



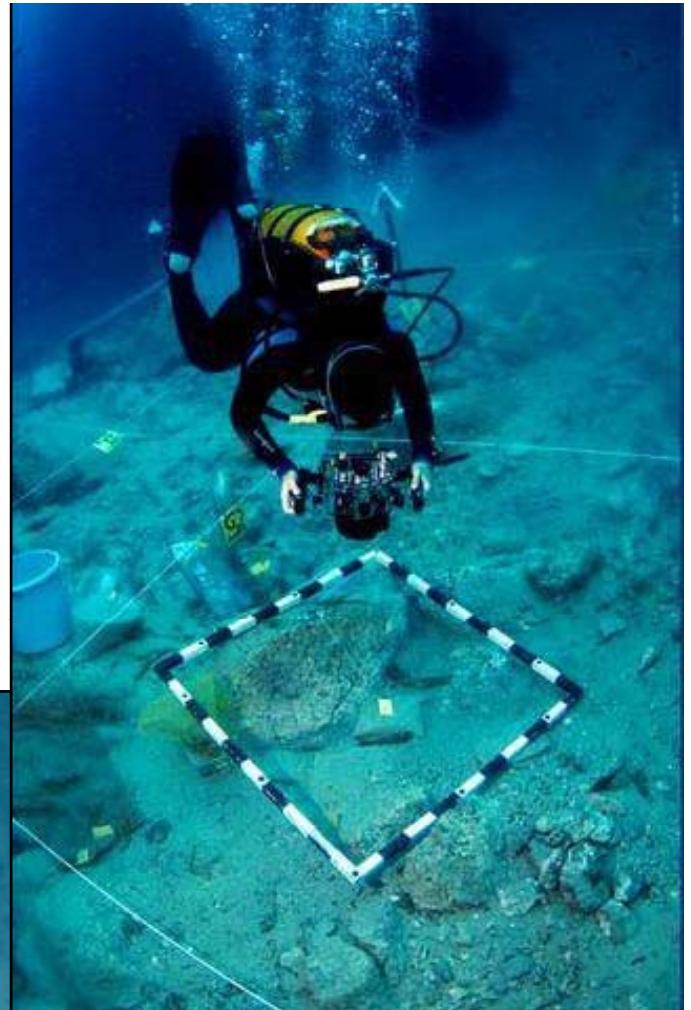
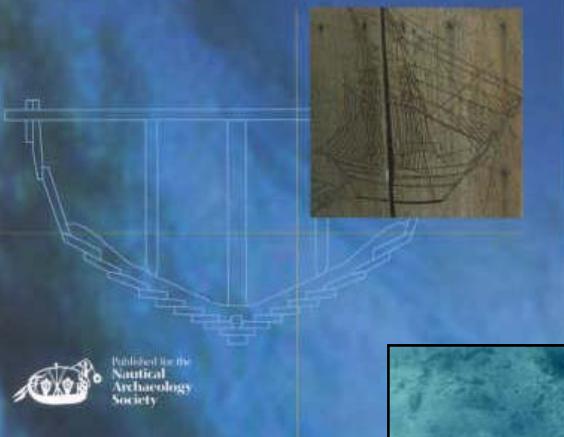
Archaeological Excavation



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**NAUTICAL
ARCHAEOLOGY**



Terrestrial vs. Nautical Archaeology

- Although Renfrew and Bahn discuss (briefly) underwater archaeology, it is important to remember that this is a highly specialized branch of archaeology with methods which are in some ways quite unlike terrestrial archaeology.
- Underwater sites, mostly shipwrecks, are to Nautical archaeology, what Pompeii is to Terrestrial archaeology, a site ‘frozen’ in time, which often gives a very detailed glimpse of a specific period and range of artifacts.
- The following discussion of excavation is about Terrestrial archaeology.

Purpose of excavation

Excavation can provide two principle types of information to the archaeologist:

- **Spatial relationships**

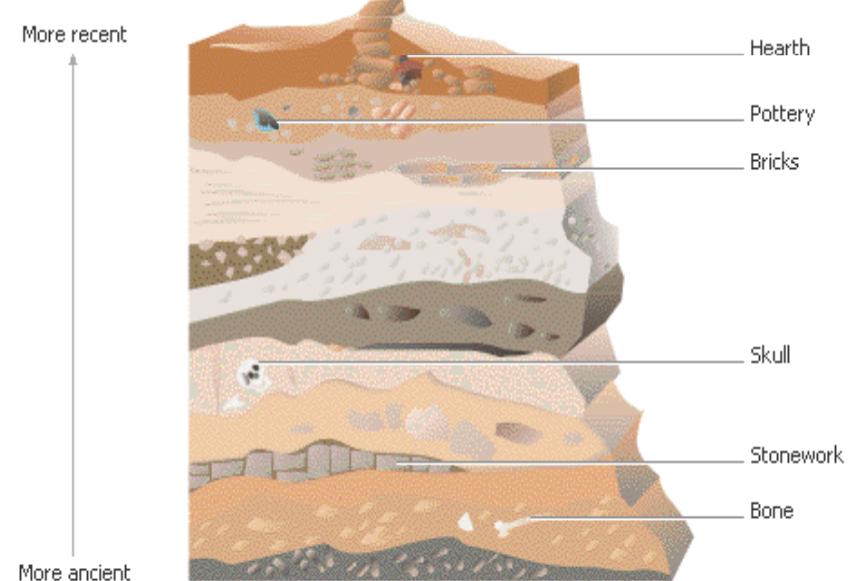
Distribution of activities in horizontal space: contemporaneity of human activities

- **Temporal relationships**

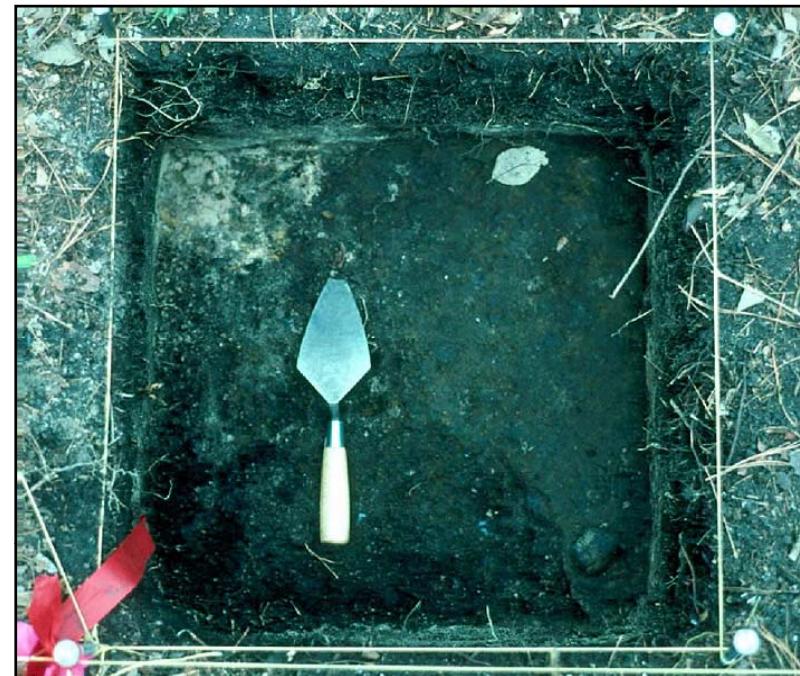
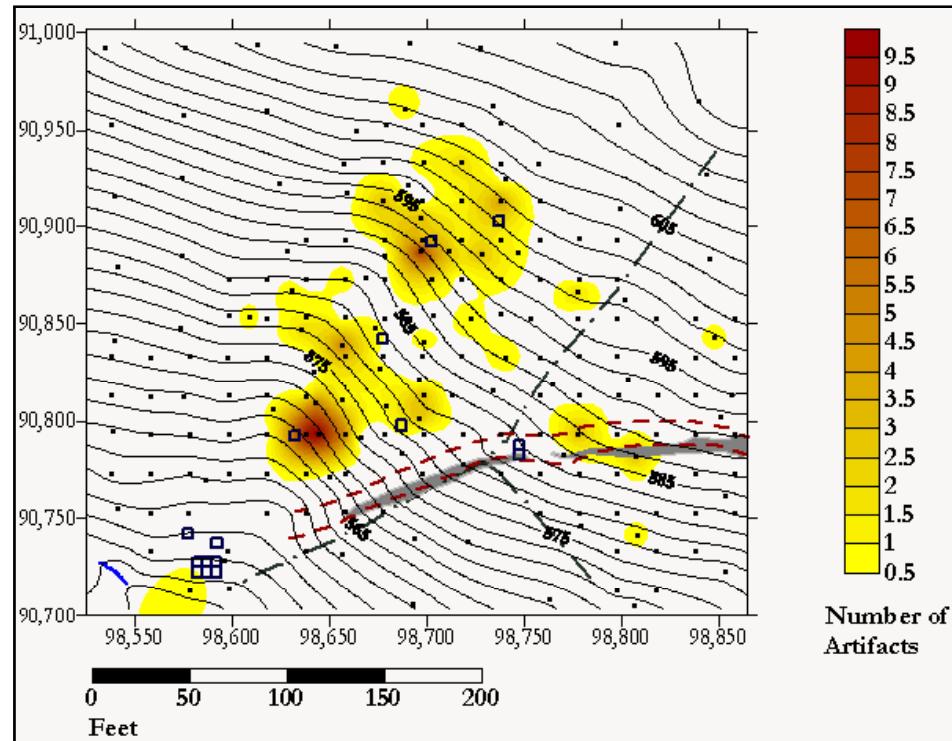
Law of Superposition:

Sequences of layers,
bottom to top = earlier to later

Refers only to stratigraphy, not the materials in the strata



- Shovel Testing/Test pits



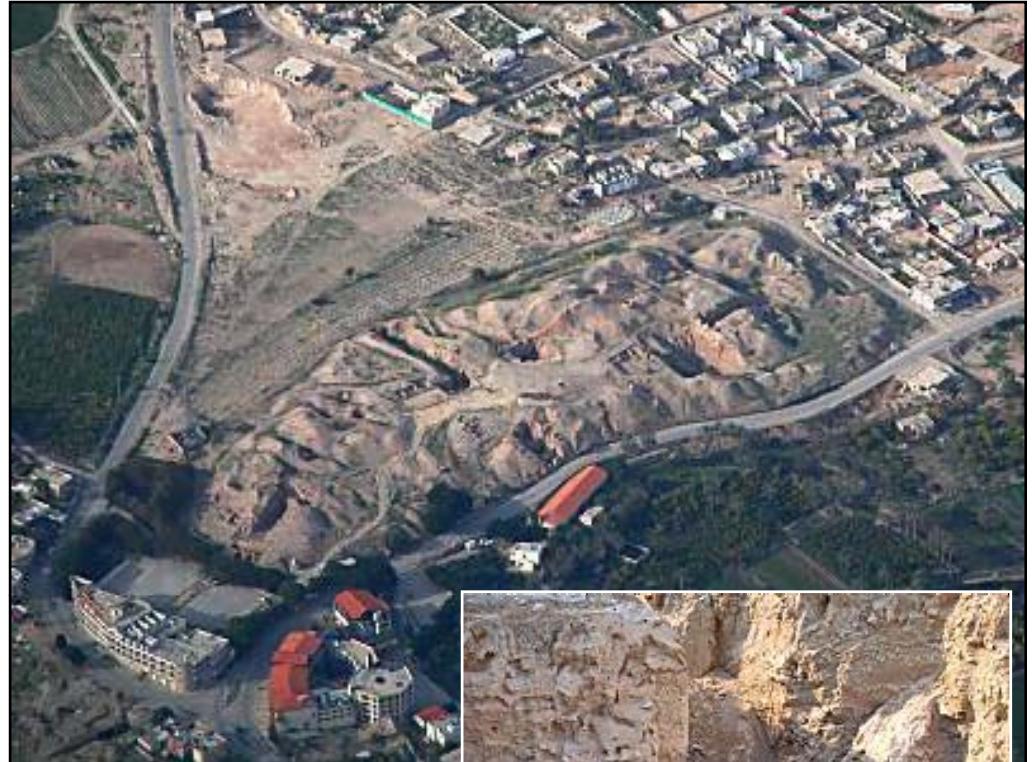
Shovel test pits reveal density of artifacts at Site 6, Monticello

Trenches

Kathleen Kenyon at Tell es-Sultan
(Jericho)



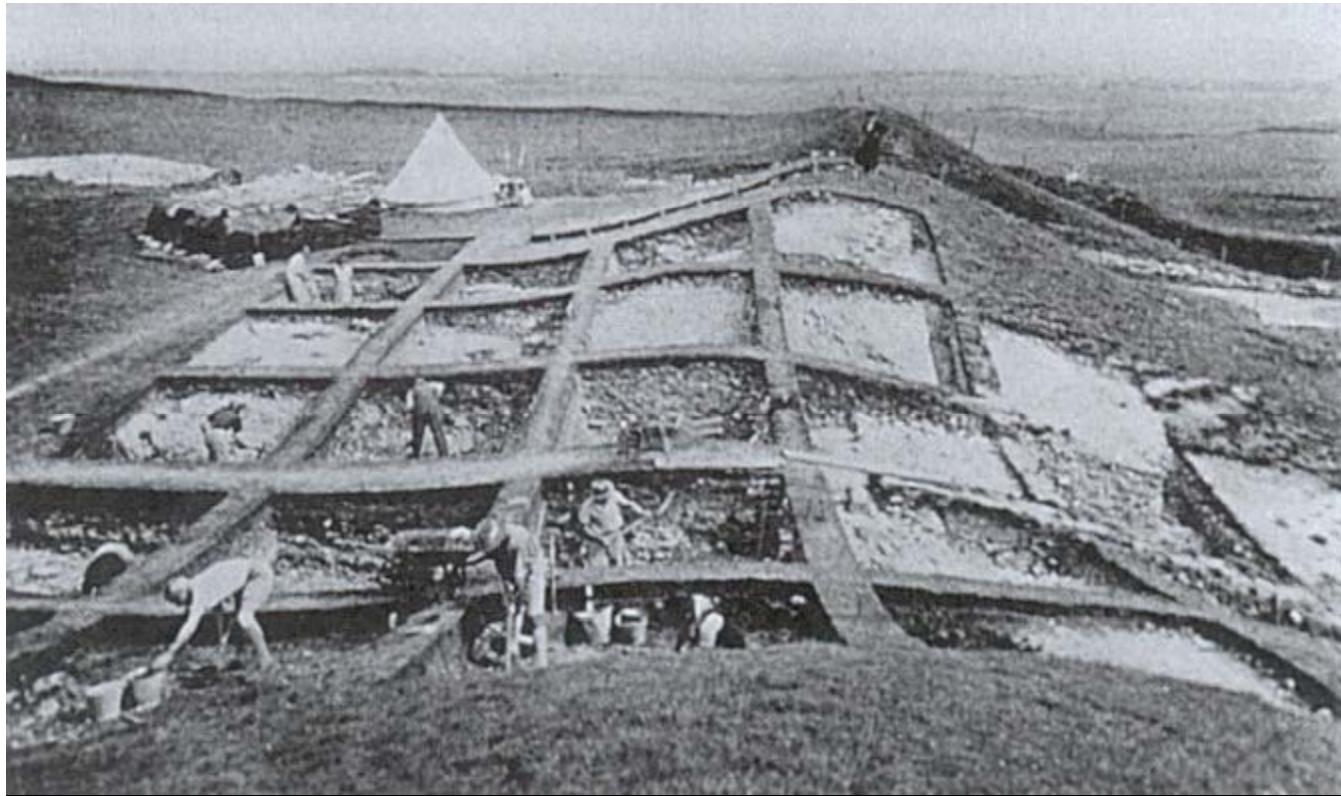
Trench 1



Tell es-Sultan



Pre-Pottery
Neolithic tower

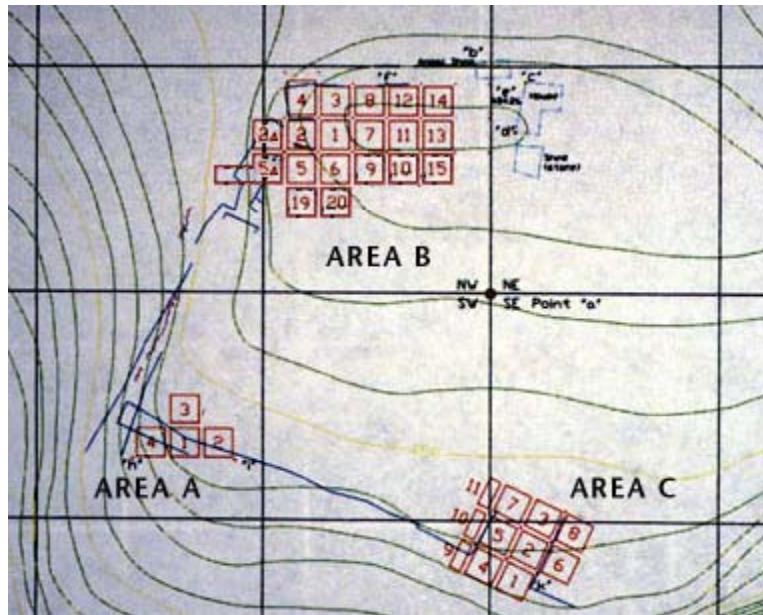


Wheeler box-grids

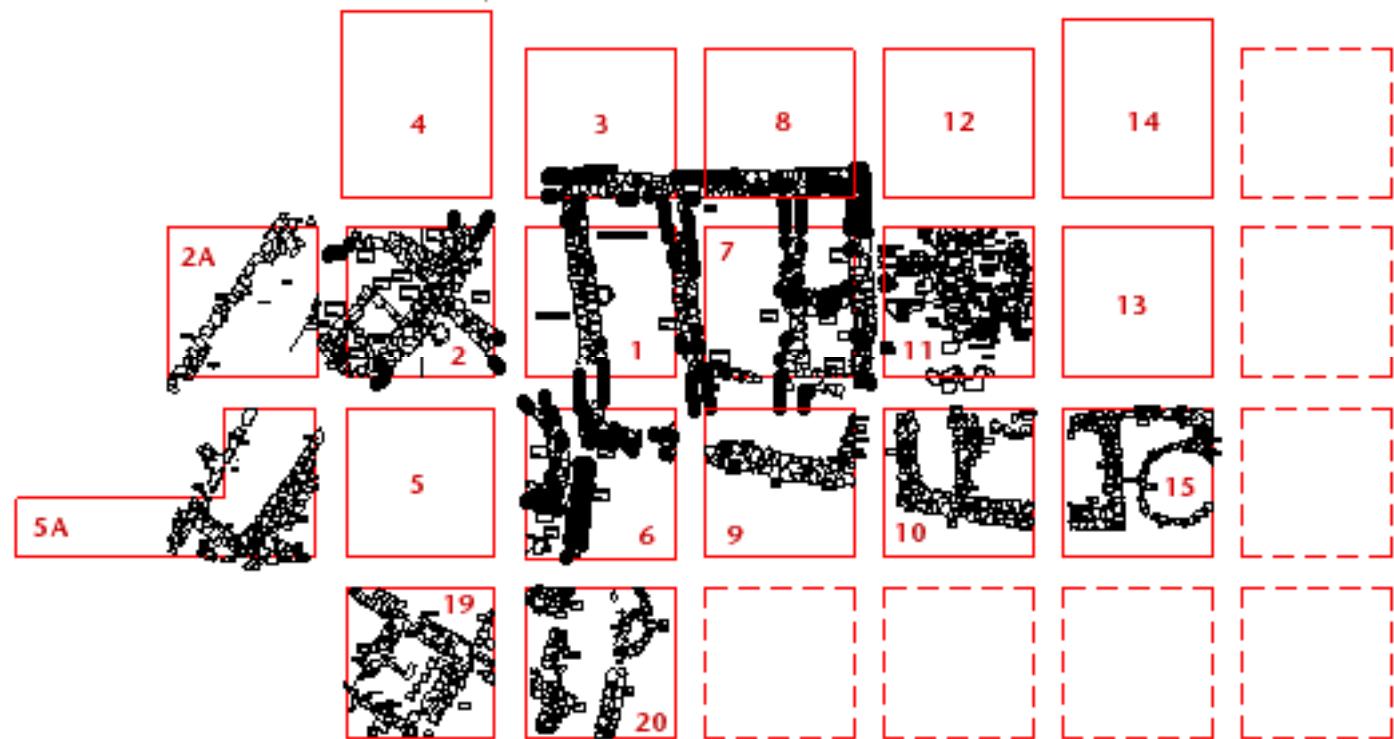




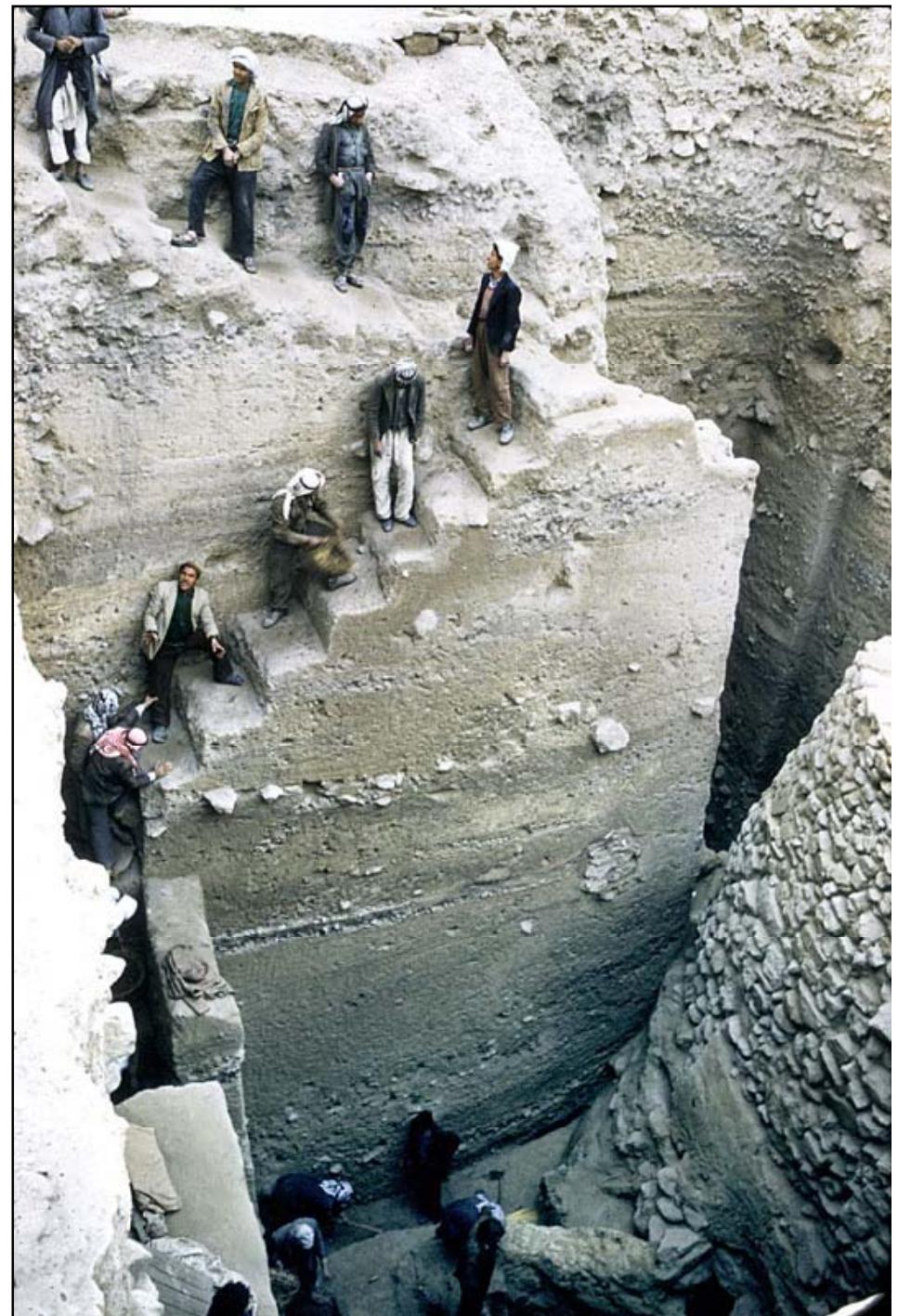
Mortimer Wheeler developed the practice of digging in ‘**box-grids**’ or **squares** as a means of recording the stratigraphy of excavations.



KHIRBET ISKANDER AREA B, PHASE A



Wheeler-Kenyon Method



Trenches take several forms



Trenching with balks



Step trenching

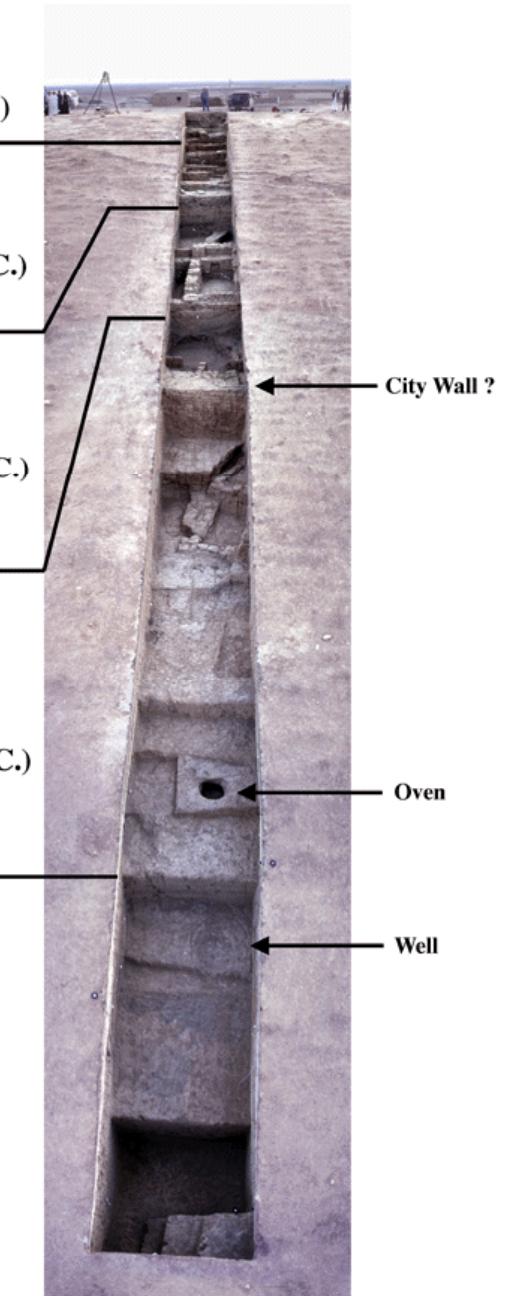


Islamic Period
(ca. 700 - 1000 A.D.)

Early Bronze Age
(ca. 3000 - 2000 B.C.)

Uruk Period
(ca. 3500 - 3000 B.C.)

**Late Chalcolithic
Period**
(ca. 4000 - 3500 B.C.)

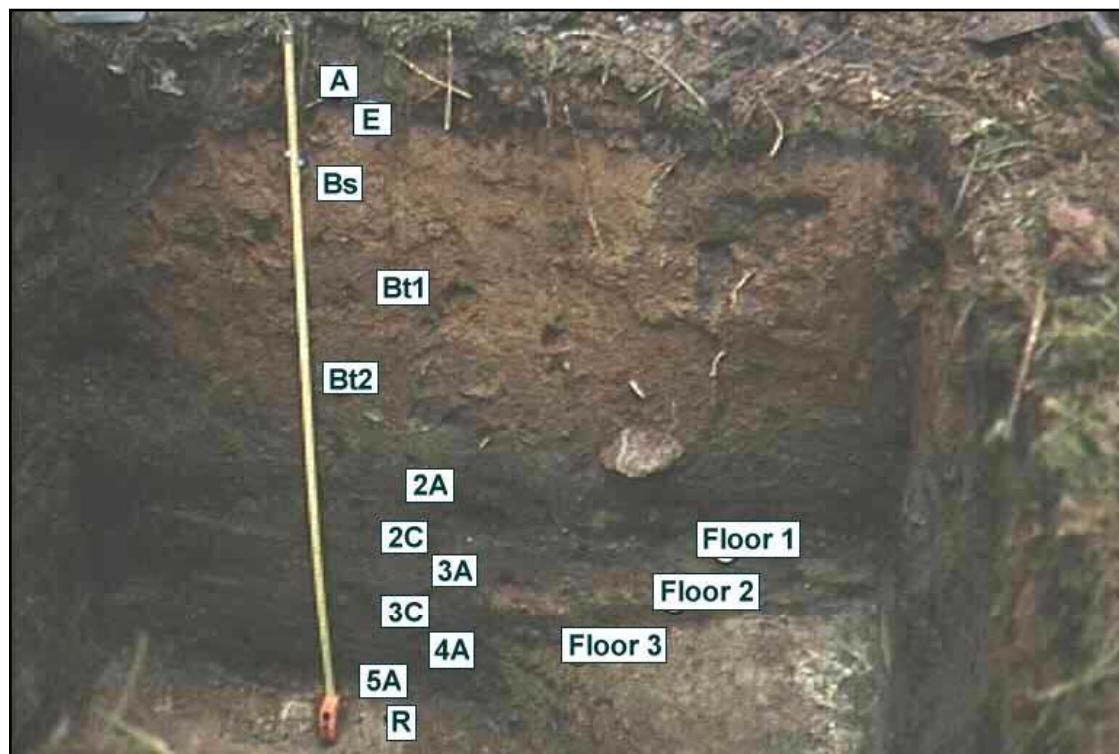
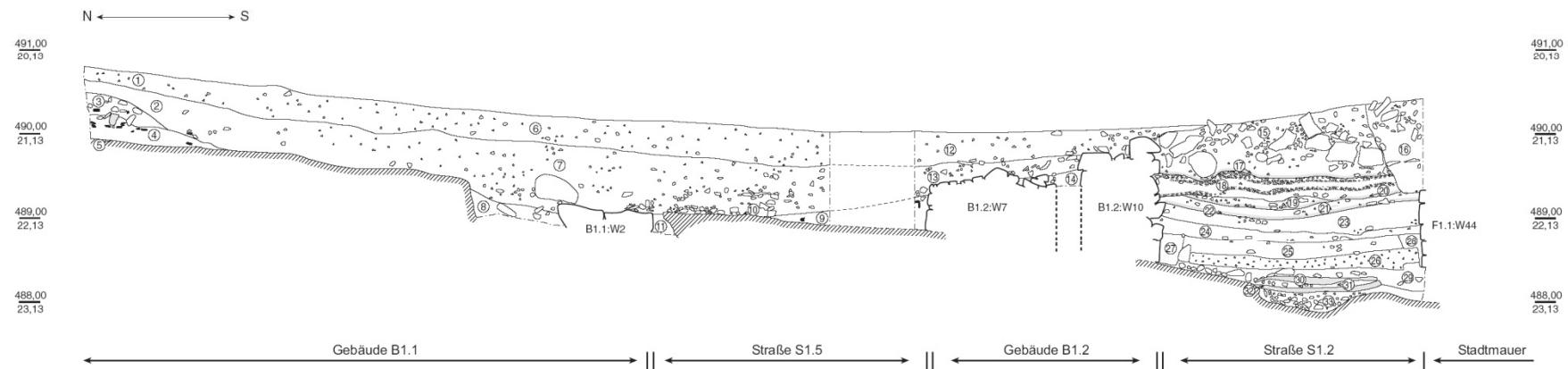


A typical step-trench

Open area excavation



Stratigraphic profiles



Principles of excavation

Context

- As we discussed in a previous class, the context of the features and artifacts in an excavation are as important as the features and artifacts themselves
- This is because often the position of these features and artifacts provide valuable information on human behavior, such as spatial relationship of activities or the use of artifacts.

Time and space

- For this reason archaeologists record all of the excavated area, artifacts, features, and even the matrix of the finds in three dimensions
- With the implementation of Total Station recording in archaeology this has become much easier and faster

Reference points



Digital surveying using a Total Station and GPS software



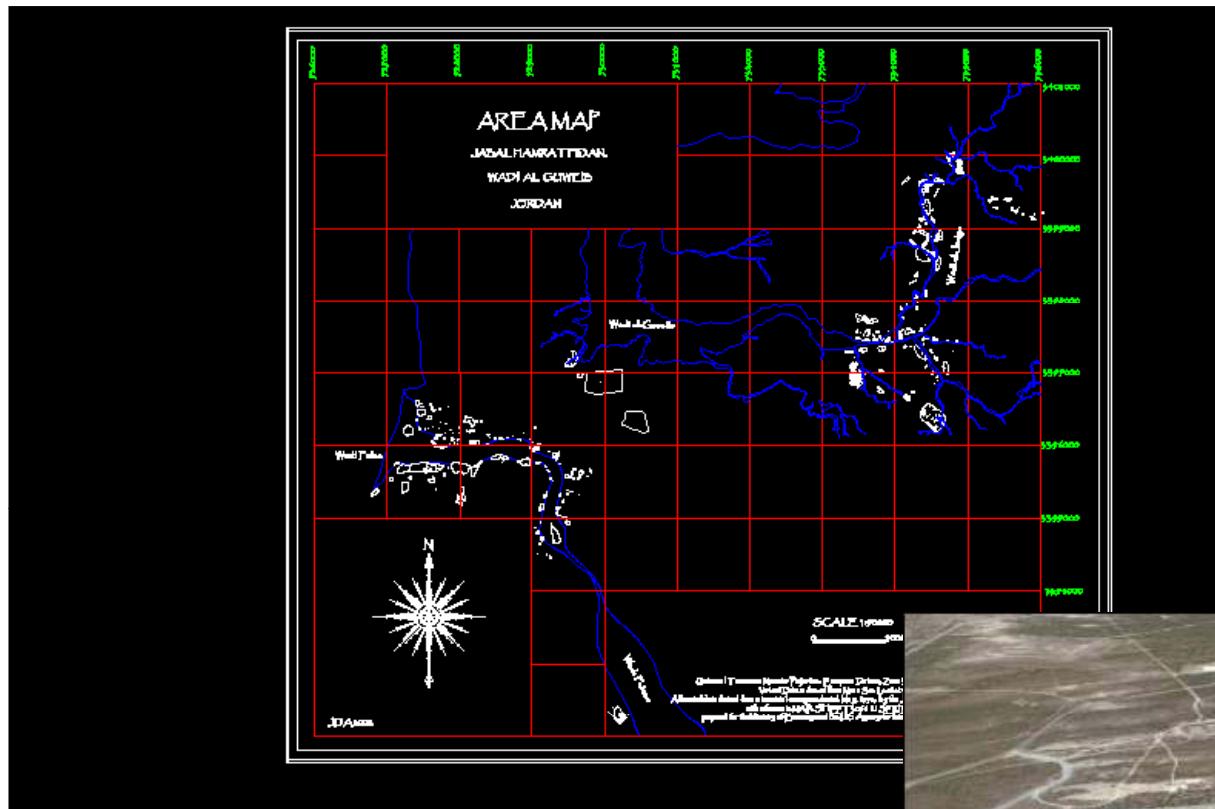
Collecting spatial data digitally to Geographical Information System

Digital surveying using a Total Station and GPS software



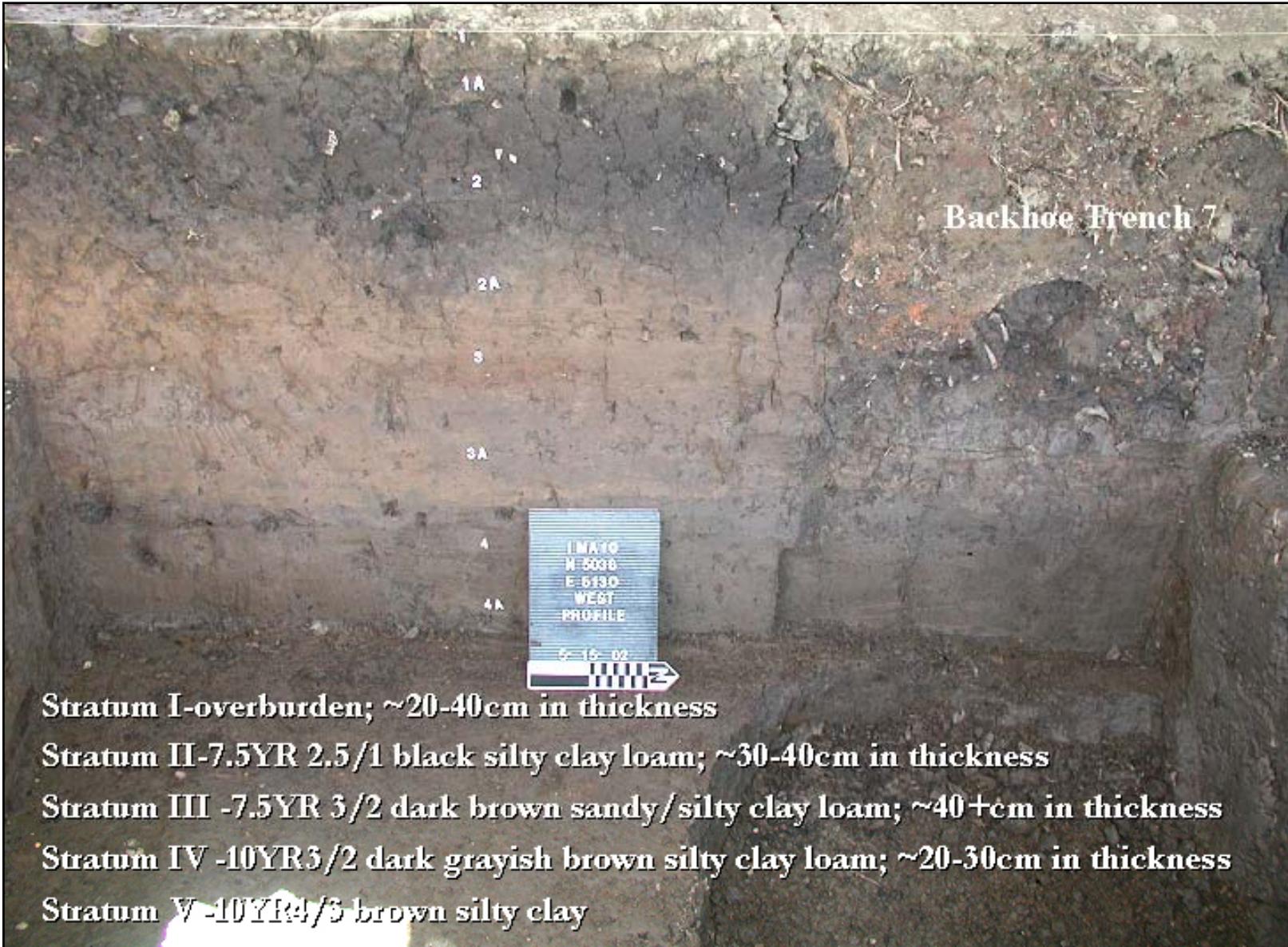
Daily top plan based on Geographical Information System data

Site, Regional and International grids

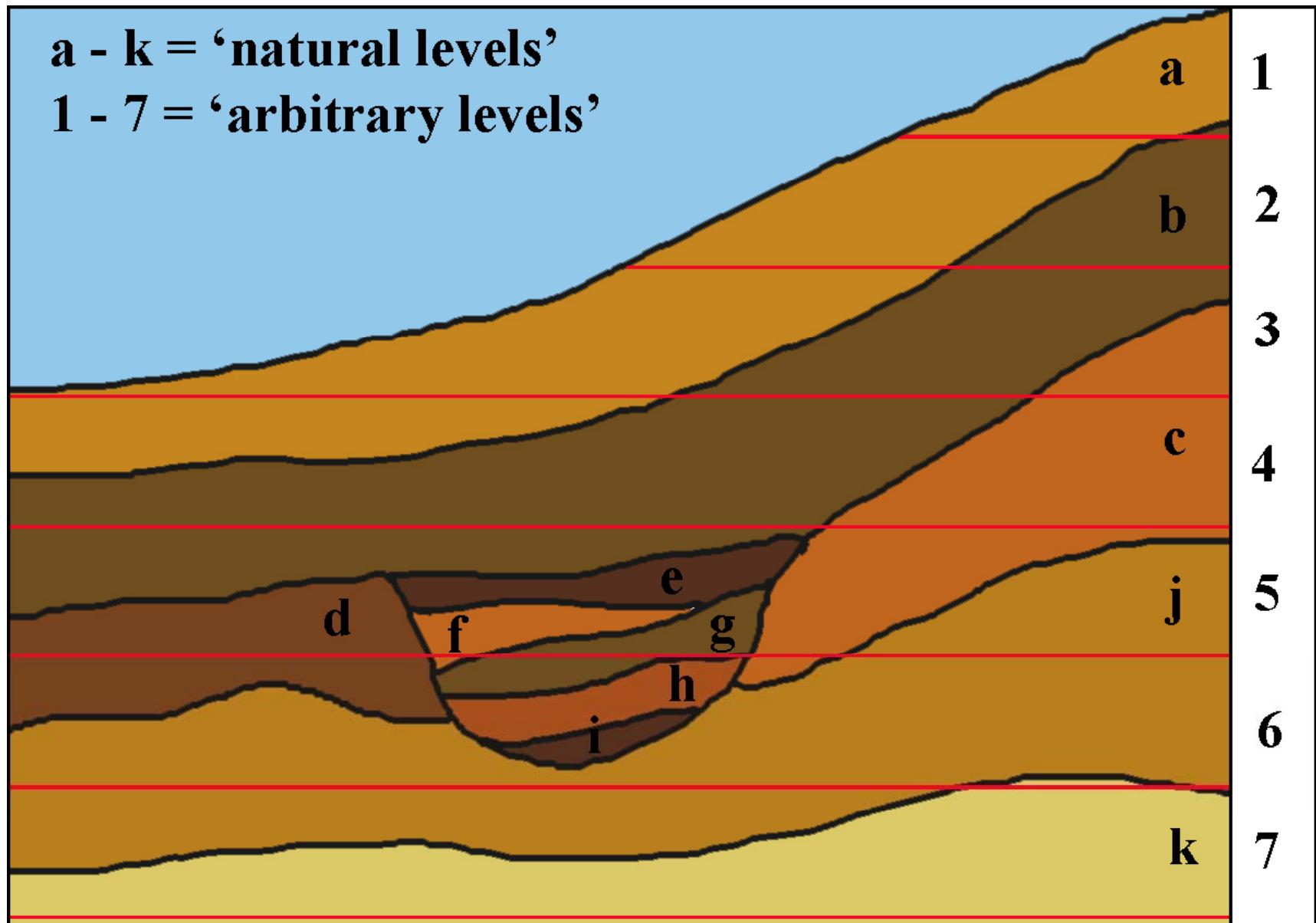


Universal Transverse Mercator (UTM)

Stratigraphy



‘Natural’ and ‘Arbitrary’ Levels



Artifact or Feature?

Definitions:

Artifact: anything that has been constructed or modified by humans

Ecofact: nonartifactual materials or remains found in archaeological sites (animal bones, botanical evidence)

Feature: generally features are artifacts on an archaeological site which can not be removed from the site without destruction (hearths, pits, post-holes, walls, floors)

Common types of features:

- Floors



Common types of features:

- Floors
- Walls



Common types of features:

- Floors
- Walls
- Reused walls



Common types of features:

- Floors
- Walls
- Reused walls
- Robber Trenches



Common types of features:

- Floors
- Walls
- Reused walls
- Robber Trenches
- Pits



Common types of features:

- Floors
- Walls
- Reused walls
- Robber Trenches
- Pits
- Post holes



Common types of features:

- Floors
- Walls
- Reused walls
- Robber Trenches
- Pits
- Post holes
- **Intrusions**



Screening

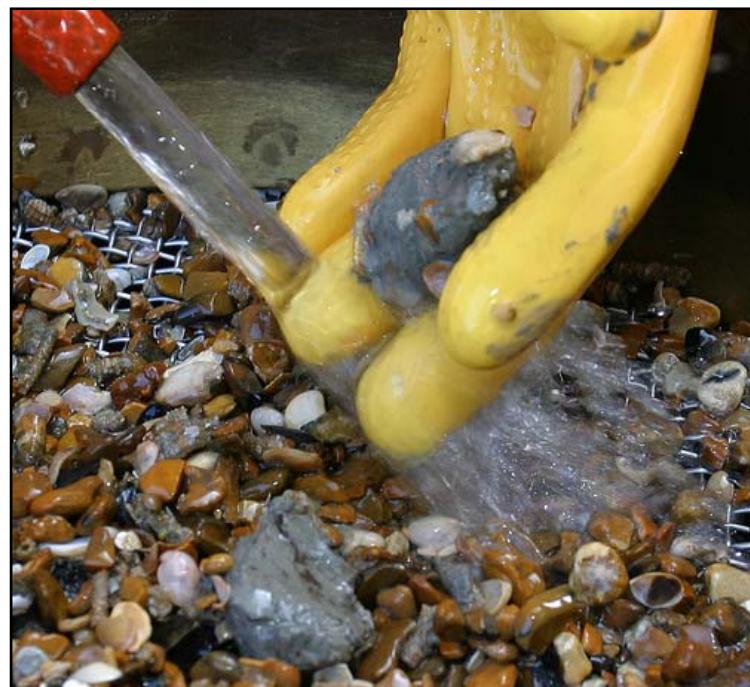


- Archaeologists ensure that they have recovered all evidence from a site by putting the soil of the **matrix** through a screen or sieve
- The sieve can vary in size, ranging from very fine to quite coarse depending on the material which is being screened and the type of matrix/context being removed
- A very coarse screen for a post-occupational fill, but a much finer one in an area which is yielding small artifacts or other archaeological finds like animal bones

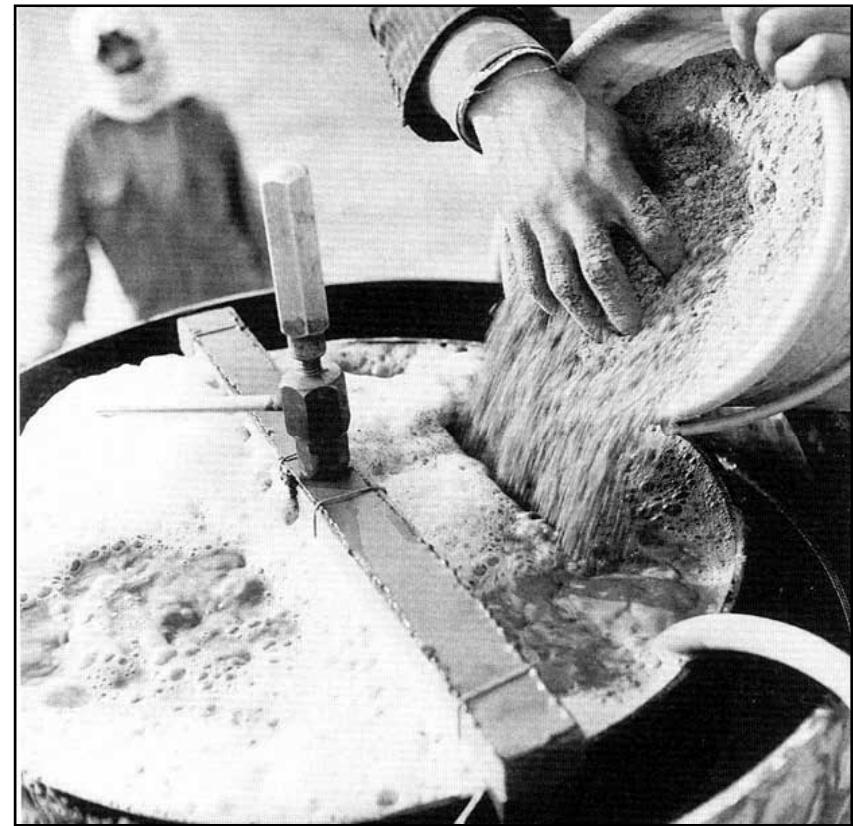
Dry Screening



Wet Screening



Environmental and subsistence reconstruction

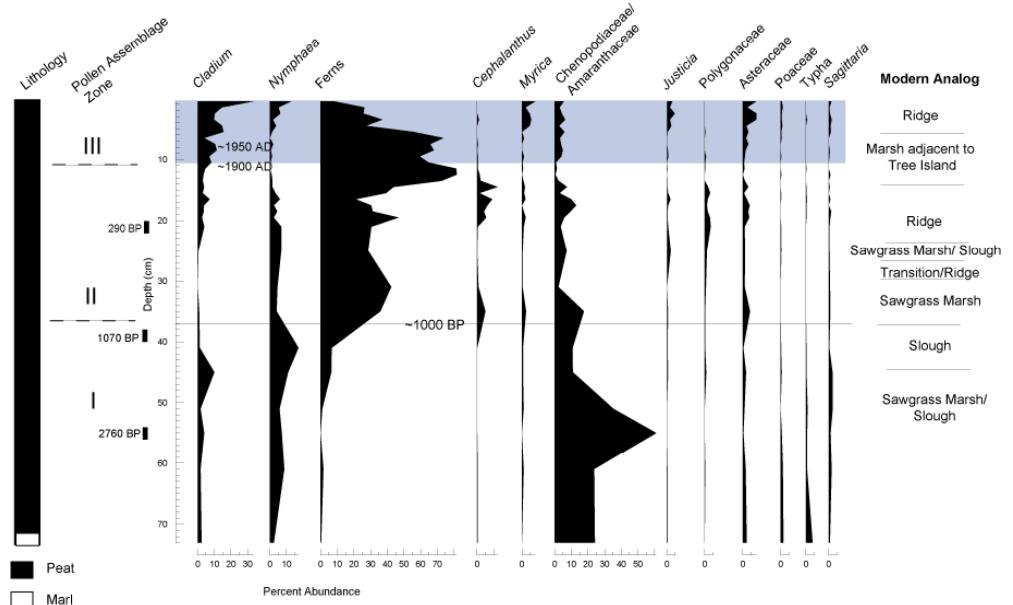
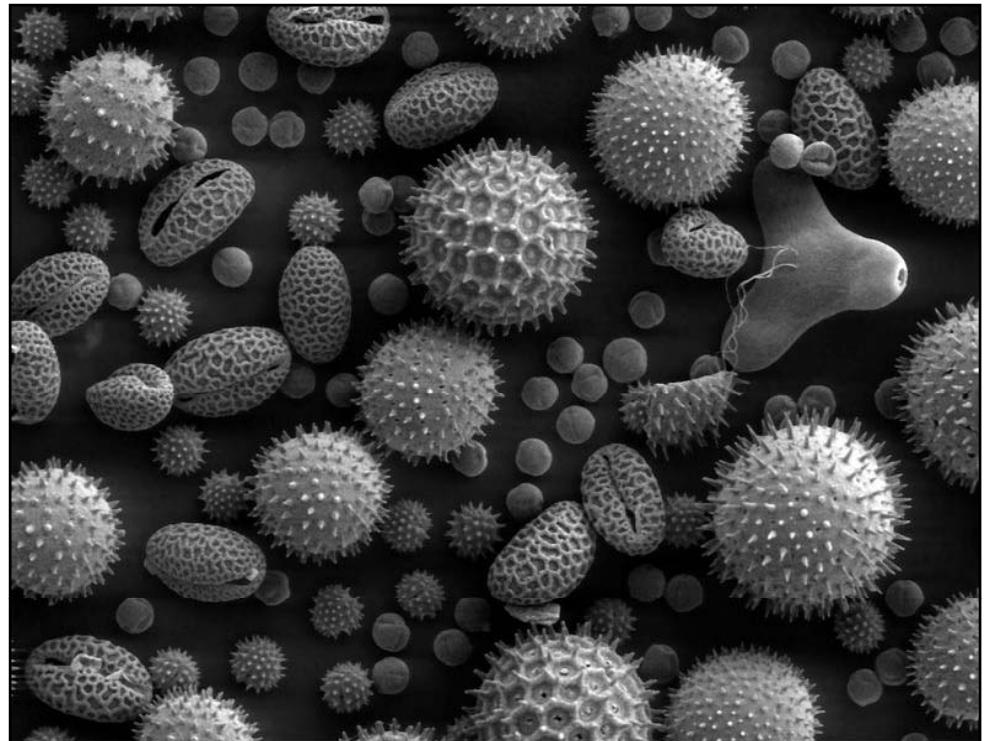
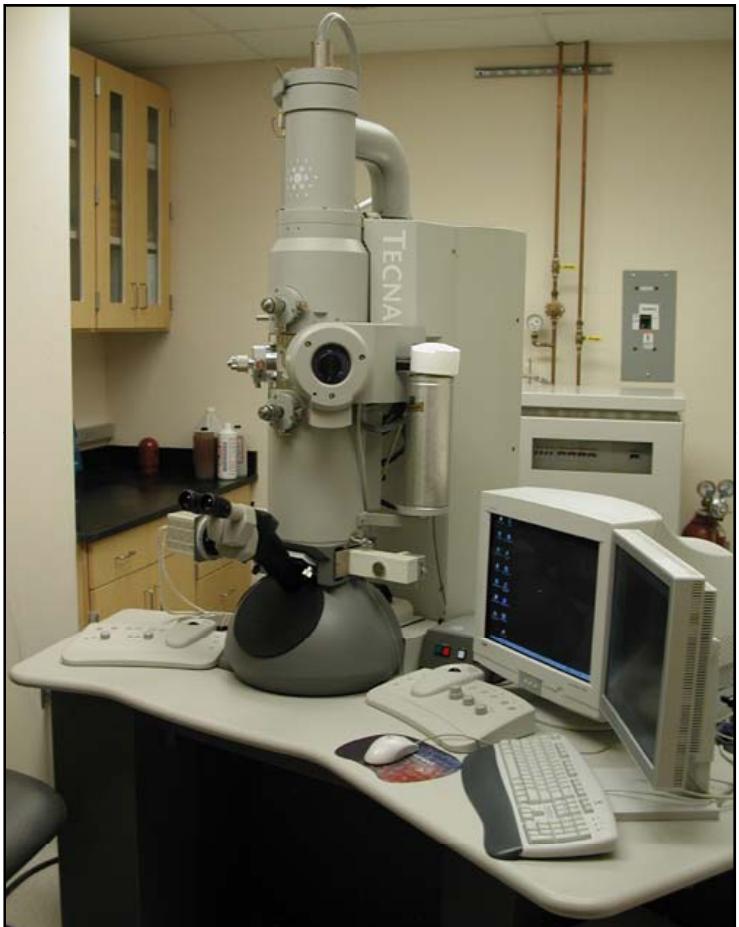




Environmental and subsistence reconstruction



Pollen analysis



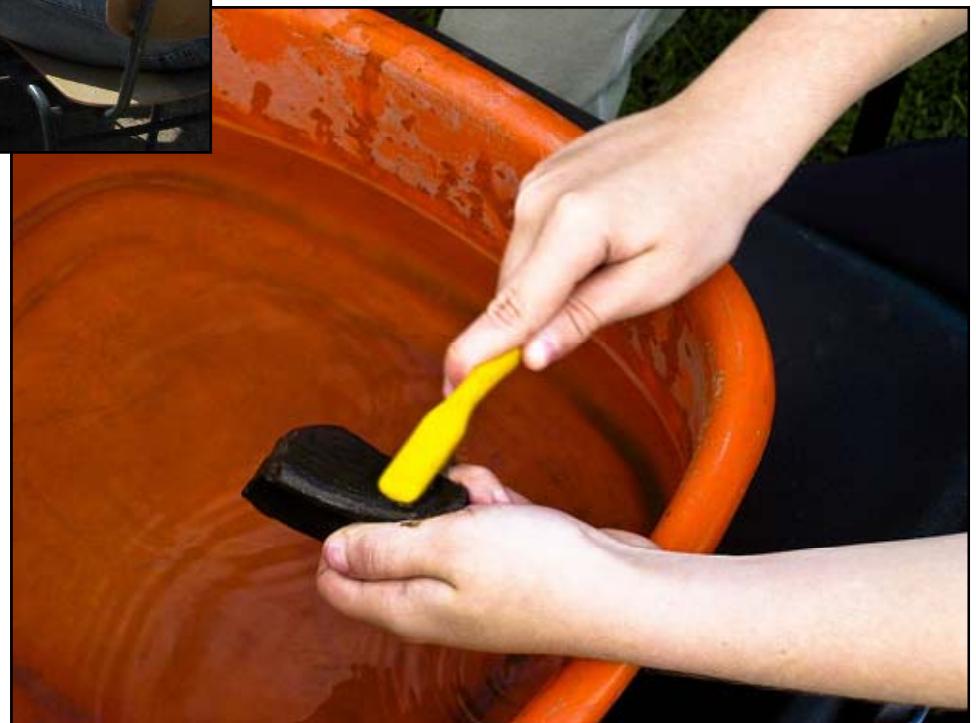
Scanning electron microscope,
pollen image (top right) and
pollen graph

Artifact processing





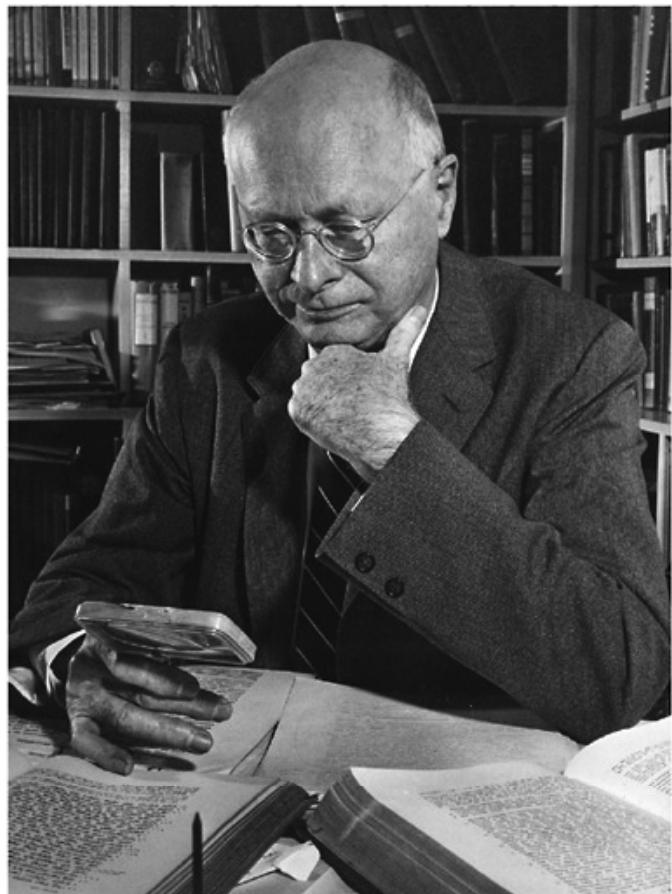
Pot washing





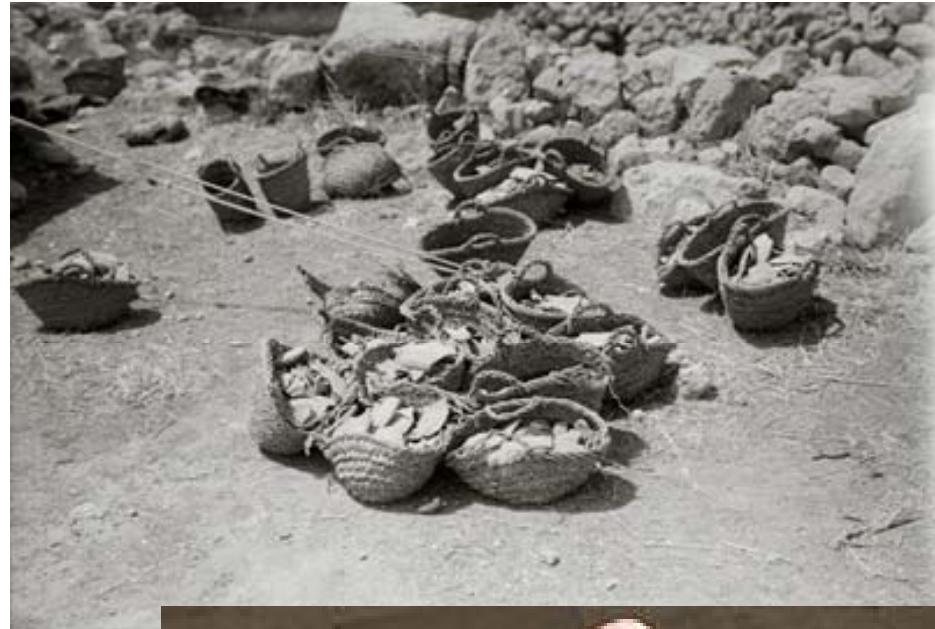
Pottery “reading”





W.F. Albright

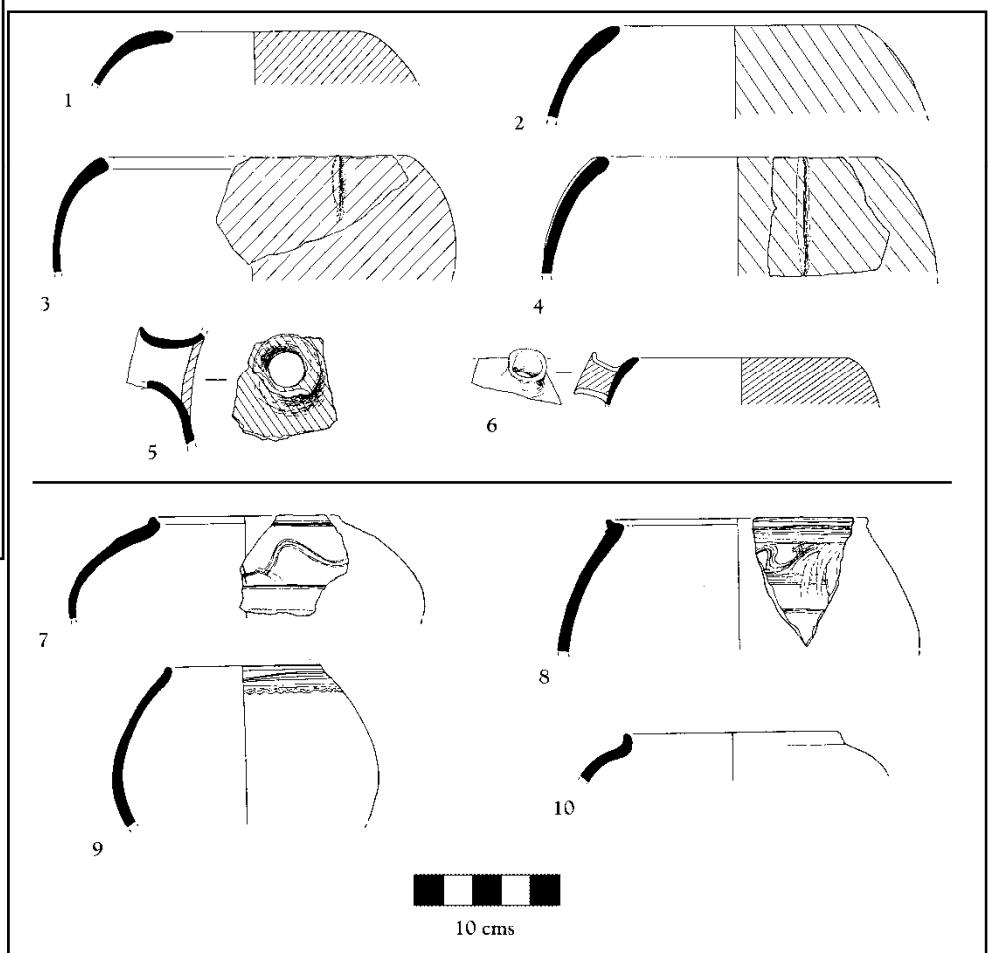
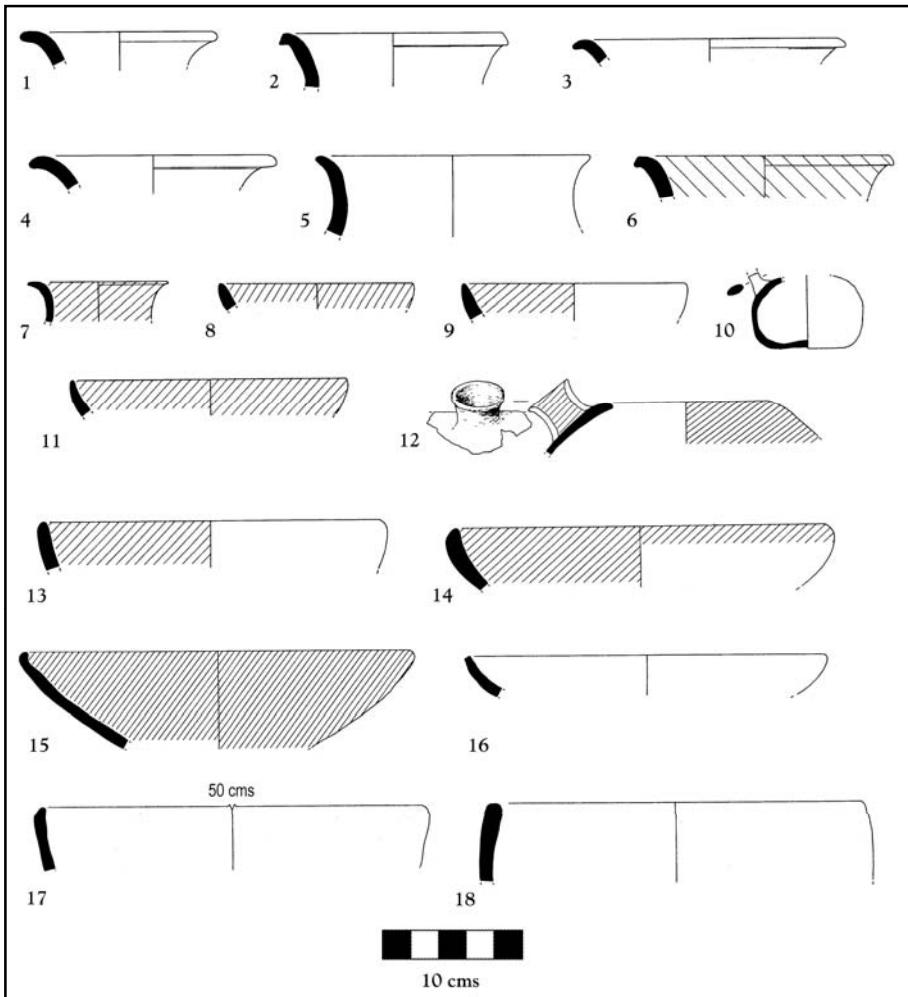
W.F. Albright



Pottery drawing



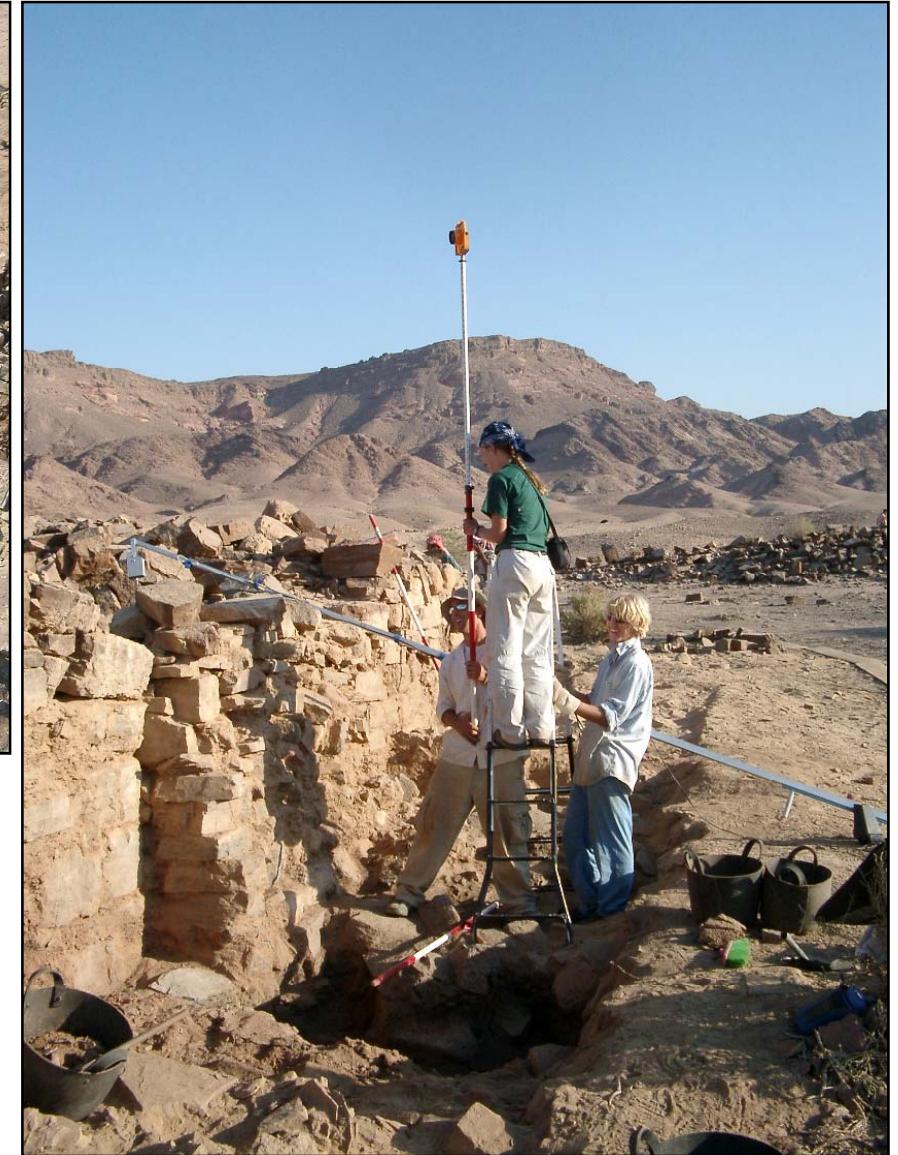
Technical drawings of pottery

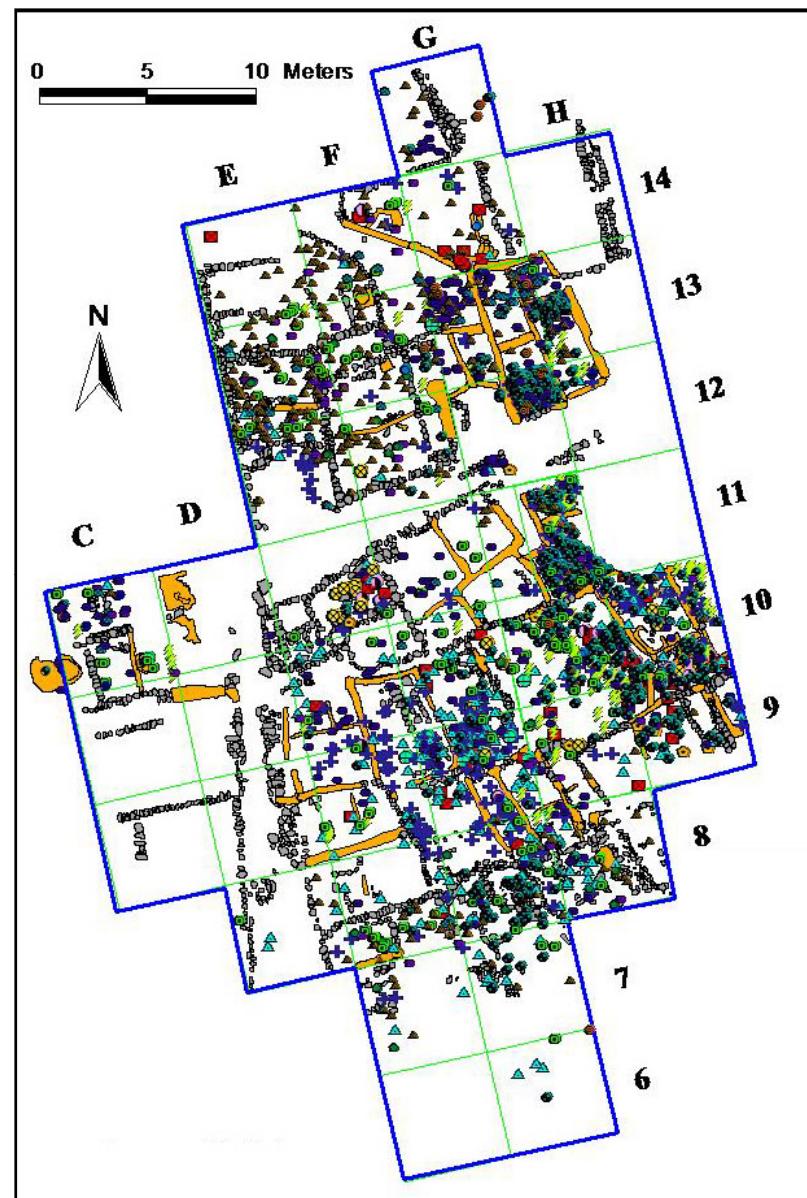


Spatial measurement and recording

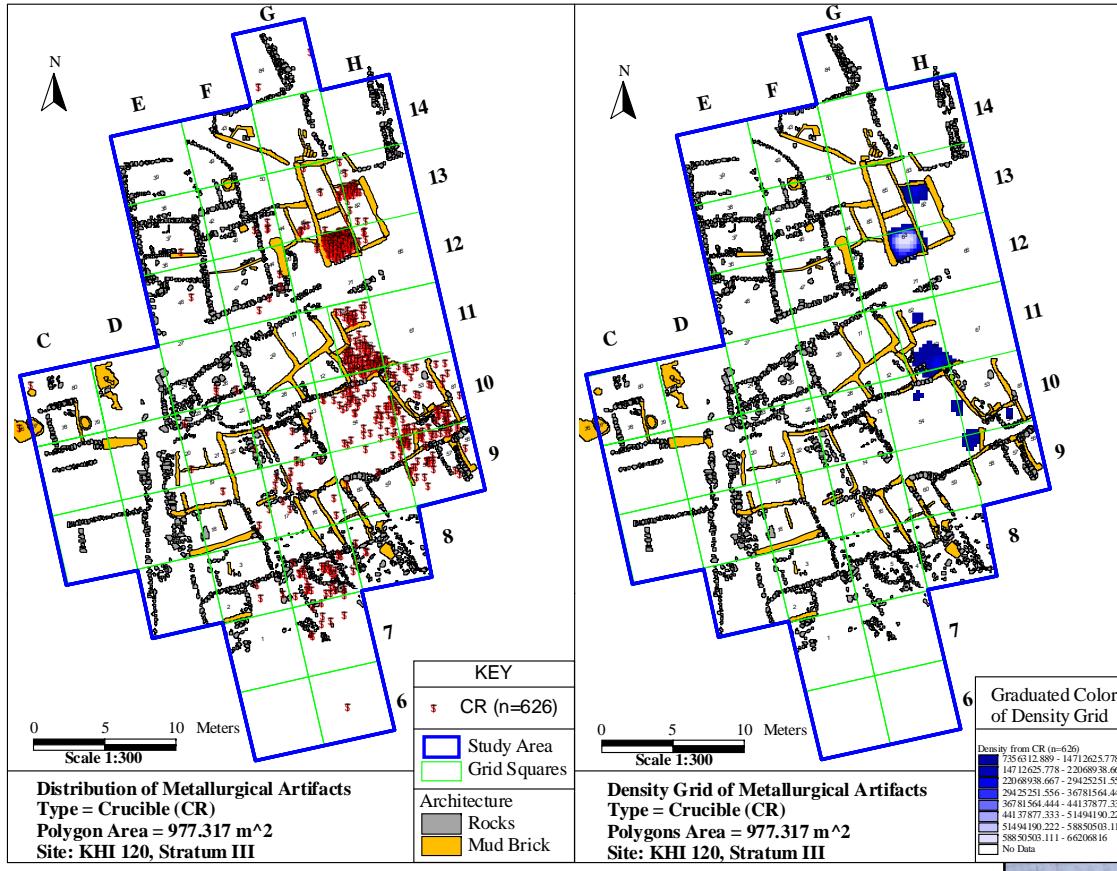


Total Station recording (x,y,z digital recording)

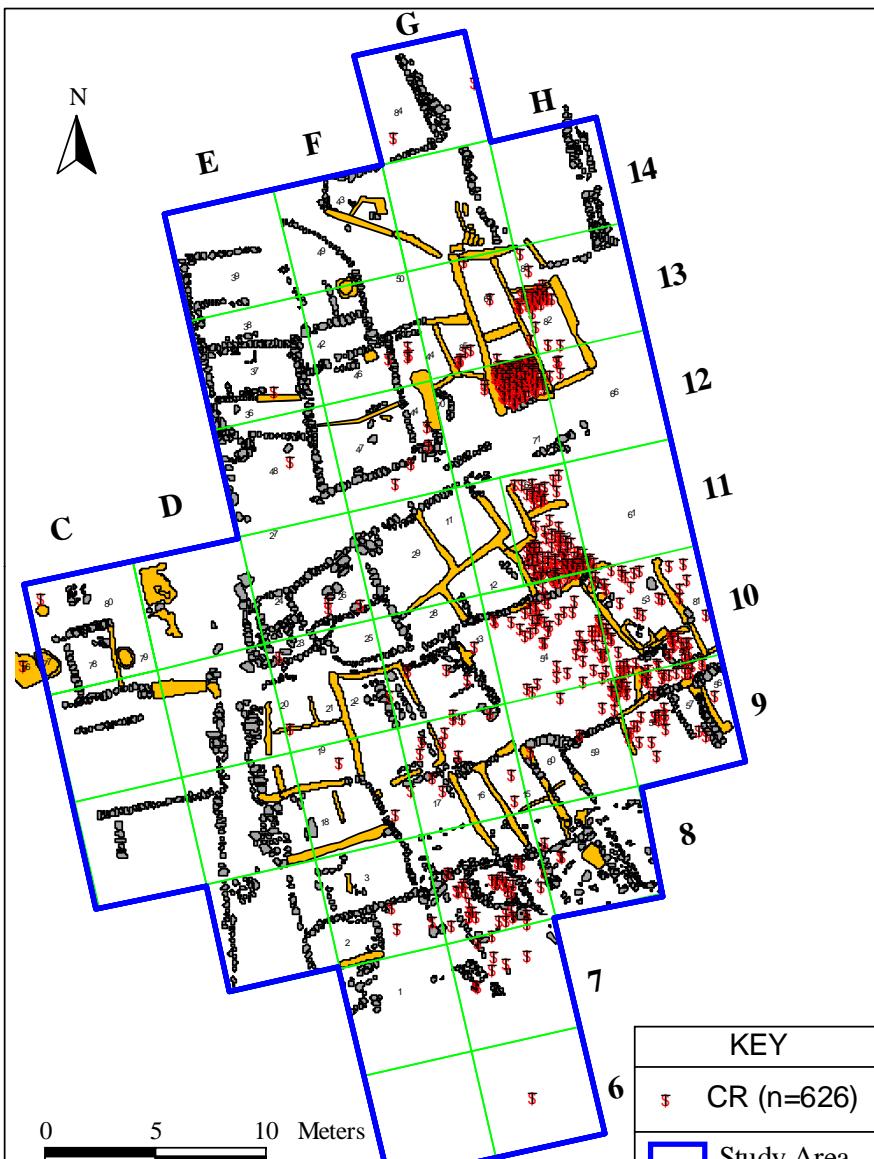




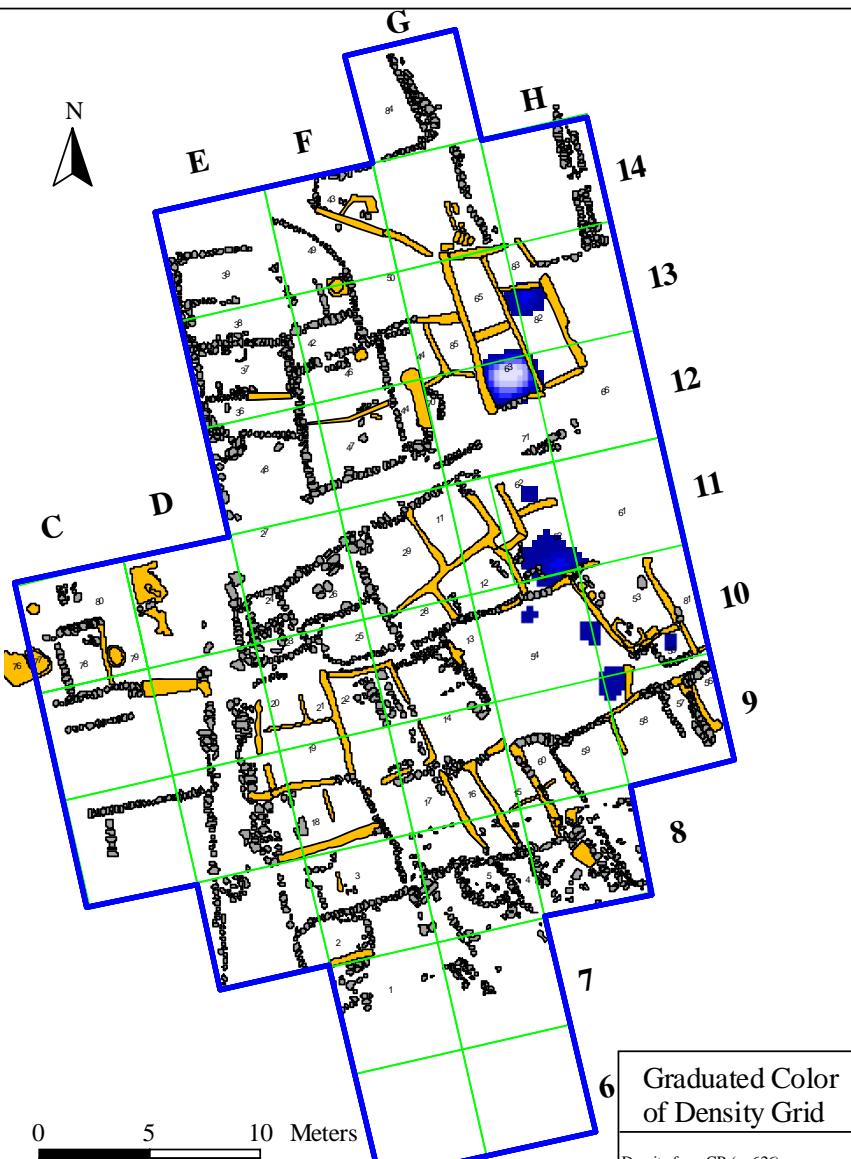
Density of Metallurgical
Artifacts in a GIS Plot



Digital data collection and GIS plots



Distribution of Metallurgical Artifacts
Type = Crucible (CR)
Polygon Area = 977.317 m²
Site: KHI 120, Stratum III



Density Grid of Metallurgical Artifacts
Type = Crucible (CR)
Polygons Area = 977.317 m²
Site: KHI 120, Stratum III

Observation



Field Notebooks



Khirbat al – Nahas

2002

Area S Daily Journal

10/8/02

First day of excavation.

The area was divided into six 5 x 5 meter squares along a north-south axis. Since the official square designations had not yet been assigned, the squares were assigned temporary designations corresponding to two north-south columns: A, the western column, and B, the eastern. Each column contained 3 squares, numbered 1 through 3, beginning in the north.

A1	B1
Baulk 1 meter	
A2	B2
Baulk 1 meter	
A3	B3

Each square was opened as a separate locus: A1 – L. 251, B1 – L. 252, A2 – L. 253, B2 – L. 254, A3 – L. 255, B3 – L. 256. Two 1-meter baulks were created along the east-west internal gridlines. The baulks will be kept for stratigraphic control. The loci were bounded by the grid and baulk lines and were used for a surface find collection, such as pottery, flint, and slag. Several walls are visible on the surface. The longest wall cuts the area from the north-west to the south-east. Two perpendicular walls are visible, one along the southern boundary and one along southern baulk. Another wall parallels the largest wall along the western boundary of the area. The walls create two rooms, one separated by the northern baulk (A1-2), the other south of the southern baulk (A3-B3). An abundance of slag was found in L. 256 along with purposely crumbled slag. In general over the entire area, low amounts of pottery and flint were collected. All of these loci were closed after the surface was cleared.

New loci were opened determined by architecture and baulks and the outer grid boundary.

L. 257

L. 257 is located in Sq. A1 and represents the northern part of the larger room. It is situated below L. 251. It is closely related to L. 259, but the two are separated by the northern baulk. The locus consists of topsoil, which was scraped to a depth of 10 cm. No finds were collected, but wall collapsed was better defined. Tomorrow, we will continue to define the collapse and lower portion of the wall.

L. 258

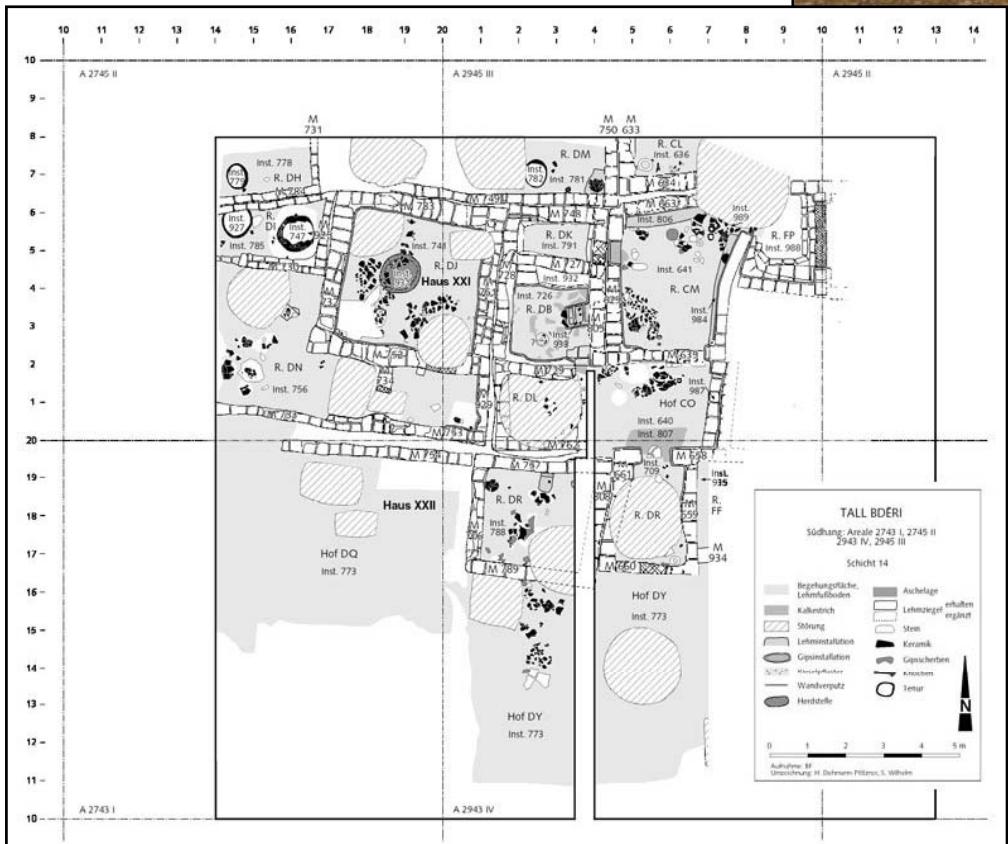
L. 258 is located in Sq. B1, below L. 252. It is located outside and to the east of the large structure. We scraped the topsoil to a depth of 10 cm. It is a sandy soil with few finds. There is a possible wall line along the eastern border of the locus. Tomorrow, the surrounding architecture will be further defined, and collapse will be removed.

Forms

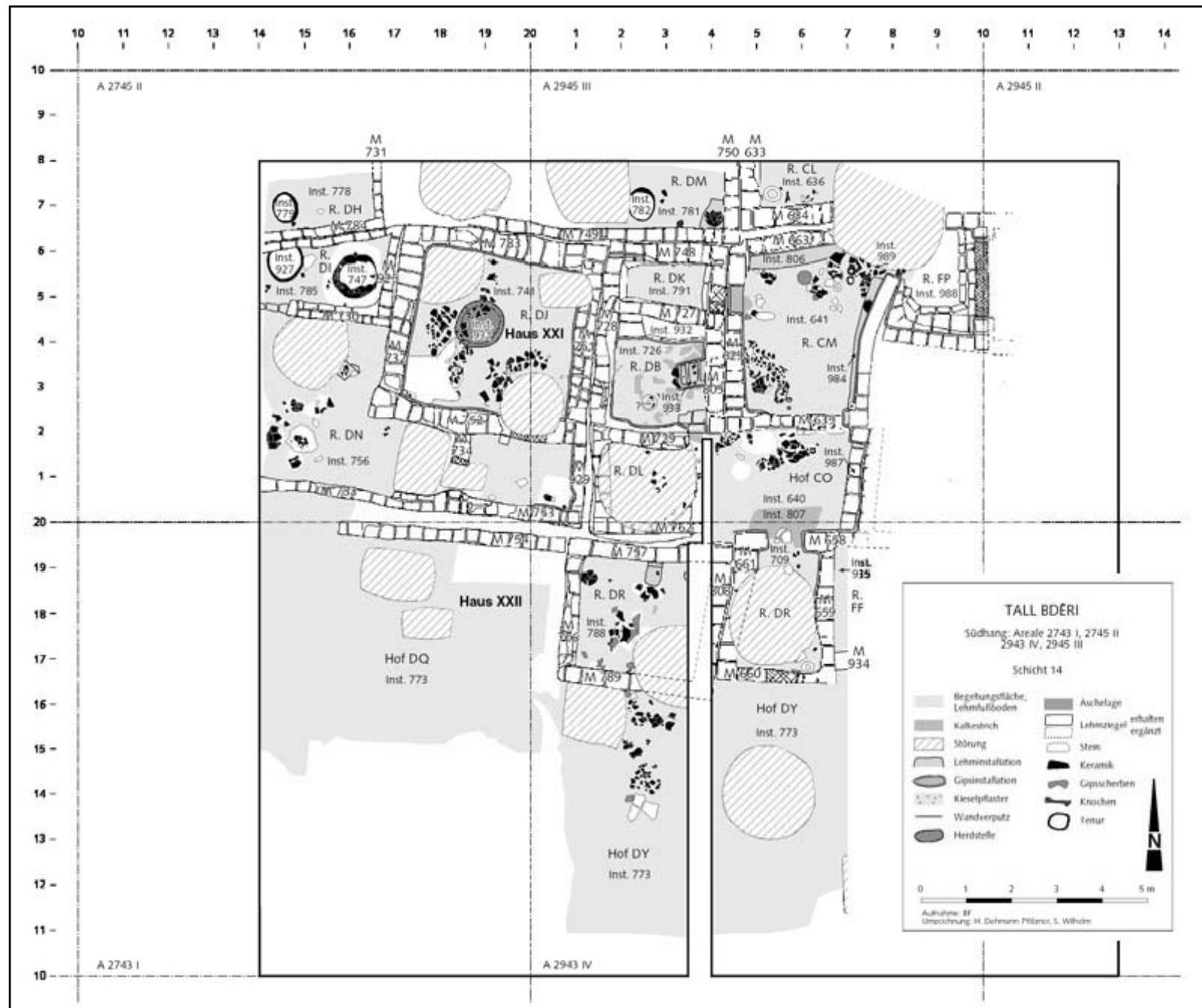
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Khirbet en-Nahas		Locus Summary Sheet																
Year: 2002		Locus	44															
Area A		Area	A															
Definition Rocks and sediment debris, NW chamber gateway complex.																		
Stratum lb																		
Square																		
Start EDM 65071																		
Start Date 24/10/2002																		
Section_No		End EDM 65146																
Section Link		End Date																
Limits N-W33, S-W47, E-W45, W-W35																		
Top Elevation 0		Bottom Elevation 0	Height 0															
Top Area 0		Bottom Area 0	Volume 0															
<table border="1"> <thead> <tr> <th>Walls</th> <th>Fill/Floor</th> <th>Structures</th> </tr> </thead> <tbody> <tr> <td>Locus (above)</td> <td>9</td> <td></td> </tr> <tr> <td>Locus (intrusive)</td> <td></td> <td></td> </tr> <tr> <td>Locus (contemporary)</td> <td>43</td> <td></td> </tr> <tr> <td>Locus (below)</td> <td>79</td> <td></td> </tr> </tbody> </table>				Walls	Fill/Floor	Structures	Locus (above)	9		Locus (intrusive)			Locus (contemporary)	43		Locus (below)	79	
Walls	Fill/Floor	Structures																
Locus (above)	9																	
Locus (intrusive)																		
Locus (contemporary)	43																	
Locus (below)	79																	
Layout Desc Fill of rocks and yellow-white sediment below the first layer of debris at the NW chamber of the gate coplex.																		
Find Desc Very few shards, some slag, an intact copper object (ca. 7x4 cm) consisting of two circles at two sides of a cylinder, at the top of which there may be a figure of a human head or face.																		
Strat Desc The fill represent the last destruction of the chamber at the event that put an end to the utilization f the structure as well as the fort and possibly the site as a whole.																		
Post Deposition Desc Covered by more debris.																		
Misc identical to L43 at the NE chamber.																		
See attached printout of Basket Finds and Digital Photo																		

Plans



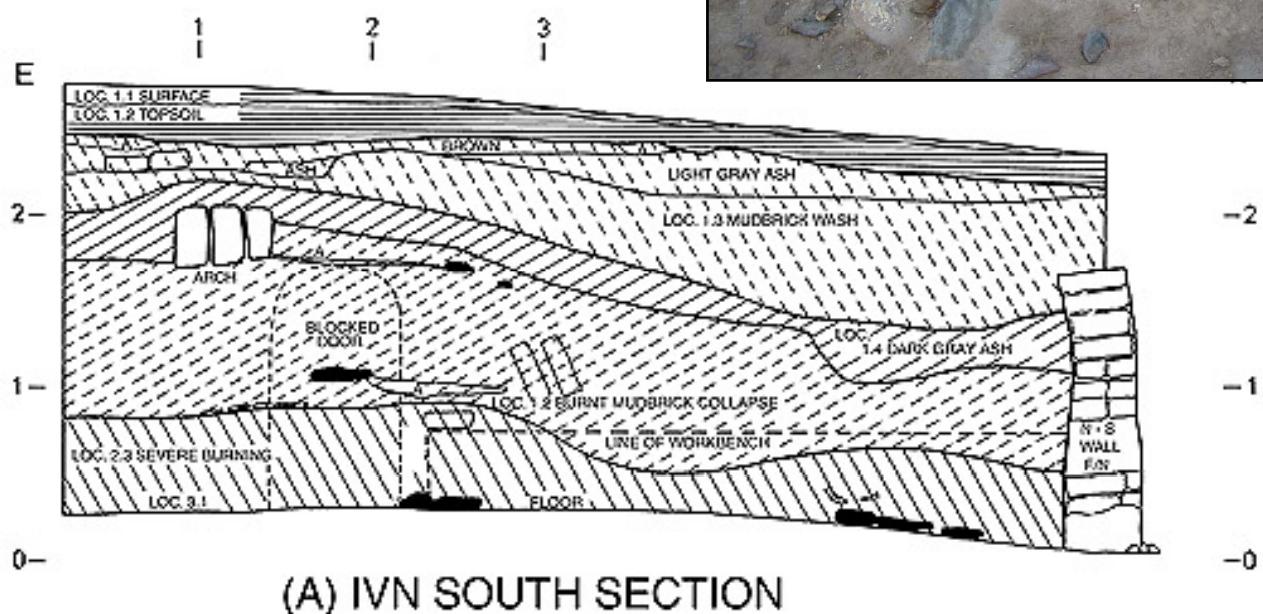
Plans



Stratigraphy



Grid Sections

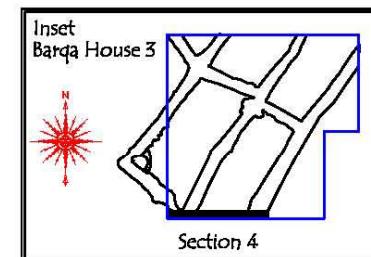


Section #4 BLS 2010, Barqa House 3

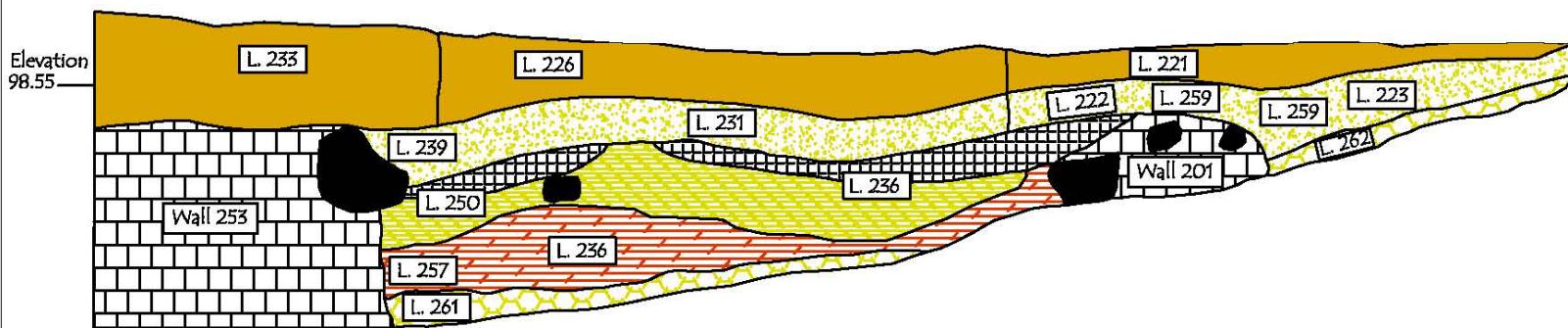
July 17th and 18th, 2010

North facing South
Standing in Locus 261 and 262

0 Scale: 1:25 1m



Legend
Sand
Wall
Rock
Grey-brown fill
Grey-white fill
Grey and ash fill
Brown ash
Chert



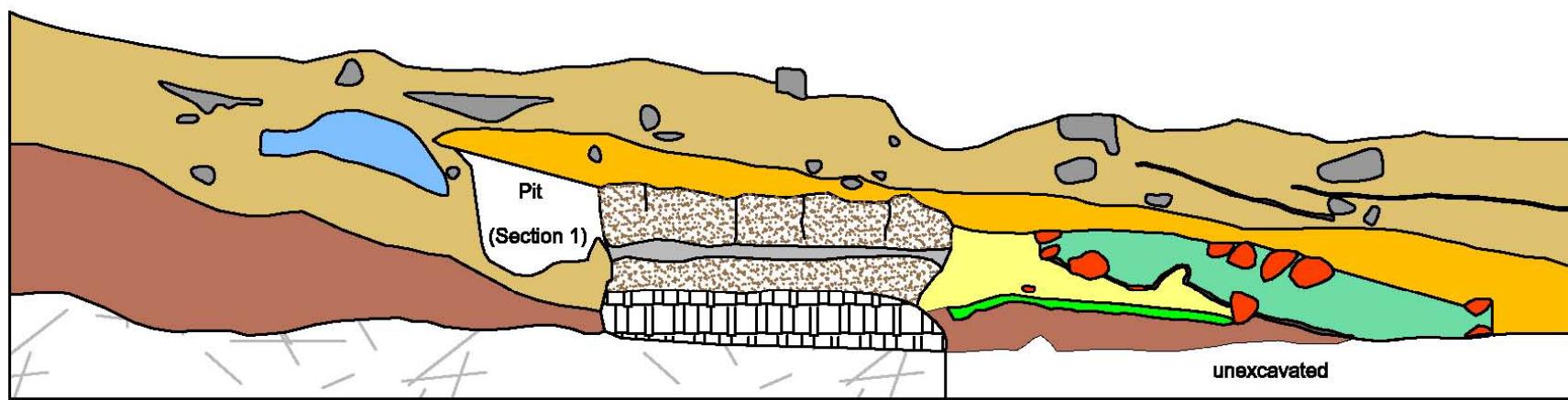
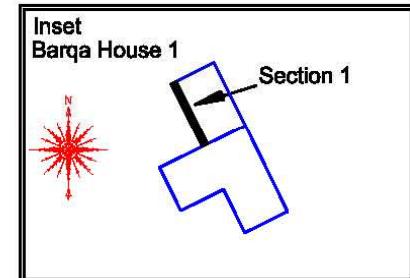
Section #2 BLS 2010, Barqa House 1

Section at external wall to north of structure

North Facing South

July 19, 2010

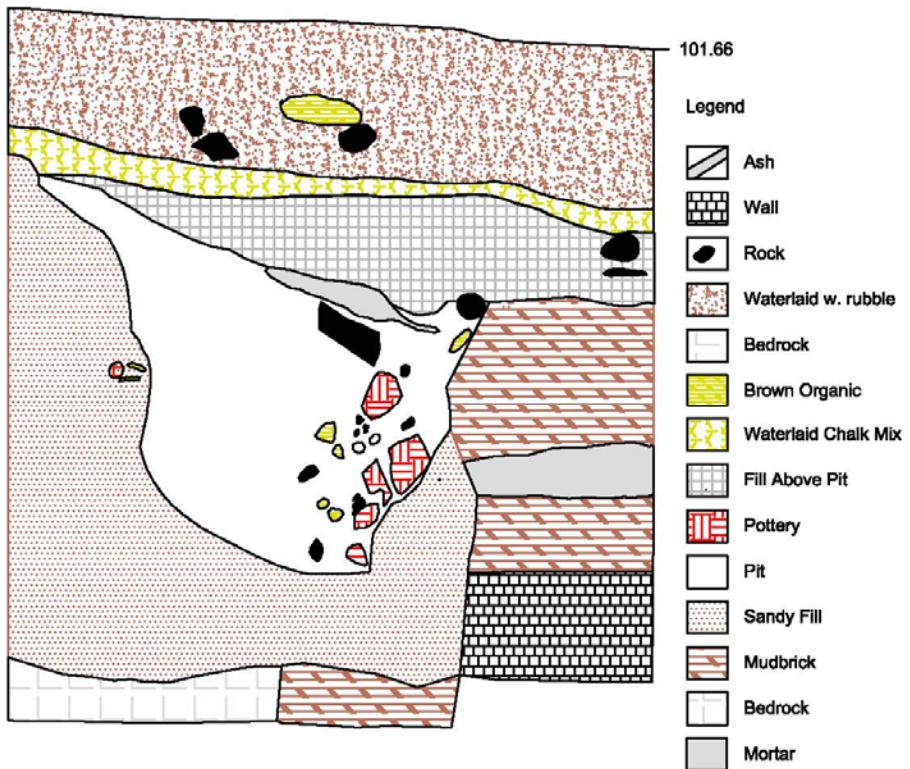
Sandy fill	Mortar
Wall	Mudbrick
Rock	Ash
Dark fill	Whitewash
Dark Solid	Light Fill
Pit	Red Inclusions
Bedrock	Brown Organic



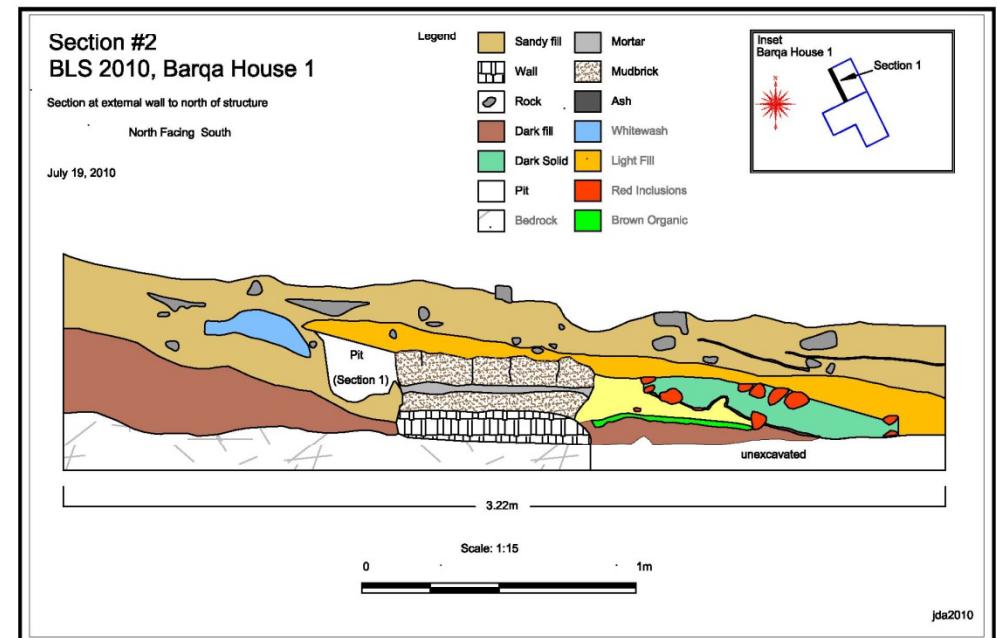
Scale: 1:15



jda2010



Scale: 1:5
0 .5m



Site Stratigraphy

BBB 43	CCC 43
Baulk 1 meter	
BBB 42	CCC 42
Baulk 1 meter	
BBB 41	CCC 41





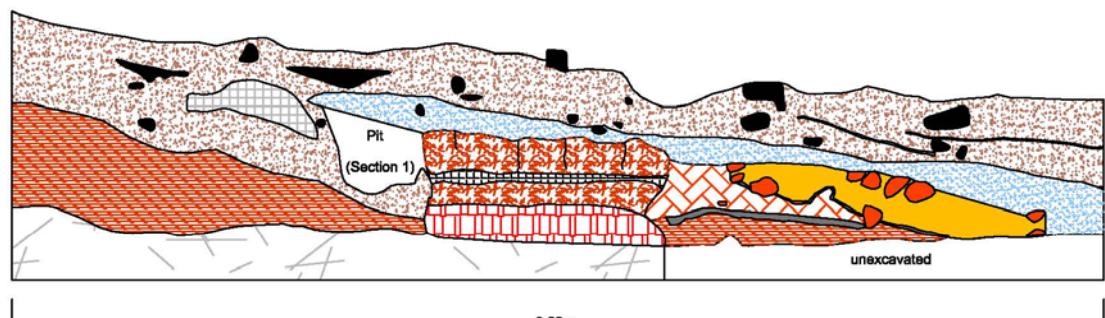
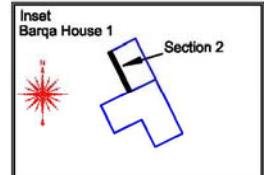
Section #2
BLS 2010, Barqa House 1

Section at external wall to north of structure

East Facing West

July 19, 2010

Fill	Mortar
Rock	Wall
Ash	Dark fill
Whitewash	Dark Solid
Light Fill	Red Inclusions
Pit	Light Fill
Mudbrick	Bedrock



Internal Sections

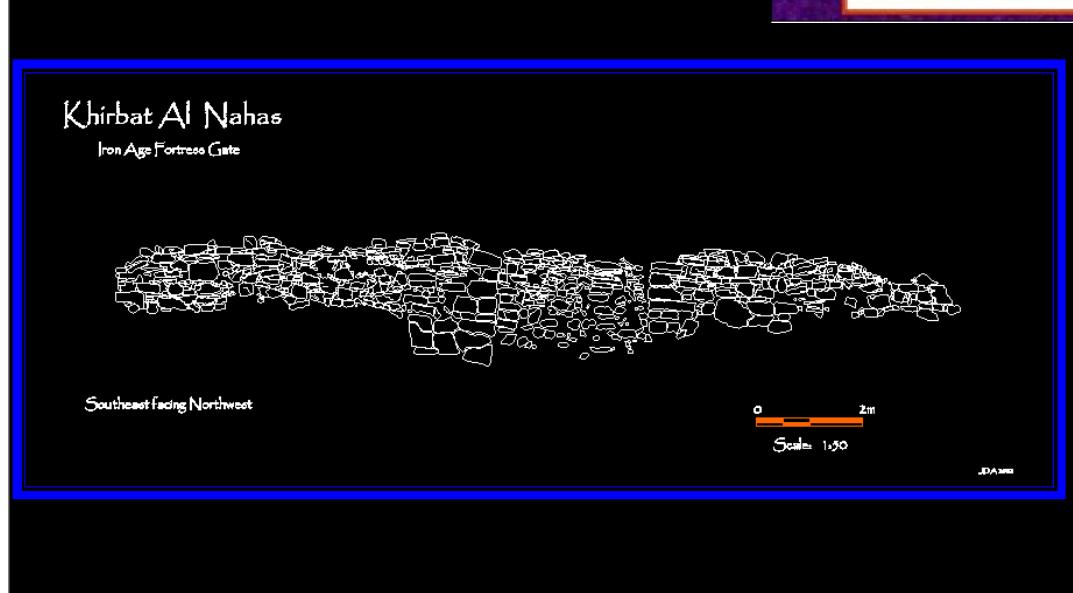
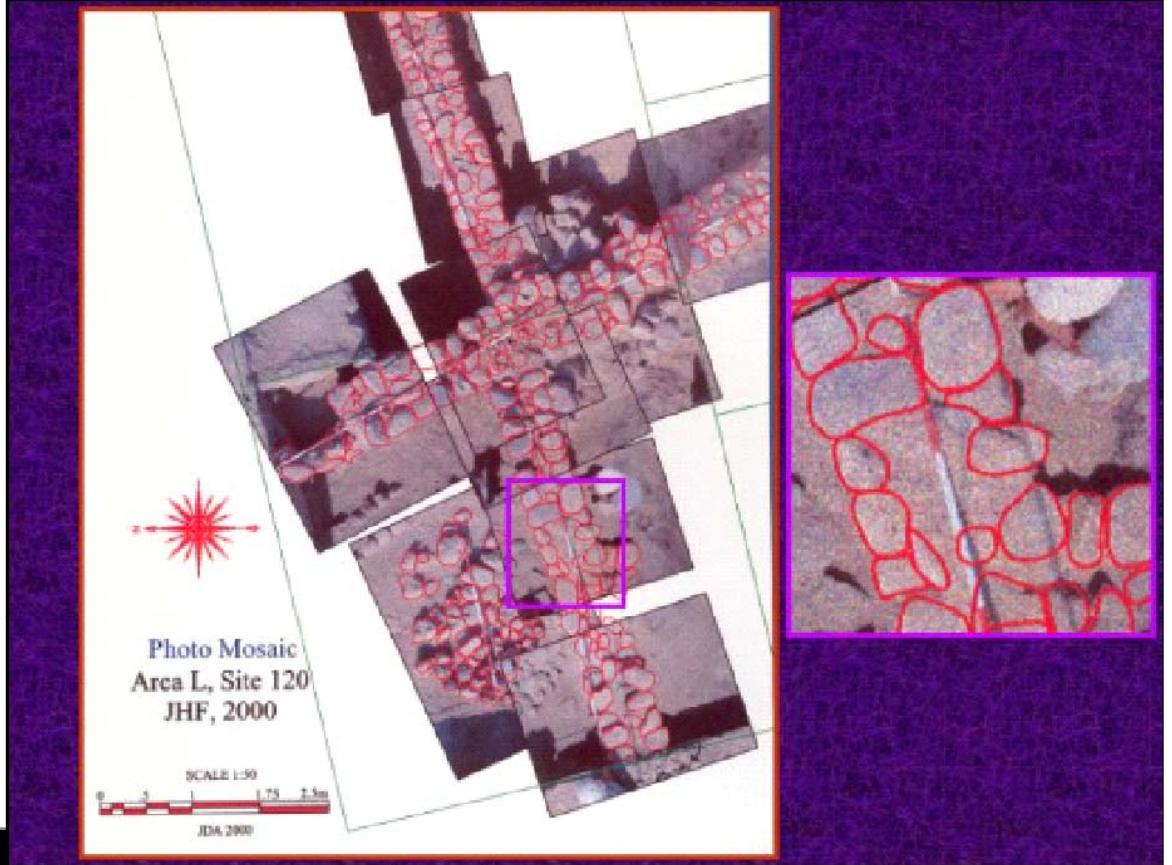
Scale: 1:15



Photography



Photography



The Harris Matrix

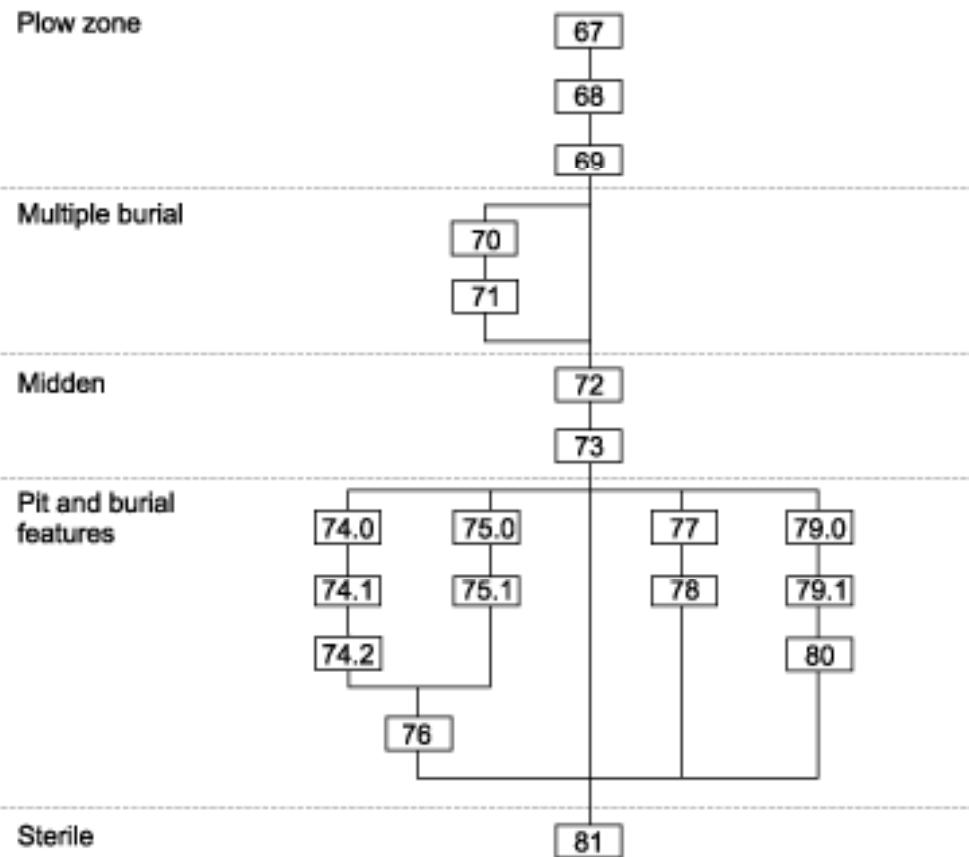


Figure 3. Harris Matrix of Analytical Units in Excavation Unit 204

Example:

Burial Excavations in Plaza 1 of Los Pilarillos,
Zacatecas, México

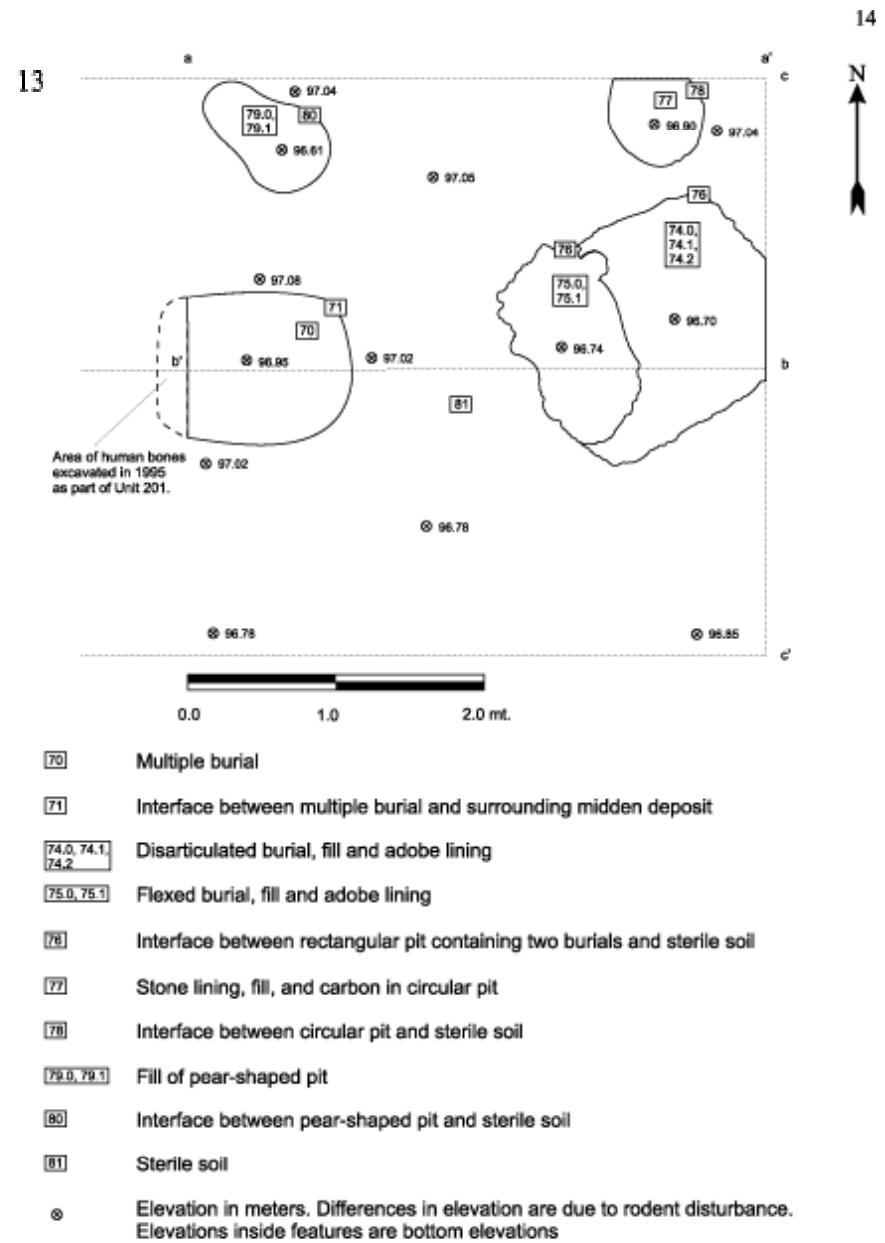
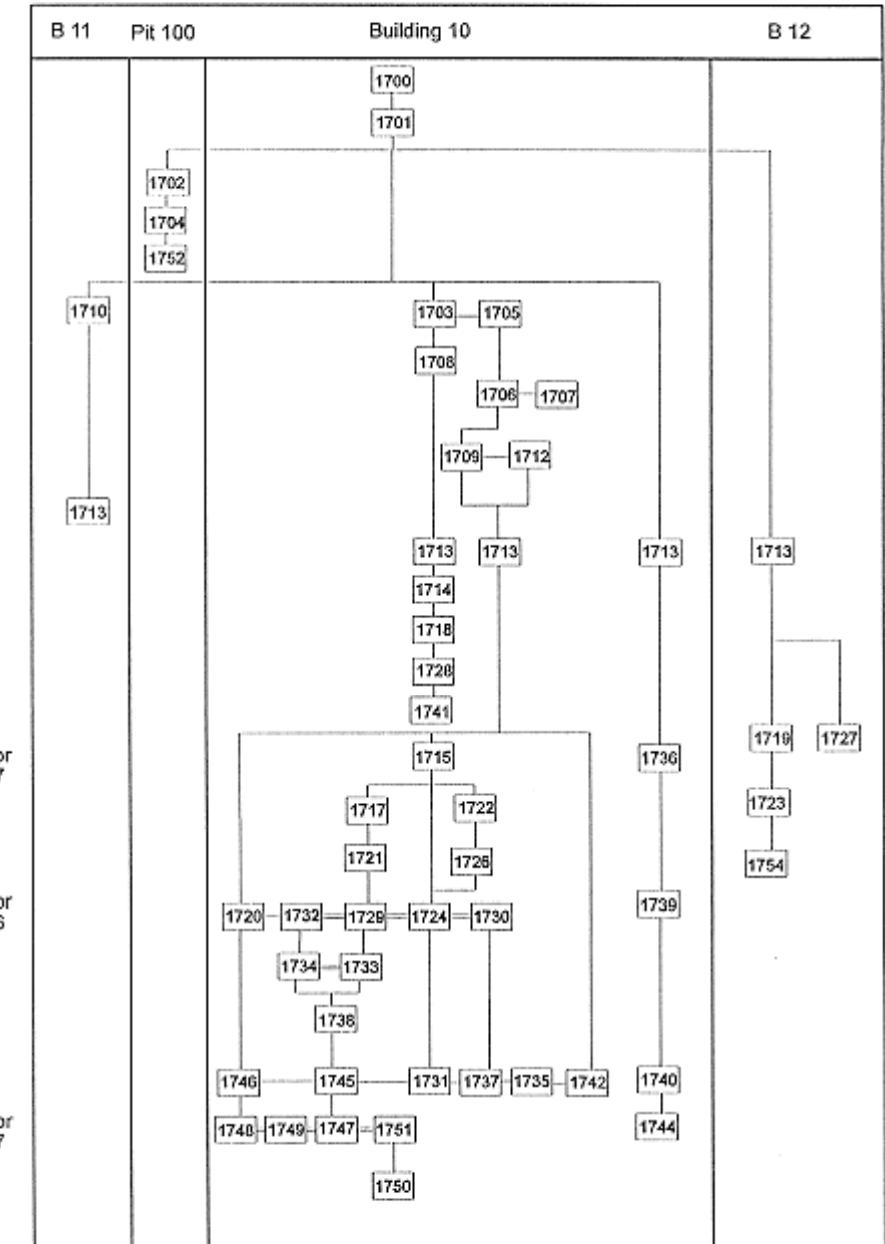


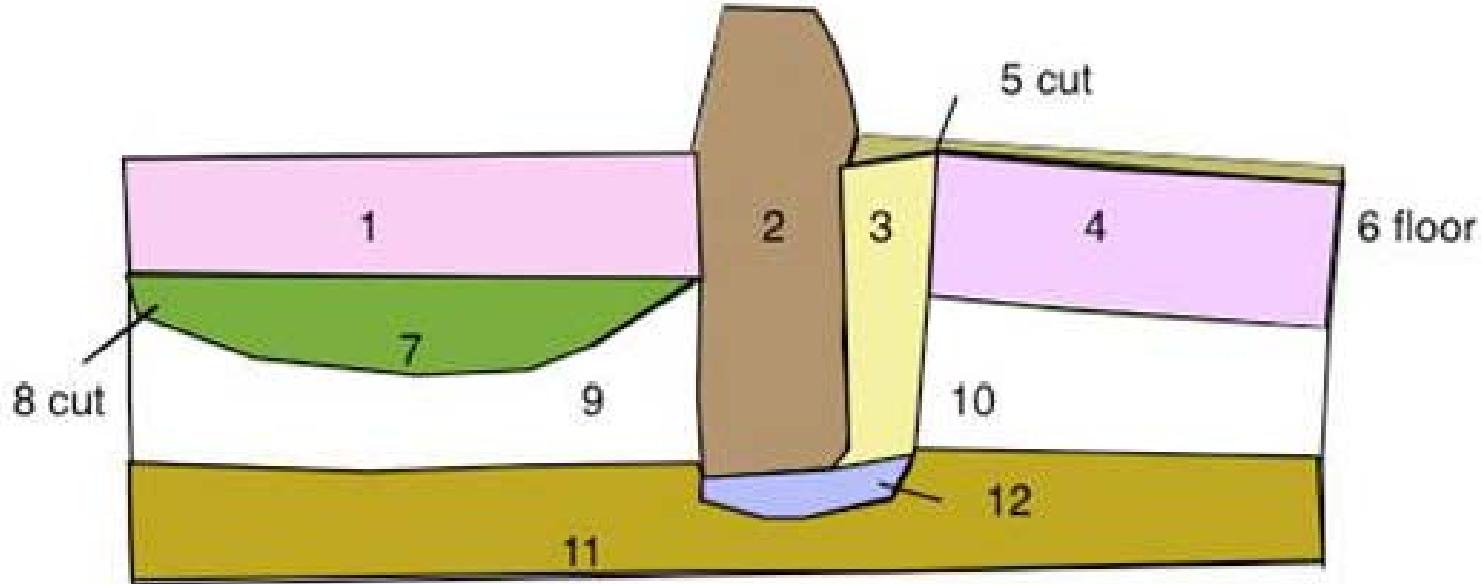
Figure 4. Unit 204, Plaza 1, major features

Harris Matrix (Matrices)

- Created by The Matrix was developed in 1974 in Winchester, England, by Dr. Edward Cecil Harris
- A Harris Matrix provides a way to document and visually show relationships between archaeological contexts and features
- These are drawn as an ongoing record of how the archaeologist understands the relationships between contexts and features
- Helps to reconstruct the relationships within an excavation, and can be a very useful tool in the analysis and publication of the site data

Summit Area
Matrix of Units

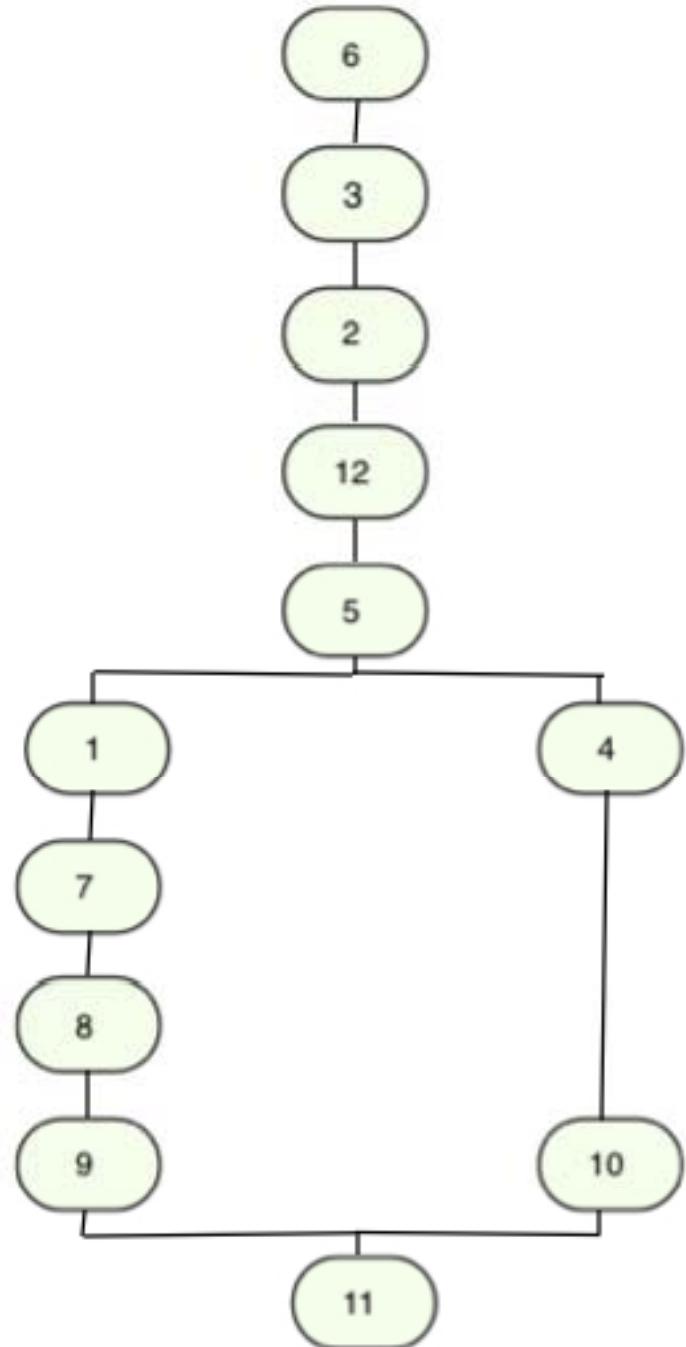




1. A horizontal layer
2. Masonry wall remnant
3. Backfill of the wall construction cut (sometimes called construction trench)
4. A horizontal layer, probably the same as 1
5. Construction cut for wall 2
6. A clay floor *abutting* wall 2
7. Fill of shallow cut 8
8. Shallow pit cut
9. A horizontal layer
10. A horizontal layer, probably the same as 9
11. Natural sterile ground formed before human occupation of the site
12. Trample in the base of cut 5 formed by workmen's boots constructing the structure
wall 2 and floor 6 is *associated* with.

Harris matrix showing order of events:

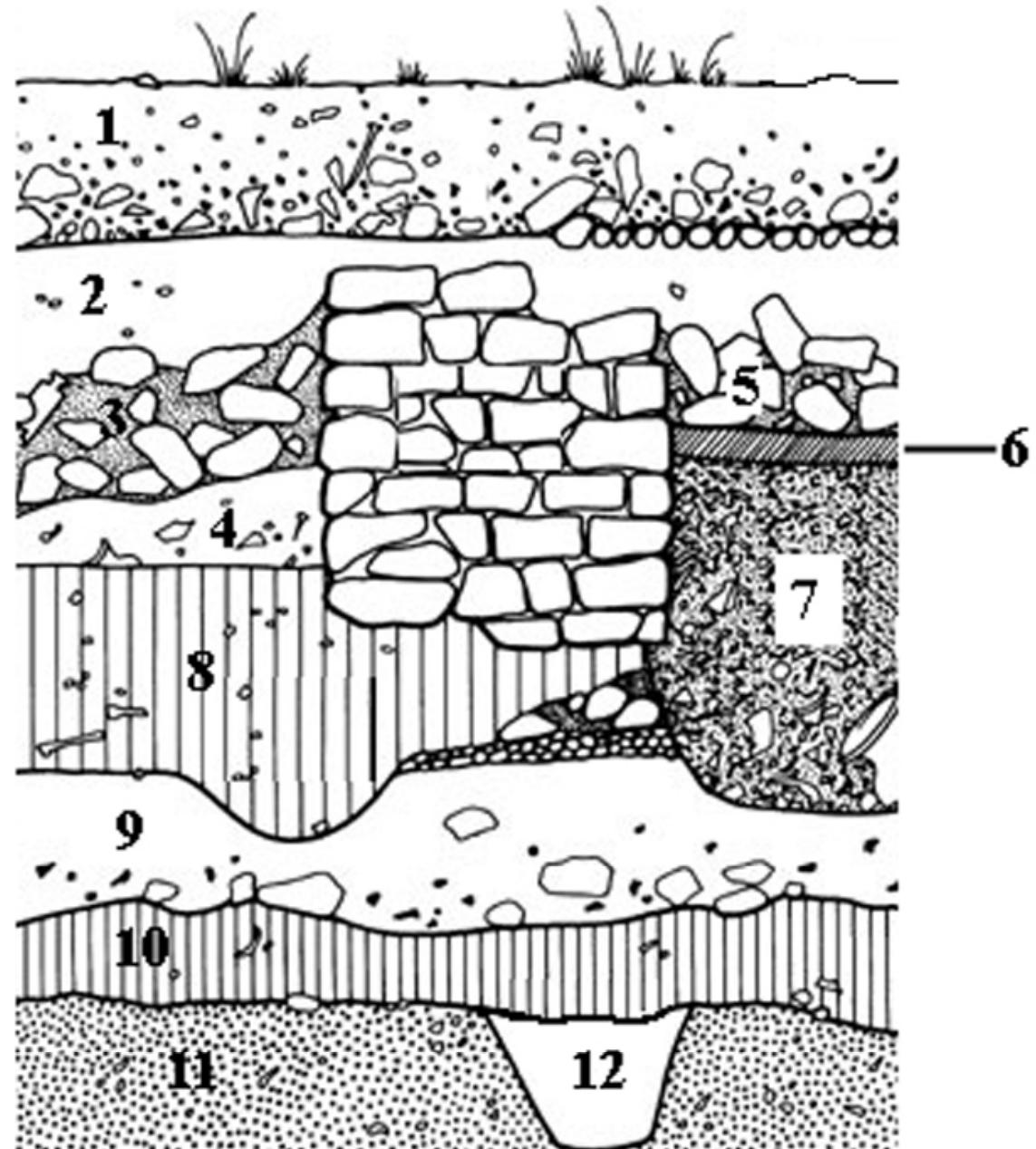
1. Natural ground formation 11 was followed by the laying down of layers 9 and 10 which "probably" occurred as the same event.
2. Then a shallow pit 8 was cut and then back filled with 7.
3. This pit *feature* in turn was "sealed" by the laying down of layer 1 which is probably the same event as layer 4.
4. Following this a major change in land use occurs as construction cut 5 is dug and immediately followed by trample of the feet of people 12 working in the construction cut 5;
5. who then build wall 2 after which they backfill excess space between the wall 2 and cut 5 with backfill 3.
6. Finally clay floor 6 is laid down to the right of wall 2 over backfill 3 indicating a probable interior surface.



Assessing stratigraphic relationships and creating a Harris Matrix

Create your own Harris Matrix of the stratigraphic relationships in this section

Law of Superposition:
Sequences of layers
bottom to top = earlier to later



Harris Matrix

