# EXCAVATION MANUAL
# MADABA PLAINS PROJECT

(2011 Revised Edition)

# I. PROCEDURES OF EXCAVATION

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## INTRODUCTION

Archaeology is a violent sport. Although we don't wear shoulder pads and helmets, we *are* destructive. Like most sports, archaeology can be entertaining and painful at times, but, instead of destroying opposing teams, we destroy what we most treasure, our finds, as we excavate gaping pits through ancient walls and floors. Yet if we record our finds in such a way that we preserve the maximum amount of information, we can at least reduce the theoretical violence of our activity. We must observe precisely and interpret accurately, so that others can work with our data. This manual helps us learn how to do that.

The first part of this manual, *Procedures of Excavation*, deals with basic day-to-day excavation activities and procedures for accurate observation. The second part, *Handbook of Recording Procedures*, describes the recording system.

### How to Read the Manual

To some, reading a manual like this one can be as dry as the hills of Gilboa (which receive neither "dew nor rain" . . . with apologies to 2 Sam 1:21). You will wade through very technical instructions and, if you have never dug before, you may find your hair standing on end "like the knotted and combined locks of the fretful porpentine," (with apologies to Shakespeare, *Hamlet*). But if you pursue with a "stiff upper lip" and gamely struggle with the manual before arriving in camp, then digging and recording will be much easier when you actually do it. Later, after the first week or two of excavation, if you reread the manual, you will find it much easier to understand as you combine the theory of the manual with the practical experience of digging.

### Basic Terms

As with any specialized discipline, archaeology has its own terminology. A glossary is provided at the back of this manual. Words and phrases that are underlined in the text, will be found in the glossary. Certain terms are so basic to any archaeological discussion that they must be understood at the outset. These terms include: artifact, balk, contamination, elevation, field, field notebook, grid, level, locus, object, plan, section (drawing), square, and sub-sidiary balk. Other terms may be looked up as necessary.

## MADABA PLAINS PROJECT

### Methodology

The method of excavation used by the Madaba Plains Project owes much to Dame Kathleen Kenyon's strict attention to the stratigraphy of earth layers (the relationship of earth layers to other features, like walls), which she imported to the Near East from England where Sir Mortimer Wheeler had developed it (it is sometimes called the "Wheeler- Kenyon Method"). At Jericho, Lawrence Toombs and Joseph Callaway learned the method and brought it to G. E. Wright'sexcavation at Balata (Shechem) (see L. Toombs' appendix in G. E. Wright, *Shechem* [NY: McGraw-Hill, 1964]). Wright combined Kenyon's stratigraphic method with W. F. Albright's emphasis on pottery typology as a guide to stratigraphic inter-pretation and began to use specialists as an integral part of the excavation and interpretive process. Our own innovations are merely amplifications of those roots. We have also been affected by interpretive approaches and research design methods from new world archaeology.

This manual provides adequate reading if you have never excavated, and provides a complete introduction to field archaeology as done within the Madaba Plains Project. Other projects, while gather-ing much the same data, use different procedures, forms, and somewhat different terminology. In fact, reading other excavation manuals can be confusing for the beginner. But sometimes, they can provide helpful supplementary material on difficult excavation concepts. The following describe digging procedures on other projects:

Blakely, J. A., and Toombs, L. E.
1980 *The Tell el-Hesi Field Manual*. Cambridge, MA: ASOR.

Dever, W. G., and Lance, H. D., eds.
1978 *A Manual of Field Excavation*. New York: KTAV.

Joukowsky, M.

1980 *A Complete Manual of Field Archaeology: Tools and Techniques of Field Work for Archaeologists*. Englewood Cliffs, NJ: Prentice Hall.

Kenyon, K.
1966 *Beginning in Archaeology*. New York: Praeger.

**Field Staff**

*Senior project director*. The senior project director is responsible for the overall direction and success of the Madaba Plains Project, including pro-fessional relations with the scholarly community (*e.g.* American Schools of Oriental Research [Stateside] and the American Center of Oriental Research [Am-man]), relations with the local government of the Hashemite Kingdom of Jordan, and matters of dig policy and general strategy. He chairs the meetings of the project directors.

*Project directors*. The Madaba Plains Project is currently divided into three major research projects, each directed by a project director. The current projects include the Tall al-'Umayri excavation, the Tall Jalul excavation, and the Hisban Restoration Project and Survey. The project directors, along with the senior project director, develop the MPP's research goals and objectives, supervise the budget, and oversee the publications of the project's results.

*Consortium director*. The Madaba Plains Project is composed of a consortium of several colleges and universities. The consortium director coordinates the activities of the consortium, chairs consortium meetings, directs excavation tours, and coordinates the projects' educational program, as well as taking part in all directors' meetings.

*Field directors*. Field directors are senior staff archaeogists who direct individual research projects under the sponsorship of the Madaba Plains Project. They are supervised by the project directors. *Field supervisors*. Field supervisors are trained archaeologists in charge of a single field of excavation. Their responsibilities include assisting their square supervisors in outlining excavation strategies for their squares; remaining alert for locusconnections between squares (and thereby, establishing a coherent stratigraphic picture for the finds in their field); organizing the work and workers in the field in an efficient manner; enforcing maintenance of neatly trimmed balks; orchestrating balk drawing; taking photographs; scheduling architects and other specialists for work in the field; ensuring that square supervisors are completing their locus sheets properly; critiquing the weekly summaries of the square supervisors; submitting a weekly interpretive summary of finds to the field director; keeping the Field director informed regarding excavation strategy and new developments; taking care of field tools and other items shared by the square supervisors (such as the Munsell Soil Color Chart and balk drawings); assisting the field director in opening and closing the field.

*Square supervisor*. Square supervisors may or may not have archaeological experience. They are charged with operating and recording a single square under the supervision of a field supervisor. They must be acquainted with this manual before going into the field. Their activities are many, including organizing the work of one or two volunteers and a local workman; excavating and recording properly; contributing to the strategy planning of the square; and being present for pottery readings each after-noon. The square supervisor's work, which oversees the initial extracting and recording of raw data, is obviously fundamental to the success of the dig.

In the evening, square supervisors check their notebooks; trace top plans; and prepare for the next day's work by making sure supplies are restocked. They may also review strategy for the next day's work.

At the end of each week, square supervisors write a descriptive and interpretive weekly summary for their field supervisor. The following are instructions for using the Weekly Summary Form (see the sample forms at the end of this manual). After completing the identification entries, list all loci which were worked during the week in the column labeled "Locus #." Describe them in general terms in the spaces to the right (for example, "monumental stone wall," "hard plaster surface," etc). In the "Interpretation" section, relate all these loci together in terms of function and stratigraphy. Do not simply copy the information from the locus sheets; try to see all the loci from a larger, more general point of view. This is the time to speculate on any pet idea you may have. Of course, always be sure to defend these speculations! Give the weekly summaries to the field supervisor no later than noon on Sunday.

*Volunteers*. Volunteers are assigned to specific squares. Their tasks include excavation, sifting, balk trimming, recording, and assistance in afternoon activities such as pottery washing, etc.

*Support personnel/specialists*. Support personnel represent the depth and variety of our excavation and turn it into a mini-university. Their job (in relation to their field work) is to process and analyze the finds according to their specialties, and to add data to the field records so a wholistic interpre-tive picture may be formed. They do much of their work in camp, though some may spend part or most of the day in the field.

**Sites of Excavation**

*Talls*. Between 1984 and 1989 the principle site of excavation for the Madaba Plains Project has been Tall al-'Umayri, a multi-period site dating from about 2500 B.C. to 500 B.C. The Arabic term tall, formerly spelled tell, means a mound of ruined cities, and is made of strata, stacked one on top of the other, like a layered cake. In 1992 digging began at a second site, Tall Jalul, a large multi-period site east of the modern town of Madaba. Both the 'Umayri and Jalul excava-tions continue side by side. During the summer of 1997, an off-season, excavations were resumed at Tall Hisban (Hesban, Heshbon) to solve certain problems that the publication of the earlier excava-tions has inspired and to understand the society and lifestyles of recent cave occupation at the site.

*Hinterland sites*. We also excavate smaller sites within a five-kilometer radius of the talls (*e.g.* Rujam Salim in 1987 and al-Drayjat in 1989, etc.). All MPP excavations use the same digging and recording pro-cedures. Each site receives the common name most frequently used by the local inhabitants, if known. Hinterland sites may or may not be divided into fields, and are generally excavated only one season. *Cemeteries*. Because cemeteries (aka: "necropoli," which is the plural of "necropolis") are usually associated with settlement sites and may be located near other cemetaries, we name the cemetery/cemeteries after the nearest site, then assign a site field letter to each cemetery and a sequential number for each tomb within that cemetery. Thus "Rujam Ahmad Tomb G2" would be the second tomb in Cemetery G near Rujam Ahmad. We excavate tombs like normal hinterland sites with special adaptations.

## SITE PREPARATION

**Limits of the Square**

The surveyors stake out each square following the overall grid pattern of the site before digging begins. We excavate only a $5.0 \times 5.0$ m area, leaving 1.0 m strips (standing balks) along the north and east sides between squares. These balks provide a vertical section in which the stratigraphy of the square remains, and can be "read." We remove the standing balks periodically as integral parts of the square, assigning the same locus numbers to features that appear in the square.

The grid at Tall al-'Umayri is based upon a regional grid that can be applied to survey sites, as well. The squares within the grid are identified by the numbers and letters of that grid which, in order to localize the squares on the site, must contain four alpha-numeric elements. For example, 8K76 refers to Square 76 within a grid of 100 squares (the number in the ten position is the N-S axis while that in the one position is the E-W axis); this grid is identified as 8K within yet a larger grid of 100 squares (the number is the N-S axis and the letter is the E-W axis). Other sites within the Madaba Plains Project simply number the squares within a field. For instance, Square B3 refers to Square 3 in Field B.

**Square Preparation**

The surveyors stake-out the square as illustrated and turn it over to the excavators. The supervisor and volunteers assigned to that square tie strings carefully between the stakes and make them taut and straight to define the limits of excavation. They then remove debris such as weeds up to a meter beyond or outside the square, and establish a bench mark for taking levels with the transit or theodolite. They enter the location and exact level of each bench mark onto the introduction page of the *Field Notebook*.

**Reopening Excavated Squares**

If you reopen a previously excavated square, erosion may have altered the original balk lines, making their reestablishment by the surveyors manditory. Clean the tops of the standing balks and the balk sections. Study the final top plan, section (or balk) drawings, locus sheets, and photographs of the previous season, making a special attempt to relocate recognizable features.

Redraw the plan of the square's features and take a new photograph prior to removing the inter-seasonal debris accummulation (cleanup). Relocate, check, and verify the previous bench mark for levels, and enter it on your new introduction pate of the *Field Notebook*. Then, carefully remove the inter-season debris accummulation. Although the previous excavators should have left plastic bags or some other indicator to mark the end of previous excavation, these may have disappeared. Keep looking for the emergence of *in situ* remains and their relation to the final top plan and photographs of the previous season. Normally, original material is slightly more compact than inter-seasonal debris. Record debris removed in this cleanup process on locus sheets, but identify it as "Cleanup A" or "Cleanup B" etc., instead of giving it a locus number. Overclean a bit to be absolutely sure

that no debris remains to contaminate the new excavation. Because some of the cleanup debris undoubtedly dates to a different occupational period than the unexcavated remains immediately below it, removing a small amount of original ancient deposit is better than excavating cleanup debris as *in situ* deposits (and thus confusing the data).

**Square Supervisor Preparation**

Before beginning, make sure you are fully aquainted with the recording procedures in this

*Manual*. Be sure your notebook contains the *Handbook*, an introduction page, several copies of each type of locus and supplementary sheets, and an ample supply of metric graph paper for top plans. We recommended that you begin each day with the following items in your work bag:

2 ball-point pens (no fine points, please—hard to read!)
1 indelible felt pen (fine point)
2 Marshalltown trowels
10 balk tags
20 nails for balk tags
25 identification tags
10 identification tags pre-numbered for pottery pails and packaged with a rubber band
20 plastic bags (for objects, etc.)
30 m of strong, slightly-stretchable nylon string
1 line level
1 3-m metal measuring tape (metal is more accurate than clothor vinyl—it doesn't stretch)
1 plum bob
1 clipboard
4 clothes pins (to keep papers on clipboard during windy days)
2 hard-lead pencils (2H is best)
3 small cardboard boxes for metal artifacts
1 ruler or scale ruler. Whenever you enter the square it is mandatory to wear shoes with flat soles so as not to deface or destroy delicate earth surfaces. Earth surfaces are the lifeline of excavation and they must be handled with delicacy.

## THE EXCAVATION PROCESS

**The Locus**

When all is ready and your field supervisor gives the green light, you may begin digging. Many dif-ferent things, each called a locus, will be found in every square. A locus is any feature, such as a wall, a surface, an oven, an earth layer, etc. Everything you dig belongs in some fashion to a locus. Think of a locus as a three-dimensional feature. There is always length, width, and height. Every locus receives a locus number, and is described on a locus sheet (see the Handbook for details). Assign locus numbers sequen-tially in the order of their discovery in the square. Continue this sequence from season to season so that locus numbers will not be duplicated.

**Earth Locus**

The most common loci are earth layers. They are the most important units in our method of excavation because they contain datable artifacts such as pot-sherds, coins, inscriptions, etc., that can help date other associated artifacts and features. Earth loci also provide a stratigraphic context for features such as walls, etc., by connecting walls in a single stratum or phase. An earth layer is made up of a homogenous mixture of dirt and inclusions and can be separated from other layers above and below. Ideally, a single earth layer stretches at an even depth across the square with no observable irregularities or inter-ruptions. Unfortunately, this is seldom the case! Earth layers may be thin in one place and thick in another; they may dip or slope; they may be easily defined in one place but difficult to define in another; they may be stoney in one place and less stoney in another;

and they may be interrupted by other features (pits, trenches, etc.). Defining a single continuous earth locus will be one of the most common and yet most challenging and important tasks of a square supervisor.

*Probing*. To help us understand earth layers correctly, the "probe and peel" allows us accurate controls. In a corner of the square (often the highest), string off a 1.0 m × 1.0 m area and arbitrarily excavate it to test the homogeneity of the earth layer, being careful to note when the next layer is encoun-tered. Keep both the main balks and the subsidiary balks of the probe straight and clean as you dig to check for the appearance of new earth layers more easily; that way you get the vertical as well as the horizontal information. Pay attention also to the dirt as you scrape it with your trowel for indications of the appearance of a new type of earth layer. Indicators will include a different color, consistence, texture, hardness, etc.

*Depth of the probe*. Never probe deeper than about 50 cm. Earth layers can be deeper than that, but it is best to assign a new locus number to the deeper debris, arbitrary as it may be, because earth loci can always be combined, but can never be separated into smaller units once they are excavated. **If you are unsure if you should assign a new earth locus, go ahead and do so**. At the least, assign a new pottery pail.

*Expanding the probe—peeling*. When you encounter a new earth layer in the probe, stop digging and peel (excavate) the upper layer throughout the rest of the square (this helps reduce the risk of contamination of the newly exposed earth layer by the one you are still digging). First, excavate a 1.0 m strip, then do the next 1.0 m strip, and so on until the upper layer is completely removed. Consult your field supervisor as you do this, and constantly clean and check your balks to make sure you are correctly tracing and removing the layer.

*Tracing earth layers*. Even the best archae-ologists may lose an emerging earth layer as they merrily trace it across (or around) the square. If you do, you will be in good company! Back up and begin again, going from the known to the unknown. The earth layer may have changed slightly, or dipped, or a pit may have cut through the layer. Scrape transitional "border zones" between the two earth layers carefully with a trowel to help bring out subtle color or texture changes.

*Cleanliness in tracing earth layers*. As you trace earth layers, make sure you **keep the area clean**. This cannot be overemphasized. Do not allow large mounds of debris to build up while you dig; carefully trowel the surface of the new layer to make sure all debris is removed. If you sweep or brush the newly exposed layer, you will not only make tracing easier, but you may also see interesting new features, such as color or texture changes. These could signal the appearance of new features such as the tops of mudbrick walls. (Mudbrick is particularly difficult since "mud" reverts back to regular "dirt" through time.)

*Controlled excavation*. Excavate no deeper than 10 cm in a single peel, even if the layer is deeper. Always excavate in an orderly and uniform manner by setting up string guides.

*Complete excavation of an earth layer*. There is no crime in excavating a small part of the newly exposed lower layer along with the upper. **It is, however, an archaeological sin of the most sinister order to leave some of the upper layer to be excavated and recorded as if it were part of the lower!** Intrusive, later, material from an upper, incompletely-removed earth layer may cause a wrong date to be assigned to the lower!

*Emerging architecture and earth layers*. Leave stones, bricks, or other such items in situ until you can establish their relationship to the earth layers around them. When earth layers approach a wall or installation, determine if the layers seal against (that is, "abut" or actually touch) the wall or whether they have been cut out before sealing against it. If they seal against the wall, the are later chronologically, but if the are cut before reaching the wall or installation, chances are that the cut was made by a foundation trench, and the earth layer is thus earlier than the wall.

**Surfaces**

*Introduction*. Surfaces are a special subgroup of earth loci. They were originally floors, streets, or courtyards, and were usually made of beaten earth. You can tell them apart from ordinary earth layers by their compactness, the presence of small bits of charcoal (and possibly seeds or manure, as well), flat-lying potsherds (from being walked on), stones that rest on it, and occasionally a very thin layer of sand on the top. The sand often causes the earth above the surface to "flake off" in chunks.

Surfaces were also the resting place of many items which have since decomposed: wood, grains, textiles, etc. If the roof or walls of a structure fell onto the floor, these organic items may be preserved as a light-colored stain or pattern in the dirt. The actual object disappeared long ago, but its outlines, and rarely, a three-dimensional "ghost," are sometimes preserved. (In fact, wooden furniture and musical instruments have been reconstructed by carefully filling this "ghost" shape or design left after the object itself had long since decayed!) If you suspect such items may have been trapped under a fallen wall (it probably is not grand furniture or musical instruments), so go ahead flake off the debris above the surface with a knife and blow the dust with a handblower.

A surface is also the place to look for charred roof beams. Carbonized wood can be used for den-drochronological analysis (tree-ring dating). Place wood samples in a plastic box (not cardboard, as the moisture in the cardboard will damage the specimen).

*Thin surfaces*. If a surface was used for only a short period of time, it may be so thin that it is difficult to

excavate. If so, dig an arbitrary 5-10 cm from the top as the “surface” and switch to a new locus for the remainder of the debris below.

*Removing surfaces*. Excavating a surface is fraught with difficulties because the earth beneath is usually much softer than the surface itself. Remem-ber, it is not a crime to take up some of the lower debris layer with the surface, but try to minimize it, if possible.

**Architectural and Wall-like Installation Loci**

*Introduction*. Walls and wall-like installations are easy to define and excavate if they are made of stone or well baked mudbricks. If three or more stones (or bricks) are found in a line, leave them standing until their relationship to other architectural features, surfaces, and earth layers can be established and recorded properly (described, drawn, and photographed).

*Mudbrick.* Poorly-baked mudbrick presents a serious excavation challenge because it is often dif-ficult to observe a clear difference between the bricks of the wall and those of the outfall, which builds up around the wall when its upper parts collapse and erode. Even with the most careful excavation you may discover too late that you have inadvertently exca-vated part of a mudbrick wall. Examine the mud-bricks carefully each morning for faint traces of mortar lines etched by the previous day’s wind. If you gently sprinkle water on the bricks, they may crack along mortar lines or along the face of the wall as they dry. Remember, regular patterns are seldom found in nature—rectangles and straight lines are often the results of human activity.

Very slight differences in color may also be apparent between the original brick and the outfall. The bricks should be slightly harder and the outfall tends to flake off from the wall if you strike it horizontally with your pick or trowel. Outfall may also contain some occupational material, such as charcoal and plaster bits, while bricks contain clear traces of straw or similar binding materials. (Some well-preserved outfall may also contain straw traces, however.) The best advice on how to work with mudbrick is to keep your balks straight and clean and analyze them often.

**Installation Loci**

Loci in this category come in many types: ovens, drains, bins, silos, pits, etc. Treat above-ground installations like architectural loci, but handle below- ground installations like pits.

**Pits**

**The pit locus is the actual line of the pit, not the debris in its <u>fill</u>**. Treat the fill as a separate earth locus. This is because the original digging and use of the pit may have been completely unrelated to its fill, functionally and strati-graphically. Make sure you leave a subsidiary balk as you excavate all pits, if possible. Try to determine the earth layer from which the pit was dug, because it helps to date the pit. The fill, of course, represents the end date of the pit’s use.

*Identifying pits*. Pits lined with stones are easy to identify, but unlined pits present a special challenge. Pit debris is usually softer, more rubbly, and often darker (because of organic matter) in color than the dirt into which it was dug. It can contain ashy debris because of burned refuse. Potsherds and stones often “float” amorphously in the fill.

*Avoiding pit contamination*. Because pits originally cut down into subsurface materials, they disrupt earlier loci and are later chronologically than the material into which they cut. If you do not recognize a pit, you could misdate a complete stratum. It is thus extremely important to identify pits. Always excavate them *before* the surrounding material. Indeed, with dirt-lined pits it is often proper to excavate an arbitrary 10 cm of surrounding earth to make sure that absolutely all pit debris has been removed.

*Foundation Trenches*. These are special kinds of pits that were dug to provide foundations for walls. Because the top earth layer cut by the foundation trench should be the latest material before the construction of the wall, and because foundation trenches may contain potsherds from the period of the construction of the wall, they are very important stratigraphic indicators. A balk, or subsidiary balk, running up to the wall is the best way to examine a foundation trench. When you find one, excavate it like a pit.

*Burials*. Burials are a variety of pit and should be so excavated. When, however, you expose the skele-ton (part of the pit fill, strictly speaking), use dental picks, fine brushes, and hand blowers. If the bones are fragile, paint on a silicon-based conservation fluid called PVA (*polyvinylacetate*). As the bones dry, the PVA will help hold them together.

# DATA COLLECTION

## Daily Excavation Habits

*Beginning daily excavation*. When you arrive at the site each morning, check the cleanliness of all balks; make sure no foreign debris has entered the square overnight; check if the dampness of the night has revealed new colors or textures in the dirt. Begin the first pottery pail.

## Method of Digging

We dig with a handpick and pointed mason's trowel (*Marshalltown* is the trowel-brand of choice). Used correctly, a good trowel can be a sensitive in-strument in your hands. Wield the handpick in your strong hand, striking the dirt with light strokes to loosen it. With your weak hand use the trowel to scrape the loosened dirt away from the emerging earth layer. Use the "feel" of the trowel as it scrapes, and the "touch" of the handpick as it breaks the dirt to help trace the earth layers. Observe the pick marks to make sure you are still tracing your earth layer ac-curately. In very loose dirt or in semi-delicate situ-ations, use the trowel alone.

Scrape the dirt underneath and behind you as you move across the square. Then carefully remove the buildup with a dustpan so the emerging layer is not disturbed. If you establish that the layer you are removing is consistently very thick, use a large pick and/or hoe. With extremely delicate work, such as articulated skeletons and complete pottery vessels, use fine tools. Brushing or sweeping each new layer helps bring out underlying earth features and eli-minates possible sources of contamination.

## Pottery

*Pottery Pails*. Broken pieces of pottery (sherds or potsherds) are found daily by the thousands. Each locus receives its own pottery pail for each day it is worked. If one pail becomes full, assign a second one with a new pail number. Using an **indelible pen**, fill out an identification tag for every pail **immediately** when you begin a new one. **It is absolutely manda-tory** that the pail numbers are not accidentally du-plicated, because both duplicated pails are useless due to confusion on their point of origin. For this reason, square supervisors must number identification tags for pottery pails **before** using them in the field. Keep them together with a rubber band to avoid losing a tag. Omitting a pail number can also cause confusion. Except for reasonably whole pieces, remove all pottery at the sieve.

*Pottery contamination*. A contaminated pottery pail is a disaster that much of our excavation tech-nique works to prevent. Imagine pulling a Roman potsherd from a well-sealed Iron Age locus! Careful, clean excavation and handling throughout is the best way to ensure against contamination. The following seven command-ments should never be forgotten:

1) **Never** lean against or sit on balks.
2) **Always** throw away sherds if you don't know where they came from.
3) **Always** keep balks clean.
4) **Never** use more than one pottery pail at a time.
5) **Always** store pails you are not using outside the square.
6) **Never** fill a pail more than 3/4 full.
7) **Always** mark the identification tag "Poss[ible] Contam[ination]" and immediately start a new pail if you suspect contamination.

*Mendable and complete pottery*. If you find a group of sherds that may be reconstructed, place them in a separate pottery pail and mark them "Mendable." Along with other sherds from the same locus, they will go to the Formator for mending. Place complete pots in separate pottery pails and enter them as objects on the locus sheets, as well. Put especially delicate sherds in a separate pail marked "Fragile."

*Pottery processing*. At the end of the day, the pottery registrar soaks the pails in water, organizes their washing (Iron Age sherds may contain writing, so examine them for writing before brushing), places them in porous plastic baskets or trays for drying, and orchestrates the "reading" sessions with the field and square

supervisors. The square supervisor enters the readings on the Pottery/Bone Readings sheets. The pottery registrar completes a pottery routing tag that accompanies the pottery in all its subsequent processing, analysis, and storage.

**Balks**

*Straight balks*. A square's main balks preserve the story of its finds in section and are referred to constantly. Keep balks clean and straight. Never undercut a balk or attempt to straighten it relying on eye alone. Periodically trim them so they are straight and plumb to the balk line. Do not leave a few centi-meters of debris, but carefully excavate right up to the balk line. (Balk trimming will be illustrated in the field.)

Do not assign a locus number to the debris from balk trimming. It is arbitrarily discarded. Pottery and other finds may, however, be saved and labeled "balk trim" on their identification tags and on earth locus sheets. If an exceptional find is made, designate the locus of origin (if you know for certain), if not, designate the several loci from which it could have come with appropriate qualifying remarks.

Leave sherds, stones, and bones protruding from the balks if they are secure, since removing them could undercut the balk. Remember that balks dry out and stones fall from dry balks more easily than they do from those freshly trimmed. Therefore, if a stone is of questionable stability, remove it before it falls out on its own. An undercut balk is preferable to a cracked head!

*Balk tags*. To remember which earth layers in the balk section correspond to your locus sheets in the notebook, place rectangular balk tags labeled with the locus number, into the balk with nails. Write locus numbers with a black indelible felt pen, boldly enough to be visible in most photos (usually 5 cm, about 2 in, high). Insert the nails at the locus bound-ary and arrange them, one above the other, in as aesthetic an arrangement as possible. **Tag your balks as early as you can**, because locus boundaries are always more easily discerned in fresh, moist dirt, than in old, dry soil. Later, when trimming the balk, it is easy to scrape around the tag. Never remove them, because you may put them back in the wrong place!

*Balk drawing*. Because the balks preserve the stratigraphy of the square, each one is carefully drawn. First, trim the balks and interpret them with the help of your field supervisor. Do not outline the locus boundaries with a trowel; it may bias fresh interpretations. Next to the plans and elevations made by the architects, balk drawings (sections) are the most precise drawings made in the field.

Have on hand a hard-lead pencil, an eraser, a sharpener (if necessary), and a large piece of graph paper attached to a clipboard. Some may desire a scale rule for measuring on the graph paper. Make sure the drawing reflects the stones and the tip lines of the earth layers as they appear in the balk. When completed, always check the drawings with those from neighboring squares to confirm stratigraphic connections. As you remove balks, add the north and east stubs to the drawing.

The process will be demonstrated in the field, but here is a short description:

1) Using a transit, place an 18 inch spike horizontally into the balk corner at any quarter-meter level (*i.e.* 1.00, 1.25, 1.50, 1.75 m, etc).
2) Tie one end of a firm, slightly stretchable string onto the spike, pull the string tight, and, using a line level, make sure the string is level. Place a second spike at the other end of the balk and tie the string to it so the string is level. This string becomes the <u>datum line</u> from which all measurements are taken. Remove the line level so the string does not sag.
3) Attach a cloth meter tape to the two spikes with clothespins so that zero begins where the true balk line is located, regardless of where the actual line is. (This will be obvious when the process is explained in the field.) Do **not** let the tape touch the datum line at any point. Although it does not need to be as tight as the datum line, stretch the measuring tape tightly enough to ensure accurate measurements.
4) Make sure the <u>balk stamp</u> is on a large piece of graph paper, and, using a scaleof 1:25, draw heavy vertical lines for the balk edges and a light horizonatal line for the datum line. Label the <u>datum</u> with its level at the side. Leave space in the side margins, for <u>balk stubs</u> which will need to be added to the drawing when balks are removed, and at the bottom for lower portions of the balk.
5) Most drawings include stones and the tip lines of earth layers. Take measurements of all features vertically, up or down, from the datum line every 25 cm. Place light dots on the graph paper for each measure-ment and connect them with a lightly drawn line.
6) Your field supervisor will check the drawing.

*Balk removal*. We remove balks in order to expose horizontal features which are more extensive than a single square, and to check stratigraphic connections between adjoining squares. Remove them **only** after they have been drawn and photographed! Excavate the north and east balks as an integral part of your square.

Remove all balks locus by locus, using the same locus numbers as in the main part of the square. Add the

new data to the old locus sheets. If new loci are encountered, assign new locus numbers. If balks are removed in a season subsequent to the primary excavation of the locus, fill out new locus sheets, but assign the old locus numbers.

When the balks are gone, draw the stubs onto the appropriate balk drawings, photo-graph them and, if free-standing, remove them layer by layer. After the newly exposed architecture has been fully studied, restring the balk boundaries and begin excavating again.

*Subsidiary balks*. Subsidiary balks are used to document the relationship of a feature to others when the main balks cannot be used. When excavating walls, cut a subsidiary balk from the wall to one of the four main balks in order to document the wall's stratigraphic relationship to the main balk. Use subsidiary balks when excavating pits in order to illustrate the method of fill. Also, never remove large or special artifacts without first cutting a subsidiary balk to them, because it is important to know pre-cisely how they are associated with the surrounding loci. Subsidiary balks are also useful when excavating very complex or unclear earth layers. The balks of a probe are actually subsidiary balks.

Draw and photograph all subsidiary balks. Otherwise documentation is incomplete. Place the drawing in the notebook alongside the top plan of the feature the balk is intended to clarify.

**Sifting**

Because we sift **all** debris and because the sieve is away from the square, carefully organize the transfer of dirt to the sieve and supply the sifter with pottery pails and bone bags, etc. Always maintain a good communication with the sifter, because pro-blems of mislabeled finds can occur. To prevent contamination, never have more than one digging operation going on in a square.

**Other Artifacts and Biodata**

*Collection methods*. Collect other (non-pottery) artifacts and biodata (floral and faunal remains) in plastic bags, cardboard boxes, or plastic containers (depending on the nature of the item) and label them with an identification tag. Do not use rubber bands and adhesive tape to bind these containers, because they contain sulfer, which can speed the chemical breakdown of some objects. Organic samples col-lected for chronometric analysis (14C, etc), must remain absolutely uncontaminated by other organic material. See the section below on Carbon 14 for further details. Glass fragments, coin hoards, beads found together, and other such group items from the same locus may be collected in one container. Some items, such as tessarae and roof tiles, can also be collected together if they are from a single locus.

Some artifacts made of bone, unbaked clay, textiles, ivory, and wood are *hygroscopic* (water absorbing) and should not be allowed to dry for conservation reasons. Place them in containers which preserve their moisture (*e.g.* plastic bags). Others, such as metal, should be kept as dry as possible in cardboard boxes.

Do not remove objects from the dirt until they are properly recorded, which means they are precisely plotted on the top plan, levels are recorded, and, sometimes, photographs are taken. **Under no cir-cumstance should supervisors clean artifacts in the field**. Dirt is often a protection, and should not be immediately removed.

*Bones*. Almost every earth layer contains animal bones. Like pottery, the sifter saves all examples (including fragments) in plastic bags with an attached identification tag. Back in camp they are cleaned and analyzed by the zooarchaeologist at pottery reading. Bone readings are recorded on the Pottery/Bone Readings sheet.

*Carbon 14*. When you excavate carbon-rich material, follow these instructions for collecting *Carbon 14 samples* (adapted from Anita Walker, p. 19 in *A Manual of Field Excavation*, ed. W. G. Dever and H. D. Lance): Clean thoroughly around the area you wish to sample (an air-puffer is a good tool for this and will disturb your carbon sample least). Take your trowel and clean off any dirt with water, then wave it in the air to dry. Slip the trowel down the outside edge of your sample area and pry up a minimum of 50 grams (half a sandwich bag), more if you can. Bag your sample, seal, and affix an identification tag. Contamination of your sample will occur only if your carbon sample comes in contact with other carbon. But avoid sampling from dirt full of root systems, if possible. If the carbon you want is likely to have rootlets in it, be sure to include that information on the identification tag, if applicable.

*Pollen samples*. For pollen samples, sterilize a knife over a match or lighter and take a fresh sample from the earth just exposed, or at a later time from the balk, and place it into a sealed container or a tightly bound plastic bag. Only a handfull is needed.

*Flotation*. Flotation tanks in camp retrieve seeds and micro-fauna. Take as many samples as you can from carbon-rich earth layers in a large plastic bag as well as periodic samples from other earth loci. The samples are then floated, dried, and analysed by a *palaeobotanist*.

**Photography**

*Preparation for a photograph*. One photograph can literally be worth a thousand words. Your field supervisor makes the decision to take a photgraph. Photograph all *in situ* objects, architecture, and installations in ways which enlighten their strati-graphic and functional relationships. Approach every photograph as if it is potentially publishable. Even daily progress photos are sometimes published. That means that the area included in the photograph must be clean! Clean all rocks so no dirt or dust adheres to them; brush out footprints in earth layers and on balk tops (another reason to wear flat shoes); and completely remove all tools and workmen.

Because photos depicting squares in several phases of excavation are very difficult to read, try to keep your square in phase as much as possible. Try to take photos in the early morning (before the sun causes shadows) or when the sun is behind a cloud. Every photo must have a scale stick placed parallel to the baseline of the photo. Include an arrow pointing north.

*Notifying the photographer*. Never call the photographer until the area is completely prepared. Cleaning often takes longer than you anticipate. Be sure the photographer understands exactly what the photograph is meant to record. Ensure that the level of detail you desire will be captured by the photo-grapher. (Wide-angled aerials are great for overviews, but lack detail; close-ups may show detail, but exclude relationships with adjacent features.)

*Daily photographs*. Take daily photographs of each square first thing in the morning to document the "progress of excavation."

*Photograph analysis*. A digital photograph will be taken of every photo opportunity. Important shots will also be taken with color slide film for use in slide lecture. Make sure the photographer gives you the number of the photograph and that you record it on the locus sheets for all loci included in the photo. Square supervisors will receive printouts of the digital photos for them to analyze and make sure they list the photo on all relevant locus sheets. The photographer will keep his/her own log of photos, including date, site, field, square, and photo number.

**Plans and Elevations**

The architect draws the plans and elevations of features such as walls and some installations at the request of the field supervisors. Enter the architect's field sheet number onto the back of the locus sheet or simply mark it as drawn.

**Afternoon Activities and Organization**

*Completing daily excavation*. Anticipate the close of work each day by shutting down earth- moving operations in time to clear out all excavated dirt, give the entire square a good brush or sweep, complete field records, collect tools and equipment, and ensure that the square is left in a clean and controlled condition.

*Afternoon activities*. There are many esential activities that are done in camp during the afternoon, including pottery washing, pottery reading, pottery registration, artifact and object registration, archi-tectural drawing and inking, specialty analysis, etc. Square supervisors work on notebook entries, and discuss problems with their field supervisors as needed.

All afternoon activities are geared toward clas-sifying, preserving, organizing, recording, and analyzing the finds. Each activity is organized and directed by specialists or registrars under the coordination of the director(s). All personnel are expected to assist in these activities as the need arises.

This is also a good time to replenish excavation supplies for the next day. Make sure you have enough object containers, balk tags, nails, etc. **Always number the pottery identification tags with an indelible pen well in advance of their use in the field**.

ANALYSIS OF FINDS

**Ceramics**

Pottery reading is perhaps the single most important aspect of finds analysis, because it provides the chronological framework for everything else. Pail by pail, all pottery is soaked, washed, and placed into plastic mesh baskets to dry. (Examine all potsherds from Iron Age II loci for inscriptions before brushing.) All square personnel (supervisor and volunteers) are responsible for washing their own pottery, although if your square has little pottery to wash (and being a "team" player), you will want to help others—your heavy days will be coming and you will appreciate their help!

To prepare pottery for "reading," lay out the washed and dried sherds on tables with the *diagnostics* (rims, bases, handles, and sherds with decoration or form) in a pile separate from the non-diagnostics (generally plain

body sherds). The pottery registrar, field, and square supervisors record the pottery readings on various forms and tags, including the pottery identification tag, the pottery routing tag, and the Pottery/Bone Readings sheet. At the end of the reading session, the sherds and the identification tags are given to the pottery registrar for filing and registration.

Some sherds will be saved in separate storage areas for publication. These sherds are registered and preliminary analysis is organized by the pottery registrar. This includes inking the registration numbers on the sherd; sawing them in two; photo-graphing selected sherds; and channeling them to various other stations of analysis, including the ceramic technician, and the formator who mends broken pots.

**Objects**

Objects are cleaned and registered by the object registrar, who describes them in detail on object forms and conserves the pieces, as well.

**Drafting and Surveying**

Architects and surveyors are busy on the site drawing detailed plans of the architecture we find. In camp these drawings are inked and labeled.

**Specialists**

Specialists do not simply serve the interests of the excavation; their work also provides data for their separate disciplines. Other specialists, such as glass specialists, numismatists (coins), epigraphers, climatologists, lithicists, geologists, etc, are used as needed, when available. Some of them may never work in the field or camp, but analyze the finds in North America.

*Osteology*. Osteologists work on both human and animal bones. At times they may be called upon to hep excavate particularly important or delicate skele-tal finds, or to render an analysis in the field. Their primary work is in camp, cleaning, labeling, sorting, and analyzing the bone materials. Because of local sensitivities, human burials are reinterred elsewhere after preliminary study.

*Lithics*. All flints, whether clearly tools or not, are saved for analysis by a flint specialists.

*Geology*. The geologist aids the observation of finds on the site as they are uncovered and helps in the analysis of surfaces and stone walls. Petrological analysis of **objects** is another aspect of the work.

*Soils*. A soil scientist helps analyze earth loci in the field and works on soil deposits in the region.

*Palaeobotany*. The palaeobotanist deals with the seeds recovered from flotation. A palynologist analyzes pollen fractions from earth layers.

*Ethno-archaeology*. The study of how the material culture of contemporary peoples in the region reflects their present social organization and cultural activities may give us clues how we can use ancient artifacts to extract similar meanings about the past.

*Regional Survey*. A separate team surveys the to determine ancient settlement patterns, economic structures, possible land use, available natural resources, etc. They operate under their own detailed manual.

END OF EXCAVATION

**Completion of a Square**

The ultimate end of excavation in every square is arrival at indisputable bedrock or undisturbed horizons of soil, including sub-bedrock features (*e.g.* cisterns). Take a final photograph of all standing balks and the bottom of the square; complete all balk drawings and locus sheets; and draw a final top plan. You are now prepared to celebrate with a bedrock party.

**An Unfinished Square at Season's End**

If you do not reach bedrock or undisturbed soil by the end of the season, photograph all standing balks and the floor of the square; draw an accurate top plan; complete balk drawings; and finish locus sheets as much as possible. Then nail three to five plastic sheets to the bottom of the square and place a small amount of dirt on top. Be sure to plot the plastic sheets on the last top plan. When the square is reopened, the plastic sheets will indicate the begin-ning of *in situ* remains.

*In phase*. If at all possible, stop unfinished squares so inter-season erosion does not destroy the remains. Attempt to end your square "in phase," so that all the exposed remains are at the same stratigraphic level.

**Completion of Camp Responsibilities**

In camp, complete all recording procedures and take an inventory of all tools and supplies. Staff members are still “on the job” and are responsible to the excavation until this activity is completed.

## II. HANDBOOK OF RECORDING PROCEDURES

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### INTRODUCTION

Archaeological excavation, by its very nature, is destructive. With every blow of the pick or stroke of the trowel the remains of antiquity are irreparably undone. However, this destruction need not be irretrievable. With responsible observation and recording techniques it is possible to gain an impressive amount of information from the process. Because these field records are virtually the only remains of an excavated ancient civilization that survive, archaeologists owe it to the future to make every effort to dig, observe, and record responsibly. This is the purpose of the ***Handbook*.** The ultimate goal is to be able to reconstruct the data using computer programs much like it actually occurred in the ground.

The ***Field Notebook*** for each square consists of two main items: locus sheets and top plans. Every designated locus receives its own locus sheet. This helps square supervisors organize and translate their observations into specific and quantifiable, three-dimensional, descriptions. Since any locus can refer to a wide variety of finds, three separate color-coded forms, each with its own data organization, have been drawn up: yellow for earth loci, pink for architectural loci, and purple for installation loci. Use the **Earth Locus Sheet** for every locus composed primarily of dirt; the **Architectural Locus Sheet** for all walls and wall-like loci (floors, however, are classified as earth loci for stratigraphic reasons); the **Installation Locus Sheet** for other non-earth and non-architectural loci (see below for more). The **Burial Supplement Sheet** is, strictly speaking, not a locus sheet (because it is used only for the skeleton). It is filled out when burials are excavated and is associated with the earth locus that encloses the burial.

**Top Plans** are careful sketches on graph paper, one for each locus, or where two or more associated loci do not obscure each other, more than one may be recorded on a single plan. (For example, a surface and related walls could be recorded together on a single top plan.) A **Daily Sketch** is optional (and at the discretion of the square or field supervisor), but it does not replace one distinct top plan per locus showing the full excavated extent of the locus with complete top and bottom elevations. Place the top plans in the *Field Notebook* in a group at the end of the locus sheets in numerical order by locus. More on top plans will be given below. Other graph paper entries frequently occur: subsidiary balk sections, elevations, sketches, etc. These are also described elsewhere in more detail, especially in "Part I. Procedures of Excavation." The *Field Notebook* should also contain an introduction page, this *Handbook*, various other supplementary forms, and weekly summaries.

This recording system demands the description of a large amount of data in very specific terms. Any computerized data sheet needs precise terms which are consistently used; it is therefore mandatory that this *Handbook* be present in each *Notebook* for constant reference. If a word is needed to describe a feature which is not suggested on the locus sheets in the *Handbook*, consult the field supervisor and/or field director before entering it.

Complete every section on the locus sheet as far as possible. The forms are not self-explanatory and you will have to refer to this *Handbook* often to make sure you make the correct entries. The field supervisors and field director check the *Notebooks* periodically. The data processor, if present on the dig, checks them weekly. If there is not enough room for a single prose entry, use an attached blank page. If there is not enough room on the back of the locus sheets, use the Locus Continuation Data Sheet. The description of the locus sheets below follows the order of entries in which they appear on the individual sheets.

### LOCUS SHEETS

As stated above, there are three kinds of locus sheets: earth, architectural, and installation. These should be able to record the many kinds of loci encountered during excavation. Recall that a *locus* was defined in the previous chapter as the smallest meaningfully identifiable feature during excavation. This could be a distinctive earth layer, a wall line or discrete wall addition, a hearth, or a pit. But a locus is not an entire room, which is a composite of loci. Nor would a plaster layer covering a wall be treated as a locus; such is treated as a locus sub-feature and will be recorded on a locus supplement sheet. Categories of information are divided into numbered sections on the locus sheet.

#### Earth Locus Sheet

There are three preliminary check boxes at the top of the page, two on the left, and one on the right.

**BALK REMOVAL**: In the very upper right corner of the sheet is a box marked "Balk Removal." Tick it only if

you excavate a locus during balk removal that was first dug in a previous season and for which you do not have the primary locus sheet. Marking this box will tell the Data Processor to add the new data to the previously existing database.

**ASSIGNED BUT UNEXCAVATED**: Tick this box if the locus was assigned the previous season but was not excavated (so no data has been recorded).

**CONTINUED FROM LAST SEASON**: Tick this box if the locus has been under excavation during any previous season.

**1. IDENTIFICATION**.

The "Identification" section serves as a header for the locus and contains the basic "when" and "where" information. The same data also occur in an abbreviated form on the reverse of the locus sheet (for quick reference at pottery readings and when data from the back page is examined). This should be the first item the square supervisor records for each locus.

**A. LOCUS**: The first item to assign to the new locus is a number. Use Arabic numerals beginning with the number 1 and progressing sequentially for as many loci as may occur in your square. The locus numbers are sequential and non-repeating throughout the life of the excavation square. Make sure to resume the sequence with the next available number when reopening a square during a subsequent excavation season. The numerical sequence is followed regardless of locus type and change of season. Numbers are never repeated. Cleanup and balk trim debris receive no locus number, but should be identified in this space as "Cleanup A" or "Cleanup B," etc. Repetition of these latter designations may occur from season to season, but not within a single season.

**B. SITE**: Use a single letter abbreviation for the site (for instance, "U" for Tall al-'Umayri; "J" for Tall Jalul; "H" for Tall Hisban).

**C. SEASON**: Enter the last two digits of the year; for example, "08" for 2008.

**D. FIELD**: Enter the capital letter representing the field in which the square is located.

**E. SQUARE**: The grid designation of the square goes in the fifth entry, for example: "6L46" in the 'Umayri system; "A6" in the Jalul system.

**F. DATES**: To keep track of the progress of excavation, enter the date on which the locus was begun in the first field and the last date the locus was active after the word "to." This gives an indication of the range of time that was needed to complete excavation. The date sequence is Day/Month, such as "18 Jul." Month designations are never numbers. Always write them out in abbreviated form; for example, "Jun," "Jul," or "Aug."

**G. SHEET**: is a sequential numbering of the locus sheets used for this one locus. It is used when extra supplemental sheets are necessary to complete the data. The basic sheet for each locus is page no. 1 and is printed on the sheet. Label subsequent supplementary pages "2, 3, 4," etc. Do not count the reverse of the sheets as a page; each sheet is a single page.

**H. SUPERVISOR**: It is strongly urged that only one supervisor work on any one locus sheet, so that consistency may be maintained. Yet, all supervisors who have worked on the locus sheet should enter their first initial and full last name.

**I. LOCATION IN SQUARE**: Give a concise verbal description of the location of the locus within the square. For example: "NW quadrant"; "East half of square"; or "grid numbers 21 & 22" (use the grid map at bottom-right of the locus sheet). This is to help people unfamiliar with the square to quickly visualize where the locus is located.

**J. DESIGNATION**: In this field label give a concise description of the locus that is as minimally interpretive as possible. For example, "Topsoil," "Surface between Walls 25 and 36," or "Sloping debris layer outside terrace Wall 6."

**2. RATIONALE**.

This section is intended to provide the rationale for distinguishing a new locus in the depositional unit being excavated.

**A. REASON**: Give your reason for assigning a new locus number to the feature. Has the color changed? Or the consistence? Or the hardness? Did a pottery reading indicate that a change was necessary? Arbitrary reasons for change in loci should also be stated.

**B. SEPARABILITY**: This entry indicates the degree of ease with which the locus was separable from the earth layers above and beneath. Check the entries which reflect your level of confidence in isolating this locus. This entry will enable later interpreters to assess the level of confidence or lack of confidence in the present locus divisions. This should be done for both the top and bottom locus boundaries. Always be conservative; tend toward the entry labeled "Average."

**3. DESCRIPTION**.

This is the largest and most variable section of the locus sheet. It is here that the various aspects of the earth locus are described as accurately and completely as possible. Because it is difficult to think of everything when a supervisor composes a prose description, the Earth Locus Sheet breaks the section down into several parts and asks for specific information. At first this may appear to be time consuming, but with practice it is actually faster than prose composition.

The description of soils is a scientific discipline in itself. Though none of us are soil specialists, it is possible to approximate the various aspects of the description in line with the conventions of the science, at least as far as they are relevant to archaeologists. Because archaeological sediment is, strictly speaking, not a "soil," and because the term "archaeological sediment" is awkward and long, we call it "earth." The field director, or someone designated by him/her performs the texture and particle shape analysis for each locus, regardless of the field or square.

**A. COLOR**: The Munsell color code should be entered in the field marked "Munsell Number." No verbal description is recorded. To facilitate an accurate and communicable description of color, Munsell Soil Color Charts are used. These are very expensive; protect them with your life! Each chart is composed of a series of color chips, identified by a number system and verbal description. To obtain the color in the field, take a small portion of fresh earth from the locus in question and compare it with the color chips until you find the chip with the closest color correspondence. Do this comparison in *direct shade*, never in the sun (the shade of one's body or head will do fine). If there are a variety of colors, they can all be entered in the "H. REMARKS" section below. Some project directors may want to enter dry and moist (from freshly excavated earth) colors. If so, enter the moist color here and the dry color in "Remarks."

**B. TEXTURE**: This field is a description of the composition of the earth matrix, excluding the inclusions which are handled in a separate section of the locus sheet. Archaeological sediment is made up of several groups of particle sizes, each group yielding potential data on origin and method of deposition. It is important, therefore, that you describe the relative proportions of the various size groups of individual particles for the matrix of every earth locus by giving categories recognized by soil scientists. These measurements are given by the chief archaeologist or someone else specially appointed to do this in the field. The following groupings derive from the Wentworth scale of particle size which classifies particles smaller than 0.003mm as 'clay,' those larger than 0.06mm (and up to 2.0mm) as 'sand,' and particles intermediate to clay and sand as 'silt.' The field archaeologist will indicate to you which of the following four descriptions best categorizes your locus sample:

1. **Sand- Sandy loam** is primarily sand or sandy soil (52- 100% sand; 0-40% silt; 0-20% clay).
2. **Loam-Silt loam** has less sand and more silt and clay (0-52% sand; 30-100% silt; 0-27% clay).
3. **Sandy clay loam-Silty clay loam** has more clay than the other two (0-70% sand; 0-70% silt; 20-40% clay).
4. **Clay** is almost never pure clay (0-50% sand; 0-60% silt; 40-100% clay).

In rare instances, layers may be excavated which contain very little earth, but are composed almost exclusively of stones, or so it may seem. Actually, there is more earth than one assumes at first. The matrix minus the stones should still be described as above, perhaps with a note in the "H. REMARKS" section that the mass of the layer seems to be made up primarily of stones; the entries in the "E. INCLUSIONS" section will quantify this observation.

**C. PARTICLE SHAPE**: The shape of the constituent particles helps interpret the type and extent of occupational activity which went on in association with the earth layer. The chief archaeologist uses the comparator to examine the sand particles in the sample. Imagine each particle to be a triangle. If all edges are sharp and unrounded, they are termed 'Angular' (**A**); if 1/3 of the edges are rounded, they are termed 'Sub-Angular' (**AS**); if 2/3 of the edges are rounded, they are 'Sub-Round' (**SR**); and if all edges are rounded, they are termed 'Round' (**R**). Enter the percentage of each class of particle in its respective field (**A**, **AS**, **SR**, **R**) with a total of 100%. These percentages cannot be absolutely accurate, but a certain amount of inaccuracy is tolerable and indeed expected by those who interpret the data. The purpose of this data is not to give laboratory-tight counts, but rough estimates as an aid to establishing categories useful in later interpretation. Although too many earth loci are excavated to provide a laboratory analysis for all of them, samples of important loci, such as surfaces, should be collected for more detailed analysis in accordance with the project's sampling protocol.

**D. CONSISTENCE**: This section records judgments regarding certain qualities which may have affected the preservation and/or distribution of data in the earth layer. It can also help interpret the origin and method of deposition which, in turn, can tell us something about the people living at the site or, indeed, their absence.

1. **Hardness**: Although it is difficult to quantify hardness, a numerical designation in the range of 1-6 on the scale of **'Very Loose'** to **'Very Hard'** can record a fairly objective observation where 1 would

designate earth that is as loose as dry sand at the beach and 6 would be as hard as plaster; 3 would be an average, uncompacted layer and 4 would be an average beaten earth surface. Thus, 2 would be a loose layer and 5 would be a very firm earth surface. While a scale of only six numbers is less than completely satisfactory, a larger scale would add undue subjectivity when more than one observer is concerned. Again, conservative observations tend toward 3 or 4.

**2. Compactness:** This is a measure of the ability of the matrix to resist deformation or rupture and is easily tested by crushing a clod of dirt in your hand. Again this is only a semi-objective measurement, but it is the best we can do without expensive laboratory equipment. Compactness entries should be marked, not with a checkmark, but using one of three modifiers: "**V**" for "very," "**S**" for "slightly," and "**M**" for "moderately." Be as conservative as possible with "very" and "slightly," that is, try to use "moderately." Mark *only one* of the categories **a-d**. If the matrix easily crushes to powder or single grains, mark "**a. Loose**;" if it easily crushes to smaller clods but not single grains, mark "**b. Crumbly**;" if it crushes under gentle to moderate pressure, mark "**c. Friable**;" if it crushes only under moderate to strong pressure, mark "**d. Firm**." Some layers have so many inclusions that a compactness test is difficult or impossible; in such cases, mark "**e. Gravelly**" if the particles turn up pebble-size (2.00 mm-6 cm) and "**f. Rubbly"** if they are a combined pebble- and cobble-size (2 mm-25 cm).

**3. Wetness:** This variable often depends on the texture, but it may be valuable in determining the proportion of preserved to unpreserved biodegradable finds. Mark "**a. Dry**" if the earth is almost bone dry; topsoil is usually dry in the Near East during summer. Mark "**b. Moist**" if the dirt is damp; many layers below topsoil fall into this category. Mark "**c. Wet**" if the dirt is more than merely damp; layers with a high clay content can hold a large amount of water, and layers above impermeable plaster are often "wet." Mark theone relevant entry with "**V**," "**S**," or "**M**" as defined in the above.

**4. Structure**: Here we record the form in which the earth has been preserved, reflecting the method of its ancient deposition. It is a description of the relation of the dirt particles to each other and helps suggest a process of origin for the layer. The entries included here are somewhat interpretive, but are also simple field observations for the trained eye. With a sharp knife or trowel pry up a cleanly cut clod of dirt and examine its cut section through the comparator. Look for sorting and laminated bedding; when possible request the geologist or soil scientist to examine the sample as well. Mark one of the following entries with an "X."

The first three types of structure are products of **water-sorting** and usually have many visible micro-lines in the dirt and lenses of sorted granules more or less parallel in a graded bedding.

**a. Puddling** is deposited as sediments in a puddle, usually by rainstorms. It is normally observed as a series of very small horizontal micro-layers with the largest particles at the bottom and the smallest at the top of each laminate. The sediments are fine-grained and may alternate between dark- and light-colored bands, from less than one to several millimeters in thickness. With each flooding of the puddle a similar series of layers is deposited. Theoretically one should be able to count these layers much like tree rings. If several puddling episodes can be observed (give the number in the "H. REMARKS" section), there was probably little human traffic in the region, since traffic usually obliterates the fragile puddling evidence.

**b. Channeling** is that deposited by flowing water. Because the size of particles left behind depends on the rate of flow and because silt and clay are usually carried away by water moving at even moderate speeds, the dirt left behind has a high percentage of sand content. The particles are again arranged in horizontal micro-layers, but the finer particles are distinctly missing. The layers need not be horizontal, but can be in a kind of dune formation, that is, with micro-layers cascading over each other.

**c. Sheet Wash** is the third type of water-deposited debris and results from downslope movement caused by saturation from heavy rains. These layers can be 10 cm to a meter thick and are made up of fine- to coarse-grained earth and stones which are usually poorly sorted. They are normally found on slopes and are thicker at the bottom; naturally they are not found on the tops of rises.

Sorting may also occur through agencies other than water. Among these you may encounter:

**d. Wind**-sorted material, often called loess. It is generally a homogeneous layer of silt between 0.03 and 0.08 mm in size, often lacking diagnostic occupational signs, such as charcoal flecks, nari chips and the normal amount of clay found in the field soil of the region. Stones, although not frequent, can be found at any level of the layer and pottery can also work its way up into wind-sorted material. The presence of wind-sorting indicates abandonment or disuse of that area of the site.

**e. Talus** Care must be taken not to confuse sheet wash on steep slopes with "talus," or dry-fall debris. Talus usually occurs on moderate to steep slopes (above 10 degrees) where the pieces with greater mass tend to roll farther down slope, and are thus excavated at the bottom of the sloping layers; a buildup of talus-sorted debris would imply a fill, a dump area or mass wasting of occupational materials above the excavated area. Sheet wash is often cemented together while talus tends to be loose and rubbly.

**f. Random**. If there is no apparent sorting of the types defined above, check 'Random.' This will be the most frequently marked entry.

**E. INCLUSIONS**: Refer to items found in layers that are not part of the matrix. Noting them helps determine the origin and use of the locus in antiquity.

**1. Stone** inclusions comprise any stones which are not part of the earth matrix or an architectural feature. For the entries "**a. Pebbles**" (2 mm-6 cm), "**b. Cobbles**" (6-25 cm), and "**c. Boulders**" (25 cm and up), *enter the number of stones* from those sizes in one basket of sifted debris. Of course, you will not send many cobbles or any boulders to the sift, but take time to count them in a basket-sized pile of debris. Boulders are so large you will almost always enter a decimal number. (Calculate how many baskets you have to dig out until you encounter one boulder, then divide 1 by the number of estimated baskets to arrive at the decimal number). Judge each size of stone by its projected diameter.

The pattern of "**d. Dist[ribution]**" of stone inclusions can be instructive in interpreting the function of the locus as well as projecting a three-dimensional picture of it. If there is no apparent pattern, check "**Random**;" if there is some kind of pattern discernable, either horizontally or vertically, check "**Patterned**" and explain the pattern in the "H. REMARKS" section below (the note "(expl)" reminds you to do this); if layering is apparent in vertical section, check "**Layered**" and explain your observation.

**2. Earth** inclusions are pockets of earth that have a different description than the matrix. They can include pockets of crushed limestone or chalk called "**a. Nari Pockets**;" "**b. Brick Material**" includes brick fragments; "**c. Pebble Pockets**" are isolated pockets of gravelly material within a significantly less stony matrix; "**d. Ash Pockets**" are small concentrations of ashy earth in a non-ash matrix and may indicate the presence of small fires. *If there are other types of earth inclusions in the layer*, a name for them should be cleared with the field supervisor and the chief archaeologist before being entered in the blank on line "**e**." Describe earth inclusions on the EARTH section of the Supplements Sheet. The "E" next to "**2. Earth**" is a reminder. For each type of earth inclusion give their "**Freq[uency]**" in the locus in the space beside the type of inclusion. Place the number of inclusions per square meter in the blank. Simply mark out a square meter in your square and count the inclusions. If there is less than one per square meter, use decimals. If there is more than one inclusion and they are similar in size, give the average size in the space to the right; but if they differ greatly in size, give the range; all measurements should round the inclusion into a circle and give the diameter. Again, check the entries for distribution in the same manner as stone inclusions above.

**3. Artifact**: This field records inclusions in two ways: 1) Pottery and sometimes flint occur regularly in most earth layers, but mark the "**a. Pottery**" entry only if sherds are extremely and remarkably "**Very Freq[uent]**" or "**Very Rare**." The same is true of "**b. Flint**." Totals for these items are placed elsewhere for pottery and are recorded by the flint specialist for flints. 2) In the space provided enter the total number of "**c. Glass**," "**d. Tesserae**" (small stone cubes used for mosaics), "**e. Tabun Frag[ment]s**" (thick clay fragments from ovens), "**f. Brick Frag[ment]s**," "**g. Roof Tiles**," "**h. Worked Stones**" (simple stones which show signs of cutting or facing), "**i. Burned Stones**," "**j. Unfired Clay**," "**k. Arch[itectural] Frag[ment]s**" (cut stones which show definite signs of chiseled decoration). Your Field supervisor will help you identify them. 3) for the last entry, "**k. Arch[itectural] Frag[ment]s**," give a very short description of the type of architectural fragment, such as "Capital," "Entablature," etc. This entry is filled only if the fragment is not sent in as an object. Consult the Field supervisor before describing the type of fragment. Again, enter information regarding distribution. All artifact inclusions, except worked and burned stones and some architectural fragments (due to size), are saved and sent in with the Identification Tag correctly marked.

**4. Organic**" inclusions are of biological origin. Because, like pottery, bones regularly occur in almost every earth locus, note "**a. Bones**" only if they are extremely and remarkably frequent or rare. Totals are recorded elsewhere in the recording system and need not be entered here. However, because they are rarer, enter the total number of "**b. Shells**" found.

Most other organic inclusions appear as ash flecks or "**c. Carbonized Bits**" and can stem from bits of burned wood, olive seeds or even feces. If "**Olive pits**" can be certainly identified (they are

easily confused with sheep/goat droppings), enter their frequency per basket of debris. The following entries should list the total frequency per basket of debris and have their average size given in centimeters in the right column. "**Burned Wood**" appears as flakes of charcoal, but complete this entry only if you are sure it is wood. If "**Other**" types of carbonized bits are identified, place their specific identification in the blank line. But if they are unidentifiable, mark "**UD**."

Periodically, pockets of decomposed organic garbage appear in earth layers. Describe them briefly under "**d. Org[anic] Pockets**," and give the frequency of the pockets (if there is more than one) and their average size. If specific items can be identified in the pocket, list them in the "H. REMARKS" section. List all other types of organic inclusions along with their frequency and size in the blank space marked "**e**." Again, check the appropriate box for "**f. Dist[ribution]**."

Where carbonized organic remains are found, a large percentage of the debris should be floated. All materials from organic pockets should be sent in, specially marked, to the botanist for possible analysis before floating.

**F. MEASUREMENTS**: Measurement entries give a three-dimensional description of the locus and, together with the top plan, fixes it spatially relative to other features.

1. **Length** is the greatest length of the locus.
2. **Width** is its greatest width perpendicular to the length.
3. **Depth** may be determined from the balk, if a representative thickness of the layer reaches any one of the balks, or it may be computed from the levels; enter a range of the least to greatest depth.

Earth layers can form a slope, but balk lines often do not cut these slopes perpendicularly. For this purpose, every field supervisor has a *Silva Ranger* compass which has been set for the correct declination at the site so that all compass readings are taken with reference to true north (magnetic north wanders over a period of time). Take two readings for every sloping layer:

4. **Downslope direct[ion]** Point the compass in the direction of the downward slope (as accurately as you can estimate it) and enter the reading in compass degrees; never enter a compass reading of 0 degrees, make it 360 degrees.
5. **Degree of slope** Using the compass's clinometer, measure the "degree of slope" by placing the long edge of the compass vertically on the ground parallel to the slope and recording the degree reading on the clinometer. Both of these measurement processes will be demonstrated in more detail in the field.

Unfortunately, all the above measurements are artificial to some degree. No layer is a perfect rectangle with a constant length and width, and no slope is ever perfectly regular. If measurements seem to misrepresent reality, qualify them in the "H. REMARKS" section. Enter any sharp variations on the top plan.

**G. SURFACE MATERIAL**: If you are interpreting the locus as a surface, complete this section. **This section is NOT completed for normal earth layers**.

1. **Beaten Earth** surface is made of ordinary earth debris similar to that usually encountered in earth layers, but it is generally harder and compact from traffic and shows other definite surface signs, such as flat-lying pottery (usually with the convex side up) and bones (often highly fragmented), thin, laminated layers separated according to particle size, carbonized bits and a tendency for the layer above the surface to pop up or break cleanly from the top of the surface (caused by sand grains "floating" at the top of the surface due to active use and rain in antiquity). Determining whether an earth layer is actually a surface is often difficult. Supervisors can easily "invent" surfaces by smooth trowelling and diligent brushing. On the other hand, beaten earth surfaces can often be composed of very thin layers of earth and are easily dug through. Because surfaces are very important stratigraphic entities care must be taken that they are correctly identified.
   Other surfaces are much easier to determine. "
2. **Lime** is finely crushed limestone with particles seldom larger than sand grains, and is *not* cemented into plaster; because the ancients sometimes sprinkled it thinly onto their beaten earth surfaces to harden them, lime surfaces often appear as very thin white layers (best seen in balks) and are very easy to dig through.
3. **Plaster** is lime which has been cemented into a fairly hard material; it is rarely more than 2.0 or 3.0 cm thick and seldom less than 0.25 cm thick.
4. **Crushed Nari** is a gravelly matrix of soft limestone and is the easiest limestone surface to make and maintain. It is therefore frequently encountered, especially in thin, laminated surfaces which represent repairs made on the original surface. It is often impossible to separate these laminated layers in any coherent stratigraphic fashion while digging. Crushed nari can have many particle sizes in its texture, including pebble-sized grains.

The next three surface categories are made of materials usually used for architecture.

**5. Bricks** and **6. Cobbles** should be clear to the supervisor.

**7. Flagstone** pavement is constructed of large stones, most of boulder size, cut or chosen to fit fairly tightly; most paved Roman roads are good examples of flagstone pavements. The Architectural portion of a Supplement Sheet should be completed for brick, cobble, and flagstone surfaces, since they need other descriptive entries not included on the Earth Locus Sheet. The parenthetical "A" is a reminder. It may seem strange to include these types of loci, which are not specifically earth layers, as earth loci. However, they are surfaces and function stratigraphically as earth surfaces; their main recording entry is thus the Earth Locus Sheet. Obviously, for such loci, sections 3.A.-D. on the Earth Locus Sheet need not be completed.

**8.** Other types of surface material may be entered into the blank line.

**9. Laminated Surface** If the surface is laminated, that is, it consists of a single "group" of multiple, thin layers impossible to excavate individually, give an accurate count of the greatest number of visible laminates, one on top of the other in the space following "**Greatest # Observable**." This entry is not a part of the above list of surface types; a laminated surface can be made up of any of earth surfaces (nos. 1-4) listed above.

**H. REMARKS**: There will undoubtedly be times when the locus sheet will not completely describe the earth layer. Place such information here. **Remember it is for aspects of DESCRIPTION only**. Be concise and direct. Avoid generalization, but at the same time do not fill the locus sheet with a long list of unimportant specifics.

**4. STRATIGRAPHY**.

In archaeological terms stratigraphy is the relationship of loci to each other. One of the major keys to archaeological interpretation lies in the correct and full recording of these data which, with the help of some desk-work and/or a computer, can allow all loci to be arranged sequentially and to be sorted into phases and strata. Stratigraphic relationship is probably the single most important aspect of excavation. It is in these relationships that the "meaning" of a single locus can be expressed. If we don't understand stratigraphy, the various dependent endeavors of archaeology, such as the analysis of pottery, coins, and, indeed, all other finds, are meaningless except as they may contribute to knowledge as isolated fragments. It is absolutely mandatory, therefore, that this section be filled out accurately and completely. Check the completeness of your work by making sure that every locus is cross-referenced on the corresponding locus sheet. That is, if Locus 6 is under Locus 5, then Locus 5 is also over Locus 6, etc.

To facilitate the analysis of this section, the following symbols should be used with the locus numbers (they are also listed at the Locus Sheet): (1) earth layer = no symbol: 25; (2) wall = box: 25 ; (3) surface = underlined: 25; (4) pit = upside down triangle: 25 ; (5) cistern = circle: 25 ; (6) other installation = triangle: 25 ; (7) foundation trench = FT before the number: FT25; and (8) bedrock = B before the number: B25. These symbols embrace every type of locus encountered. For convenience these same symbols may be used elsewhere, such as on top plans and in weekly summaries, etc.

There are no limits to the number of loci which may fall under a specific stratigraphic category, nor is every relationship as neat as the locus sheet may suggest. Always check with other people in completing this section.

**A. UNDER**: Include all loci which your locus is directly under.

**B. OVER**: Likewise, enter all loci which your locus is directly over. The stratigraphic importance of these entries is obvious: the upper loci are later than the lower ones. As mentioned above, make sure all locus numbers are cross- referenced on the corresponding locus sheets.

**C. EQUALS**: The term applies to earth layers which are identical in both description and stratigraphy. 1) If you excavated and recorded two layers as two separate loci but later discover they are actually the same, enter the equal locus number here. 2) If an adjoining square contains a locus identical in both description and stratigraphic relationships, enter that locus preceded by the square number. Cross-reference your entry in the "Equals" line of the corresponding locus sheet.

**D. CONTIGUOUS TO**: At times, two layers with identical statigraphic relationships but different descriptions are found. If you cannot decide which layer was laid before the other, enter the locus number in the "Contiguous To**"** line. Contiguous loci are contemporary. Again, cross-reference your entries.

**E. SEALS AGAINST**: Make an entry in this field when your locus lies against another (usually an architectural or installation locus) in such a way that they clearly touch each other, and no other material intervenes; bread dough seals against its bread pan. The stratigraphic relationship is clear: the earth was deposited against a locus which was already present; thus the loci listed in this entry were present prior to the deposition of your locus. Of course, cross- reference your locus in the "Abutted By" line of the corresponding Architectural or Installation Locus Sheet.

**F. CUT BY**: Earth loci never cut other loci. If they appear to do so, a pit or installation is present. Even a

brick, cobble, or flagstone surface should have a foundation trench (technically, a "pit"). However, architectural and installation loci very frequently cut earth loci and should be entered in the "cut by" line. For example: 8 is a pit which has been dug through Layer 7; therefore Layer 7 is cut by Pit 8. Obviously, loci which are cut by other loci were deposited earlier than the loci which cut them. Cross-reference your locus in the "CUTS" line of the corresponding Architectural or Installation Locus Sheet.

**G. REMARKS**: The "remarks" entry can be very important if some of the stratigraphic relationships need qualifying. If there are any unanswered questions regarding the stratigraphy, indicate them here.

[From here on all locus sheets are identical in terms of data sections. However, some sections may be longer or shorter than others.]

**5. GEOSPACIAL DATA**.

We record levels in meters and centimeters above sea level; they help obtain a three- dimensional fix on the loci. There are two basic ways of taking levels: with a surveying transit or dumpy level and with a line level. It is usually understood that the transit gives a more accurate reading and is thus used for important levels: those which give promise of remaining permanently in or around the square and those from which line level readings are planned to be taken. Line levels use a length of string, a 3-meter tape and a line level which can move along the string. One person holds one end of the string at a known transit level within or near the square and makes sure the line level is level; a second person pulls the string tightly over the point to be read and measures the distance down or up from the string to the object. The level is then computed by either subtracting or adding the measured distance from the original transit level.

Because loci of all kinds are seldom perfectly level, it is necessary to take several levels at different locations and to record both the top and bottom levels at each location. For example, a layer that is fairly regular and covers the complete square is best represented by levels taken in each corner and the center; exact locations are usually determined by the contours of each locus and a decision about how best to represent it three-dimensionally.

Taking levels can be time-consuming until some short cuts are learned. **Always record the top level before excavating** and the **bottom level when excavation is complete**. Obviously, if the location of levels for one locus is the same as the location for the succeeding one below, the bottom level of the upper locus and the top level of the lower locus will be identical and it is not necessary to take two levels. It is also possible to take levels from balks, if necessary. Since levels are recorded in meters above sea level, the levels should be entered fully into the proper column; for example, do not write "1.45 m" when you mean "881.45 m."

**A. LOC[ATION]**: Determine the location reference number from the grid found in the lower right-hand corner of the locus sheet; it is divided into numbered locations corresponding to square meters in your square. Enter the number from the box which corresponds to the general location. Note that the upper and right sides of the reference square correspond to the north and east balks. More precise locations are placed on the top plan (below).

**B. TOP**: Enter the top elevation of the locus at the location specified in A. above.

**C. BOT[TOM]**: Enter the bottom elevation of the locus for the location specified in A. above. Never take a top level without its corresponding bottom level. At times, however, it may be necessary to take a bottom level where a top level was not taken, for example, when the earth has already been removed making a top level impossible (sometimes levels can be taken from balks, however); enter the bottom level and draw a line in the "Top" column.

**D. East[ing]/North[ing]**: Enter the last five digits of the readings (i.e. E. = xxx.xx; N. = xxx.xx)

**E. TYPE**: Enter a "T" here if the level was taken with a transit, "GPS" if appropriate, or "D" for dead-reckoning.

This concludes the front page data of the Earth Locus Sheet. At the bottom right corner is a space to write the locus number, if you keep your locus sheets on a clipboard.

**6. IDENTIFICATION**.

This section on the reverse of the Earth Locus Sheet is a duplication of the data on the obverse. The repeated information makes it easier to work with the back side by simply referring to the top of the page rather than turning it over every time you enter information.

**7. POTTERY.**

This section includes the data gathered in the field that will aid in the later analysis of the pottery. Each horizontal line through the columns relates to a single pottery pail. "Field" or "Camp" indicates when the data

should be available to be entered.

**A. PUB(LISHED):** (camp) Enter the number of pieces set aside as publishable (if any) as determined by the ceramicist during pottery reading in camp.

**B. DATE**: (field) Record the date the pottery pail was excavated, not the date it was read. It should be entered immediately when the new pottery pail is tagged in the field. To avoid confusion, abbreviate the month instead of a number ("7 Aug" instead of "7/8," or "8/7").

**C. PAIL**: (field) The "pail" column contains the sequential number of pottery pails within the square. Because most loci entail the use of more than one pail, the pail number will probably never be equal to the locus number with the exception of the first pail of Locus 1. The pail number is unique within the square. Take extreme care to avoid duplicating or (only slightly less tragic) skipping pail numbers. Duplicating pail numbers causes much trauma in camp and the possible loss of both pails, since provenance is uncertain. Other records are also confused, since artifacts and biodata are recorded by pail number, too. It is therefore mandatory that all square supervisors number their pottery tags prior to work in the field. This will ensure against duplication. Pail number sequences continue from season to season.

**D. LOCATION**: (field) Enter the GPS coordinates if for some reason you need to provide a specific location for the pail. This will be particularly relevant when a cluster of broken pottery is suspected of being a reconstructable vessel and is given a separate pail number. If GPS coordinates are unavailable, enter the location number(s) from the reference grid. Other reasons for providing a 'Location' is when contamination is feared, or when stratigraphy is questionable. Enter as many reference numbers as the pail covers.

**E. COUNT**: (camp) Two counts are needed here: 'Diagnostic' on the left side of the divider and the 'Total' number of sherds in the pail on the right. These counts will be taken when the pottery is laid out for reading back at camp. The total count provides the number of all the sherds in the pail. The diagnostic count provides the number of diagnostic sherds (rims, bases, painted body sherds) as part of the total count.

**F. TOT[AL] BASKETS**: (field) Write the total number of debris baskets, or *guffahs*, removed from the square for each pottery pail. Counting the *guffahs* can be done in a number of ways, but each square supervisor has a counter which advances one number each time the trigger is pushed. Experience has shown that it is easiest for the sifter to press the counter each time a *guffah* is put into the sift. This is a very important statistic, because it allows us to compute the volume of earth removed and hence to study all data relative to earth volume. It was found in 1984 and 1992 that roughly 105 average baskets of debris (including stones) make one $m^3$ of *in situ* debris.

**G. FORM AND PERIOD READING**: (camp) The expedition ceramicist will examine the pottery and give a reading of the forms and periods represented. Enter the forms and periods of the pottery including the quantitative analysis of forms (jars, jugs, cooking pots, etc.). Continuous reference to this information during excavation will keep you aware of the chronological makeup of the loci and possibly provide early warnings of problems. Use the following abbreviations: Mod (modern); Tur (Turkish); Mam (Mamluk); Ay (Ayyubid); Cru (Crusader); Fat (Fatimid); Ab (Abbasid); Um (Umayyad); Byz (Byzantine); Rom (Roman); LR (Late Roman); ER (Early Roman); Hel (Hellenistic); Per (Persian); Ir (Iron); LB (Late Bronze); MB (Middle Bronze); EB (Early Bronze); Chal (Chalcolithic); Neo (Neolithic); E (early); L (late). When periods are subdivided, use Arabic numbers, such as EB3, not Roman numerals.

**H. COMMENTS**: (field and/or camp) Note special features of the pail's provenance in the comments space. Was it near a pit, or on a surface, etc.? When there is a possibility of contamination by pottery from another locus (or loci), it should be noted here. Do not treat this section lightly. If the pail comes from a probe later turned into a locus, mention it here, because the probe could have gone deeper than the rest of the locus and the pottery might show it. Record any special remarks about readings as the ceramicist requests during pottery reading.

An extension of the pottery information on the locus sheet is the Pottery/Bone Supplement sheet. When you run out of pottery entry spaces on the Earth Locus Sheet, begin a Pottery/Bone Supplement sheet. Copy the basic identification information from the locus sheet to the supplement header (1. Identification). Fill out the pail information exactly as you do on the Earth Locus Sheet.

**8. BONES**.

Complete this section similarly to that of the pottery. MPP projects process bones divergently. 'Umayri does not enter bone data in the *Field Notebook*.

**9. ARTIFACTS**.

This section is used for all finds not included within the "**3. E. INCLUSIONS**" section on the obverse of this sheet. Artifacts are finds which have at least a degree of museum value, such as complete pottery vessels, coins, beads, stone bowls and grinders, metal objects, worked bone, jewelry, stone and ceramic figurines, etc., even when fragmentary. The field records for these objects need be limited only to establishing an accurate provenance and an archaeological context. The formal, detailed analysis of the find is made by the Object Registrar or a specialist.

**A. DATE**: The first column contains the date when the find was made (for example, "7 Jun").

**B. PAIL**: The second column includes the number of the pottery pail in use when the object was found.

**C. FIELD #**: This is a sequential number series beginning with "1" for each locus; it is easiest to prenumber your locus sheets. If you use a Pottery/Bone Supplement sheet (which also contains an Artifact section) for a locus with many objects, carry on the number sequence. You will also record this number on the identification tag you send in with the object, allowing the Object Registrar to connect the formal description and analysis of the object with your provenance data on the locus sheets. **This connection cannot be made unless the Field# is present!**

**D. LOCATION**: Write the GPS coordinates or the number of the reference square in which the find was made (it should, of course, also be accurately plotted on your top plan).

**E. LEVEL**: If you do not have GPS coordinates, then take a level for every object and record here. The measurement should always be at the bottom of the object, because objects are often resting upon surfaces; a top level is not necessary since the object's description will allow that to be reconstructed.

**F. TOT[AL]**: Sometimes objects are found in groups. If more than one of the same type of object are found together, their total should be entered in column six. This can happen with such items as beads, coins, complete pottery vessels, metal items, and even glass objects. Do not give totals if a separate field number is given to each object in the group.

**G. REMARKS**: Include any remarks which may qualify the interpretation of the find. Is its provenance uncertain? Was it in wet or dry dirt? Was it in an important stratigraphic position? All coins should have an entry here regarding the circumstances of their discovery: Were they discovered by the supervisor? Or did a workman find it? Could the workman have planted it, etc? You may also enter your own designation of what the object is, but it may be changed by the Object Registrar.

**H. IN FIELD**: Check this box if the object was so large it had to be left in the field.

**J. REG[ISTRATION] #**: should receive the object registration number assigned by the Object Registrar. Make a special effort to get this number, because it provides the relationship between specific loci and their associated registered objects when they are published by specialists.

If you find more objects than there is room on the locus sheet, use the Pottery/Bone Supplement sheet (which also contains an Artifact section). Enter the corresponding sheet number for the continuation of the data ("**Continued on sheet _____**").

**10. INTERPRETATION**.

Fill out this section of the locus sheet when you are finished excavating the locus. It is, in your best judgment, a statement of what the locus was (its function) and its relation to other features (stratigraphy). All the significant descriptive data should be kept in mind along with daily field discussions between you, your field supervisor, the field director, and specialists. Weigh all options and enter as many as you can think of. Ideas which sound outlandish at the time may turn out to be not so crazy in the end, and vice versa!

**A. FUNCTION**: This entry should discuss the use to which your locus was applied in antiquity. Was it a floor? What kind of activity produced the locus? Was it a fill layer to prepare a foundation? Was it a destruction layer, etc? Put the locus into a structural or functional context. Was it part of a house or a temple? Was it dump debris from a pit? Was it water-channel debris from roof runoff? Where did it come from and why was it located where it was found? What does the locus mean? How did it contribute to the history and culture of the site? Do not simply repeat the description section.

**B. STRATIGRAPHY**: This stratigraphy entry is more general than the "4. STRATIGRAPHY" section on the obverse of the locus sheet. A simple restatement of that information will not do! Give the general relationships your locus has with other features. For example, if it was a surface, record which walls were contemporary with it and what other parts of building complexes seem to connect to it. If it was a wall, record what surfaces and other walls were associated with it. If it was a pit, indicate which earth locus it was cut from, etc. Mention problems and other options.

**C. CLEAN LOCUS**: If the pottery pails in the locus consistently produced pottery from one period only and there was no mixing of ceramic horizons, mark 'Clean Locus' here. This is a layer with no contamination from earlier periods and we can express certainty regarding its homogeneity not only for pottery but most likely for other finds, as well. Clean loci are relatively rare.

**D. LOCUS DATE**: Give your conclusion regarding the archaeological period to which your locus dates. Remember, the pottery may date the debris, but the stratigraphy could mandate a later date. For example, the earth may contain pottery no later than Iron 2, but it lies ABOVE a layer with Hellenistic pottery. The locus is therefore Hellenistic or later. If there is not enough room for your interpretation, use another sheet and give the sheet number at the top of the section.

**E. PHASE**: This entry will be entered later as the field supervisor writes the seasonal report.

**F. STRATUM** : Like the 'Phase' determination, the 'Stratum' will be determined later as the field supervisor writes the seasonal report.

**Architectural Locus Sheet**

**11. IDENTIFICATION**.

Most of the information in the 'Identification' section is explained for the Earth Locus Sheet (see sections 1. A-J., above). The addition here is the entry for 'Phase.' Sometimes architectural and installation loci have several phases; each phase of construction is designated with a capital letter (starting with the letter "A" for the most recent phase, the letter "B" for the next, etc.) in "**I. PHASE**." **Every phase has its own Architectural Locus sheet** so that they may be isolated and described fully. For example, the two-phase architectural Locus 67 will have two locus sheets, designated Locus 67 Phase A and Locus 67 Phase B. If, upon complete excavation, you can observe only one phase, skip this entry.

A two-phase mudbrick wall would thus have two Architectural Locus sheets, all with the same locus number: the first for Phase A, the second for Phase B. (Be sure to list pottery and objects from these two sources on the reverse of the respective locus sheet; do not combine them to one sheet.) Most forms asking for locus numbers will have a slash designated to separate locus numbers on the left from the phase designations on the right.

**12. RATIONALE.**

Fill out this section identically to earth loci (see "2. RATIONALE").

**A. REASON**: A simple observation, "stones in a line," will frequently suffice for the 'Reason.' Discuss the separability of a mudbrick wall from its outfall, or the visibility of *in situ*, stacked mudbricks.

**B. SEPARABILITY**: need only be completed when phases in the wall's construction are present.

**13. DESCRIPTION**.

Describing architectural loci is complex, because walls can be made of several materials and each one needs to be described in its own terms. Therefore, a great deal of specific information is requested on the Architectural Locus sheet, but much of it may not apply to any one wall.

**A. MATERIAL**: Walls are constructed primarily of stone and mudbrick. However, any one wall may have been constructed of several different types of materials. Thus the 'Material' section asks for several varieties of information. Record the types of material in your wall by entering one or more of the qualifier letters in the space to the left of nos. 1-6. Then enter the percentage of the MASS of the wall (not the percentage of pieces making up the wall) occupied by each type of material in the space to the right. A few simple measurements can improve the accuracy of your estimate. Of course, the total percentages should equal 100%.

Your field supervisor will complement the following definitions in the field. The most frequently encountered stone in the Madaba Plain region is "**1. Limestone**" and most stone walls are built of it. "**2. Chert**" is very hard, much like flint, and is very difficult to break up with a sledge hammer; chert blocks often have a mottled appearance. "**3. Basalt**" is a very hard, heavy black rock not indigenous to the Madaba Plain, but imported from the eastern desert (and elsewhere) where it was formed in extensive lava flows; it was most often used for grinders. "**4. Nari**" is a very soft limestone which breaks up easily; sometimes you can break off pieces with your bare hand; some people describe it as decayed or decomposed limestone. "**5. Mudbrick**" is, of course, obvious, but because it is made with dirt, the Earth Supplement (abbreviated "E") needs to be filled out. A single wall may contain bricks of different descriptions reflecting different origins of the clay; if so, give a range of descriptions on the Earth Supplement. The sixth line leaves room for other materials (**6.**). Consult with the field director before selecting a descriptor.

The qualifiers, whose letters you place in the space to the left of each entry, are located in the right column. They should be understood by all square supervisors in as similar a way as possible. Because the qualifiers are often quite subjective, they are meaningful only if the qualifier is unmistakable. Therefore, always consult your field supervisor. If the material is average, enter "**a. None**." This will probably be your most frequent entry.

"**b. Hard**" and "**c. Soft**" are easy to understand, but you need field experience to determine whether the material is hard or soft enough to merit the qualifier. "**d. Cherty**" is used when limestone or nari contains chert nodules. "**e. Fossiliferous**" indicates that the stone contains significant quantities of fossils; the term should not be used whenever a fossil is seen in the stone, but only when enough appear to make it worthy of remark (limestone is quite often fossiliferous). "**f. Decayed**" can be used with limestone, chert, nari or mudbrick and indicates a degenerate form of the rock or brick characterized by natural flaking, chipping and sloughing. When used with mudbrick it indicates the disaggregated brick debris eroded from the wall. "**g. Freshly-quarried**" indicates stone that clearly and beyond doubt was freshly quarried just prior to its use in the wall. This is usually best determined by a geologist. Most

walls built of homogeneous stones of a similar size, dressing, and tooling would fall into this category. "**h. Reused**" stones are the majority in most stone walls of a non- homogeneous makeup. Although it is impossible to know for certain whether stones are reused or not, for our purposes they should be considered reused if they are not definitely freshly-quarried.

The next three qualifiers refer to mudbricks. "**i. Oven-baked**" bricks are very hard and are easy to trace during excavation; "**j. Sun-baked**" bricks are not as hard and can be broken with your hand, but not crumbled easily; "**k. Unbaked**" bricks are very difficult to separate from bricky earth and are easily crumbled in your hand. Both bricks and stones can show signs of being "**l. Burned**." Usually this is shown by a discoloration toward black or gray, but sometimes white. The geologist may be able to analyze samples for degree of burning, so send in a sample.

For each material in the wall, be sure to go through all the qualifiers to be positive you skip none that apply. If another qualifier is needed, use "**m**." and fill in your suggested qualifier. Communicate with both your field supervisor and the field director.

Note that more than one qualifier may apply to any one material type. For instance, the limestone may be "b" (Hard), "e" (Fossiliferous), and "g" (Freshly-quarried). In that case, write the letters b, e, and g in the space to the left of "limestone." Separate them with commas.

Many times, both hard and soft limestone may be present; if so, enter both "b" and "c" and suggest a percentage along with any other details of interest (for example, the large stones may be generally hard, and the small one soft, etc.) in the "L. REMARKS" entry at the bottom of the DESCRIPTION section.

In rare cases, carved **"7. Arch[itectural] Frag[ment]s**" from earlier structures are reused in later buildings. These are not simply reused hewn stones, but fragments of capitals, pillar bases, entablatures, etc. They are very rare prior to the Hellenistic period. If they are included in the wall, however, count them and enter the total in the space to the right. List the type of fragment in the following entry under "**Type**" (for instance, "pillar base," "capital," etc).

With the aid of the geologist, the "**8. Origin**" of the stone can sometimes be determined. If the quarries can be identified, record this information in the entries beneath "**Quarry**." The geologist determines the precise terms to be used. Many, if not most, of the stones will also have been reused from earlier walls. If you know the walls of origin with certainty, enter the locus numbers of the original walls in the entries marked "**Reused**." Always include a percentage of the total wall mass of the wall for each group of stones whose origin is known, whether from a quarry or an older wall. If there is less certainty about origin, however, record the locus number with a question mark.

Record any qualification or modification concerning the material of the wall that is not requested, but seems mandated by the evidence into the "L. REMARKS" entry. Be sure to identify it as coming from the "A. MATERIAL" section.

**B. MASONRY**: is a more detailed description of the individual components making up the wall (bricks and/or stones). This is done by giving the proportion of stone sizes used in the wall. For "**1. Wall Stones**" consider only the stones making up the major mass of the wall. But they can include many sizes of stones. A "**a. Cobble**" is 6-25 cm; a "**b. Sm[all] Boulder**" is 25-50 cm; a "**c. Med[ium] Boulder**" is 50-75 cm; a "**d. L[ar]g[e] Boulder**" is 75-100 cm; and a "**e. V[ery] L[ar]g[e] Boulder**" is 1.00 m and up. A blank line (**f.**) is provided if other sizes are present. Give the percentage of the mass of primary stones within the wall for each of these sizes; do not include chinkstones. The entries in this column should equal 100%.

Most non-ashlar stone walls have "**2. Chinkstones**" between the larger stones to stabilize them. Place the percentages of the chinkstone sizes in the space provided. Note that this is the **percentage of the chinkstones only**, not the percentage of total stones; the chinkstones and the main wall stones should be separated so that the chinkstone percentage alone totals 100%.

In rubble-filled walls, the "**3. Fillstones**" contained between the facing rows of the wall can have their own character. List the percentage of the fillstones in the spaces provided. If there are no fillstones, leave this column blank.

The fourth part of this section deals with walls made of "**4. Brick**." Because a single wall can be made up of bricks in varying sizes, all from the same factory, the range of all three dimensions needs to be given in centimeters. For "**a. Length**," "**b. Width**," and "**c. Thickness**," give the range of sizes for each dimension, smallest measurement first. The entries should be inclusive and not average, though a single remarkable exception should probably not be included in this section. Instead, note it in the "L. REMARKS" section. Samples from every brick wall should be saved.

**C. DRESSING**: This field is relevant for stone walls only and describes the way in which the stones were worked or finished. Because a wall may be built of stones dressed in different ways, give the percentage of the total number of stones with each type of dressing. The entries should total 100%. "**1. Unhewn**"

stones are field stones with no discernable signs of dressing; "**2. Semi-hewn**" stones exhibit some dressing so that the stones fit securely with a minimum of chinkstones; "**3. Dressed**" designates stones which show definite, clear signs of having been squared into blocks and chinkstones almost never occur; "**4. Ashlar**" stones have a smooth rectangular shape with square corners and an excellent fit so that no chinkstones are needed; "**5. Bossed**" stones are ashlars with a boss of semi-hewn to dressed degree remaining in the middle of the stone's face leaving a line about 5-20 cm wide around the edge of the stone which has been finely dressed. Use the "L. REMARKS" section is for specific descriptions of the dressing.

**D. TOOLING**: Most stone dressings leave signs of tool marks. The "**D. TOOLING**" section, used for stone walls only, seeks to describe these tools marks. If possible, measure the "**1. Width**" of the tool and record it in centimeters to the mm. Generally speaking, ancient stone masons hammered their tools at an oblique angle to the stone making cuts of varying "**2. Lengths**." Sometimes these lengths can be informative regarding the type of metal used for the chisels as well as the skill of the mason; give a range in this entry. A quick sketch can help interpreters reconstruct the shape and measurements better; check the space labeled "**3. Sketch**" when you make your sketch and place it with the locus top plan. So that we can begin a typological study of stone-cutting technologies, all types of stone cutting in a single wall should be photographed. Check "**4. Photo**" when the photographs have been made.

**E. MORTAR**: Complete this section if the stones or bricks are held together with a cementing material. Because most ordinary stone walls have no mortar, the first entry labeled "**1. Dry-laid**" is the most frequent one marked. If there is no mortar whatsoever, write "100%" because the wall is 100% dry- laid. The same principle should apply to each entry; estimate the percentage of interstices between the building materials (brick or stone) joined by the mortar. The total of the percentages, of course, should equal 100%.

Mark "**2. Clay**" if the mortar is earth with a texture primarily of clay. "**3. Mud**" is earth with texture designations larger than clay. Everyone is acquainted with "**4. Cement**," although ancient cement was often softer than our modern varieties; because it seems to have been invented by the Romans it should probably not be used as a descriptive term in deposits older than the first century BC. "**5. Plaster**" is often used in lining cisterns and other installations or coating walls and can sometimes be almost as hard as cement. Its basic makeup includes lime or chalk and can be combined with proportions of mud and sand. "**6. Lime**" is finely crushed limestone not quite hardened into plaster. A blank line ("**7.**") is provided for any other type of mortar. At the bottom of the section, give the "**8. Av[era]g[e] Thickness**" of the mortar in centimeters. Earth-like mortar needs to be described in the Earth Supplement. Note the "(**E**)" prompt for this purpose.

**F. FACING**: In this section mark "**1. Unfaced**" if the wall shows no signs of having had an exterior or interior lining; this entry will probably be the most frequently marked. If there are any signs of plaster, check "**2. Plaster**" and go on to describe the plaster in an Earth Supplement. Although "**3. Mud**" facing is usually not preserved, fill out an Earth Supplement if you happen to find some. Sometimes traces of "**4. Paint**" are found on walls, primarily on plaster facing. If the paint is in the form of a design, have the architect draw it and, whether or not there is a design, record the Munsell "**Color**" (number and verbal description) in the space beneath.

**G. CONSTRUCTION**: section records data about the manner in which the wall's individual pieces (stones or bricks) were constructed into a whole.

**1. Style**: The 'Style' column under the 'Construction' heading lists several ways in which walls may be built. The most common stone construction style, "**a. Boulder & Chink**," is composed largely of semi-hewn or unhewn boulders with smaller chinkstones wedged between giving stability to the wall. A wall with a "**b. Ashlar Fit**" is made entirely of ashlar stones so nicely cut that no chinkstones are necessary and it is difficult to insert a knife in the stone interstices (an ashlar fit may be accomplished with "Ashlar," "Dressed," and "Bossed" stones). "**c. Header-stretcher**" refers to a style used mainly with ashlar or dressed stones, rectangular in shape, and placed so that the short sides of the stones (headers) loosely alternate with the long sides (stretchers). Many thick walls are "**d. Rubble-filled**," that is the space between two outer rows of boulders is filled with rubble. Sometimes walls are constructed solely of "**e. Rubble**." Obviously these "walls" would never have had much importance in the past, unless they were extremely thick Mudbrick walls can be constructed in two ways. "**f. Stacked Bricks**" refers to bricks set simply one on top of the other, with no attempt to tie them. **"g. Tied-in Bricks**" refers to the normal type of brick construction found in buildings today, where vertical brick joints never go up through two courses of bricks. If the tie-in is other than the usual alternate pattern found most often today, the method should be described or sketched in the "**4. Remarks**" entry of this section. "**h. Quoin & Pier**" construction (also called "pillar and rubble") is typified by ashlar or dressed stones laid in columns or

column-like formations at intervals of two-to-four meters with the intervening spaces filled with unhewn or semi-hewn stones. "**i. Orthostat**" construction is made up of very large ashlar boulders which are relatively thin, set on edge in the wall. Such a wall may be only one stone thick, though it may also have two rows of orthostats.

You can theoretically mark more than one entry in this column. For example, an ashlar-fit wall can also be header-stretcher. Likewise, you may discover other combinations, such as "Boulder & Chink with Rubble" or "Header-stretcher with Rubble," etc. Mark both entries and explain their relationship in the "L. REMARKS" section. Enter other, single construction techniques in the blank line at the bottom ("**j.**").

**2. Support**: The way in which walls are constructed relative to their surroundings is the concern of this second column describing the construction. If the wall is "**a. Free- standing**" with no visible means of support except its own construction mark the first entry. If short subsidiary walls seem to have "**b. Buttressed**" it, mark the second entry. If the wall was "**c. Battered**" against earth deposits, mark the third entry. Most walls have foundations that help to support them. If so, check "**d. Foundation**." The lack of a mark here is considered significant, since walls without a foundation are rare. Other forms of support may be listed in the blank line ("**e.**"). If your wall is long enough to display more than one type of support, mark the relevant entries and explain in the "L. REMARKS" of this section. Because these entries are interpretive, take special care that they are as defensible as possible.

**3. Tendencies**: This entry is concerned with the aims of the builders as they constructed the wall and as the later occupants used it. Was there an attempt to place flat stones on the outside? Is there a pattern in the way the stones were laid relative to their size, dressing or shape? Is the wall heavy and bulky, monumental or light and flimsy, etc? Try to verbalize the mood the builders were trying to project in their construction. We cannot be rigidly specific regarding terminology in this entry, though you should solicit the advice of your field supervisor and the field director.

**H. COURSES**: Walls are usually built vertically by means of horizontal lines of "**H. COURSES**." Enter here the range of preserved courses visible in the wall, the lowest number first, in the entry marked "**1. No**." If there is no range, simply enter the one number in the first space. If no coursing is observable, mark the entry labeled "**2. Random**."

**I. ROWS**: are lines of stones in a course running the length of the wall. Enter the number of rows in the first space labeled "**1. No**." If the number of rows vary, enter the range with the lowest number first. The concept of "rows" assumes that each row is more or less similar in description; with rubble-filled walls, however, where this is not the case, mark "**2. Two w/rubble**." The following blank line ("**3.**") allows other forms of rowing to be entered, such a "One row w/rubble," etc. If there are no observable rows, mark "**4. Random**."

**J. MEASUREMENTS**: provides space for three dimensional measurements of walls. For the "**1. Length**" give the greatest preserved measurement, because the original wall was at least as long as its greatest measurement. For the "**2. Width**," give a range of measurements from narrowest to thickest, if the range is clearly present. If there is no range, simply enter the one measurement in the first space. The "**3. Height**" should also include the range from the lowest preserved height to the highest.

Give the "**4. Orient[ation]**" of your wall with the compass degree reading of either direction in which the wall runs. Do not give both directions. It is taken for granted that the wall also runs in the opposite direction.

Occasionally you will note a "**5. Dip**" to the coursing of your wall as you follow it lengthwise from one end to the other. The wall may have been constructed that way or one end may have slumped. Enter the degree of the downward slope here.

**K. PRESERVATION**: section describes the preserved state of the wall. If the wall was complete, that is, from the foundation up to the roof, mark the entry labeled "**1. Complete**," but this is almost never the case. If part of the superstructure has been preserved, mark one of three sub-entries: "**2. Partial Superstructure: Most**," "**3. Partial Superstructure: Half**," and "**4. Partial Superstructure: Little**." These should be viewed as blocks of thirds, that is, "Half" should refer to a wall from one-third to two-thirds preserved, etc. If nothing of the superstructure is preserved, mark "**5. Foundation Only: Complete**" or "**6. Foundation Only: Partial**." If the wall has been completely robbed, mark "**7. Robbed**;" this indicates that no sign of the original wall has been preserved for excavation, but a "ghost wall"(robber trench) or some other sign of the wall is all that remains.

Most walls were meant to be vertical, but as the result of destruction or abandonment, they can be found to lean. In "**8. Lean**," enter the "**Direction**" of lean in compass degrees as well as the "**Degree**" of lean from vertical. Use the clinometer for the latter measurement.

With most walls it is useful to record the "**9. Top Foundation Level**," especially if the wall is

poorly preserved. If there is no observable difference between the foundation and superstructure of the wall, the level of the earliest surface used with the wall may be given. Record observations which are not accounted for in the above entries in the "L. REMARKS" entry.

**L. REMARKS**: section belongs to the overall description of your architectural feature. Many times there are subtleties about the wall which are not included in the above specific categories. Give a thoughtful, concise, and specific description of such features here, indicating to which section the comment pertains.

**14. STRATIGRAPHY**.

Several of the 'Stratigraphy' entries have been covered above in the discussion of the Earth Locus Sheet ("4. A. UNDER," "4. B. OVER," "4. C. EQUALS," "4. F. CUT BY," and "4. G. REMARKS"). Because they are essentially the same here, they do not need to be discussed again. However, there are several stratigraphic relationships unique to architectural loci.

**D. ASSOCIATED FT**: (FT stands for "Foundation Trench") should include all locus numbers which designate the foundation trench(es) on both sides of the wall. Although not strictly related to the wall because of the intervening fill layers, this entry is one of the most important stratigraphic entries, since it helps define the earth layers through which the foundation of the wall cut and hence helps to date the original building of the wall. Moreover, the **latest** pottery within the foundation trench fill should give us a theoretical *terminus post quem* for the wall (*i.e.*, the latest date after which the wall was constructed).

**E. CUTS**: use when the wall cuts through or into other loci. Strictly speaking, it is not the wall which cuts the loci, but its foundation trench. There are times, however, when the wall is so close to its foundation line that the trench lines are invisible (such is the case frequently with battered walls) and thus cannot be isolated and assigned a locus number. In such cases, and only then, do we consider the wall itself to do the cutting. If, on the other hand, there is a foundation trench, leave this space blank. Be sure to cross-reference this locus number on the "**F. CUT BY**" line of every locus you recorded here.

**G. ABUTS** AND **H. ABUTTED BY**: are siblings of the same entry. Only walls and wall-like installations can apply here. A wall abuts another when it is built up against a pre-existing wall. Both walls may appear to have been constructed at the same time based on the earth layers related to them, but the fact that one abuts another indicates that the former (the one abutting) was constructed after the latter, although perhaps only by a matter of hours or days. Again, all locus relationships should be cross-referenced, once in the "G. ABUTS" line and the second time on the corresponding locus sheet in the "H. ABUTTED BY" line.

**I. SEALED AGAINST BY**: Since earth layers never "abut" nor are "abutted by" other loci, "sealed against by" is used for recording earth layers which seal against the wall. This relationship implies the prior existence of the wall. The cross-referenced entry occurs as "4. E. SEALS AGAINST" on Earth Locus Sheet.

**J. BONDED TO**: Only walls and wall-like installations may be "bonded to" other, similar loci. Bonding means that, where two walls join, the stones or bricks are part and parcel of both walls, indicating that both walls were constructed at the same time. Of course, both bonded loci should be cross-referenced in their corresponding "J. BONDED TO" entries.

**15. GEOSPACIAL DATA**.

This section has been described above (section 5 in the Earth Locus sheet). Bottom elevations for walls will only be recorded once the founding level has been reached. More exact locations for wall levels are available on your top plans where they should also be recorded.

**16-20. Back (Architectural Locus Sheet)**.

The reverse side of the Architectural Locus Sheet is identical to that of the Earth Locus Sheet. In the "**20. INTERPRETATION**" section, consider very carefully the role your wall played in its larger architectural context. When phases receive their own locus sheets (see 11.I.), list the finds on the locus sheets corresponding to the phase from which they came.

**Installation Locus Sheet**

Though many loci are bonafide "installations," this locus sheet also falls heir to other, "catchall" loci which are neither simple earth layers nor architectural features. Moreover, installations are so varied that it is impossible to be as specific about the format of this locus sheet as the others. Thus, if an installation is wall-like or earth-like, you should fill in the corresponding parts of the Supplements Sheet Abbreviated capital letters, E or A, are reminders.

**21. IDENTIFICATION**.
The information required for this section has already been discussed above (section 1).

**22. RATIONALE**.
This section has already been discussed and needs no further explanation (see section 2). It is not necessary to record separability for installations.

**23. TYPE**.
Because the 'type' of installation is an interpretation, record it at the same time as you fill out the "31. INTERPRETATION" section. Always determine the type of installation with the aid of your field supervisor. Enter one of three abbreviations: if there is absolute certainty about the designation, use "CERT;" if all consulting parties are not quite certain, use "PROB;" and if there is a lesser degree of certainty, enter "POSS."

**A. PIT**: A 'pit' is a catchall term for features dug down into the dirt or bedrock without reference to their function. Mark it only if a specific function cannot be determined. The pit locus is separate from its fill and if unlined, is simply the theoretical line separating the earth outside the pit from the fill within it. In antiquity the pit was an open space below surface level and its designation and description in archaeological recovery should reflect that function. Give separate earth loci to the fill.

**B. SILO**: A 'silo' is a pit used for storage of organic material. It may be lined with stone or bricks, rarely with plaster.

**C. BIN**: A 'bin' is a storage installation usually built of stones or brick above ground, often in courtyards. The walls are often thin and ephemeral.

**D. KILN**: A 'kiln' is a large oven for baking pottery, slaking lime, or smelting metals. It can be below ground level and/or above and is usually constructed of stone or brick. Heavy signs of fire are frequently found.

**E. TABUN**: *Tabun* is the Arabic word for "oven" and is used to indicate a simple household oven, normally used for baking bread. It is usually made of unfired clay which then hardens with use. Potsherds often line its exterior. It is a circular beehive shape, averaging about 50 cm in diameter. Tabun fragments are often found like thick pieces of pottery in earth layers.

**F. CISTERN**: A 'cistern' is an underground facility (usually in bedrock) for storing water. It has a small mouth just large enough to allow a person to descend and widens out beneath bedrock to the size of a small room or larger. Most cisterns are plastered to prevent water seepage through the solution cavities in the local limestone bedrock.

**G. RESERVOIR**: A 'reservoir' is a large, water-storage unit sunk into the ground. Most reservoirs are dug into bedrock, though very strong walls can suffice for the sides in small stretches above bedrock. They are usually plastered, and are so large that several squares are often necessary to expose the entire structure.

**H. BURIAL**: A 'burial' is a pit, intended to contain a skeleton. It may or may not be lined with stones or bricks. A burial, as an "installation," is only concerned with the cyst (pit), not with the skeletal remains (which are recorded on a separate Burial sheet). Objects not found directly with the skeleton are recorded with the installation fill.

**I. PAVEMENT**: A 'pavement' is a floor made primarily from boulder-sized stones. Because it is a surface, it is stratigraphically an earth locus, but its construction makes it also an installation. For similar reasons a "Mosaic Floor" is also considered here, although it, too, functions stratigraphically like an earth locus. Needless to say, mosaics should be described very carefully and the pattern drawn by the architects.

**J. FOUNDATION TRENCH**: A 'foundation trench' is the pit in which the foundations of a wall have been placed. Like any unlined pit, the foundation trench is only the theoretical line separating the undisturbed dirt outside the foundation trench from the fill layers inside. A foundation trench always implies the existence of a wall or wall-like feature.

**K. ROBBER TRENCH**: A 'robber trench' is a pit where a wall or other architectural feature once stood, but has been removed in antiquity so that the stones could be reused or, in rare cases, by ancient or modern treasure hunters. Sometimes whole walls are theoretically reconstructed solely on the basis of robber trenches.

**L. UNKNOWN**: If no one has an idea about the type of installation involved mark this entry.

**M._____**: The blank line is for any other type of installation not covered in the above list. Always check with the field director before assigning a new type.

**24. DESCRIPTION**.

The description section of the Installation Locus Sheet accounts for the fact that installations can be made from almost all materials in an infinite variety of ways.

**A. MATERIAL**: Here we describe the materials from which installations were constructed by using qualifiers to fine-tune the description. As with the "13. A. MATERIAL" section of the Architectural Locus sheet, the first entry to the left of each material should contain the letter(s) of the qualifiers (a-m) which most clearly describe the material. More than one qualifier may be relevant, but usually none will apply ("**a. None**"). Follow the same procedure as that outlined above for the Architectural Locus Sheet in determining which qualifiers are to be used (13.A. a-m). Again, record the percentage of each material used in the mass of the installation in the second space. Several of the materials need to be described in terms which are not available on the Installation Locus sheet. Thus the Earth section of the Supplements Sheet needs to be completed for "**3. Ceramic**," (made out of pottery) "**4. Mud**," "**5. Mudbrick**," "**7. Plaster**," and "**8. Earth**." Complete the architectural section for "**5. Mudbrick**" and "**9. Stone**." The letters "E" and "A" are prompts to use this Supplements Sheet. The terms in this section have all been described elsewhere in the manual or are obvious.

**B. PLAN**: Because of the variety of forms which installations can take, information entered in this field helps give a rough idea of its general shape. Place the relevant qualifiers from the second column, a-f, in the space to the left of the one relevant plan. If, as is usually the case, no qualifiers are applicable, mark the space with "**a. None**." Again, more than one qualifier may be used, but some are mutually exclusive, such as "**b. Rounded**" and "**c. Squared**" and "**d. Nearly**" and "**e. Slightly**."

**1. Linear**: A linear installation is one that is in a straight line (a single wall or narrow, parallel set of walls would be a linear installation). It need not be perfectly straight, but should be very close to it. (Use the appropriate qualifiers to suggest nuances).

**2. Curvilinear**: This is a linear installation which is not straight.

**3. Rectangular**: Select this for installations that tend toward that shape (again, use qualifiers as necessary).

**4. Triangular**: If three angles seem to be present, 'triangular' is a good description.

**5. Circular**: This indicates a tendency toward circularity; perfection not required.

**6. Semi-circular**: A semi-circular installation is half-moon shaped, but not linear.

**7. Oval**: An 'oval' installation can be elliptical, or egg-shaped, as well as truly oval.

**8. Irregular**: is for all amorphous shapes which cannot be described in the above terms (no qualifiers would make sense with this entry). When no qualifiers are appropriate and letter "a" is placed in the entry, it is implied that the installation's plan is very close to the ideal represented by the chosen term. However, it is very infrequent that an installation displays the exact form of any one of these plans.

**10. Remarks**: Annotate here when any ambiguities remain.

**C. LINING**: of installations can be of various materials. Each of the entries listed in this section has been described elsewhere (13. A., 13. E., 13. F.) and needs no more explanation. Simply mark the appropriate entry and, in all but the first case, complete the relevant Earth and Architectural sections of the Supplements Sheet as prompted.

**D. MEASUREMENTS**: (see 13. J.). The orientation (D. 4. Orientation) record need be completed only if the installation tends toward linearity.

**E. REMARKS**: This section needs no further explanation except that, due to the variable nature of installations, it may be necessary to include more remarks than usual.

**25. STRATIGRAPHY**.

There is only one entry in this section which has not been treated previously (see sections 4 and 14).

**J. FILL LOCI**: This includes all the earth loci which make up the fill of a pit. Cross-reference the locus in the "4. E. SEALS AGAINST" entry for each fill locus.

**26. GEOSPACIAL DATA**.

This section is identical to sections 5 and 15.

**35-43. Back (Installation Locus Sheet)**.

The back of the Installation Locus Sheet is identical to other Locus Sheets. See the explanation of sections 6-10 for further information.

**Supplements Sheet**

The Supplements Sheet is used to record an Earth Supplement, Architectural Supplement, or an Installation Supplement as a complement to the principal locus and its locus sheet. Use this sheet when supplementary data is needed, as cued by the letters "E," "A," and "I" in parentheses on the original locus sheets. For example, an architectural feature such as a wall may have plaster adhering to it which requires an Earth Supplement to describe and record that plaster. The requested information is identical to that in the description sections of the three locus sheets.

**Pottery/Bone/Artifact Continuation (Supplement)**

Use this sheet when there is no more space to record **pottery**, **bone**, or **artifact** information on any of the three principal locus sheets or the burial supplement.

Only the basic identification data need be entered here so the data processor can know where the information comes from. If it is missing, the data may not be usable.

The entries here are identical to those on the back of the locus sheets. For pottery, refer to Section 7; for bones, Section 8; and for artifacts, Section 9.

**Top Plan**

**Top Plans** are careful sketches on graph paper, one for each locus, or where two or more associated loci do not obscure each other, more than one may be recorded on a single plan. (For example, a surface and related walls could be recorded together on a single top plan.) A **Daily Sketch** which shows the excavation activities of a single day is optional (and at the discretion of the square or field supervisor), but it does not replace one distinct top plan per locus showing the full excavated extent of the locus with complete top and bottom elevations.

Make a top plan of each locus at its fullest extent and place it next to its locus sheet in your notebook. It is a semi-accurate sketch in pencil on graph paper, not meant for publication, but a fair representation nonetheless. More than one locus may be included on a single top plan, but never at the cost of crimping the portrayal of any one locus. If you place two loci together on one top plan, do not forget to place the number of the main locus on the back of the locus sheet for the second loci.

*The stamp*. Make sure the top plan stamp, which includes the identification data, is stamped onto the *upper right corner* of the graph sheet and fill in the required information. As indicated on the stamp, the scale of the top plan should be 1:50. Both the drawing and *the stamp should be oriented so that north on the plan is at the top of the page*.

*The drawing*. Draw the top plan itself by outlining the shape of your square to scale and drawing the borders and other features of the locus in the correct position. Several measurements from balks are usually necessary and datum lines may at times prove convenient. Sketch in schematically any other loci related to the locus or loci being drawn to lend context to the plan. Locate levels for your loci as precisely as possible with a circled "x" if given by the transit and a plain "x" if taken from a line level measurement. Place the top and bottom levels next to it with a "T" marking the top level and a "B" for the bottom one. These levels should correspond to the level locations given less precisely on the corresponding locus sheet. Sketch the stones in a wall or installation locus individually if it is the *primary locus* of the top plan; if not, simply sketch in the wall lines. The architect will later complete a detailed drawing of the wall including all visible stones and/or bricks. When objects or special features (such as bone or pottery aggregates and heavy organic deposits) are found within the locus, locate them as precisely as possible on the top plan, identify them, and give a level (the bottom level, since they may rest on a surface). If the special feature is at all complex, draw a supplementary top plan at a scale of 1:10. If surfaces are covered heavily with ceramic remains, plot them on the top plan for that surface. If an earth locus slopes, draw an arrow in the direction of the slope and place the slope's measurement in degrees next to it. If there is more than one slope, draw more than one arrow. If any remarks are necessary, record them beneath the drawing.

You may draw the outline of the square for top plans well in advance, because the given measurements of the square remain the same throughout the season. Include the balks of the square in the drawing and make sure the top plan stamp is placed in the upper right corner. It may also be possible at this stage to fill in most of the information requested by the stamp and to sketch the unchangeable features of the square which will be present when you draw the locus. Place the top plans immediately after their corresponding locus sheets in the *Notebook*.

When you illustrate two loci on the same top plan, file it in the correct position for one of the loci involved, usually the first in numerical order, and the location of the second locus in the "DRAWINGS" section (13, 27, 42, 55) of the locus sheet which thus apparently has no top plan.

*Sample top plan.* Read the following discussion while examining the sample top plan. The completed identification stamp in the upper right corner shows that the site was Tall al-'Umayri ("U"), the season 1986 ("86"), Square "5M40," and Locus "31;" the drawing was done on June 7th, "Jun 7," by Larry G. Herr ("LGH"). Both the drawing and the stamp are oriented correctly to North ("N") and the scale is 1:50.

The plan includes the full six-meter boundaries of the square, but only the excavated portion is illustrated. The north and east balks may be completed at a later date if and when the balks are removed. The date for that operation will be entered in the identification stamp in the entry marked "Balk." If the balks are not excavated until a later season, draw a new top plan for the balks. The top plan for balk removal is filed with the new *Notebook*.

Because Locus 31 was a surface it is written on the top plan with a line beneath (use the symbols discussed above in the "4. STRATIGRAPHY" section of the Earth Locus Sheet with top plans). This surface stretches between Walls 27 and 26, and borders on Pit 28 and Oven 23. The three levels (taken with line level from the transit datum point on Wall 26) show that the surface is quite level (sloping only very slightly to the SE) and fairly even in thickness.

Other loci are illustrated to lend context to the drawing. SW of Wall 26 is Surface 25; NE of Wall 27 is Foundation Trench 30 which cut Earth Layer 24 in which is Cistern 16. The top plan is not the place to illustrate stratigraphic relationships for these latter loci and they are not necessarily "in-phase" with Locus 31. However, try to place the primary locus in stratigraphic relationship with the loci immediately adjacent to it. Thus Surface 31 is seen to run up to Walls 26 and 27 and Oven 25 while it is cut by Pit 28.

Because the drawing could be understood to suggest that Pit 28 was cut from Surface 31, the remarks at the bottom of the drawing assure any interpreter that it was cut from a higher level. While this information is not mandatory (it occurs with the top plan of Locus 28), it aids the analysis of this top plan.

**Progress of Excavation**

The excavation report is sometimes facilitated when the researcher can reconstruct the progress of excavation in a square. The *daily photographs* of each square and the "DATES" entry in the identification section (sections 1, 15, 29, 44) of the locus sheets aid in this endeavor. But every square supervisor should fill out a **SQUARE SUPERVISOR DAILY SUMMARY**, which entails a listing the loci worked during a single day.

*Square Supervisor Daily Summary*. Include identification data on the first line: "Site," "Season," "Field," "Square," "Date," and "Supervisor." List all loci worked on during the day. The "**Action**" column should include descriptions of what was done, such as "Probed through in NW corner," or "Exposed three more courses," etc. The bottom half of the page should include three short descriptions of digging activity. First, give a quick "**Description of [the] Strategy**" for the day, such as "Attempted to peel Layer 34 across the whole square," or "Drew sub-balk and removed all fill in Pit 96." Be sure to acknowledge when strategies changed. This is the time and place to explain why. Next, describe how "Execution" of the strategy was performed, such as "Removed Layer 34 by meter increments from W to E," or "Removed the remainder of the fill in Pit 96 locus by locus from the top of the sub-balk." Finally, describe the "Results," such as "Layer 34 was almost totally removed; only a $1.0 \times 1.0$ m patch remains in the SE corner," or "Pit 96 was totally cleaned of fill and the sides were scraped to ensure the absence of contamination." Be as accurate, but as concise, as possible.

*Square Supervisor Weekly Summary*. In order to provide the perspective of hindsight to this daily information, square supervisors fill out a **SQUARE SUPERVISOR WEEKLY SUMMARY**, which entails a listing of the loci worked on during the week. The sections of this sheet are identical to those of the "daily" sheet, except for the "Interpretation" section (which replaces the last three on the "daily" sheet). This "Interpretation" section allows you to describe the meaning of the features you excavated during the week. Try to reconstruct the cultural history indicated by your loci: "Bonded Walls 37 and 39 form the SE and NE walls of a (possibly) domestic room, associated with plastered Surface 45. NW of Entry 44 (a probable doorway), is Beaten Earth Surface 59 which contains Hearth 61 and midden Pit 63. Taken together, Square 4M37 indicates a room with a doorway opening onto a (possibly) exterior food- preparation area." Of course, each weekly summary may not be so neatly interpretable!

## III. GLOSSARY

with significant contributions by Randall W. Younker and David Merling

Many of the terms in this glossary do not occur in the Manual. But because they often come up during conversation, strategy sessions, pottery readings, and lectures, they are included here for your convenience.

### A

*Age* An archaeological era, often divided into periods. It generally derives its name from the dominant technological capability of the time; for example: Lithic (stone), Chalcolithic (copper-stone), Bronze, and Iron.

*Amphora(e)* Greek term for a large jar with two handles.

*Amphoriskos* Greek term for a small jar with two handles.

*Amulet* Small object used for personal cultic purposes.

*Analytical Sherds* See Diagnostic Sherds.

*Apse* A semi-circular area at the east end of Byzantine churches; with a vaulted ceiling.

*Aqueduct* Water channel.

*Architect* The specialist who is responsible for drawing final top plans of all architecture.

*Artifact* Anything that has been made or modified by humans.

*Artifact Registration* The process during which artifacts are cleaned, numbered and described. A staff specialist is assigned to oversee this process.

*Ashlar* Well chiselled and squared building stones.

*Assemblage* A group of objects of different types found in association with each other.

### B

*Balk* The vertical section of earth, usually one meter wide, left between excavated squares for control of stratigraphy (standing balk). The term is also used to refer to one of the four sides of a square. When excavating a probe, the standing balks are called main balks and the new, temporary balks, are called subsidiary balks.

*Balk Stamp* A rubber stamp used on balk drawings which provides space to record site, season, square, locus, date, balk, supervisor, north (orientation), and scale.

*Balk Stub* The intersection of two balks, revealed when one balk is removed.

*Beaker* A pottery drinking vessel usually with depth greater than diameter and also usually with handles.

*Beaten Earth* A hard earth surface which has been compacted by traffic. It is often associated with paths, floors, or other occupational surfaces; (*cf. terre pisee*).

*Bedrock* Solid underlying rock formation below the level of human activity and artifacts.

*Bedrock Party* A traditional celebration marking the completion of excavation in a square (actually, it is merely an excuse to justify a party ... almost any “reason” will do).

*Bema* A platform in a cult center.

*Bench Mark* A point (usually with exact elevation in meters and centimeters above sea level) to which all elevations are referenced. Also called datum mark or simply, datum.

*Biodata* Organic samples (seeds, microflora, etc.) collected by excavation, sifting, and flotation.

*Bioturbation* Mixing of debris caused by burrowing animals.

*Body Sherds* Sherds from an undiagnostic portion of a vessel.

*Bone Bag* The plastic bag in which bones are collected during routine excavation. Comparable to a pottery pail for pottery.

*Bonded* Two walls with interlocking stone or bricks (as opposed to abutting one another); a technique which suggests that the walls were built together at the same time.

*Bossed Stone* A stone with its edge or border trimmed, leaving a rough face in the center.

*Bulla(e)* Small clay object that sealed ancient documents; Iron Age examples often contain seal impressions.

*Burnish* A polish given to a pot by rubbing the dried clay with a tool before firing.

**C**

*Cairn* A mound of stones covering a burial or serving as a landmark.

*Carination* Angular ridge around the body of a ceramic vessel where the body takes a sharp turn.

*Cartouche* Oval frame encircling an Egyptian royal name in hieroglyphic signs.

*Casemate Wall* A fortification system made up of two parallel walls with periodic crosswalls; in plan, it looks like a ladder.

*Ceramic Technician* The specialist responsible for analyzing how pottery is made: type and mixture of clay, inclusions, firing procedures, construction techniques, initial, and secondary pottery use, etc.

*Characteristic Sherds* See Diagnostic Sherds.

*Cistern* An underground "pit," often plaster-lined, used for water storage. It may be associated with a system of channels for channeling water to its mouth.

*Contamination* The invasion of non-contemporaneous foreign material into a locus or a group of finds. A locus could have been contaminated in antiquity or by faulty excavation process.

*Coprolite* Dried or fossilized feces.

*Corbelling* The roof-building technique wherein stones or bricks extend over space, overlapping each other, until they meet and are then covered with a capstone.

*Course* Layers of brick or stone in a wall; a stone wall, three stones high, would be have three courses.

*Crater* See Krater.

*Cyclopean Wall* Wall of massive stones; irregular and close-fitting. The stones are so huge that, as the ancient Greeks said, none but the Cyclops could have built the wall!

*Cylinder Seal* A cylinder-shaped object (most often of stone) incised to produce a seal impression when rolled over moist clay.

**D**

*Data Processor* The staff member responsible for inputting handwritten excavation data into the computerized database.

*Datum* See Bench Mark.

*Datum Line* Fixed line in a balk with a known level. It is used for drawing to scale.

*Debitage* Bits and pieces left over from a manufacturing process; *i.e.* "flint debitage," the flint flakes left over from tool-making.

*Detritus* Debris composed of loose, disintegrated rock and mudbrick.

*Diagnostic Sherds* Sherds from rims, bases, and handles; or with decoration or special form. They are used as chronological indicators or to provide insights into the pottery-making industry.

*Dipinto* A painted inscription.

*Dolmen* A megalithic burial above ground level made up of two or more upright stones with a capstone.

*Door-jamb* Frame of a door opening, the vertical edge of a doorway.

**E**

*Earth Layer* A homogenous deposit of earth that can be separated from other layers above and below.

*Elevation* A drawing of a wall face. It is not the level of a feature above sea level (see Level).

**F**

*Faience* Powdered quartz, covered with glaze; used primarily for Egyptian(-style) amulets and figurines.

*Favissa(e)* See Votive Deposit.

*Fibula(e)* A decorative "safety pin" used to hold clothing in place; it is usually made of bronze, rarely of bone.

*Field* A sector or area of excavation made of a group of squares, and is identified by a capital letter (for example, Field A). Excavation is supervised by an experienced archaeologist called a field supervisor.

*Field Notebook* The Field Notebook includes the Handbook, Introduction page, locus sheets, supplementary sheets, top plans, and daily and weekly Summaries.

*Figurine* A small model of a human or animal.

*Fill* Debris used to level or elevate an area for subsequent construction activities.

*Flint* Very hard stone, often used as raw material for making tools; *cf.* Debitage.

*Formator* The pottery reconstructor.

*Foundation Trench* A trench dug as part of wall construction into which the foundation for the wall is laid. Archaeologically, it is treated as a pit.

*Founding Level* The bottom level of a wall's foundation.

*Fresco* Painting on wet plaster; a type of wall decoration.

**G**

*Ghost Wall* A "robbed-out" wall from which the stones have been removed, leaving a filled robber trench.

*Glaçis* The "glass-like" slope of beaten earth, often covered with lime, outside the fortifications.

*Graffito(I)* Figures or inscriptions informally scratched or painted onto a surface.
*Grid* The general surveying organization of a site, based on a grid with the lines oriented to true north and, at MPP sites, 6.00 m apart. This forms excavation squares $6 \times 6$ m each.

**H**

*Hammer-dressed* Roughly-smoothed building stone, not polished, but clearly worked in antiquity.

*Handpick* A small, hand-held pick (*aka*, "mankush") used in primary excavation.

*Header* A wall stone, the longitudinal axis of which, is perpendicular to the line of the wall. In construction, they may be associated with "stretchers."

*Hearth* An open, uncovered cooking pit; often characterized by burnt debris and charred stones.

*Hoard* A group of small objects (such as coins) found together.

*Hoe* A squared or pointed tool used for scraping or moving loose dirt.

*Huwwar* Arabic term for soft, chalky, white limestone.

*Hygroscopic* The property of some materials (such as wood, etc) to absorb water.

*Hypocaust* A Roman period heating system, often in baths, which consisted of hot air circulated through a subfloor. The heat radiated through the floor and into the room.

**I**

*In phase* The condition wherein all the remains visible in a square or field are part of the same occupational phase.

*In situ* Finds are *in situ* when they are found in their original location. *In situ* finds have not been moved and then replaced.

*Indicator Sherds* See Diagnostic Sherds.

**K**

*Kiln* A special, industrial oven which was used for baking pottery or reducing lime from limestone (for plaster).

*Kokh(im)* Hebrew term for a loculus or burial niche.

*Krater* A large bowl often with handles.

**L**

*Lapidary script* The writing style on a stone monument.

*Lapis Lazuli* A gemstone of intense blue color.

*Large pick* A large, hand-held primary excavation tool used for loosening debris quickly. It is only used when it has been clearly established that an earth layer is so thick that no finds will be destroyed.

*Layer* A distinctive earth deposit distinguished by identifying characteristics: color, texture, soil type, etc.

*Lens* A verbal descriptor for a small earth layer that thins (lenses) out and disappears. It is usually considered a part of a layer.

*Level* The measurement of the altitude of a feature in meters and centimeters above mean sea level; it is obtained from on-site bench marks established by surveyors.

*Lime* Finely crushed limestone with particles seldom larger than sand grains, and not cemented into plaster.

*Lintel* In architecture, the horizontal piece over doorways.

*Loculus(I)* A burial niche in a tomb; *cf.* kohkim.

*Locus(I)* The basic unit of the recording system. It is any item, real or artificial, which can be isolated, defined, and related to other loci (or features), such as earth layers, walls, pits, etc.

*Locus Number* An arbitrary arabic number assigned to a particular locus. In each square the loci are numbered in a sequence that is not repeated as long as the square is excavated.

*Locus Sheet* A form, completed by hand in the field, which organizes the descriptive data of a particular locus or burial. There are three varieties: earth, architectural, and installation sheets.

*Locus Summaries* Inclusive data summaries produced by the computer from locus sheets and specialist reports. Ideally, these summaries provide complete data and cross-referencing.

**M**

*Main Balk* See Balk.

*Massebah* Hebrew term for a standing stone. Often associated with cultic activities.

*Megalith* A single, large stone. Walls and buildings made from megaliths are called megalithic.

*Menhir* A single, upright megalith, apparently for commemorative purposes.

*Meter stick* A ruled rod, often one meter long, used as a scale in photographs.

*Microlith* A very small flint tool typical of the Epipaleolithic period.

*Midden* A refuse or garbage heap.

*Monolith* A single, large, hewn stone.

*Mosaic* A floor or wall design made of small cubed stones (tesserae).

**N**

*Naos* The central chamber of a temple.

*Nari* Very soft limestone which breaks up easily, pieces of which can sometimes be broken off with the bare hand; often described as “decayed” limestone. Crushed nari originates from this soft limestone and is the easiest limestone surface to make and maintain. It is therefore frequently encountered, especially in thin, laminated surfaces which represent repairs made on the original surface. Crushed nari can have many particle sizes in its texture, including pebble-sized grains.

*Nave* The central portion of a basilica-type building.

*Necropolis* Lit. “dead city;” a cemetery.

**O**

*Object* Objects are artifacts with possible museum interest and are handled differently than other artifacts. They are registered with the government, photographed, and drawn.

*Object Registrar* Specialist who controls and operates the object registration process by registering each object with the government, describing them in detail on object forms, and conserving them as necessary. The registration numbers assigned by this person are entered onto the locus sheet in the "OBJECTS" section.
*Orthostat* Usually a large, thinly hewn stone, often used in walls placed upright on one of its thin edges.

*Ossuary* A small, stone box used for secondary burial of human bones; primarily Roman period.

*Ostracon(a)* A potsherd with inked, painted, or inscribed writing.

*Oven* A closed structure used for baking; distinguished from a hearth by being closed.

**P**

*Palaeobotanist* A specialist who studies ancient botanical specimens.

*Period* A chronological term referring to a cultural horizon. It is sometimes used as a sub-division of an Age, or may refer to the dominant people group; for example: MB II period; Roman period; etc.

*Phase* A distinct stage of habitation or development as determined by excavation. It is normally a sub-division of a stratum, but is also used by us to designate temporary stratification before a final set of strata are assigned.

*Pilgrim Flask* A ceramic vessel with flat, spherical body (like a lentil), usually with one or two handles.

*Pithos* A large, ceramic storage container (jar).

*Plan* A plan (or top plan) is a drawing of a locus or loci as viewed from above.

*Plaster* Lime which has been cemented into a fairly hard material; it is usually used for coating walls, often in water storage facilities. In such cases it is rarely more than 2 or 3 cm thick and seldom less than 0.25 cm thick.

*Pollen sample* An earth sample collected in order to detect the spectrum of plant life (by pollen).

*Postern* A secret, semi-hidden gate in a city wall.

*Potsherd* A broken piece of pottery; most often abbreviated as "sherd." Its British form is "pot-shard."

*Pottery Identification Tag* A form which is attached to every pottery pail in order to identify the original location of the pottery.

*Pottery Pail* A bucket, properly tagged, into which collected pottery sherds are stored in the field prior to cleaning, analysis, and registration.

*Pottery Reading* An afternoon activity at which pottery sherds are chronologically identified by specialists.

*Pottery Registrar* The staff member who registers pottery and directs selected sherds to various other stations for analysis, including the ceramic technician, and the formator.

*Pottery Registration* The process during which the pottery registrar registers pottery and conducts preliminary analysis, including inking the registration numbers on publishable sherds, sawing them, and photographing selected sherds.

*Pottery Washing* All pottery recovered is washed in the afternoon to prepare the sherds for pottery reading.

*Probe Trench* A small, exploratory excavation, often not larger than $1 \times 1$ m. It is dug in order to test stratigraphy prior to larger excavation.

*Provenance* (provenience) Place of origin.

*Pyxis* Greek term for a small, squat, cylindrical ceramic vessel.

**Q**

*Quern* The lower millstone upon which grain is ground.
*Quoin-and-pier* (pronounced "koin and peer") is a method of stone wall construction in which uncut field stones (quoins) are "wedged" between vertical ashlar pillars (piers). Also called *a-telaio*. The piers are often at intervals of two-to-four meters with the intervening spaces filled with unhewn or semi-hewn stones.

**R**

*Revetment* A wall built below a step or vertical face of a bank (terrace) to prevent slippage or to maintain a level surface.

*Robbing* Ancient or unauthorized modern digging into earlier remains.

*Roof Tiles* Ceramic roofing materials.

*Row* A single line of stones in a wall course.

**S**

*Scarab* A seal and/or amulet resembling a dung beetle (scarab) which was sacred to the ancient Egyptians.

*Sealed Locus* A locus which is stratigaraphically situated so as to be inherently free from contamination by later or intrusive loci. Usually, this means it lies below an undisturbed locus.

*Section* A vertical cut through any locus or loci. The term is also used for drawings of such cuts. A balk drawing is an example of a section drawing.

*Sherd* See Pottery Sherds.

*Sieve* The screened tool for separating objects from dirt. Also the process of that recovery. Sometimes called "sift" or "sifting."

*Significant Sherds* See Diagnostic Sherds.

*Slip* A thin, outer layer of liquid clay applied to pottery prior to firing.

*Square* A single excavation unit, usually $6 \times 6$ m (including balks), and is identified by the grid designation to which it corresponds. Several squares make up a field. Excavation is supervised by a square supervisor, in consultation with a field supervisor. The north and east balks are integral components of the square.

*Stela (or stele)*, pl. *stelae* An upright stone, often with an inscribed or sculptured surface.

*Stratigraphic Context* The scientifically verifiable archaeological setting in which an object, installation, or locus is found.

*Stratigraphy* The relationship of loci and phases to each other.

*Stratum(a)* An occupational level of a site in terms of architecture (contemporaneous buildings) and associated earth layers. It includes three stages of activities: 1) preparation of the site, 2) use of the buildings and associated surfaces, and 3) deposition of destruction or abandonment debris.

*Stretcher* A wall stone laid so that its long axis follows the line of the wall. In construction, they may alternate with headers.

*Subsidiary Balk* A balk temporarily left standing to clarify the relationship of one locus to another when one of the main balks cannot be used.

**T**

*Tabun* The Arabic term for a baking oven; it is usually made of clay and shaped like a beehive; see tannur.

*Talus* The debris formed by dry accumulation at or near the bottom of a slope.
*Tannur* The Arabic term for an oven which is larger than a tabun.

*Tall* Arabic term (formerly spelled tell; tel in modern Hebrew) referring to a mound of ruined cities, or strata, stacked one on top of the other, like a layered cake.

*Temenos* The sacred area of a temple.

*Terminus a quo* "Point from which," that is, the earliest possible date (=*terminus post quem*).

*Terminus ad quem* "Point to which," that is, the latest possible date (=*terminus ante quem*).

*Terminus ante quem* "Point before which," see *terminus ad quem.*

*Terminus post quem* "Point after which," see *terminus a quo.*

*Terra sigillata* A type of fine Roman pottery covered with a thick red slip; often called "Roman red ware."

*Terra-cotta* Baked clay, ceramic.

*Terre pisee* French term for beaten earth surface.

*Tessera(e)* Small, individual stones or ceramic cubes used to make mosaics.

*Threshold* The sill under a doorway.

*Transit* The surveying instrument used to establish levels.

*Trowel* A triangular-bladed, hand-held primary excavation tool which cuts or scrapes the earth during removal. It is very sensitive and can be used for delicate excavation and trimming.

*Tumulus* An ancient grave mound.

*Typology* The study of the ways in which genres (or types) of objects or features change and develop through time by classifying and sorting them.

**U**

*UD* A casual abbreviation of "undeterminable;" it is used for any object or feature which does not display enough diagnostic characteristics to define it.

**V**

*Votive Deposit* An object or group of objects left in a sacred place. Also called a favissa.