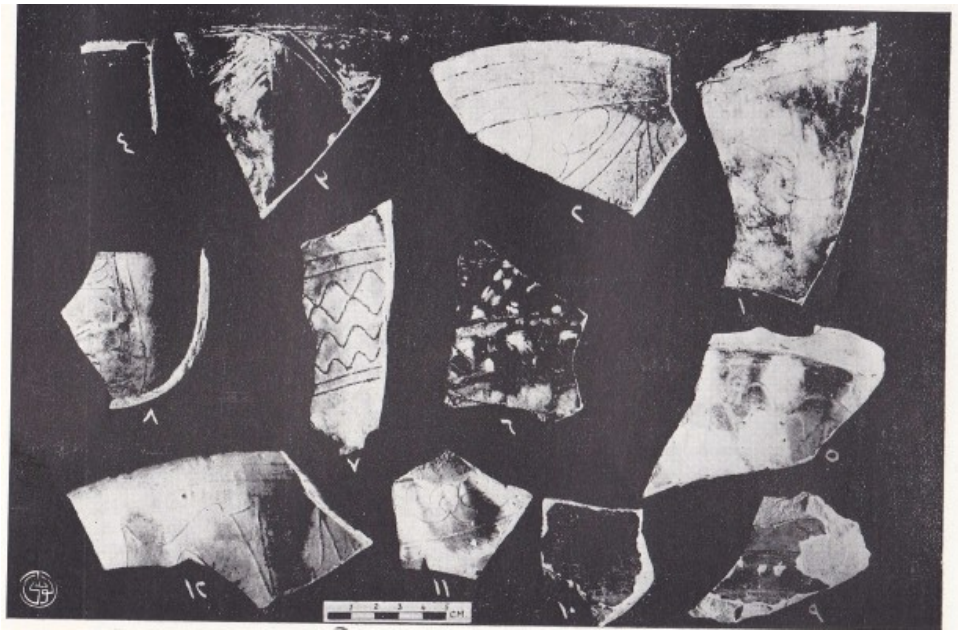


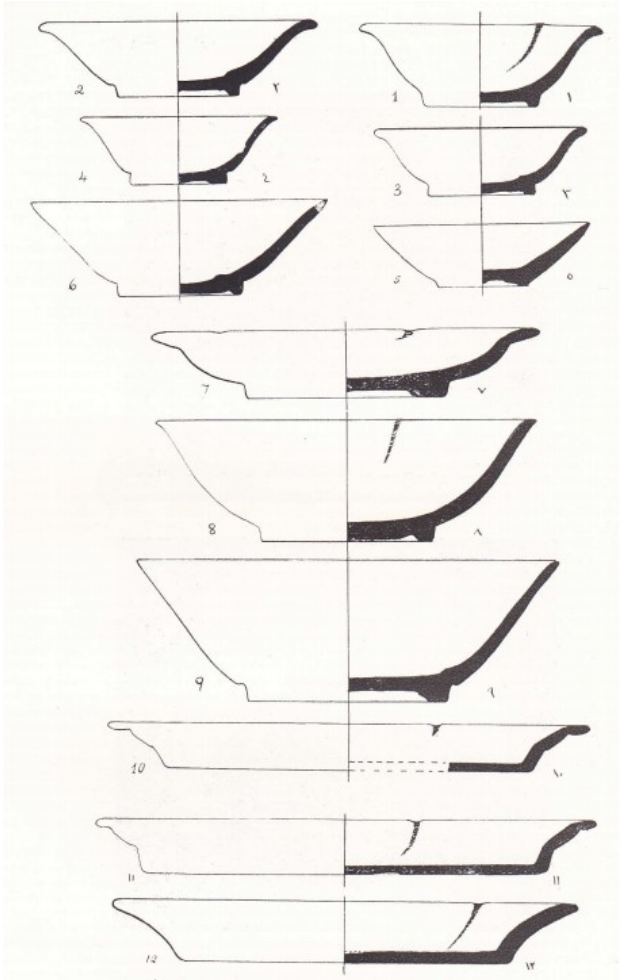
7ac. Adams 1965 Type 13.E. (Government of Iraq, Dept. of Antiquity 1940, Pl. 83)



7ad. Adams 1965 Type 13.E. (Government of Iraq, Dept. of Antiquity 1940, Pl. 84)



7ae. Adams 1965 Type 13.E. (Government of Iraq, Dept. of Antiquities 1940, Pl. 85)



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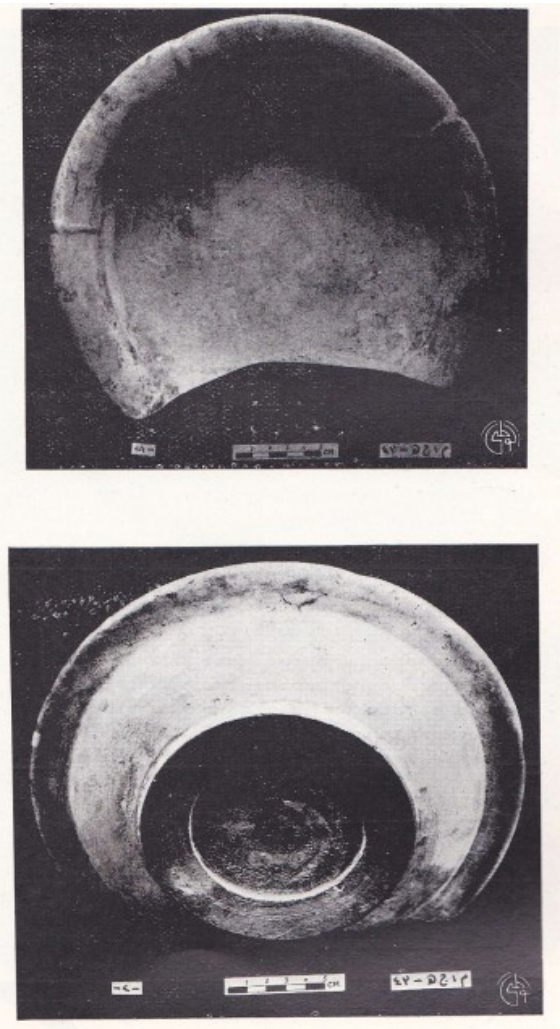
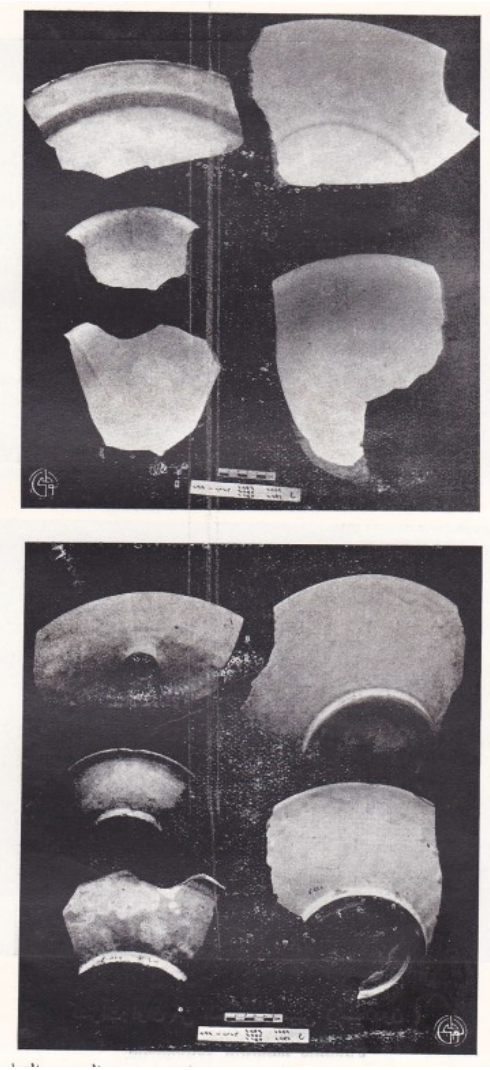
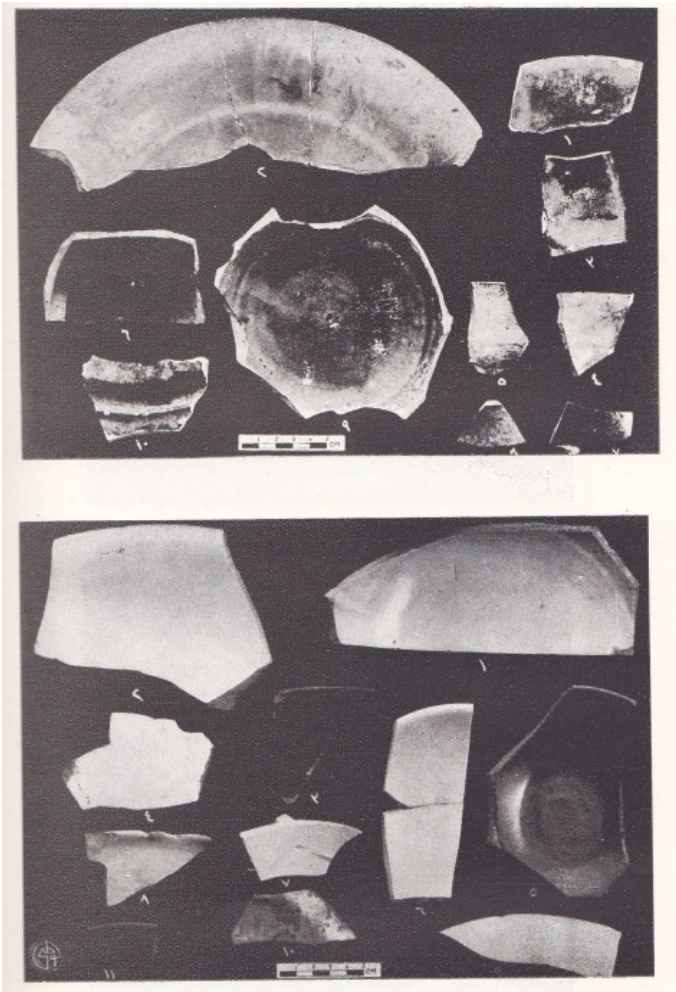


7ag. Adams 1965 Type 13.F. (Government of Iraq, Dept. of Antiquities, 1940, Pl. 100)

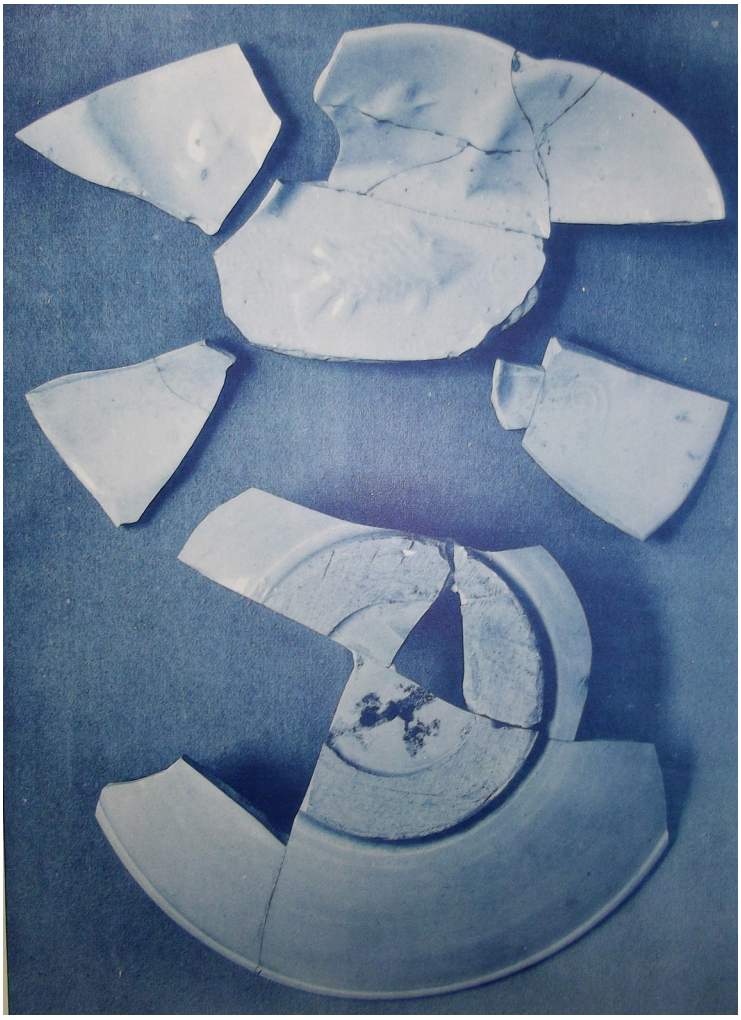


7ah. Adams 1965 Type 13.F. (Government of Iraq, Dept. of Antiquities, 1940, Pl. 101)

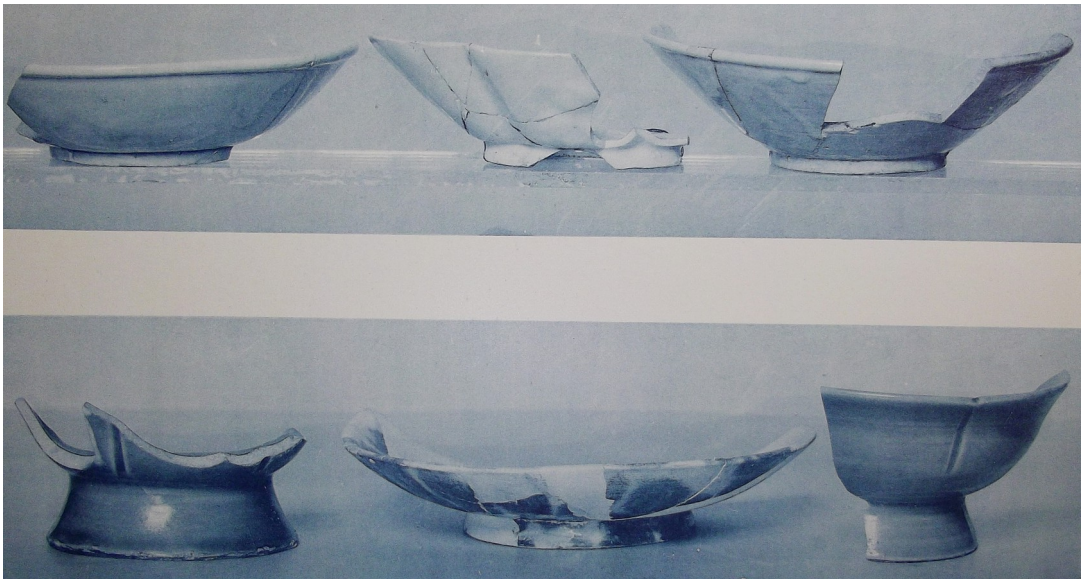
7aj. Adams 1965 Type 13.F. (Sarre 1925, Taf. 23)



7ai. Adams 1965 Type 13.F. (Government of Iraq, Dept. of Antiquities, 1940, Pl. 102)

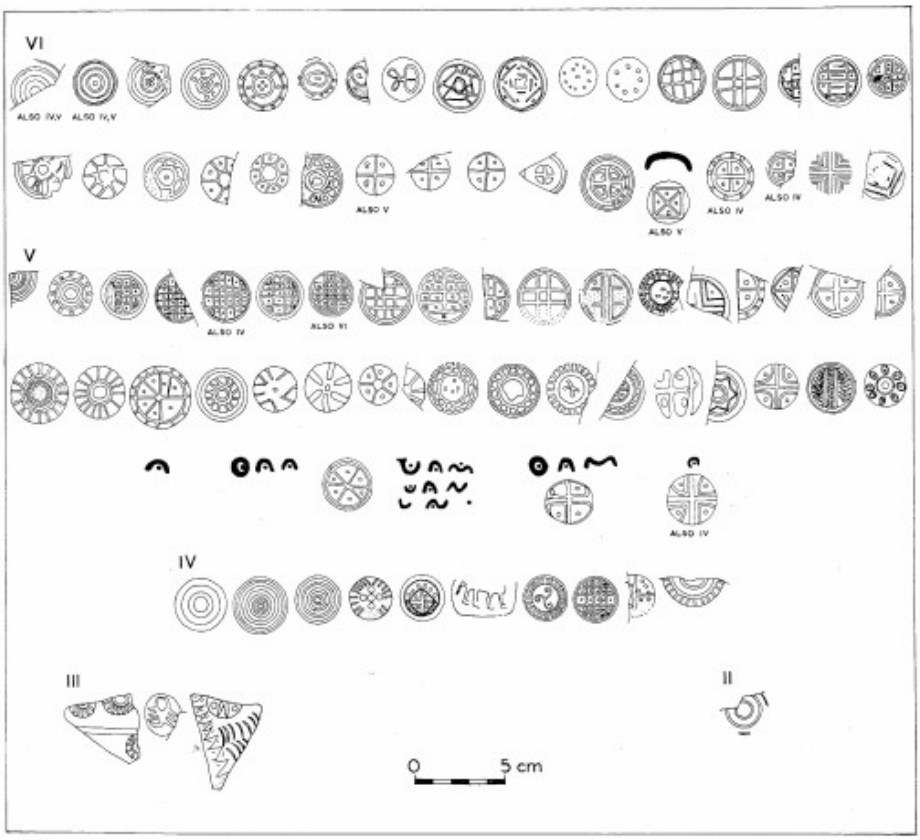


7ak. Adams 1965 Type 13.F. (Sarre 1925, Taf. 24)

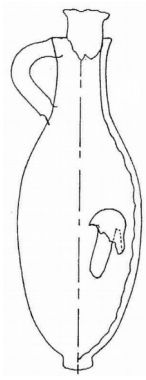


7al. Adams 1965 Type 13.F. (Sarre 1925, Taf. 25)

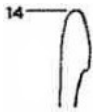
7am. Adams 1965 Type 13.F. (Pope 1938, Vol. 5, Pl. 589A)



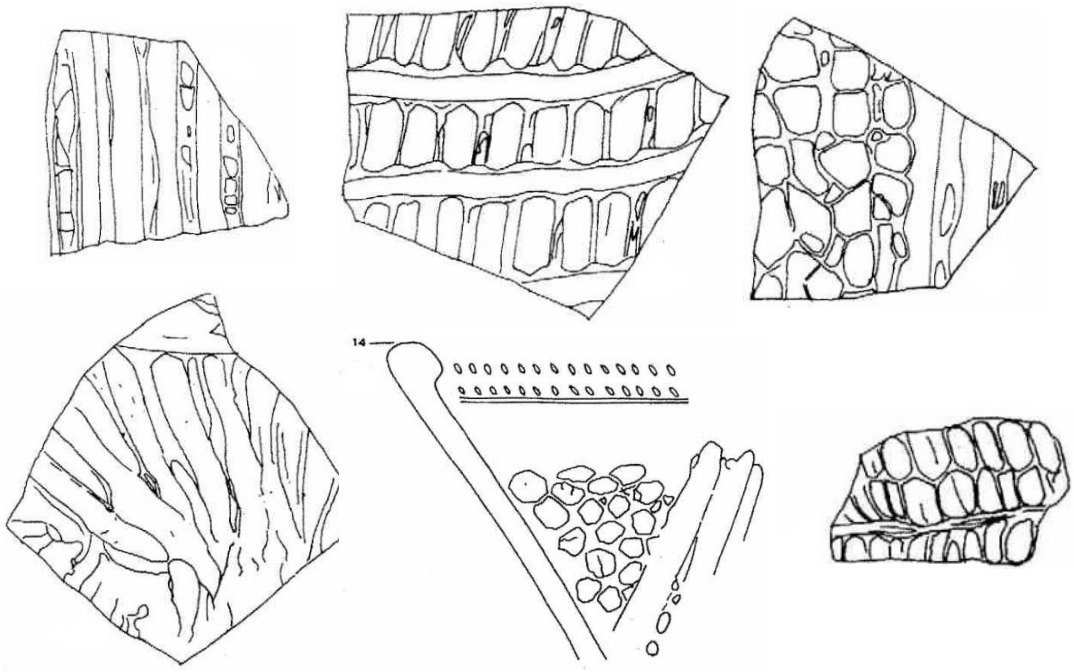
8a. Stamp impressions and painted symbols, plain ware jars, grouped in levels. Scale 2:5 (Adams 1970, Figure 9, Plate 4)



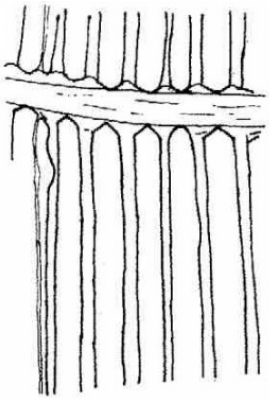
8b. Type 12.K, button base. Level II (Adams 1970, Figure 6y, Plate 3) Scale 2:5



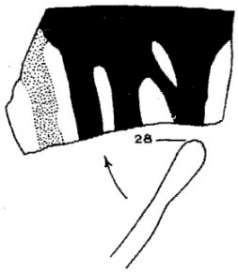
8c. Type 12.L Scale 4:5 (Adams 1970, Figure 6e, Plate 3)



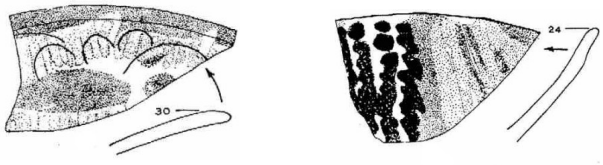
8d. Type 12. (m). Scale 4:5.Level III (Adams 1970, Figures10aa-ac, ag-ai, (left to right) Plate 5)



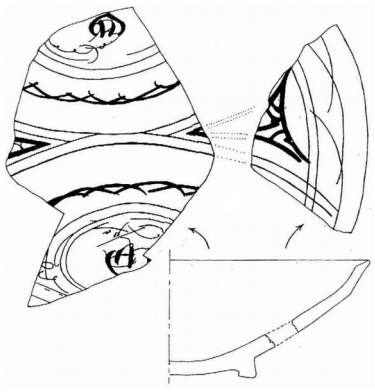
8e. Type 12.(m). Level III. Scale 4:5
(Adams 1970, Figure 10aj, Plate 3)

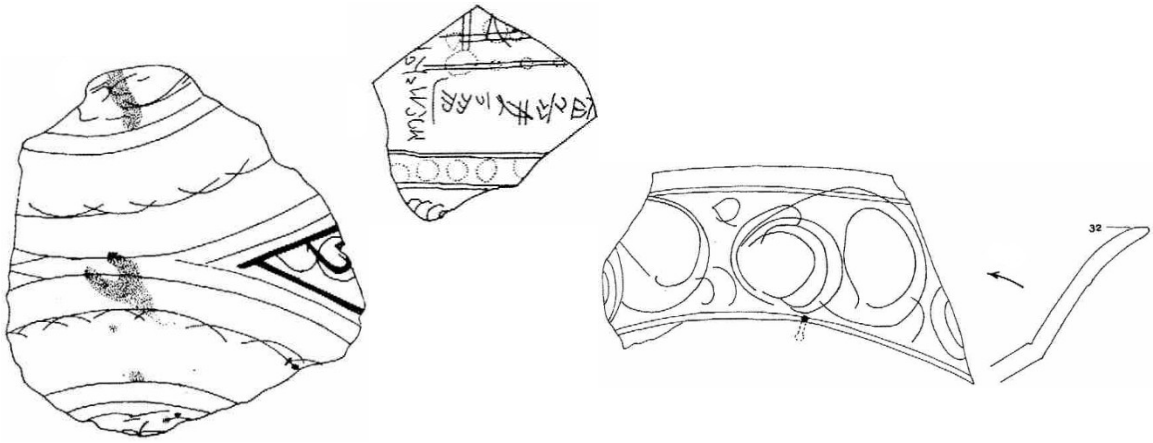


8f. Type 13.A. Surface. Scale 4:5. Level
(Adams 1970, Figure 7d, Plate 3)

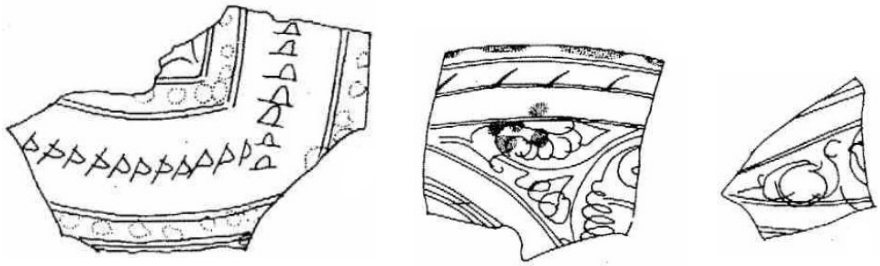


8g. Type 13.D. Level V. Scale 4:5, far-right 1:5
(Adams 1970, Figures 11a, b, g, (left to right)
Plate5)

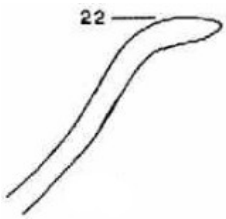




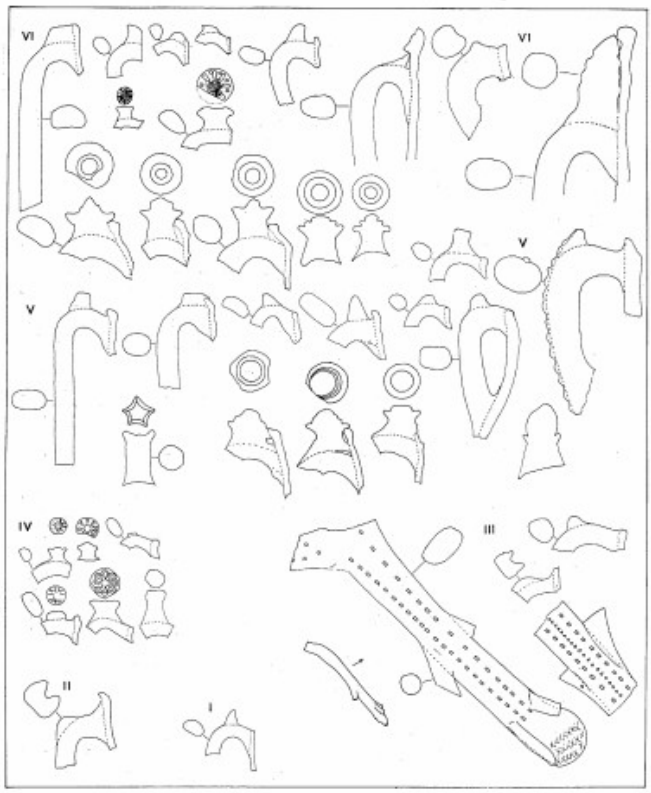
8h. Type 13. D. Level VI. Scale 4:5
(Adams 1970, Figures 11h, i, p (left to right) Plate 5)



8i. Type 13. D. Level V. Scale 4:5. (Adams 1970, Figures 11j, k, q, (left to right) Plate 5)



8j. Type 13.F. Level IV. Scale 4:5. (Adams 1970, Figure 11aa, Plate 5)



8k. Turban Handles grouped in Levels. (Adams 1970, Figure 8, Plate 4)

TABLE 19

SITES OF THE SASSANIAN PERIOD IN THE LOWER DIYALA REGION

1. Parthian sites continuing into, or reoccupied during, the Sassanian period:
   Cities:
   74 (Karastel [Artemita?], 150 hectares), 338 (Tell Jimʿah, 100 ha.), 666 (Salmān Pāk [Ctesiphon, including Asfānabr] 540 ha.), 734 (Sumāka), 791 [Tell al-Dēr, 100 ha.], 826 (Tell al-Shuʿaila, 100 ha.).
   Six sites, approximately 1,390 hectares of settlement.
   Small urban centers:
   497 (Abū Jilāj, 55 ha.), 627 (Tell Tabl).
   Two sites, approximately 99 hectares of settlement.
   Large towns:
   157 (10 ha.), 223 (Tulūl Khattāb, 20 ha.), 246 (Tell Amlah, 16 ha.), 275 (Tell al-Dīmf, 13 ha.), 287 (Tell Borākhān al-Seghīr), 300 (12 ha.), 329 (Tulūl Umm al-Tarish, 18 ha.), 358 (Tell Salāma, 20 ha.), 450 (11 ha.), 492 (Medar, 27 ha.), 608 (Abū Sōqa, 10 ha.), 663 (Tulūl Bāwi, 15 ha.), 664 (Tulūl Bāwi, 18 ha.), 682 (Tulūl Abū Jāwan, 17 ha.), 711 (Tell Zuhra al-Sharqī), 799 (Jemdet Shahrazād), 802 (14 ha.), 833 (Tell al-Mlaich, 18 ha.), 836 (10 ha.).
   Nineteen sites, approximately 297 hectares of settlement.
   Small towns:
   125, 234, 269, 292, 295, 335, 478, 499, 510, 567, 571, 605, 667, 672, 738, 763, 764, 767.
   Eighteen sites, approximately 110 hectares of settlement.
   *Villages:**
   1, 8, 19, 28, 32, 387, 53, 54, 57 (2), 108, 111, 112 (2), 128, 141, 144, 145, 155, 165?, 175, 194, 203, 216?, 232, 242, 300, 311 (2), 316, 323, 333, 353, 359, 375, 434, 502, 507, 513, 5577, 584, 588, 603, 633 (2), 661, 669, 670 (6), 673, 745, 796, 798, 801, 810, 843, 844, 858.
   Sixty-two sites, approximately 90 hectares of settlement.
   Mainly non-residential:†
   52, 62?, 677, 85, 668 (2)?
   Six sites, approximately 6 hectares.

2. Newly Founded Sassanian Sites:
   Cities:
   41 (Bint al-Emīr, Eski Baghdad [Duskara]), 252 (Tell Abū Jaʿari, 150 ha.), 620 (Abertā‡, 150 ha.).
   Three sites, approximately 444 hectares of settlement tabulated 1 additional site (Weh-Antiokh-i-Khosrau, or Rūmiyā) known but unlocated.
   Small urban centers:
   363 (Tulūl Rughāth), 700.
   Two sites, approximately 89 hectares of settlement.
   Large towns:
   15 (Tell al-Hafnʿir 27 ha.), 167, 219 (16 ha.), 250 (2), 407 (12 ha.), 467, 472 (Fleye, 17 ha.), 480 (Tell Abū Chit, 18 ha.), 538 (14 ha.), 544, 601 (15 ha.), 613 (Tell Abū Fahadah), 689, 704 (Tell Abū Kharsīrah, 25 ha.), 705.
   Sixteen sites, approximately 302 hectares of settlement tabulated; 6 additional sites§ known.
   Small towns:
   7, 37, 44, 129, 206, 208, 237, 247 ,274, 288, 290, 324, 328, 332, 379, 424, 477, 500, 504, 533, 543, 578 (2), 593, 609, 619, 625, 626, 647, 658, 676, 708, 712, 717, 722, 724, 727 (2), 777, 828, 839.
   Forty-one sites, approximately 246 hectares of settlement.

* Numbers in parentheses indicate that more than one site of same class is subsumed under the preceding site-number, as opposed to a single settlement. Where sites of different classes (e.g., a town and several smaller villages) are subsumed under a single site-number, that number is listed separately in the different categories. Question marks indicate that the sites to which they pertain could only be assigned roughly to the Parthian and/or Sassanian period because of sparse or absent surface scrannies or an inadequate collection.

† For discussion of this category see p. 73.

‡ The question of a possible Parthian or earlier occupation of this site was not fully explored; it hence remains open.

§ Probably also to be included under this heading are the following six towns: Shahrābān, Baʿqūba, Bājarā, Nahrawān, Jarjarāyā, and Humāniyya. Shahrābān

TABLE 19—*Continued*

Villages:
4 (4), 5, 9, 13, 17, 18, 21, 34, 35, 40, 47, 48, 49, 50, 51, 55, 59 (3), 60, 66 (2), 72, 73, 80, 83 (2), 86, 91, 93, 95, 101 (4), 110, 126, 130?, 131, 132, 135, 136, 138, 143, 148, 150 (2), 151 (6), 153, 154, 168, 173 (2), 174, 177 (2), 178, 180, 190, 196?, 199 (2), 200, 201, 205, 206, 207, 208, 209, 210, 224, 226, 228 (2), 230, 233, 235, 241, 245, 248 (4), 249, 250, 254 (4), 258, 259, 260, 263 (2), 265, 266, 271, 272, 278 (3), 279, 281, 289, 310 (6), 312, 315, 317, 319, 320, 322, 325, 328, 330, 334, 336, 337 (2), 344, 345, 346, 350, 352, 357, 361, 367, 368, 371, 374, 376, 385, 387, 388, 394, 398, 408, 416, 420, 425, 428, 432, 433, 444, 451, 469, 473, 475, 486, 488, 491, 501, 505, 506, 511, 512, 516, 519, 523?, 525 (2), 526, 527, 528, 529, 532, 537, 540, 542, 546, 549 (2), 559?, 565, 570, 572, 574, 583, 586, 587, 589 (3), 591, 594, 597, 598, 611, 614, 630, 632, 638, 659, 660, 674, 675, 676 (2), 701, 707, 715, 716, 725, 732?, 735, 737, 740 (3), 744, 746, 747 (4), 756, 782, 788, 790 (2), 793, 797 (2), 803, 815, 816, 821, 822, 831, 841, 846, 848, 854, 862.
Two hundred and forty-six sites, approximately 350 hectares of settlement.
Mainly non-residential:
27, 3, 42, 84, 104, 2117, 225, 313, 348, 400, 438 (2), 468, 562, 564?, 775.
Sixteen sites, approximately 66 hectares.

In total: 437 recorded sites, aggregating approximately 3,489 hectares of built-up area. This includes 9 cities aggregating 1,834 hectares, 4 smaller urban centers aggregating 188 hectares, 35 large towns aggregating 600 hectares, 59 small towns aggregating 356 hectares, 308 villages aggregating 439 hectares, and 22 non-residential sites aggregating 72 hectares. Of the 3,417 hectares of primarily residential area, 59 per cent was urban, 28 per cent was in towns, and the remainder was in smaller villages.

3. Sites abandoned or partly abandoned during or soon after the Sassanian period:‖
   Cities:
   74, 252, 338, 620, 666, 791, 826.
   Small urban centers:
   497.
   Large towns:
   15, 157, 219, 223, 246, 275, 300, 329, 358, 407, 450, 472, 480, 492, 538, 601, 608, 663, 664, 682, 704, 802, 833, 836.
   Other:
   1, 2, 3, 4, 5, 7, 8, 9, 13, 17, 18, 19, 21, 28, 32, 34, 35, 37, 38, 40, 42, 44, 47, 48, 49, 50, 51, 52, 53, 54, 55, 57, 59, 60, 62, 66, 67, 72, 73, 80, 83, 84, 85, 91, 93, 95, 101, 104, 108, 110, 111, 112, 125, 126, 128, 129, 131, 132, 135, 136, 138, 141, 143, 144, 145, 150, 155, 165, 173, 174, 175, 177, 178, 180, 190, 193, 194, 199, 200, 201, 203, 205, 207, 208, 209, 211, 216, 224, 225, 226, 228, 230, 232, 234, 235, 241, 242, 245, 247, 248, 249, 258, 259, 260, 263, 265, 266, 269, 271, 272, 274, 278, 279, 281, 288, 290, 292, 295, 299, 310, 311, 312, 316, 317, 319, 322, 323, 324, 325, 328, 330, 332, 333, 334, 335, 336, 337, 344, 345, 346, 348, 350, 352, 353, 357, 359, 367, 374, 375, 376, 387, 388, 394, 398, 408, 409, 416, 420, 424, 425, 428, 434, 438, 451, 468, 469, 473, 475, 477, 478, 486, 488, 491, 499, 500, 501, 502, 504, 505, 506, 507, 510, 512, 513, 519, 525, 526, 527, 528, 529, 537, 540, 542, 543, 546, 557, 562, 564, 567, 570, 571, 572, 574, 578, 587, 588, 589, 591, 593, 597, 603, 605, 609, 611, 614, 625, 630, 633, 638, 647, 661, 667, 668, 669, 670, 672, 673, 676, 701, 707, 715, 716, 732, 735, 738, 740, 744, 746, 756, 763, 764, 767, 775, 777, 790, 796, 798, 801, 803, 810, 815, 821, 843, 846, 848, 858.

In total: Of the primarily residential sites aggregating 3,418 hectares, 1,969 hectares or approximately 58 per cent were subsequently abandoned.

(Le Strange, G. 1905:62), Jarjarāyā (cf. p. 91) and Humāniyya (Oberpeaver, J. 1959:192 ff.) are mentioned in contemporary sources or credited with a Sassanian origin in Islamic accounts. The locations and names of the others has positively suggest the same contexture. For Nahrawān there is the further evidence of a number of Sassanian bullae collected at the site (modern Sifwah) by Herzfeld (1948:44).

‖ In this listing an attempt has been made to estimate the actual proportion of the surface area of each site which was not occupied after the Sassanian period. Such a calculation is obviously hazardous from surface inspection alone but may serve as a first approximation in the absence of other evidence.

9a. Sasanian Settlement Data from the DIyala Survey
(Adams 1965, p72)

TABLE 20

SITES OF THE EARLY ISLAMIC AND SĀMARRĀN PERIODS IN THE LOWER DIYALA REGION

1. Important cities and towns that are identified in contemporary Arabic sources (for descriptions see pp. 89–96):*
   Baghdad, (6,400 hectares [Le Strange 1900:325]); Sāmarrā, (6,800 ha. [Herzfeld 1948:137]); ʿUkbarā, (130 ha.); Busrā, (5 ha.); Al-Madāin (Taq-i-Kesrā, Salmān Pāk, 665–666 [100 ha.?]); Deir al-ʿĀqūl (791), (20 ha.); Humāniya, (20 ha.?); Jarjarāyā, (20 ha.?); Nahrawān (Sifwah, 308–309), (25 ha.); Duskara (Eski Baghdad, 41), (20 ha.?); Shahrābān (20 ha.?); Barāz-al-Rūz (Balad Rūz), (20 ha.?); Baʿqūba (10 ha.?); Bājarā (Buhriz ?), (5 ha.?); ʿAbertā (620), (100 ha.); Uskāf-Banī-Junayd (Sumāka, 734), (400 ha.).

2. Sassanian sites continuing into, or reoccupied during, the Early Islamic or Sāmarrān periods (not including those given above):
   Small urban centers:
   627, Tell Tabl (44 ha.); 700 (40 ha.); 826, Tulūl al-Shuʿailah (35 ha.).
   Three sites, approximately 119 hectares of settlement.
   Large towns:
   167 (20 ha.); 287, Tell Borākhān al-seghīr (20 ha.); 363, Tulūl Rughāth (20 ha.); 371, Tell Mukherij (16 ha.); 467 (25 ha.); 544 (25 ha.); 613, Tell Abū Fahadah (11 ha.); 632, Tell Jubayl (10 ha.); 689 (20 ha.); 704, Tell Abū Khamāra (16 ha.); 705 (20 ha.); 799, Jemdet Shahrazād (18 ha.).
   Twelve sites, approximately 221 hectares of settlement.
   Small towns:
   237, 379, 533, 578, 619, 626, 658, 708, 717, 722, 724, 727 (2), 771, 777, 828, 839, 867.
   Eighteen sites, approximately 114 hectares of settlement.
   Villages:
   81, 86, 120, 148, 153, 154, 168, 173, 196 (?), 200, 210, 228, 233, 248, 252, 254 (4), 263, 271, 288, 313, 315, 320, 361, 368, 385, 394, 432, 433, 444, 511, 516, 523 (?), 532, 542, 549 (2), 559 (?), 565, 583, 584, 586, 594, 597, 659, 660, 673, 674, 711, 725, 737, 738, 740 (3), 744, 745, 747 (4), 782, 788, 793, 797, 816, 822, 831, 841, 844, 854, 862.
   Seventy-four sites, approximately 103 hectares of settlement.

3. Newly founded Early Islamic–Sāmarrān sites:
   Small urban centers:
   514, Tell Javara (50 ha.); 641, Tell Zahra (40 ha.); 675, Tell al-Drāzi (56 ha.).
   Three sites, approximately 146 hectares of settlement.
   Large towns:
   551, Tell Daimat al-ʿOda (12 ha.); 592 (10 ha.); 642, Tell Mirhij (21 ha.); 649 (14 ha.); 655, Tell Mujassas (25 ha.); 710, Tel Mʿabēd (12 ha.); 756 (10 ha.); 804, Mayyah al-Shaqī (19 ha.).
   Eight sites, approximately 123 hectares of settlement.
   Small towns:
   90, 183, 268, 301, 318, 360 (?), 372, 373, 406, 454, 490, 493, 521, 529, 553, 555, 575, 600, 606, 650, 681, 683, 686, 736, 743, 750, 759, 761, 762, 766, 769, 778, 805, 807, 823, 834, 855.
   Thirty-seven sites, approximately 213 hectares of settlement.
   Villages:
   43, 124, 127, 179, 181, 182, 184, 185, 188, 202, 204, 207, 231, 236, 273, 277, 280, 282, 347, 351, 356, 365, 369, 377, 378, 382,

* Because of later occupation, extending up to the present time, the areas of many of these sites are impossible to determine accurately. Areas shown with a question mark are frankly speculative.

TABLE 20—*Continued*

383, 386, 391, 393, 395, 401, 402, 403, 404, 405, 423, 448, 452 (?), 453, 462, 464 (?), 482, 483 (?), 485, 518, 524, 536, 547, 548, 550, 552, 554 (4), 585, 602, 615, 616, 621, 635, 636, 640 (2), 643 (3), 644 (6), 645 (2), 651, 652, 653 (3), 654, 656, 677, 688, 690, 691, 692, 694, 695, 696, 697 (3), 699, 702, 706, 709, 713, 714, 718, 719 (2), 720 (2), 721, 723 (2), 726, 728, 729, 731, 733, 739, 746 (3), 748, 749, 752, 753, 754, 755, 757, 758, 760, 765, 768, 774, 780, 781, 784, 785, 786, 787, 789, 792, 794, 800, 806, 808, 809, 815, 819, 820, 827, 830, 833, 834, 840, 845, 847, 850, 852 (3), 853, 855 (2), 856.
One hundred and sixty sites, approximately 264 hectares of settlement.

In total: Not including Baghdad and Sāmarrā, 329 recorded sites, aggregating approximately 2,198 hectares of built-up area. This includes 4 cities aggregating 730 ha., 6 smaller urban centers aggregating 295 ha., 28 large towns aggregating 499 ha., 57 small towns aggregating 337 ha., and 234 villages aggregating 367 ha. Excluding Baghdad and Sāmarrā, 45.5 per cent of settlement area was urban and 38 per cent was in towns. Note that Baghdad and Sāmarrā each occupied several times as large a built-up area as all other contemporary settlements in the Diyala basin together.

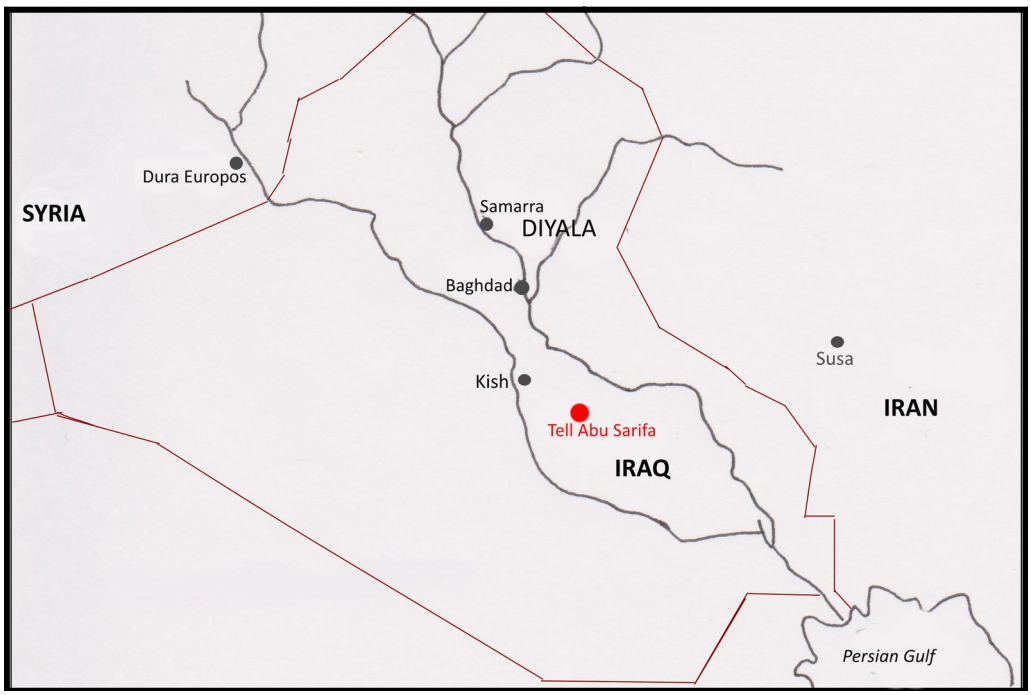
4. Sites largely or wholly abandoned before the Sāmarrān period:
   Large towns:
   167, 287, 363, 467, 544, 592, 613, 649, 689, 705, 756, 826.
   Twelve sites, approximately 210 hectares of settlement.
   Other:
   43, 83, 90, 130, 148, 153, 154, 168, 173, 196 (?), 200, 248, 254 (4), 263, 282, 315, 320, 356, 361, 365, 368, 373, 377, 378, 379, 383, 391, 423, 433, 444, 448, 452, 453, 454, 462, 511, 516, 518, 521, 532, 539, 542, 549 (2), 573, 578, 583, 584, 586, 594, 600, 602, 616, 619, 635, 640 (2), 643 (3), 658, 659, 673, 681, 690, 712, 722, 724, 725, 739, 745, 746 (2), 747 (4), 768, 774, 782, 793, 806, 820, 827, 831, 833, 839, 840, 841, 845, 850, 853, 854, 862, 867.
   Ninety-eight sites, approximately 218 hectares of settlement.

5. Sites largely or wholly abandoned soon after the Sāmarrān period:
   Cities:
   620 (ʿAbertā), 734 (Uskāf).
   Two sites, approximately 476 hectares of settlement. In addition, most of Sāmarrā itself must have been abandoned with the return of the Caliphate to Baghdad.
   Smaller urban centers:
   514, 627, 641, 675, 700.
   Five sites, 230 hectares of settlement.
   Large towns:
   655, 799, 826.
   Three sites, 53 hectares of settlement.
   Other:
   86, 124, 202, 204, 268, 271, 288, 308, 351, 360 (?), 372, 382, 385, 482, 483 (?), 493, 523 (?), 524, 536, 539, 554 (4), 555, 559 (?), 565, 585, 597, 615, 621, 636, 645 (2), 653 (3), 654, 656, 660, 674, 677, 688, 692, 702, 706, 708, 709, 711, 714, 717, 718, 719 (2), 720 (2), 721, 728, 729, 733, 737, 738, 740 (3), 743, 744, 746, 748, 749, 750, 752, 753, 757, 758, 762, 765, 766, 788, 792, 797, 816, 823, 844, 847, 852 (3), 856.
   Ninety sites, approximately 204 hectares of settlement.

In total: Not including Sāmarrā, 210 sites aggregating approximately 1,382 hectares of settlement abandoned before the Late Abbasid period. This was 62.5 per cent of all settlement during the Early Islamic and Sāmarrān periods.

9b. Islamic Settlement Data from the Diyala Survey
(Admas 1965, p98)

APPENDIX 2: MAPS



Map 1: Tell Abu Sarifa, Diyala, and Mesopotamian Site Locations

Map 2: The Persian Gulf

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