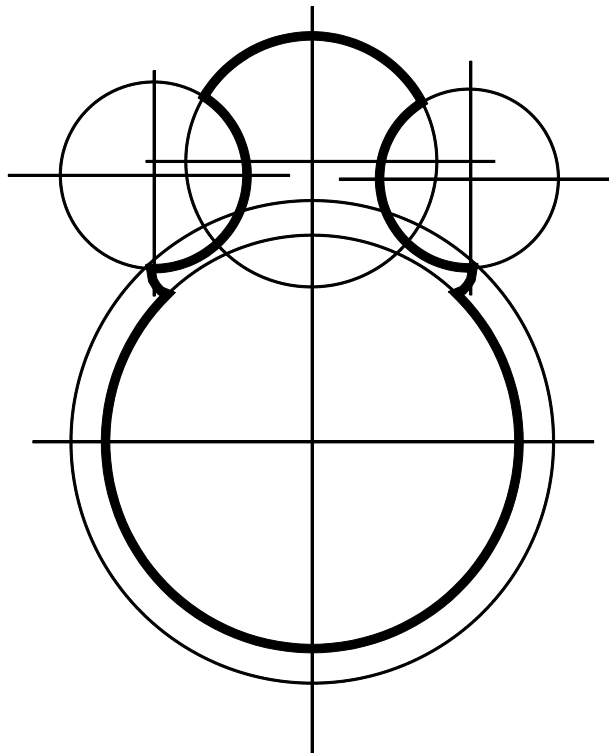


**THE SHIKHIN EXCAVATION PROJECT
MANUAL FOR AREA SUPERVISORS**
(Formerly the Excavations at Sepphoris Manual for Area Supervisors)

**James F. Strange
Thomas R. W. Longstaff
Dennis E. Groh
James Riley Strange**



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PREFACE

(From “The American Archaeological Field School in Galilee: Pedagogical Goals, Educational Outcomes and Participant Impact,” by James Riley Strange and Penny Long Marler, forthcoming)

“What we refer to in this paper as ‘the American archaeological field school in Galilee’ emerged in the 1970s. It drew, however, on developments at Judean sites in the early 1960s as digs began to hire fewer local workers and to rely more heavily on volunteer labor. At Masada in 1963, Yigael Yadin began using both Israeli and foreign volunteers whom he trained in archaeological method. Probably one year earlier in ’62, David Noel Freedman used a similar practice at the Ashdod Excavation Project. Freedman made the dig’s educational goals and training in method explicit and offered lectures to volunteers. In 1964, Hebrew Union College Jerusalem and the University of North Carolina Chapel Hill offered a summer seminar in Israel that included experience excavating at Tell Arad. Bernard Boyd of UNC Chapel Hill continued to offer lectures, presumably to both student and non-student volunteers, at digs he helped to organize at Beersheba, Lachish, and Arad into the mid-1970s.

“It was the field school at Tell Gezer that developed the prototype adapted by American directors at many Galilean excavations. In 1964, William G. Dever, a student of G. Ernest Wright and veteran of the Drew-McCormick Expedition at Shechem, began using students and non-student participants rather than hired workers as the base for the excavation crew of the Hebrew Union College/Harvard Semitic Museum Excavations at Tell Gezer. Dever gives two rationales for making this change: the first was to assign the digging to people who were educated in archaeological reasoning and excavation methods; the second was to popularize and spread American archaeological methods. H. Darrell Lance, Associate Director of Gezer’s Phase I, wrote an *Excavation Manual for Area Supervisors* in 1967, which Joe D. Seger, Phase II Director at Gezer, updated as the *Handbook for Field Operations* in 1971. This was followed by Dever’s and Lance’s *A Manual of Field Excavation* (Dever and Lance 1978). Archaeologists with ties to Gezer exported and adapted this model to other site excavations: notably Joe Seger at Tell Halif (the Lahav Research Project) and Eric M. Meyers at the Meiron Excavation Project in Galilee. Shechem veteran Larry E. Tombs, with Jeff A. Blakely *et al.* set up a similar school at Tell el-Hesi (The Joint Archaeological Expedition), as did Robert J. Bull, also a

veteran of Shechem, at Caesarea. Beginning in 1970 the Meiron Excavation Project gave two courses for credit and appointed an Educational Director to its senior staff while increasing the number of evening lectures and adding afternoon and weekend site tours to the curriculum.

“James F. Strange wrote the manual for the excavation Bob Bull directed at Caesarea, and as early as 1972 he revised it to create the ‘Meiron Excavation Project Manual for Area Supervisors.’ In the following decades, that manual was adopted by and revised for site excavations all over the Galilee, among them the University of South Florida Excavations at Sepphoris directed by James F. Strange, the Sepphoris Regional Project directed by Eric and Carol Meyers, the Omrit Excavations directed by J. Andrew Overman and Dan Schowalter, the Excavations at Khirbet Qana directed by Douglas Edwards and C. Thomas McCollough, and the Shikhin Excavation Project whose field school is the focus of the present study.”

The aims of the SEP field school, therefore, are to collect data and to educate the people who collect the data. This Manual explains how and why to achieve the first goal. Its purpose is the second.

INTRODUCTION

At the site of Shikhin, Area Supervisors control the excavation, recovery, and recording of data that help the directors form a picture of daily life at ancient Shikhin. Accordingly, no task is more important. The work requires that Area Supervisors somewhat ingeniously maintain both scientific control and Square morale, and that they think beyond the moment to an imagined future when dig directors comb through their field notes, seeking to understand how excavations proceeded on a particular day, grasp one soil layer’s relationship to another, or even correct an error in a registry. It is essential, therefore, that Area Supervisors know the details of the digging and recording method, and that they appreciate why these details are important.

Objectives: Before sinking a spade into the ground, it is absolutely imperative that Area Supervisors have a clear idea of (1) what they are doing and (2) why they are doing it. The more basic question is the second. If they have formed a clear answer to this question, they are in a better position to answer the first. If the thrill and romance of discovery is the aim, then methodology can simply be digging holes for pots. If

some more global aim controls the process, such as the elucidation and reconstruction of history and culture, or the discovery of the laws of process in human culture, then a much more careful approach is in order.

More than sixty years ago, W. Taylor noted that the gathering of data from an archaeological site really followed from the desire to recover what he called the “human environment” (1948). Twenty years later, R.A. Heizer and J.A.A. Graham called it the desire “to learn as much as possible about the form of culture and way of life of (ancient) people.” Since then, others have offered the goal of understanding culture through an explicitly scientific approach, through systems theory, or through ecological models. Others seek to disclose past ways of thinking about things as deduced from archaeological remains (cognitive archaeology). Then there are concerns for gender, history, evolution, post-modern concerns, and questions of value and religion (or ritual). All of these have followers, but we find our conceptual home to be closest to the goals of social archaeology, i.e., the reconstruction of past social systems and relations (Renfrew 1984). Archaeology makes available the physical evidence for past human activity and values and thus provides importantly different information than that found in literary texts. Literary texts tend to focus on unusual or atypical individuals, those who make history. Archaeology provides a broader range of information, often from the activities of those people and groups who go unmentioned in literary texts.

Broadly speaking, archaeological method is designed to recover and record data in such a way that the archaeologists can infer a model of an evolving social world. The inference is ultimately made through verbal descriptions (field notes), top-plans, sections, and photographs. Earlier generations of archaeologists concentrated either on the vertical dimension of digging down to living surfaces or upon architecture as defined exclusively by walls and rooms of a given building. The Sepphoris and Shikhin method incorporates both of these former concerns and emphasizes the interrelationship of the *loci* and *strata* (see below) and the structures. Archaeologists dig vertically, but ancient people lived horizontally: that is, within a given spatial and temporal period. Hence, stratigraphic archaeology may be said to be a method by which deposits in space are turned first into records of inferred sequences (which deposits came first and which came later), and then into complex technologies, social structures, beliefs, and

values that changed over time (the historical and human dimension).

In any case, the potential archaeologist needs to know that archaeological excavation is a destructive science. In the process of examining the evidence the archaeologist destroys it. Materials will never again lie as they do before they are exposed by an excavation. In other words, fieldwork by its very nature dismantles the original record in soil and stone. Therefore, it must follow that the responsibility of the Area Supervisor or volunteer as archaeologist includes keeping as complete a record as is reasonably possible. It is even necessary to record things that may appear to be trivial or of no special significance to the neophyte. One never knows what will be important later.

Consequently, just as the aim of archaeology may be understood in terms of the reconstruction of past social systems and relations, so its method includes (1) digging with maximum control and (2) recording for maximum information retrieval.

The person reading this manual should keep in mind, then, that the excavation and recording system presented here is intended to reflect this twofold consideration. Its usefulness will be judged by its ability to enable the excavator to fulfill the need for control and the recovery of data.

Peculiarities of a Ruin: There is another consideration, however, and that is the nature of the site itself. A ruin, such as ancient Sepphoris or Shikhin, makes peculiar demands on the archaeologist that a tell does not: namely, unlike a tell, in a ruin, later occupants often dug into or even cleared away the debris of earlier occupants. Tells are the more traditional sites of interest in ancient Near Eastern archaeology. In the cases of Sepphoris and Shikhin, we have material, sometimes deep, sometimes shallow, deposited as the result of natural processes such as erosion, or as a result of human activity. We have occasional traces of walls at the surface, underground chambers, re-used building stones, stone fall, and other characteristics unique to a ruin. Excavating in this context requires a unique response from the excavator. This manual is the result of many years’ digging in ruins and in a few tells. It has benefited from criticisms from students, Area Supervisors, Field Supervisors, and others. It is to them that it is dedicated.

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EXCAVATION METHODS

Before launching into a discussion of excavation methods, a few words about surveying will be helpful. Most excavations like those at Sepphoris and Shikhin begin with an archaeological survey, conducted either by the archaeologists who dig the site or by a separate team. For our purposes, "survey" refers to two activities. The first is to walk the site and simply to look at it. Volunteers spread out in a line and walk slowly, with eyes to the ground, watching for anything that interrupts the organic jumble of nature: concentrations of pottery sherds, architectural fragments, three or more stones in a straight line, cuttings in bedrock, cistern openings, tombs, and so on. Such indicators of human activity allow archaeologists to make educated inferences about

where to sink their first probes. Also, although they will not be tied to particular loci (see below), the types of pottery sherds and their relative frequency enable archaeologists to form hypotheses about the life of a settlement (founding date, periods of growth and decline, and abandonment), whether pottery was made locally or imported, where domestic spaces probably stood in distinction to industrial and other types of space, and many other things, all of which can be tested by excavating.

The second use of "survey" matches more closely what many think of: in the "old days," the use of surveyor's transit, chains, and range poles; and more recently, the use of total station or extremely powerful GPS (global positioning satellite) or GNSS (global navigation satellite systems) receivers to create a contour map of the site and its features of archaeological interest. As with other technologies that have transformed what used to be done on paper alone, the map is created digitally before ever being printed. Indeed, it may never see paper. Also, it can be combined with aerial photography of the site to create a GIS (geographic imaging system) database, which itself can contain a startling amount of data, including information from remote sensing (satellite photos, LIDAR, and other technologies that "see through" vegetation and even the soil) as well as raw data collected in the field in the form of drawings, photographs, and even hand-written field notes. The database can then be made available on-line and in interactive form, and it can be continually edited and updated as more data come out of a dig, to which subject we now turn.

The "rules of excavation" are derived from two readily understandable principles: (1) One digs each locus (or three-dimensional feature, including soil layers—see Glossary) separately from all other loci, and one does so with maximum control. (2) The aim of stratigraphic digging is to separate the artifacts, pottery, biological samples, etc. from each locus as cleanly as possible, as each layer is understood by its own unique contents and dated by the latest artifact within it.

In American excavations in the Middle East, one or more contemporary loci make up a "phase," a set of phases constitutes a "stratum," and the various "strata" form the material history of the site. For example, all of the loci that date to a discreet sub-historical period constitute a "phase," such as the Early Roman phase. All the phases that date to a historical period constitute a stratum—i.e., one may hypothesize that the ER stratum is comprised of Early Roman

phases 1 and 2. But our understanding of the characteristics of strata, phases, and loci in terms of relative or absolute date, type of occupation, and so forth rests upon our knowledge of the distributions of the artifacts and pottery in the loci themselves. The distributions can only be recovered if they have been excavated and recorded separately, with minimum contamination, locus by locus.

Our study of the separated artifacts, layer by layer, distribution pattern by distribution pattern, enables us as archaeologists to infer a typological history of tools, weapons, pottery, etc. We can also infer the development of technology for a site. In addition, we will reconstruct the social systems and relations of the people of Sepphoris and Shikhin. We will even forge a model of their religions, values, politics, and aesthetics. Eventually, we will deduce the development of the economics and religion or other social relations of the people for an entire region. But without the prior separation of artifactual material by loci and the careful recording of position, the task is rendered virtually impossible.

Consequently, contamination of one locus from another, or the intrusion of later artifacts into earlier contexts, is a grievous error in excavation, for it completely skews the data upon which we base our interpretations. Each layer must be removed in such a way that no later material is carelessly mixed with earlier.

Therefore, (1) dig one locus at a time. If you must dig two loci at once, make provision to dig them far apart so that you minimize the danger of contamination. (2) Dig the latest locus first. For example, pits are always excavated before digging the layer(s) into which they are cut. (3) Dig the locus at the highest elevation first. (4) Select tools with the type of earth removal in mind: pick and hoe for major dirt moving, hand-held pick ("patish") and trowel for small areas, and knitting needle, spoon, or dental tools and brush for delicate work. (5) Dig at one elevation, i.e., excavate the entire layer at once so that structures emerge all at the same time, if possible (called "digging in phase," see below).

It is generally preferable to finish digging one locus entirely before starting another. In practice, however, it is not always possible to follow this dictum, as it may not be feasible to keep an entire crew busy on one locus. If so, then another locus may be dug in a removed part of the square if proper precautions are taken. Pottery buckets are to be far apart (one for each locus) and even of different colors, if

possible. Tags must be predominately displayed and very clearly marked. Object boxes and bone bags need to remain by their respective pottery buckets. Gufas (rubber baskets) of soil are to be tagged to avoid contamination at the sifter. All possible correctives need to be built in, for once contamination takes place, one can never be sure of successful "decontamination."

If one digs the latest loci first, one reduces the possibility of contaminating earlier loci. Digging two loci or areas of distinct date is called "digging out of phase" and is to be avoided for the reason mentioned. In practice, this means that all pits, burials, and foundation trenches must be removed before probing the earlier layers into which these intrusions penetrate. One may even have to "overdig" a foundation trench or pit to be sure that all of it is gone before continuing. This means digging into the loci into which the foundation or pit was dug in antiquity. Digging slightly into an earlier locus does not distort the dating, as any earlier material that comes up with the later locus cannot alter the dating of that later locus. On the other hand, leaving even a few sherds of later pottery in an earlier locus will definitely change the estimated date of the earlier locus, as it must be dated by its latest contents.

Therefore, remove the later layers first, dig in phase, and dig cleanly at one level.

Just a final note: if in the course of digging you think you may be coming onto a new locus, but you are not sure, then clean up, change buckets, and take new elevations. This is a way of protecting yourself in case of doubt, as the new bucket can always be assigned to the next locus. But if there is any possibility that it contains pottery or other artifactual material from the old locus, then assign it to the old. Remember that the date of the upper layer cannot change by having earlier pottery in it.

Starting a New Square

It is well to remember that you, the excavator, will always dig blindly, even if you have some idea of what lies beneath your feet. Therefore, it behooves you to move cautiously at first, carefully selecting your area of first earth removal. This means in practice that you must remove all grass and other vegetation from the entire square (including balks) before you can lay out the first probe. Vegetation and other organic matter can conceal a great many important details.

After clearing vegetation, your first task, if it is not done for you already, is to string up your square. This means stretching strings from the four corners of your square so that you can isolate your plot from all the others around. This also ensures that the area you excavate is a square that can be precisely located on the master grid for the site and later incorporated into a master plan for the excavation.

The surveyor should have surveyed in by optical instrument at least two, if not all four, corners of your 5 x 5 m. square. If the surveyor has located two corners on grid, e.g. the NW and NE corners, and if the ground is flat, then you can stretch one tape five meters from the NW corner and stretch a second tape **7.07 meters** on the diagonal of the 5 x 5 m. square to find the fourth corner. Use string and line levels to assure that the measuring tapes are level. Check the placement by measuring from two other known points.

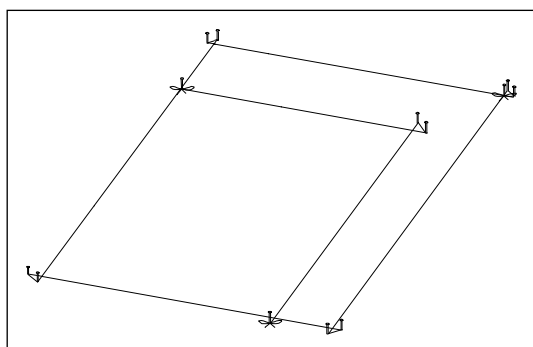


Fig. 1: 5 x 5 and 4 x 4 meter squares triangulated.

The figure shows the triangulated corners of the 4 x 4 meter digging plot within the 5 x 5 meter square. You will use balk string for the process, which is like ancient Egyptian or Greek geometry (string stretching). Remember that you will leave your north and east balks unexcavated. The 4 x 4 meter digging area, then, is located wholly in the southwest part of the square. The hypotenuse of a 4 x 4 square is **5.66**.

A note on safety: to avoid creating trip hazards with string, string up only the area to be excavated (the 4 x 4 square or a probe within it), and string only when you must use the strings to delineate the excavation area when you begin, to trim balk, to draw top plan, or for some other purpose. The rest of the time, coil the balk strings neatly near the corner nails so that they are ready to be re-strung as needed.

At Sepphoris and Shikhin we use the probe trench

method of trial excavation, which is a refinement of the Wheeler-Kenyon method used with success at Tell Gezer and other digs. This means that a small area, perhaps 2 x 4 m. or 1 x 2 m. in our squares, is laid out along a major balk and dug rather rapidly, but with separation of the loci. This exposes a sample of the stratification so that the rest of the digging in the square is not entirely blind. Its main disadvantage is that some stratification may be missed in the probe trench because of the speed with which it is dug, though this can usually be recovered in the rest of the square.

Lay out your probe trench across the high point of your square. We generally lay it out against a major balk (north or east, see below) so that a major section is exposed first. It is the major section com-

**YOU MUST RECORD THE
ELEVATION OF EVERY
BUCKET OF POTTERY**

posed of several balks that contains the major stratigraphy of the site. In Fig. 2, for example, we show the first probe set up against the east balk, for that is one of your two permanent balks. The other permanent balk is the north balk. Your first probe then lies against the north balk and east balk, your two permanent balks (see Fig. 2).

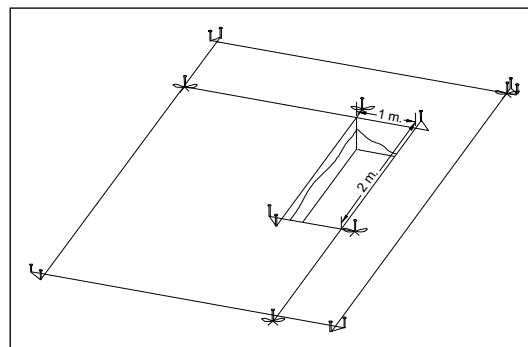


Fig. 2: 1 x 2 m. Probe laid out in NE

Before you remove any soil, however, you must know at what elevation you are starting. This means that you as Area Supervisor have already ascertained where your relative datum points are (indicated prominently in your square) so that you can calculate relative elevation above mean Mediterranean Sea level of features in your square. Each datum point is surveyed by the surveyor or by someone

with the necessary skills. Often this is the top of one of the stakes that mark the intersection of the 5 x 5 grid lines. MARK YOUR DATUM POINT OR DATA POINTS PREDOMINANTLY.

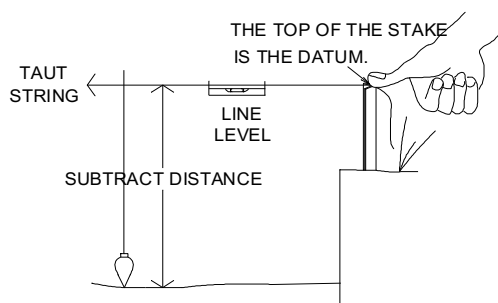


Fig. 3: Taking levels from a known datum.

Normally "line levels" are measured off a permanent datum point with a string, line level, and meter tape, though at times you may ask for a surveyor's elevation (see below). This bit of information is entered on your top plan, in the notes, and on the appropriate place in your locus sheets.

The mechanical process of taking levels is simple enough: one person holds a string taut at the datum point while someone else holds the other end over the point where the elevation is desired. The second person holds a meter tape vertically from horizontal string to ground. It helps to hold the tape with a plumb bob to keep it vertical. The line level is attached in the middle of the string to insure that it is held level. (The horizontal string actually forms a catenary curve because of gravity, so the line level must be in the middle of the string.) When all is level, the distance from string to point is measured. This measure is subtracted from the figure for the datum point to yield the elevation of the locus in question. (This operation is better seen than described.)

You may have use of a "dumpy" (optical) level in the field. This level should be set up by someone who has been trained, and the setup should be checked before every elevation taken to make sure that the machine remains level. If the levelling bubble is not centered, the entire setup procedure must be repeated.

The setup procedure is as follows. First, set up the tripod legs for the dumpy level some place in the field away from regular traffic, then screw the level to the top of the legs, tightening only to finger tightness. Using the adjustable legs, raise or lower legs until the leveling bubble is roughly within the circle,

then use the leveling knobs at the base of the level to precisely align the bubble.

The procedure for using the level is as follows. One person holds the "rod" (pole with centimeter graduations, adjustable in length) on a datum point with a recorded elevation. The person at the dumpy level uses the vertical crosshair to tell the rod person when he or she is holding the rod level, then tells the rod person to rock the rod back and forth, away from and toward the dumpy. The person at the dumpy reads the lowest number indicated by the horizontal crosshair. Upon each setup, all Area Supervisors using the dumpy should record the setup for that day.

Here is how that is done. Place the rod on a datum point in the field that is higher than the points to be measured in the squares, record the number, and add it to the elevation of the datum point. This is the elevation of the dumpy level from which all elevations will be subtracted. When you take BD or ED elevations, elevations for pottery buckets, or elevations on artifacts, subtract the number read via dumpy from the dumpy elevation. For example, if the elevation of the datum point is 186.385 m. and the rod measurement above that datum is 1.299 m., the dumpy elevation is 187.684 m. If the rod measurement over the point in the square is 1.478 m., the elevation of that point is 186.206 m. (This operation is also better seen than described.)

Surveyor's elevations on the various loci are also indispensable. When all of one locus is exposed, for example, it is a good idea to call in the surveyor so that you have instrument elevations on that feature. This is particularly important in the case of beginning and ending elevations on major loci or top and founding elevations on walls and floors. It also provides a good corrective on whatever cumulative error may have crept into line-level or dumpy elevations.

Note: on all top plans, indicate line-level and dumpy elevations with "+" or "x." Indicate all surveyed elevations with "⊕" or "⊗."

One cannot overestimate the importance of elevations, or "levels" as they are often called. "Beginning of the Day" ("BD") elevations are yesterday's "End of the Day" ("ED") elevations. These bracket your excavation day both in your notes and on your top plans. Top and bottom elevations on each and every locus must be taken. Top elevations and founding elevations on walls are absolutely indispensable. Every

feature in a square, and therefore every locus, has a beginning and end elevation, and several more, if the layer or feature in question slopes or is otherwise irregular. Nothing is more frustrating than trying to interpret “cold” archaeological data without elevations.

Before digging, therefore, clean the vegetation from your square, lay out the probe trench, and take elevations. You must also decide on two other things; where to dump and where to put the sifter.

Location of the dump is more critical than you might think. More than one archaeologist has had to dig his or her own dump because of poor placement. (This is called “Wooley's Law” in archaeology, because Sir Lawrence Wooley dug his own dump so often at Ur.) Therefore, locate your dump far enough away from interesting features that it is not in danger of being excavated, but close enough to be convenient. Ideally it will be next to your shared sifter, for obviously the sifted dirt has to be dumped. Location of sifter and dump is normally a matter of consultation with other Area Supervisors and your Field Supervisor. The Regional Archaeologist of the Israel Nature and Parks Authority will wish to see good placement of the dump.

Excavating Specific Features

Walls are allowed to emerge, so to speak, as soil layers are dug away. Soil layers against a wall preserve the record of the usage of the wall after the floor or surface first associated with it went out of use, including the use called “abandonment”. That is, do not follow the top of a wall to see where it goes, as this procedure will separate a wall from its context. Rather, take down the layers above the wall all at once, as usual. You may want to leave a small, temporary balk across the wall so that you can easily see the stratification against it. In no case will trenching along the face of a wall enable you to recover stratification! It is also important to separate material on one side of the wall from material on the other side of the wall. Since walls define the use of space, it may be presumed that two different loci are identifiable, especially when separated by the wall. If the soil layers are fill material which has been laid in or has eroded in over the wall, the two loci can later be combined. It is easier to combine two loci into one than to try to separate one locus into two.

Floors may either be paved or of beaten earth. Paving is hard to miss, but beaten earth floors may not be so easy to find. When excavating water-washed or wind-blown layers, it is important to

remember that these layers were laid onto something, and this is likely to be a floor. Therefore excavate such layers at one level, carefully, so that maximum exposure of a floor or other level feature is detected. The floor itself will usually reveal itself above all by its compaction, though there are a few other indicators: (1) small, flat stones, sherds, coins, and compacted earth laying flat. (2) Accumulated debris above but not embedded into the surface, this includes pottery and artifacts, dung, charcoal, bone, and coins. (3) A high percentage of clay, plaster, or other harder material in the suspected floor.

Pits are the perfect example of the archaeologist's nightmare, for they are the prime reasons for contamination. Pits are sometimes difficult to detect in soil layers, but must be always suspected, expected, and detected.

Pits usually declare their presence in the same way as other loci: by changes in color, contents (or texture), and composition. Generally they are rather circular in plan. Therefore a roughly circular change in color (they are often noticeably darker from ash or lighter from lime), compaction (they are usually softer), or contents (lots of kitchen middens) is immediately suspect. Fortunately, some pits are clay or stone-lined and thus simple to detect. (For further information on detecting pits see p. 15 below.)

Fills. Ancient workmen often needed to level an irregular surface in order to build upon it. Soil added in this way is often recognizable by its soft compaction, its varying soil type and color, and the wide variety of its contents (stones and pottery of widely differing sizes and conditions), and by the fact that the soil lines in the balk run horizontally (therefore, humans have leveled the fill).

Dumps. Like modern people, ancients often dumped surplus soil, gravel, pottery, plaster, and other materials. A dump may be differentiated from a fill by the random tip lines in the balk. Workers tipped containers of dump materials over a wall or structure. As each load of material was tipped over the edge, it left diagonal traces of its deposit, call “tip-lines.”

Humans often walked on the tops of dumps in antiquity, and their compacted tops can be mistaken for a living surface such as a floor. However, in an ordinary dump, sherds are often embedded in the top at random angles rather than in the flat-lying position characteristic of a floor or living surface. Materials in dumps tend to be gravity-sorted, the heaviest

materials being at the bottom of the dump, the lightest being at the top.

Whether excavating a pit, a fill, or a dump the best procedure is to remove only half the material at first, until one is sure how the material was laid.

Foundation trenches are normally part of every wall that is not built on bedrock. They are a necessity, as a wall with no foundation is vulnerable to water erosion. Therefore, when a wall is constructed, the builder digs a trench as deep as he feels is necessary, lays in several rough courses of stone for the foundation (ordinarily larger stones than those in his wall), then lays in the upper, visible courses. He fills the foundation trench with fill brought in for the purpose, so it often has the characteristics of pit fill. He may then level the inside of the building with more fill, and above this he will construct his beaten earth or paved floor. The layers of leveling ("makeup") and beaten earth or paving seal the foundation trench, which is quite important from the archaeological point of view. In other words, the foundation trench is "sealed" beneath a purposefully laid make-up for a floor and by the floor itself, so the foundation trench remains uncontaminated by later debris.

It takes a bit of experience to find a foundation trench, since on our site soil will silt down the face of a wall preserved to a height of several courses. Generally, a foundation trench is spotted by a patch of loose fill-soil wider than .01-.03 cm. from the wall. A foundation trench is usually associated with a compacted surface on which the workman stood to dig the trench and found the wall.

In removing a foundation trench's fill, the associated surface on which the workman stood must also be removed first, as it is normally the last feature built. It is included with the building phase.

If it is necessary to remove a wall in order to proceed to the next coherent phase in your square, you will need to dismantle in reverse order to the above sequence. That is, remove separately the paving, the make-up, the wall, the fill in the trench, and the founding courses, in that order. **PLEASE NOTE THAT ALL THESE FEATURES RECEIVE SEPARATE LOCUS NUMBERS.**

From the point of view of chronology, the foundation trench effectively dates the founding of the wall. The material sealed beneath a floor dates that floor, and, if it is made up to the wall, provides a

date for one use of the wall. Sometimes the interval between founding and last use of a wall is surprisingly long. We have walls at Sepphoris that have lasted 350 years.

Burials are also a sub-category of pits, though specially characterized by their contents. They must be excavated both as intrusions and as potentially valuable bearers of historical and cultural data. Excavation of necessity proceeds with hand tools, even delicate tools, particularly when digging in and around bones. Your first objective is to expose the skeleton and burial goods without disturbing them. Then, after recording in diary notes, sketches, and photographs, all contents are removed, boxed, labeled, and the pit is cleaned up.

Choice of tools, as you may have gathered, is generally dictated by the type of locus that you are about to dig. If it is a surface locus, then pick and hoe are in order, at least partially because of the great compaction you will encounter. If it is a thinner occupation layer, it may be necessary to use *patish* (hand pick) and trowel. If it is a matter of an extremely delicate layer, or of soil in and around pottery smashed *in situ*, then use a knitting needle, spoon, dental tools, or bamboo skewer and brush. (We know we said this earlier.) In any case, it is up to the Area Supervisor to decide with one eye on the skill of his or her team members and the other on the soil to be removed. Err on the side of caution, as less will be lost if soil is moved too slowly rather than too quickly.

Strategy

Normally strategy is decided by weighing over-all stratigraphic objectives against particular excavation priorities. Your stratigraphic goal is to expose the coherent occupational phases within your square one at a time. Digging priorities are then as follows: (1) After finishing a probe, expose all of a given layer with its associated walls or other features (hearths, artifacts *in situ*, tabuns, column bases and other architecture, etc.). (2) Locate and excavate all pits, burials, drains and water channels, and erosion channels. (3) If the Directors and the Field Supervisor agree that you are to proceed to the next phase, then dismantle the walls if you have been told to do that. Then excavate foundation trenches. (4) Check to see that everything has been recorded (drawings and photographs), then lay out your probe for the next advance.

Laying out a building for excavation:

The Grid

The two main objectives of architectural archaeology as we practice it are (1) to expose an entire structure in context and (2) to learn everything possible of its founding, use, and abandonment. These two aims require exposure and balks, though the balks will eventually come down in the final few days.

These aims are met by following the classic variations on the idea of a grid. At Sepphoris we use the Hebrew University Grid, set up by Ehud Netzer and associates in 1985 before our second digging season. At Shikhin we use a grid that we established the first season of excavation in 2012. This grid uses 100 x 100 meter plots within which we lay out our 5 x 5 m. "squares" or "areas." We designate as a Field a coherent excavation unit, usually of associated architecture. These are designated with Roman numerals to distinguish them from the areas, which are designated by Arabic numerals. This type grid has no built-in regard for architecture, which may run in any direction, but always according to some overall pattern.

However, the 5 x 5 m. grid can be adjusted where necessary to allow for peculiarities of the site. For example, at Sepphoris we have dug 5 x 7.5 m. squares, and at Shikhin 5 x 10 m. squares, even though we are thereby digging two different 5 x 5 m. grid squares, where the architecture warranted it. At Sepphoris, squares around the foundation of the "citadel" were aligned with the walls. There is little point in sticking to the 5 x 5 m. grid squares if violating it means you will gain a better understanding of the data. Any size or orientation of square can be used, provided it can be drawn easily on millimeter paper (with respect to the size of the square, a multiple of 25 cm. is desirable).

Fields in our Excavations at Sepphoris:

Field I: probes on the top of the site against the Roman Tower ("The Citadel"), in Waterman's trench, and in the common bath.

Field II: The Roman Theater

Field III: A Probe on the south side of Sepphoris that yielded no ancient occupation.

Field IV: Two squares on the north side of Sepphoris and east of the Franciscan property.

Field V: The civil basilica down the hill to the east.

Field VI: A modern house at the NE corner of the civil basilica in Field V.

Fields in our Excavations at Shikhin

Field I: Associated buildings on the crown of the northernmost hill (A1).

Field II: Installations located during a gradiometer survey north of Field I.

Field III: The necropolis on the western slope of Jebel Qat (D) to the east.

Field IV: The miqveh south of Field I.

Field V: A line of carved stones at the NE foot of the hill.

THE RECORDING SYSTEM

The recording system is a direct descendent of that used by the Joint Expedition to Tell Balatah (ancient Shechem) in the 1960s, by the Joint Expedition to Tell Gezer in the 1960s and 1970s, and by the Meiron Excavation Project to the end of the 1970s. It makes use of a field notebook in each area that contains a locus list, coin list, photo list, bucket list, architectural fragment lists, balk drawings, photo sheets, alternating sheets of top plan paper and notebook paper, and a sheaf of locus sheets. The top plan paper is for top plans, the notebook paper is for notes, and the locus sheets are for recording loci. The sheets for lists are for recording those pieces of information that their name implies.

An innovation in Palestinian field archaeology was the **top plan**, introduced by Paul Lapp in the 1960s. Its use has been thoroughly tested and vindicated in the field.

The top plan is a daily, stone-for-stone, scale record of every feature in your square. It shows all the loci with locus numbers, elevations, and pottery buckets (see sample plan). All top plans are drawn at a scale of 1:25 on top plan paper especially printed for the expedition. Trace your top plans for the next day from one master plan in order to avoid cumulative error, or persuade someone to do so as part of his or her archaeological training.

Follow the following TOP PLAN CONVENTIONS:

1. Print the heading in LARGE LETTERS with site, date, Field and Area designations, and scale. Include

a north arrow (north should be at top). This must all be readily readable.

2. Stones should be drawn with "characteristics" so that they resemble real stones rather than jelly beans or flat irregularities. During the course of the day, mark all stones that you remove with an "X" on the plan. Do not copy removed stones on the next day's top plan.

3. Enter line level elevations on the plan with a "+" or "x" and surveyor's elevations with a "+" or "x" within a small circle. Put this mark on the plan precisely where the elevation was taken in the square. This includes end of the day elevations or beginning of the day elevations, which are marked "E.D." or "B.D." Write top elevations for walls on the stone where taken. Write founding elevations beside the point underneath the wall where they were taken and furnish them with an "S"-shaped arrow.

4. Label everything with locus numbers, preceded by a capital L. All the locus numbers for your square consist of three digits added to the square number. Thus, for example, if you are digging Square V.31, your modern surface (where the grass grows) is L31000. The next discernable layer that you excavate is designated L31001, and so forth to L31999, which is our convention for bedrock.

NOTE: Locus numbers between 100 and 199 (e.g. L31100, L31123, etc.) are reserved for the excavation of underground chambers.

The "point one locus number" designates the first five centimeters of a thick, dirt floor. For example, if the floor is L1022, then the pottery and other artifacts impressed into the first 5 cm. are removed separately as L1022.1. This pottery is important evidence for dating the last use of the floor. Write "POINT ONE LOCUS" on the pottery tag to alert us in pottery reading. Both the floor locus and the point one locus are, naturally, critical.

5. Indicate the boundaries of probe trenches and other limited areas of excavation with dashed lines (- - -). All probes should be immediately identifiable by this convention.

6. Around the margins of your drawing, enter pottery bucket numbers with arrows to the places from which they are dug.

7. If you draft a drawing of a mini-balk, draw it on the bottom of the top plan, if it fits, otherwise on a properly labeled, separate piece of balk drawing

paper. Indicate on the drawing which temporary balk it is. For example, label the mini-balk drawing "Section A-B", then show points "A" and "B" on your plan. Indicate the scale of this mini balk drawing directly on the drawing.

FIELD NOTES

Anywhere in your text that you happen to mention a locus, be sure **to draw a rectangle around the number** (to make it stand out) after you have entered the date on the back of the locus sheet for that locus. This is the **MENTION INDEX** and is very important for the Field Supervisor or Directors or whoever has to make final sense of that locus. It shows every page in your notebook where that locus is mentioned.

You are to organize field notes around pottery bucket numbers with their loci and elevations near the left margin (see sample page). That is, the left margin will have the Field.Square.Bucket number followed by the boxed locus number, and beneath that the elevation for this specific bucket. For example:

I.33.75

L33002

207.22

THE LINE UNDERNEATH THE BUCKET NUMBER MEANS THAT THIS BUCKET NUMBER HAS BEEN ENTERED ON THE LOCUS SHEET IN THE SPACE PROVIDED.

Underline the number after entering the bucket on the locus sheet as a way of checking to be sure that it is done.

In the lines to the right of the margin entry illustrated above write *what* you are doing and *why*. In your very first sentence, note the numbers of the squares to the north, east, south, and west. Write any hypotheses, observations, speculations, or theories about the archaeology of your square that you wish. You may speculate about the relation of loci to one another. It is also valuable to theorize about the relationships between the loci of your square and those of neighboring squares. In other words, which layers that you are digging are also to be found in the squares around yours? If your Directors or Field Supervisors interpret something, record the

interpretation, but your own informed opinion and the evidence you adduce is also worth recording.

Include a brief description of *where* in the locus the digging is going on and also *where the locus lies in the square*. Your discussion will also encompass **color**, **compaction**, and **contents** ("the Three Cs"). Mention relationships to other loci (above what, under what, next to what, identical with what?), its tip or slope, and other variables listed on the locus sheet. Its **color** will be given in Munsell notation, and will be an average color, but you should note if you run into patches of yellow or black or whatever.

Compaction is a relative measure: very hard, hard, rather hard, somewhat soft, soft, very soft, loose. Water-washed material is rather hard, unless it is gravel. Air-laid particles tend to be rather soft unless walked on. Dirt floors are very hard, even when exposed to wind and water erosion. Such floors were pounded while wet during their make-up, then thoroughly trodden down. Besides, they often contain a fair amount of clay or lime or both.

Always refer to *particle size* quantitatively, i.e., give a range of particle size in centimeters or millimeters. It is more helpful to say that your gravel is 2-3 cm. (in diameter) than "cherry sized." If it is less than 1 mm., say so. It may be silt-sized, so say so. You will also need to mention *how* you think this layer was laid down, as this is a correlation of compaction and particle size (texture).

Was this layer washed in, blown in, or brought in by humans or animals? Water-washed layers tend to be compacted and the particles are sorted in size: the silt is on the bottom and the gravel remains on top. On the other hand, wind-blown (air-laid) particles tend to be uniform in size and rather soft. Silt-sized particles will dominate. There will also be much less horizontal striations or layering in air-laid material.

WALLS require rather extensive discussion, but with architectural variables also in mind. Each wall is a separate locus and should be numbered in sequence with other loci. The number, however, is preceded by a capital W rather than an L, and only the number itself is boxed (example: W³³⁰¹⁴). Fill out the special locus sheet for walls (see below). Be sure to record the following descriptors as you discover them:

1. Preserved length in meters.
2. Preserved width (probably a range, as 61-72 cm.).
3. Preserved maximum height above foundation.

4. Top elevations (select two or more high spots).
5. Founding elevations (select two or more low spots).
6. Is it founded in a trench? What is its number?
7. Is it founded on bedrock?
8. **Bonds** with which walls? (See "Bond joint" in Glossary)
9. **Butts** with which walls? (See "Butt joint" in Glossary)
10. Associated floors, including floors upon which it sits and floors made up to it.
11. Associated features, such as doors, windows, niches, bins, or other domestic features built against it.
12. Wind-blown heaps or refuse piles against it.
13. Is it robbed out (robber trench number?) or cut by a pit (its locus number?) or otherwise disturbed? by which loci?
14. This wall cuts into which other loci?
15. Number of rows wide.
16. Is there rubble between a two-row wide wall?
17. Number of courses high.
18. Average size of stones.
19. Are they field stones (undressed)?
20. Are they hammer dressed only? That is, no one cut them.
21. Are the margins drafted with a boss (see Glossary) left on the face?
22. Are the margins drafted and is the face cut like Herodian stones?
23. Mortared with what?
24. Are the stones keyed (pecked) for a layer of plaster?
25. Number of courses laid in the foundation trench.
26. Number of finished faces. If there is only one finished face, which is it? (The finished face ordinarily is intended to be seen, so it faces outside.)
27. Are any of the faces plastered? If only one, which one? (Often the plastered face faces inside.)
28. Are the stones "dry laid" (no mortar)?
29. Does the wall betray a repair or rebuild from different size or dressing of the stones? where?
30. Where is it found in the square?
31. Direction it runs (approximate compass orientation).
32. What is its evident function? (North wall of room terrace wall, outside wall, screen wall)

DON'T FORGET TO INCLUDE A SKETCH OF THE WALL IN THE GRID PROVIDED ON THE WALL LOCUS SHEET. FILL OUT THE BACK OF THE WALL LOCUS SHEET AS YOU WOULD THE BACK OF A STANDARD LOCUS SHEET.

When you dismantle the wall, there may be pottery and other artifacts between the stones or mixed

in the plaster or mortar. This pottery is to be tagged and sent in as is any pottery, and the bucket number, date, reading, and associated artifacts are to be entered on the locus sheet.

The **LOCUS SHEET** is to be kept up to date, which usually means filling in the blanks from your field notes either on the site or in the evenings at camp. It is imperative to enter on the locus sheet all the descriptors as they become known, particularly pottery bucket numbers, dates, and readings. Also enter artifact categories on the locus sheet as they are found with each pottery bucket number.

It is impossible to overestimate the importance of the locus sheet, as it gives in brief all the essential information about any given three dimensional feature in the square. One of the surest measures of the seriousness that any given Area Supervisor gives to her or his notebook can be found in the care with which she or he does the locus sheets, as they abstract all the information recorded elsewhere on top plans and in the field notes. Sometimes this has been referred to as the "cursed paper work," but this is mainly what we have when we get back home. The point of the continuous repetition of information on the various forms is to provide a "fail-safe" system of recording, so that errors made on (e.g.) a pottery tag or in the field notes can be caught and corrected in the (e.g.) locus sheets.

POTTERY TAGS give all necessary information for a given bucket of pottery. Fill them out with site, date, Field. Square. Bucket number (write these three with periods between them), and locus number (in its rectangular box). If the bucket is from a critical locus, mark the tag "CRITICAL." In situations where you think the pottery can be restored, mark the tag "RESTORE." If it is possibly contaminated, mark the tag "POSSIBLE CONTAMINATION." In the first instance it is passed on to the Formator, in the second instance it will be probably thrown out after being given its due in Field Pottery Reading.

Sh13	6/15
I.5.75	
L5002	
CRITICAL	

Figure 4: Pottery Tag

Artifact tags. Artifacts (except for bones and coins) are labeled on the artifact boxes in pencil (so that the box can be reused) with the pottery bucket information, exactly like the pottery tag, written on the lid. In addition, a one or two word description of the contents of the box is written below the pottery tag information (nail, lamp, lamp fragment, glass, ring, etc.). This one or two word description also appears on your locus sheet. The Registrar will be more exhaustive. ***In your notes, describe where the artifact was found. Take an elevation on find spots for all coins, lamp molds, whole vessels, or other significant artifacts (the elevation of the pottery bucket will serve for other artifacts).*** Include a sketch in case of mix-up later. On your top plan, put a small "x" where the artifact was found, draw an arrow to it, and indicate in the margin the word "nail" or whatever it was. On the locus sheet, on the back where pottery buckets and pottery readings go, write the same word to the right of pottery readings.

Coins are to be placed in coin envelopes upon which is written the same pottery tag information together with your own "C number." This is a serial number you assign to coins from your square. That is, your first coin is C-1, your second is C-2, and so on. You should also enter on your coin page the record of this coin:

C-No.	Date	Bucket	Locus	Comments or I.D.
C-1	6/17	2	330010	Probus.
C-2	6/17	4	33002 Found	<u>in situ</u> between
				stones of wall
				33004

Biological materials. The recovery of biological materials need not be a difficult procedure, and the evidence from such remains can provide valuable information which is accessible in no other way. From plant and animal residues it is often possible to reconstruct an ancient ecosystem, understand details of a people's diet and health, and draw conclusions about their methods of managing both flocks and fields.

It may be useful to think of biological samples in terms of four general categories: [1] microflora (including such materials as pollens, spores, and phytoliths); [2] microfauna (primarily the remains of insects and other small animals, including fish scales); [3] flora (including seeds, grain, nuts, wood, charcoal, fabrics, or any other plant residue); and [4] fauna (usually limited to hard tissue: bones, teeth, horn cores, and shells).

The Directors may ask you to obtain soil samples from the loci which you excavate. Take these carefully to avoid contamination (a particularly great danger when one is dealing with materials of microscopic size). A thin layer of earth should be carefully removed with a trowel (usually by scraping gently). A uniform quantity of earth then gathered, placed into a "zip-lock" plastic bag and sealed at once then tagged like an artifact. The recovery of microflora and microfauna is not a field procedure, but requires careful work in a biological laboratory.

Larger biological materials may be obtained using methods employed to recover other artifacts. Careful observation and screening (sometimes supplemented by flotation) will enable one to pick out the bones, teeth, shells, fish scales, charcoal, and other biological materials. These materials are often particularly fragile and susceptible to damage because of the changes in temperature, humidity, acidity, etc. to which they are exposed by excavation. Place these materials into a paper bag or cardboard box (the latter is particularly useful if the sample appears to be particularly fragile). *Do not seal them in a plastic bag, as this will accelerate the deterioration of the sample.* The bags or boxes should be marked with the same information as the pottery bucket with which they are associated and turned in along with other artifactual material at the end of the workday. Biological materials will, of course, be recorded in the field notes and on the locus sheets.

STRATIFICATION AND STRATIGRAPHY

It is important to observe an elementary distinction here. The layers as they are found are *stratification*; the interpretation of them is *stratigraphy*. In other words, we do not take the layers home themselves, but our records of them.

Recognition of stratification is a learned skill, but the principles of this skill can be set down. It is simply a matter of recognizing differences in "the three Cs": Color, Compaction, and Contents.

The human eye can recognize more differences in color than you might believe. You will need to train your own eye to notice significant differences almost unconsciously, although a perusal of the *Munsell Soil Color Chart* would help you to discover whether you tend to notice differences in hue, darkness/lightness of hue, or strength of hue.

Hue refers to the point on the spectrum that a color occurs, its wave length, if you please. In the

Munsell system, colors of soils advance from red (R) to yellow-red (YR) to yellow (Y), each on a differentiated scale from one to ten. That is, theoretically, "red" ranges from 1 to 10, in which 5R is the middle of the scale. At 10R we start with 1YR (Yellow-Red) on its scale of 1-10, and at 10YR we meet with 1Y (yellow), until we reach 10Y, the last soil color in the chart.

It is obvious that 10R is identical with 1YR, and 10YR is identical with 1Y, but these sheets do not occur in the soil color chart.

Hues lighten on a vertical scale ("value") from 2-8 (1 and 9-10 are too difficult to manufacture as yet). Hues also vary in intensity (the amount of pigment, called "chroma") on a horizontal scale from 2-8, or sometimes 2-10. Thus almost any soil color can be closely matched with a color chip in the soil color chart, which locates the color in three dimensions. Practice with the chart increases accuracy, and some volunteers already trained in color discrimination are a valuable asset. In any case you need to be thoroughly familiar with the Munsell notation system, as it is a standard in many excavations. It has long been in use in American and European anthropological archaeology.

Note: A more detailed explanation of the Munsell system is found in the Japanese soil color chart; introduction. See also A. H. Munsell, A Color Notation, 1946, pp. 14-16.

NOTE: NEVER DUMP SOIL DIRECTLY ON THE COLOR CHIPS.

Texture, which includes **compaction** and **particle size**, has already been discussed on page 10. It is very important that you develop a discriminatory sense in this matter and that you work on "quantifying" it. That is, you need to familiarize yourself with particle scales that use measures instead of analogies as a means of standardizing notation. The metric system should become familiar enough to you that you can look at a rock and gauge its diameter (within a range, as 10-12 cm.) in centimeters, without mental conversion. Estimating degree of compaction is still relative, but can be done systematically.

The **Contents** as a soil variable really refers to the contents. For example, a given locus may contain large quantities (relative to other loci) of pottery sherds, plaster chunks, ash (*black is smothered ash; white is burned-out ash*), charcoal, slag, glass, water-washed gravel, sand, silt, organic fibers, animal bone

fragments, snail shells, etc. In each case an explanation of the presence of such materials is called for.

Furthermore, the *condition* of these materials is important, as that is a clue to their provenance and use. Are they water worn, burned, crushed, sub-angular (with sharp edges), patinated (from oxidation), heavily corroded, lightly corroded, decomposed, sun-bleached, or what? Also their *concentration* or *distribution* in a locus is important. That is, do they all occur together next to a wall, or are they spread out rather regularly? All such groupings or their converse call for explanation and help us understand the nature of the locus in question.

When excavating a locus, when two of the three key characteristics of locus description (color, compaction, and contents) change, it is usually best to change locus numbers.

Recognition of Methods of Deposition

All the layers that you will find were laid either by natural forces (generally, "erosion") or by human beings ("fill" or "dump"). Aside from animal burrows, the two agents of natural deposition are either water or air. Earlier we mentioned some criteria for recognizing how layers are deposited, but it is well here both to review and expand that discussion.

Water-laid layers usually are not level except in the bottom of cisterns, sumps, and pits. Such layers where water stood for a length of time often contain predominantly silt-sized particles, are rather compact to very hard (depending on whether they were ever sunbaked), and homogeneous. But those layers that are deposited from moving water, either in an erosion channel or in a rapid wash across an abandoned floor or courtyard, are usually sorted by particle size (gravel on top; silt on bottom, rather compact, and heterogeneous in contents. Often the contents include water-washed and battered (smoothed) stones, animal bones, pottery, and other materials. The condition of the contents is an excellent clue to the method of deposition.

Wind-laid material is most often recognizable by its softness, silt to sand particle size, and by its piling up in corners. Often under a magnifying glass it will contain material characteristic of occupation: tiny pieces of pottery, animal bone, ash, charcoal (bone, wood, or dung), organic fibers (grass, weeds), shell, wood, and so on. On the other hand, it may contain relatively "sterile" particles of sand, silt, stone, and organic fibers. It is important to note composition of

wind-laid material exactly the same as any other locus as a clue to its provenance.

Human-made layers divide into fill, make-up, leveling operations, floors, courtyards, and accumulations. **Fill** can be recognized mainly by the random arrangement of its contents (sherds, stones, wood, etc.) and by its softness. If the fill has been deliberately thrown into an abandoned cistern or other hole of some depth, it is usually gravity-sorted. That is, the heavier stones roll further toward the bottom as the dirt descends, while the smaller, lighter particles slide less far and more slowly. Such fill is often very loose. **Make-up** (of floors) and other **leveling** operations, on the other hand, are often identifiable by a more or less horizontal orientation of their contents, a result of their having been spread around by the people who brought them in. They are much more compact than simple fill, though not as hard as beaten earth floors.

Accumulation on floors is often difficult to distinguish from the floor itself, if the floor is poorly constructed. Accumulation is apt to have a higher ash and charcoal content than other layers and much more pottery. It will be less compact than the beaten earth floors.

Dirt Courtyards, if they cannot be discerned by their location, often can be detected both by the dung ash and wood charcoal in their contents and by the casts of seeds that appear in quantity (feed). Animal and human activity churns up these areas, so the contents are often worn, broken, and battered.

Another characteristic of dirt courtyards is the high incidence of erosion patterns, perhaps because often the roof was made with a gutter that emptied into the courtyard. Such channels have a different texture and color from the layers that they cut, partially from particle size, but also from the well-washed contents.

Floors have already been discussed briefly on p. 6. You will need to look for the three characteristics mentioned there if you suspect the presence of a beaten earth floor.

We find earthen floors, or even transient surfaces, on our site, so you must be prepared to discriminate between other compact layers and floors. The latter are usually much more compact than the layers that rest upon them. They are further distinguished by their own composition and by the flat orientation of material resting upon them or pressed into them. They often exhibit horizontal striations in section,

though their color may not differ dramatically from the layers above them.

If you are digging a courtyard floor in particular, you must be prepared to look for **PITS**. (Pits are also discussed on p. 6.) Here are some things you can do if you suspect the presence of a pit but are not sure: (1) Scrape lightly with your trowel the layer from which the presumed pit is cut. A change in texture or composition often results in a different "feel" or in the sound of the trowel. (2) Stand away from the suspected area to get a different perspective. You might also try different lighting conditions at different times of day. (3) Ask the opinion of those who are trained to detect tiny differences in color (artists, art historians, geologists, people who work with dyes, experienced field personnel, etc.). If all else fails, lay out a small probe across the suspected pit and dig out about five centimeters. Clean up the probe and examine its bottom and mini-balks. Even the most stubborn pit will usually yield to this. Because pit-material is usually softer in compaction or darker than the surface or soil layer cut by the pit, the horizontal extent of a pit can often be traced from the top by careful use of a trowel. Scrape the harder surface, allowing the trowel point to penetrate gently into the softer pit. This is a useful way to outline the intrusive pit. Balk nails can be used to mark for subsequent excavations the points where the trowel has gone off the hard surface into the pit.

BALKS

The single most indispensable stratigraphic record in the field is the balk as a vertical section through the layers. Sometimes a careful dressing and reading of the balk has clarified a host of stratigraphic problems; therefore, you should understand the purpose and proper care of balks.

Trimming and Maintaining Balks

You will dig within four vertical balks, and they must be cut as cleanly and vertically as possible. The point in cutting balks this way is 1) to preserve a stratigraphic record of your excavation, particularly in relation to the structures and installations in your square; and 2) to remove material that can contaminate lower and earlier loci. This problem occurs when sloppy balk trimming leaves a "bathtub effect" at the bottom of the balk, which is then removed with the earlier locus. As a general rule, if it's time to change locus, it's time to trim balk.

During the course of digging you will have your pick person cut as vertically as possible, remaining 5–10 centimeters away from what will be the finished balk. All volunteers must understand that they are to leave final balk cutting to whoever has been properly trained. They will then get in the habit of excavating no closer than 5 cm. from the balk.

Normally all team members including the Area Supervisor are trained in balk cutting at "balk school" in the field or in some other way. They will therefore always be on call to keep your balks trimmed and straight, preferably daily.

Before you can cut your balk, you must be sure that the balk strings are accurately laid out and taut. You will trim straight down with the *patish* from the balk string, using a plumb bob to insure that you remain vertical. First, cut a vertical track in the balk 5–10 cm. wide, checking frequently with the plumb bob and tape measure to make sure you are not undercutting the balk. *Undercutting is a serious error, as what is removed cannot be put back.* An effective way of checking that you cut vertically is to hang a plumb bob from a pick or hoe handle that has been laid across the top of the balk, but that is not lying on the balk string. Measure horizontally from the undisturbed balk string to the plumb bob string. That measure should remain constant all the way down the track as you cut, measuring from the plumb bob string to the balk. In other words, if the measure from balk string to plumb bob string at the top of the balk is 15 cm., then the plumb bob string should always be 15 cm. from the inside of the track. Continue to cut vertical tracks, spaced around 10 cm. apart, and then cut out the soil between them.

You can cut the balk face fairly accurately with a *patish*, but the final careful trimming is to be done with a trowel. *Stones are not to be pulled out, as a large piece of balk may come with them. Neither are stones to be chiseled through.* Trim soil around stones in the balk flush with the vertical face of the balk and leave the stone in place, unless there is obvious danger from a large, loose stone. **NEVER ATTEMPT TO SECTION THROUGH A HARD STONE.**

Keep your balks trimmed to within about 5-10 cm. of the bottom *as you dig*. If you get too far behind in final trimming it will take too long to catch up. It is also important to cut balks in another part of the square away from your major excavation work, as all material from balk cutting or trimming is prime **contaminating** material. Remember that balk trimmings come from much higher, therefore earlier loci, and

will consequently contaminate what you are removing below.

Also, balk material is mixed from several loci, therefore it is to be *thrown out*, unless it is a significant find, such as a coin, lamp mold, or other important artifact. Furthermore, you or your regular balk trimmer must clean up this debris constantly so as not to tread contaminating material into lower layers.

To maintain a balk in its cleanest, most readable condition, it may be necessary to avoid using it as a catwalk. Often a line of stones or sand bags is laid across a balk to erect a small barrier to indicate **NO THOROUGHFARE**. But sometimes one must warn distracted archaeologists and volunteers several times, and perhaps forcefully, *DON'T WALK ON THE BALK!*

Temporary Cross Balks are a valuable tool for keeping track of the stratigraphy of a feature that does not touch any of your four main balks. For instance, you may discover the stub of a wall in the middle of the square that does not intersect any of your balks. You may then find it useful to leave a temporary cross balk extending from a main balk, running across the wall. In this way, you preserve clear proof of its stratigraphic relationships to other walls and floors. If a red earth layer runs over this wall and over the other main walls in your square, then all the walls are earlier than the red layer. If, on the other hand, you discover a foundation trench in the red layer for the isolated wall, then it is later than both the red layer and the other walls, even though it may be at the same founding level.

These temporary cross balks are to be drawn like a main balk, but the drawing is entered on the bottom of the top plan for that day. It is treated as all balk drawings (see below).

Balk Tags are part of every square. Such tags are very simple to read and extremely useful for keeping track of stratification, especially if you spend locus numbers freely.

Every layer or other feature in the balk is to be tagged as soon as you have numbered it. The tag reads L1008, for example, and is pinned to the center of that locus with a nail. If there is much wind or that particular locus is soft, you may have to use two nails. But in any case tag your balks. You may have an inerrant memory, but your Director and colleagues do not.

Balk Drawing

The convention at Sepphoris and Shikhin is to draw the north and east balks. The Director will inform you if it is necessary to draw another.

Balk drawings are the final permanent visual record of the stratification of your square. In principle they are to be drawn by the one who did the digging, or, if he or she does not have any drafting skill, by someone under his or her supervision. Area Supervisors are responsible for the balk drawings in your square.

In terms of time spent on balk drawing, you will probably find that you can stay ahead if you draw exposed features regularly, that is either weekly or daily. Whatever interval you choose to keep your balk drawings up to date is not as important as making sure that they are accurate and clear.

Balks are drawn at a **scale** of 1:25 on special balk drawing paper, which is four centimeters to the meter. One tiny square on balk drawing paper represents two centimeters. At this scale, your accuracy is ± 1 cm, which is well within a tolerable margin of error.

Before a balk can be drawn, however, it must be trimmed, and then provided with a **Datum Line**, which is merely a string stretched between two iron rods driven into the balk at the same elevation near two corners. Surveyor's elevations are taken on these *data points* and this reading is then attached to the rod. That is, write it on a pottery tag with a marking pen and tie it to the datum point. Also mark it on the balk drawing paper.

Consult the sample balk drawing in the appendix. Notice that nothing is drawn schematically, but that everything is drafted stone-for-stone to the nearest 1 cm. There is a reason for this: namely, so that the maximum information may be retrieved from the balk drawing. A well-executed balk drawing is manna from heaven for the archaeologist poring over field notes and drawing in the winter, or a decade later. He or she may discover, for instance, that a layer clearly appears to be gravity-sorted in the drawing, but that the notes imply that the layer is deliberately compacted. This calls for explanation. Therefore, draw only what is there, but do it fully and accurately.

The actual mechanical process of balk drawing is simple enough. You must first stretch a meter tape along your datum line, fastening it to the data points

with clothes pins or paper clamps. This establishes an X-axis and tells you where you are horizontally with reference to the corners of your square (this tape must be set up accurately so that the 1 m. measure is in fact 1 m. from the corner stake). *Mark your horizontal line on the paper to represent your datum line and label it with its elevation* (see balk drawing). Near the top of your balk drawing paper, print a legend with Field and Area, balk designation, date, and your name.

When these preliminaries are done, you are ready to locate the surface on your paper. Your caller will call height of surface above datum for you every 25-50 cm. along the datum line (you decide on the interval). Place a LIGHT pencil dot on the paper at these points, and then draw in this line as in a dot-to-dot game. Dots should be light enough that as you connect them, they disappear into the pencil line. Add the convention for grass:

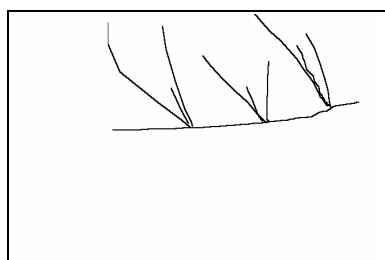


Figure 5: Convention for Grass

Draw the bottom of the balk in the same way. Your **caller** will now call points on the stones for you, and you will draft in the stone on the

paper. This will include walls that intersect the balk. Finally, draw in the lines that indicate the separation between layers, having your caller call the points them exactly as she called the surface.

Label every locus on your drawing and include the rectangle around the number. Check that you have not mislabeled anything or left anything out. Pay attention to details, such as texture of a locus, i.e., include gravel or specks of charcoal concentrated somewhere. Artistic touches need not be included, as aesthetics are not as important as accuracy. The drawings of any two balks that intersect one another, for example, should match at their edges, just as the balks do.

Balk Removal

Removal of a balk in the sense of catwalk is a species of any soil removal. You have the distinct advantage of knowing what is there, for you and your north and east neighbors have labeled the balk on both sides.

You have the usual task, then, of careful stratigraphic removal of the layers in opposite sequence to their deposition. The single complication is that you are to record the numbers that your northern and eastern colleagues have assigned to the locus in their square. You are also to record any discrepancies. These data belong both on the locus sheet under "remarks" (e.g. this L1035 = L2019 in the next square east) and in your notes.

Note: Remember that the north and east balks are yours. Your neighbors will deal with the south and west balks.

WEEKLY REPORTS

Weekly reports are prepared by the Area Supervisor to enable the directors to have a permanent brief account of activities in the areas. It is also useful for the Area Supervisor (who gets one typed copy) to write down in brief compass her goals and how she is achieving them. She fulfills this recording requirement in a three part report containing the miniature schematic top plan, a text, and the indices.

The **WEEKLY TOP PLAN** is prepared at a scale of 1:25 as usual. It simply represents the main features in your square, though everything is labeled **with its locus number**. It is an invaluable visual reference for the person reading your weekly report.

The **text** is about a page of description of your goals that week, how you achieved them, did any problems that remain outstanding. This is a highly condensed version of your week's notes.

The **indices** are merely lists for the week of new items in each of the following categories:

1. Pottery buckets with locus numbers and elevations
2. glass
3. coins
4. bone
5. tesserae
6. metal
7. plaster
8. architectural fragments
9. new loci
10. photos
11. drawings
12. organic samples
13. soil samples

14. miscellaneous

If no tesserae were found that week, then write "none" for item 5. If you turned in to registry five metal artifacts, then list what pottery buckets and loci they are associated with.

Turn in an electronic, typed copy by Sunday evening.

PHOTOGRAPHS

Photographs are one of the most important means of recording information that we have. Therefore it helps to know some of the **principles of field photography**.

1) Photographs are supposed to store information, therefore they must be clear, distinct, and well composed. This also implies that the subject must be clean. No one knows how deep dirt is from the photograph alone, therefore it is impossible to guess how much has been concealed by what you as excavator know to be only one millimeter deep.

2) Photographs record not only the appearance of the subject such as the construction of a wall, but also its relationship to other features (such as the relation of the walls to floors and other surfaces).

3) Photographs may also be designed to reveal day by day exposure of some important feature. For example, a series of end-of-the-day photographs may reveal *how* a locus was covered in the first place, an important point in final interpretation.

The Area Supervisor makes sure that everything is absolutely clean for the photographer. The last one out of the square must actually brush away his or her footprints. This is most important, as anyone knows who has been faced with the problem of interpreting photographs of improperly cleaned walls and floors. (Is the pottery smashed *within* the fill or *upon* the fill, as the excavator suggests?)

Basically, there are two kinds of archaeological photographs: (1) Informal photos, and (2) publication photos. Each has its own justification.

The informal photo or "**record shot**" is intended to be a spot record for you of what is going on in your square. **It is not a substitute for a publication photograph.** Therefore, you or the dig photographer will take digital photos only to clarify something for your own use, not for a permanent record of what is there or what has happened stratigraphically. Go

ahead and mount them in your book. Think of them as of limited and transient use, but essential to understanding what goes on.

One type notebook photograph is the so-called "end-of-the-week shot." This is simply a record of how far your excavation has proceeded by Friday of each week. You clean up for this photo in exactly the same way as for any other record shot.

Record photos are properly mounted and annotated on a note book page and inserted within the note pages in your notebook.

Publication photographs are called for by your Directors who have conferred with you and are satisfied that this feature is now completely exposed. Often several such photos of various width and depth of frame may be required to record all the information desirable (the whole square; a particular wall; the rebuild in the wall; a single stone with graffiti).

Consult the photographer, by the way, for his or her professional judgment as photographer. Consult your Directors for their professional judgment as archaeologists.

In any case, you should know that all photos should be taken without shadows, if possible, for shadows create a host of problems. This means that the best publication shots are taken either very early or very late, when the sun is below the horizon, but the sky is still bright. It may be necessary to clean up at 1:00 and come back before sunset. The use of a "Joshua cloth" enables photos to be taken after the sun has risen or before it has set

Photographs are to be mounted in the notebook. Be sure to record the photograph number (which the photographer will give you), the orientation (compass direction), locus or feature being photographed, and any other explanatory comments you feel are necessary.

You also need to keep a **Photograph Index** in the front of your notebook. This is simply a running list by date of numbered photographs in your square. Such a list will be arranged neatly as follows:

Date	Photo No.	Subject (locus No.)
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ARTIFACT ANALYSIS IN CAMP

The purpose of this section is simply to introduce

you to our artifact processing. Perhaps if you have a good understanding of this process you can aid in its expedition, particularly in the care you exercise in preparing artifact and pottery labels in the field.

Pottery is processed in a regular unvarying process. The first decision about importance or significance is made in *pottery reading*. This is the process of separating pottery into categories according to its chronology and sometimes typology for the purpose of finding out what archaeological periods are being dug. But the point is that the decision to keep or discard pottery is reserved for the pottery reading table. Attendance at the daily pottery reading is mandatory for excavators in training.

Pottery represents the quickest and best indication of the chronological horizons of a locus under excavation and acquaintance with the main forms found on our site constitutes an essential part of the excavator's competency. Rims, bases, and handles are "indicator" sherds that most easily designate the type of vessel and its chronological horizon.

We classify the pottery found at Sepphoris and Shikhin into *crude wares* and *fine wares*.

Crude wares were locally manufactured in Palestine and, in the case of our site, were made very near Sepphoris. Seventy-five percent of crude wares at Sepphoris are manufactured at nearby Kefar Hananiah and another ten percent (including some of our most distinctive forms, like the Sepphorean Bowl or Lid) were made at ancient Shikhin (the "Asochis" of Josephus). At Shikhin we have uncovered extensive evidence of pottery manufacturing.

Crude wares include the coarsely-made pottery used in cooking and daily life—plates, bowls, cooking pots, jugs and juglets—and larger storage jars and amphorae.

Fine wares in the Galilee are all imported from other regions of the Eastern Mediterranean. The more finely levigated clay and the red wash ("slip") that coats their surface differentiates them easily from the crude wares.

The three widely used ware types of late Antiquity—Cypriot Red Slip Ware, African Red Slip Ware, and Phocaeian Red Slip (Late Roman "C") Ware—are represented at Sepphoris. We have recovered very little fine ware at Shikhin.

Crude ware forms tend to change slowly, since the same general type of cooking and commercial vessels are preferred by several generations, but

they do evolve (within one hundred to one hundred and fifty years), and the recognition of this evolution helps in our chronological identification of the loci.

Fine wares—fancier and more expensive vessels—are more responsive to changes in human taste and preference and, hence, provide the excavator with greater chronological precision (within fifty to one hundred years usually, with sub-types revealing even shorter chronological horizons). Field recognition of such forms greatly aids the excavator.

After pottery is washed, dried, and read, it goes to **Pottery Registry**. The sherds have been bagged during Reading, and in some instances the bag is marked "RESTORE." All bags of sherds then go to Pottery Registry to be *registered*. This is the process of marking on the sherd with waterproof ink its site, field, and square designation with the serial number from 1 to N for that specific bucket. That is, if the bucket contains 22 sherds, then the sherds are marked as above with a serial number from 1 to 22. The license number also appears on each sherd.

Registered pottery is then sent to the Restorator or Formator, if it is marked "RESTORE." Otherwise, it goes directly to drafting to be drawn and then to be photographed. Not all pottery is drawn, and not all that is drawn is photographed. But all pottery that is to be published must be described. The description of pottery usually involves recording color inside, outside, and of the core, color of slip or wash, type and color of temper (quartz, sand, calcite, "grog," organic fibers, etc.), and size and percent distribution of temper. These variables are important for distinguishing imported from locally made pottery, for example.

Pottery that has been designated "draw" is taken to drafting. There it is drawn in outline in a special computerized process that will produce the inked drawing from the digitized penciled outline. The digitized drawings are stored in the computer with the descriptions of each sherd for production of the pottery plates for publication.

Artifacts are processed in much the same way, except that each separate artifact is assigned a registration number, called "R-number" for short. This is a serial number from R-1 to R-N, depending what the number of the last artifact from Shikhin will be. The first two digits of the R-number are the last two digits of the year excavated. For example, R133252 tells us the artifact was excavated in 2013 and was the 252nd recorded that year.

In this process, **Registry** must decide which artifacts are significant and therefore to be kept and registered. In any given day several hundred tiny fragments of glass may be sent in, for example, but perhaps only a dozen can be successfully drawn and photographed, though on some days fully 90% of all glass is retained as significant. Again this is a decision for Registry and not for the field.

Artifacts that are kept are each placed in separate boxes, are drawn, photographed, and described. The description will include material, extent of preservation, color, manufacturing technique(s), form, and other significant variables.

Artifacts are entered onto spreadsheets, both in camp and back in the States. The categories that we use are as follows:

Site	"S" (for Sepphoris)	1 letter
	"Sh" (for Shikhin)	2 letters
Yr	Year	2 digits
No.	Registry Number	2 digits
F.	Field	2 digits
Sq.	Square	2 digits
Loc.	Locus	last 3 digits
Pail	Bucket Number	3 digits
Part	Rim, handle, etc.	
Artifact	Its identification	
Technique	How it was made	
Color	Munsell notation	
Decoration	(or the date)	
Material	Stone, ceramic, etc.	

Coins undergo a rather special processing after they are registered (as artifacts), for then they must be cleaned and "read" by a numismatist. Coin reading then becomes a significant aid in determining which archaeological periods are being excavated in the square as preliminary coin readings are entered on the coin sheet under "comments."

Of course, during the winter the pottery, artifacts, and coins undergo detailed study. This may require correcting earlier field readings.

Pottery reading, artifact analysis, and coin readings presuppose a set of **ARCHAEOLOGICAL PERIODS**. The field pottery readings, for example, are recorded as "LR" or "EB", and it is helpful if you are aware what this refers to. Here is the chronology of archaeological periods presupposed at Shikhin together with their abbreviations:

Iron I	I1	1200–1000 B.C.E.
Iron II	I2	1000–586 B.C.E.
Persian	P	586–333 B.C.E.
Hellenistic	H1	333–152 B.C.E.
Hellenistic	H2	152–37 B.C.E.
Early Roman	ER	37 B.C.E.–135 C.E.
	(phase 1	37–70)
	(phase 2	70–135)
Middle Roman	MR	135–250 C.E.
Late Roman	LR	250–363 C.E.
Early Byzantine	EB	363–451 C.E.
Late Byzantine	LB	451–640 C.E.
Early Islamic	EI	640–950 C.E.
Late Islamic	LI	950–1291 C.E.

Note: The dating of the MR and LR periods differs from the current chronology in use in Palestinian archaeology, but best represents what we currently see emerging at our site. The dividing of ER into two phases follows that of the Sepphoris Regional Project.

Of course, you may already know that at tells with earlier occupation, EB, MB, and LB refer to Early, Middle, and Late Bronze respectively. We do not anticipate any confusion here, however, as our occupation starts with Iron II pottery.

Treat **Architectural Fragments** rather like artifacts, but they are handled in the field rather than by the Registrar. You will need to assign every architectural fragment that you unearth an "AF number," which is a serial number for your square. That is, the first "Arch. Frag." you find will be "AF-1," the second "AF-2," and so on. You should mark on the piece of stone in question your Field.Area designation and its AF number. **Also paint on the Architectural Fragment our license number.** This will distinguish it from other arch frags from other squares and from those excavated by another expedition.

Keep your **Architectural Fragment List** up to date. Fill it in according to the sample below:

No.	Date	Locus	Description
AF-1	6/18	33088	Column drum. 51 cm. dia., 5.12 m. long, uniform diameter, broken at one end.
AF-2	6/18	33089	Piece of molding, 9 x 2 x 11 cm.

A rough sketch in your notes will also be necessary

and useful, as will a digital photograph. It should appear on the note page for the day it was found. Therefore, your arch. frag. list is cross-referenced to that sketch by date. Of course, on your note page will appear a complete description of dimensions, orientation (where it fell), decoration, dressing, surface, treatment (plastered, painted, polished, etc.), and so forth.

The **Locus Sheet** contains a summary of all the information gleaned from the course of the excavation season. The locus sheets are often the first thing that the directors turn to after the dig season is over, and the information on them is formatted to give quick access to the information they want. Keep your locus sheets up to date and in pencil. They are to be treated like laboratory notebooks, as they record the primary data by the Area Supervisor on the days of discovery. Alterations after the fact are very troublesome and need to be in red ink to show that they are corrections.

Here is a line-by-line explanation of the Locus Sheet:

Final Comments and Interpretation serves as a summary of the locus sheet. Although it is one of the first things listed on the sheet, it usually will be the last thing you fill out. It allows you to say in the end exactly what you think the locus is. If the Directors think differently later, they will note with gratitude that you took the trouble to try to interpret it anyway. You may as well confer with the Directors on this one if you have any questions. Be sure to include the archaeological period of the locus, derived from pottery readings.

If the locus is critical for dating features in your square (especially if it is a sealed locus), indicate that by circling "critical?".

Sketch of Locus is a relatively new feature of the locus sheet. It gives the reader a basic visual image of the locus to correlate with the final comments and interpretations without having to flip back to daily top plans.

Stratigraphic Relationships refers to how this layer or feature is related to others around it. List the first locus above it, the next locus below it, and those loci around it ("adjoining"). Confer with the area Supervisor(s) in the next square(s) to see if this locus is to be found there as well. Record what you think it is. Locus sheets from previous seasons used to have a place for your "Tentative explanation": your

inference of what the stratigraphic relations add up to. You might conclude that this feature is a heap of ash *upon* floor 3029 and *under* wind-blown solid 3022 *against* wall 3010 in the east of your square. These inferences are now incorporated into the Final Comments.

Average physical dimensions is fairly straightforward. If the height or depth of this layer is not constant, then you have to say so. You must also say where it is that it is 10 cm. thick and where it is 15 cm. thick. If it slopes down to the *east*, then say so. If it appears in a balk, indicate which one. If it appears in none of your balks, then enter "none."

Contents summarizes what is in the soil layer, if it is a soil layer. Enter the Munsell color reading *and* the name of the color. Refer to the special sheet on particle scale to fill in the size of particles. For "compaction" it is only necessary to use relative language, like "soft" and "rather soft" or "hard," and it is very helpful to note the excavation tool: pick, patish, trowel, or dental tool. Be sure to list contents such as ash or bones, as this is critical to the interpretation. "Explanation of contents" is an opportunity to explain how the stuff you listed just above got there. You may decide that all this black ash implies that this soil is near a fire that was never allowed to burn out completely. Is it a hearth? Say so.

Particle Size: The following particle scale is presented in the interest of quantifying our identification of particle size. It is essentially a simplified and somewhat expanded version of the Wentworth scale, which is a standard used by geologists for analysis of sediment and rock particle size. Obviously, you will not be able to identify clay and silt particles exactly without the aid of some optical measuring device, but this identification is offered here for your understanding and use.

Clay	less than 0.002 mm. in diameter.
Silt	0.002–.06 mm.
Sand	0.06–2 mm.
Pebbles	2–4 mm.
Gravel	0.4–6.4 cm.
Cobbles	6.4–10 cm.
Flagstones	10–25 cm.
Boulders	larger than 25 cm.

Recording on the back of the sheet contains cross-references to the field notes and other sources where one should look for photographs, drawings, and other records of the locus. "Photography" includes record shots and publication photographs.

“Architect's Drawings” means those completed by the expedition's architect or by the architect's staff. They are numbered and/or dated. Enter both the number and the date of the drawing, where that is known. Indicate when the surveyor shot in official elevations. Indicate other reports that you may have received, such as reports on organic remains, on soil, or anything else you feel is pertinent.

Pottery readings are filled in at the pottery table. Add a list of objects (coins, architectural fragments, lamp fragments, and other artifacts) later.

The mention index allows people to locate every page of your notebook on which you mention the locus. Keep the index up to date, as it is an arduous task to complete mention indices at the end of the dig season. The index is a critical tool for those who read dig notebooks. Often supervisors do not appreciate the importance of the index until they are reading locus sheets from someone else's book.

Following are samples of the locus sheet and wall locus sheet used at our site:

DATE OPENED: _____

LOCUS IDENTIFICATION:

LOCUS NO.: _____

IDENTICAL LOCI IN
ADJOINING AREAS:

FINAL COMMENTS AND INTERPRETATION:

CRITICAL? (circle)

STRATIGRAPHIC
RELATIONSHIPS:

Loci above:

Loci adjoining:

Loci beneath:

Top elevations + dates excavated
(pottery bucket elevations):

Means of deposition:

Appears in which balks?

AVERAGE PHYSICAL DEMINSIONS:

Height or Depth:

Width:

Length:

Tip line or slope down to the:

SKETCH OF LOCUS:



CONTENTS, etc.:

Munsell color reading:

Particle size:

Compaction:

Contents, such as ash, charcoal,
gravel, pottery, bone, etc.:

Date	Bucket No.	Reading	Objects, etc.

RECORDING

Photography dates and nos.

Architect's drawing (e.g. final top plan),
Date and name:

Best sketch to scale (e.g. daily top plan),
Date and name:

Appears in which balk drawings?

Other samples and reports (e.g. biological)

MENTION INDEX

Date Page

LOCUS SHEET FOR WALLS, USF EXCAVATIONS AT SEPPHORIS, 20____

DATE OPENED: _____

LOCUS IDENTIFICATION: _____

WALL LOCUS NO.: _____

IDENTICAL WALLS IN _____

ADJOINING AREAS: _____

FINAL COMMENTS AND INTERPRETATION:

FILL IN THE INFORMATION THAT APPLIES.

1. Preserved length:

13. How disturbed:

2. Preserved width:

14. Disturbs what:

3. Preserved max. height:

15. Number of rows wide:

4. Top elevations:

16. Rubble between two rows:

5. Founding elevations:

17. No. courses high:

6. Founding trench locus no.:

18. Avg. size of stones:

7. Founded on bedrock?

19. Field stones.

8. Bonds with what walls:

20. Hammer dressed.

9. Butts with what walls:

21. Margins with boss.

10. Associated floors:

22. Margins and face cut.

11. Associated features:

23. Mortared with what.

12. Associated debris:

24. Keyed for plaster.

SKETCH OF WALL:

↑

25. No. courses in foundation:

29 Where repaired:

26. Which face finished.

30. Location in square:

27. Which face plastered.

31. Direction it runs:

28. Dry laid.

32. Function:

GLOSSARY

architectural fragment: A technical term for a building fragment, such as a column drum, capital, column base, cornice, lintel, etc., found out of place. They are assigned architectural fragment numbers ("A.F. numbers"), the number is painted on them, and they are moved to their storage areas.

area: A technical term for the 5 x 5 m. or larger plot within a Field (q.v.). Also known as a "square."

artifact: Any material object that is altered by a person for some purpose, such as a stone or metal knife, a coin, clay fired into a figurine or vase, etc.

balk: (1) The vertical face of the wall of soil left around a trench, cut, or square, i.e., the two-dimensional face; or (2) the 1 meter wide catwalk left around four sides of a square. All squares in a geometric grid leave their north and east balks, which effectively leaves four catwalks.

bond joint: A joint between two walls in which the stones in the courses overlap across the joint. In this type of joint, the two walls are built at the same time. One wall cannot be dismantled without disturbing the other.

boss: The untrimmed, projecting face of a stone with drafted or squared margins. Popular in the Late Hellenistic and Early Roman periods.

butt joint: A joint between two walls in which the later wall simply runs up against the earlier. These walls can be dismantled separately.

caller: The one who assists the one drawing balks. The caller's job is to call the x-y coordinates, referring to the datum line and a steel tape held at right angles, for any feature in the balk that the draftsman may request. All calls are given to the nearest centimeter.

cameo: A relief portrait, usually formed by cutting away a thin layer of one material so that the resulting portrait is accented against a darker material, such as a cameo bone portrait on stone.

chroma: In the Munsell color notation system, "chroma" refers to the intensity or strength of color

core: The thin, darker line of less-well fired pottery inside a sherd. That is, the cross section of a sherd may look like three layers, in which the center layer is the "core."

course: Each line of bricks or stones atop one another is a "course" of masonry.

crude ware: coarsely made pottery, kitchen, transport, and storage purposes, characterized by gritty cores (See "core") and rough dull slips (See "slip").

datum line: The string across the face of a balk at some specific elevation. This line is stretched between two datum points (q.v.).

datum point: 1) Any permanent feature upon which is painted its surveyed elevation above sea level. This is the reference point for deriving reduced elevations (q.v.).

2) A stake in the face of a balk at some specific elevation, used for the datum line (q.v.).

description: In pottery analysis, this is a technical term for recording surface treatment, temper, color, and hardness. By analogy it is a technical term for observation and recording of all standard variables in analysis of any artifact.

dump: The area where excavated, sifted soil is discarded. Also, discarded mixed materials from earlier occupations usually tipped over the side of a wall or other structure in order to clear an ancient area for building or rebuilding.

elevation: 1) A surveyor's measure of height above or below mean Mediterranean sea level. It is normally measured by total station from a fixed point, such as one of the British Ordnance Survey triangulation points, or one established by the Survey of Israel.

2) A reduced elevation is measured from a datum point (q.v.) beside a square. The vertical distance from the datum point to

the feature is subtracted from the datum to yield the reduced elevation, popularly called the "level."	vated soil.
erosion: Soil, gravel, sand, etc., brought in by natural processes, such as wind or water. Contrast with "fill."	header: In masonry a brick or stone with its narrow face or "head" end in the face of a wall. Usually they extend all the way through the wall forming a kind of binder or strengthener. The opposite of "stretcher" (q.v.).
fall: Stone or brick remains from the collapse of a wall or other architecture.	hue: The technical term for color; the wave length of reflected light.
field: One of the large plots made up of many "squares" (q.v.).	hammer dressed: A method of removing the most prominent irregularities from wall stones by merely knocking them off roughly.
fill: Soil, gravel, sand, etc., brought in specifically to level up underneath a planned floor or other structure in antiquity. I.e., it is the result of human activity. Contrast with "erosion." Often occupation debris (q.v.) is used, in which case the fill will contain artifacts and pottery from all earlier occupation on the site.	indicator sherd: the parts of a broken vessel which most surely indicate that vessel's type and date: usually a handle, rim, or base fragment.
fine ware, see "red ware."	<u>in situ</u> : Pronounced "in see-too" means "in place" and referring to undisturbed artifacts and architectural fragments.
Formator: Also known as "Restorator." The person charged with reconstructing pottery from sherds. Also refers to anyone who reconstructs ancient walls.	intaglio: The opposite of cameo. An engraved pattern, usually on a gem.
founding elevation: The lowest point of a wall's foundation, i.e., beneath the foundation stones.	locus, pl. loci (pronounced "low-cuss, low-sigh": Any three dimensional feature in a square, such as a layer of earth, a wall, pit, bin, etc.
foundation trench: The long, narrow trench dug in antiquity for the founding courses of a wall. Often such a trench is quite wide so that the mason can stand in the trench while assembling the foundation. On the other hand some are narrow, which required the mason to kneel outside. On occasion a trench may exhibit features of both types. (C.F. Kenyon, <u>Beginning</u> , p. 81)	make-up: Often synonymous with "fill," but "make-up" is reserved for the leveling operation underneath floors.
gastropod: Technical term for "snail."	Mention Index: The list kept on the back of the locus sheet by date of each mention of a locus in the notes.
graffito, pl. graffiti: Any casual writing on plaster, pottery, stone, and so forth in antiquity.	NS: "Not Saved," refers to pottery sherds that are thrown out in the pottery reading (q.v.) because the bucket is contaminated or the sherds are not distinguishable in period, or "UD" (q.v.).
grog: A temper material in pottery made from ground and crushed, fired pottery. Usually appears red, yellow, or almost black under a stereo, 50x microscope.	occupation debris: Soil mixed with other materials characteristic of human occupation: tiny particles of bone, pottery, charcoal, ash, seeds, and organic matter.
<u>gufa</u> : (Arabic <u>gufa</u>) A rubber basket for moving excavated soil.	patish: Hebrew for "hammer," but on American archaeological excavations in Israel refers to a small handpick.

patina: 1) On chert ("flint") refers to the surface layer that is often stained yellow, brown, or red. Also sometimes used for the glossy cutting edge, which has been polished from cutting grain.

2) With reference to copper or bronze indicates the greenish layer of corrosion and compacted dirt on the surface of the artifact.

3) With reference to glass, the opalescent coating caused by weathering or chemical interaction with the soil.

phase: 1) A sub-division of "stratum" (q.v.)

2) A rebuild or re-use of some structure or smaller feature, such as a rebuild or repair of a wall or re-surfacing of a floor.

phytolith: A silicon cast of an individual cell from a plant formed when water evaporates through the cell walls leaving an increasing concentration of silica. After the plant dies and the outer wall of the cell decays the residuum is a small silica stone in the exact shape of a single cell from the plant.

pithos, pl. pithoi: Any large storage vessel intended to stay in one place.

point one locus: A special type of locus number used to indicate the first five centimeters of material in a floor. For example, if the floor is designated L1088, then the pottery and other artifacts within the first five centimeters come from L1088.1.

pottery reading: The process of identifying the periods represented in a bucket of pottery sherds.

probe trench: Sometimes merely "probe." The small, rapidly dug trench that is excavated so as to clarify the nature of the underlying loci. This enables the excavator to proceed not entirely blindly.

relief: A type of carving in which the decorated element is raised above the background, which is cut away. The opposite of "intaglio" or "engraving."

red ware: A specific type of 4th to 6th century

Byzantine pottery characterized by repeated decoration and red, oxidation firing. Sometimes slipped with the same clay. See "terra sigillata."

restorator, see Formator.

robber trench: The long, narrow trench that remains after robbing out a wall in antiquity.

row: The lines of stones that form the *thickness* of a wall.

screen wall: Loosely used to indicate a wall that butts at both ends on earlier walls and is one row wide. Perhaps to be associated with animal enclosures.

section: 1) The two-dimensional face of a balk.
2) The balk drawing.

slag: The glassy, waste material that is formed as a by-product in iron or copper smelting.

slip: The clay coating on pottery formed by dipping the pot into clay + water of pea soup consistency, then firing it.

square, see area

stratification: The layers and other features in a square as they are uncovered.

stratigraphy: The process of observation, interpretation, and recording of stratification.

stratum, pl. strata: A historical and cultural period of habitation of a site, as the "Roman Stratum. Strata are distinguished from one another by differences in artifacts, pottery, and other architectural orientation.

stretcher: In masonry construction a stone whose long side is in the face of a wall. Corners of walls are often made of headers (q.v.) and stretchers.

surface: 1) The modern topsoil.

2) The ancient topsoil.

3) A floor, courtyard or other plane upon which people or animals walked in antiquity.

tabun: A beehive-shaped oven made of clay, fired in place, and often with large sherds impressed into its outside surface.

TBD: "To be drawn," a designation for pottery or artifacts to be reserved from the registry (after their completed registration) and sent to the artist.

temper: An archaeologist's term for the material added to clay to reduce its plasticity. Potters more often say "filler." This material is commonly grog (q.v.), calcite, sand, quartz, or organic matter, though other materials are used.

tessera, pl. tesserae: The small, cubic stones of which mosaics are made.

terra sigillata: 1) An Early Roman pottery characterized by white clay and thin, red glossy slip. Often it is signed or stamped (sealed) on the bottom by the potter, which accounts for its name.

2) Popularly used in a general sense for red-slip pottery of various wares from the second century B.C. to the fifth century C.E. more properly called "red ware" or "fine ware" (q.v.).

tip line: Sloping lines in the balk that indicate that the layer in question was thrown out. Such

material is often gravity sorted, evidenced by the gradual increase in particle size as one follows tip line down.

top plan: The daily scale plan of a given area (square).

typology: Classification of artifacts according to development of a feature or features (form, decoration, surface technique, manufacturing technique, etc.) over time.

ud: "undistinguished," usually referring to body sherds of pottery that do not manifest identifiable characteristics, i.e., they are not unambiguously classifiable to any period.

unk: "unknown," usually referring to an unfamiliar pottery form.

value: The darkness or lightness of a color in the Munsell Color notation.

wash: An unfired coating on pottery, usually thin and easily worn off.

white ware: A specific type of Byzantine pottery on the one hand and 13th century Arab pottery on the other characterized by white clay and no glazes. The Arab variety has incised, geometric decoration.

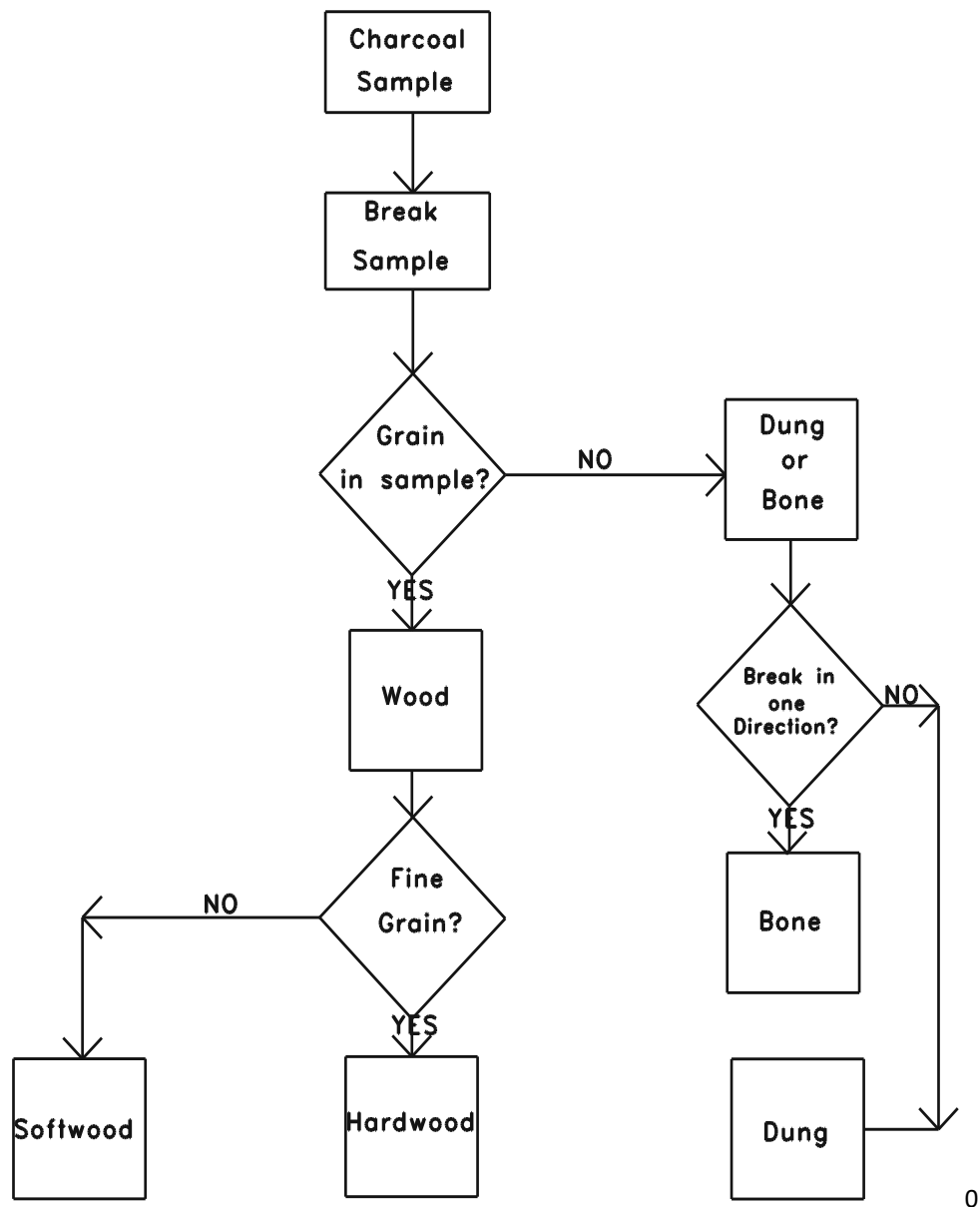
APPENDIX 1: THE IDENTIFICATION OF CHARCOAL

Charcoal can be identified as hardwood, softwood, or bone by simply breaking it. If a wood grain shows in the break, it is obviously wood. Hardwood exhibits a fine grain and softwood a large grain.

If, on the other hand, the sample tends to break in only one direction, namely longitudinally, then it is probably bone. If there is no discernible direction of break or of grain, then it is doubtless dung charcoal.

There may be times that you may mistake bone charcoal for hardwood charcoal, but by and large it is rather simple to identify the sample correctly by careful examination after fracturing it.

Flowchart for Identification of Charcoal Samples



APPENDIX 2: SAMPLE DAILY NOTES

SH 12
I.4
June 45

(p. 25)
CDG
LES

Objectives:

To open the southern portion of the square and excavate the upper soil layer(s) and expose features.

We had left off digging the south area of the square at L4002. The elevation of the last pottery bucket L4002 bucket I.4.05, was 185.733. The elevation (surveyor's elevation) of the rock barely emerging from the soil in the SE corner of the square is 185.661. We merged the ~~two with the~~

I.4.21

L4002

185.661

We opened bucket I.4.21 at 185.661. We are waiting for change since immediately the S half of the 4x2 meter area appears harder in compactness and more rocky than the portion to the N. But initially we are saving pottery ^{if any} together until the difference becomes more clear. We are sifting all soil.

Content: pottery, glass, unknown artifact (base of stone vessel??), subangular chips, roof tile, chunks of floor plaster. The glass is numerous w/ several identifiable pieces.

Munsell: 7.5 YR 5/3 brown

I.4.22

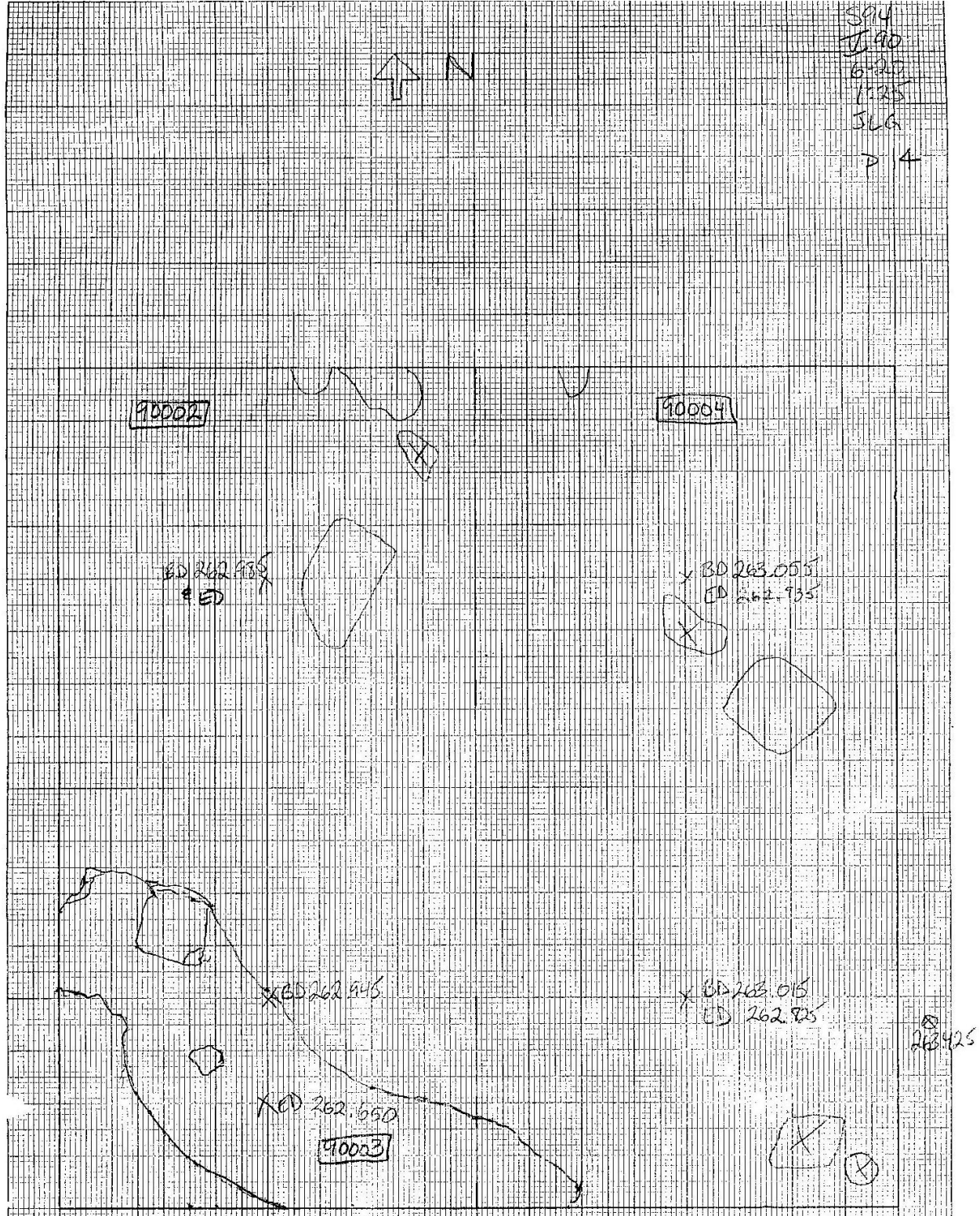
L4002

185.661

Because the soil was yielding ample pottery and we were running a sifting operation, we opened pottery bucket I.4.22 - also for L4002 and at the same elevation.

Composition: sand with some limestone cobble

APPENDIX 3: SAMPLE DAILY TOP PLAN



APPENDIX 4:
SAMPLE LOCUS SHEET FILLED OUT

LOCUS SHEET, SHIKHIN EXCAVATION PROJECT 2018

DATE OPENED: 5/31 LOCUS NO.: L21004

LOCUS IDENTIFICATION: TUMBLE FIELD W/ LARGE STONES, CUT STONES, FLAGSTONES, COBBLES IN SOIL & POTTERY IDENTICAL LOCI IN ADJOINING AREAS:

FINAL COMMENTS AND INTERPRETATION: CRITICAL? (circle)

THE STONE TUMBLE NOW SEEMS LIKELY TO HAVE INCLUDED THE STONES THAT WERE ADJACENT TO W21006, WITH THE EXCEPTION OF THE LARGE PERPENDICULAR ASHLAR & THE AREA THAT HAD TWO LAYERS OF PLASTER PLACED TO BE EVEN WITH THE TUMBLER SIDES. [W21004] WAS ALL STONE TUMBLE SOUTH OF WHAT WAS DECLARED A POSSIBLE BENCH [W21008], AND THOSE STONES ARE NOT ON THIS DRAWING.

STRATIGRAPHIC RELATIONSHIPS:

Loci above: L21001 L21002
L21003

Loci adjoining: W21008 W21007

Loci beneath: L21005

Top elevations + dates excavated (pottery bucket elevations):

Means of deposition: EARTHQUAKE OR HUMAN ACTIVITY

Appears in which balks? E

SKETCH OF LOCUS: ↑

AVERAGE PHYSICAL DIMENSIONS:

Height or Depth:

Width:

Length:

Tip line or slope down to the:

CONTENTS, etc.:

Munsell color reading: 7.5 YR 5/3

Particle size: ASHLARS, BOLDERS, LARGE STONES, FLAGSTONE, COBBLE

Compaction: MEDIUM

Contents, such as ash, charcoal, gravel, pottery, bone, etc.:

APPENDIX 5: SAMPLE LOCUS SHEET FOR WALLS, FILLED OUT

LOCUS SHEET FOR WALLS, USF EXCAVATIONS AT SEPPHORIS, 20____

DATE OPENED: 14 June

LOCUS IDENTIFICATION:

First course of well-laid wall

FINAL COMMENTS AND INTERPRETATION:

Cross wall to room

LOCUS NO: 90051

IDENTICAL WALLS IN

ADJOINING AREAS:

89007

FILL IN THE INFORMATION THAT APPLIES:

1. Preserved length:

3.6 m

2. Preserved width:

61 cm

3. Preserved max. height:

22 cm

4. Top elevations:

262.94

5. Founding elevations:

240.05

6. Founding trench locus no.:

90060

7. Founded on bedrock?

yes

8. Bonds with what walls?

none

9. Butts with what walls?

none

10. Associated floors:

9015

11. Associated features:

burn

12. Associated debris:

?

13. How disturbed:

dismantled

14. Disturbs what:

nothing

15. Number of rows wide:

one

16. Rubble between two rows:

no

17. No. courses high:

one

18. Avg. size of stones:

51 x 66

19. Field stones:

no

20. Hammer dressed:

no

21. Margins with boss:

yes

22. Margins and face cut:

✓

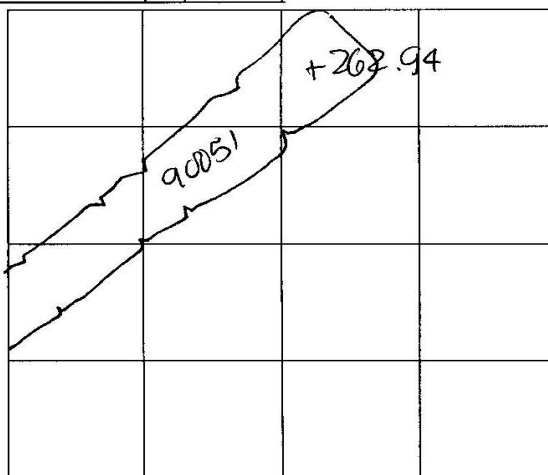
23. Mortared with what:

none

24. Keyed for plaster:

no

SKETCH OF LOCUS, i.e., the WALL:



25. No. courses in foundation:

unknown

26. Which face finished:

N & S

27. Which face plastered:

none

28. Dry laid:

yes

29. Where repaired:

?

30. Location in square:

NW quad

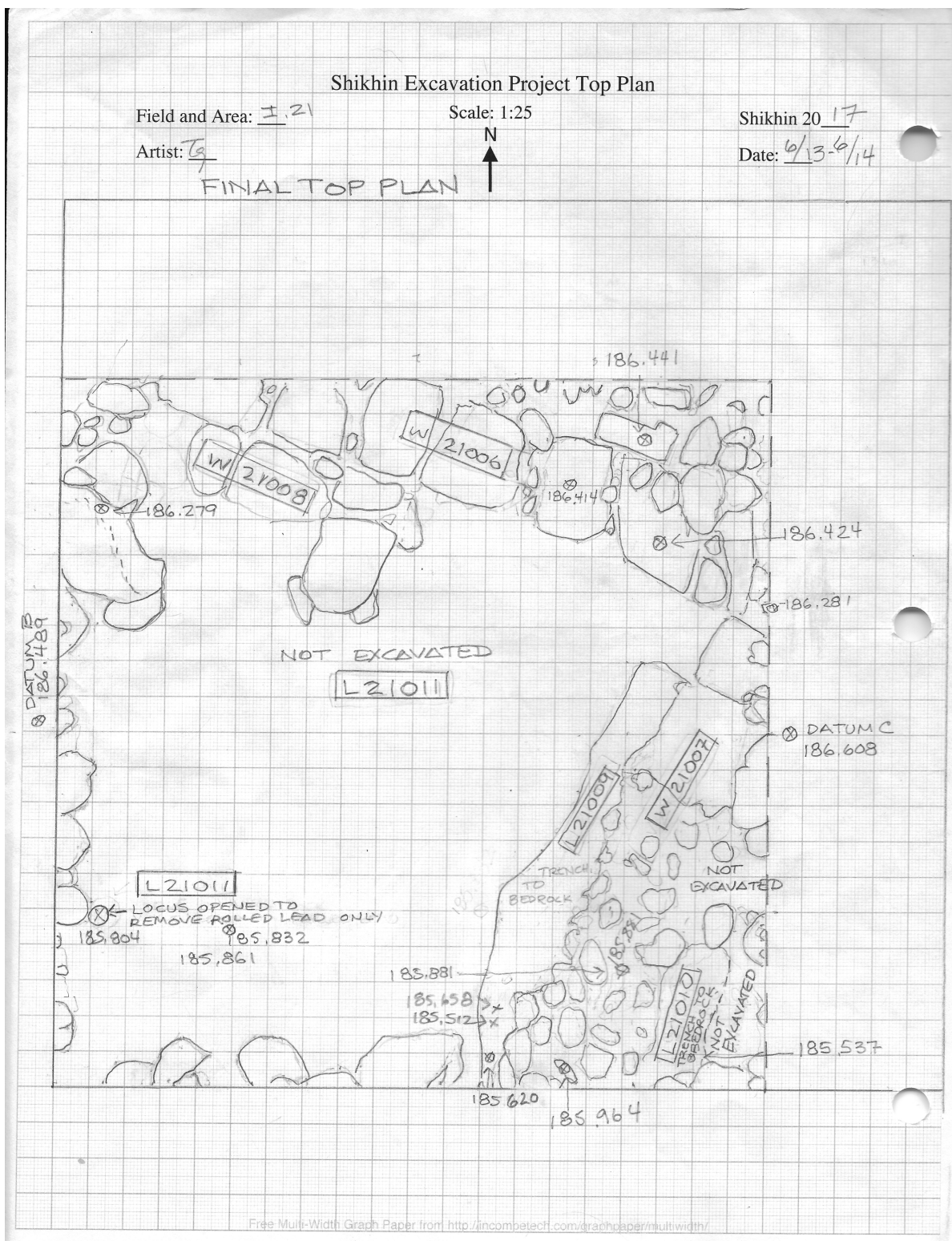
31. Direction it runs:

NE → SW

32. Function:

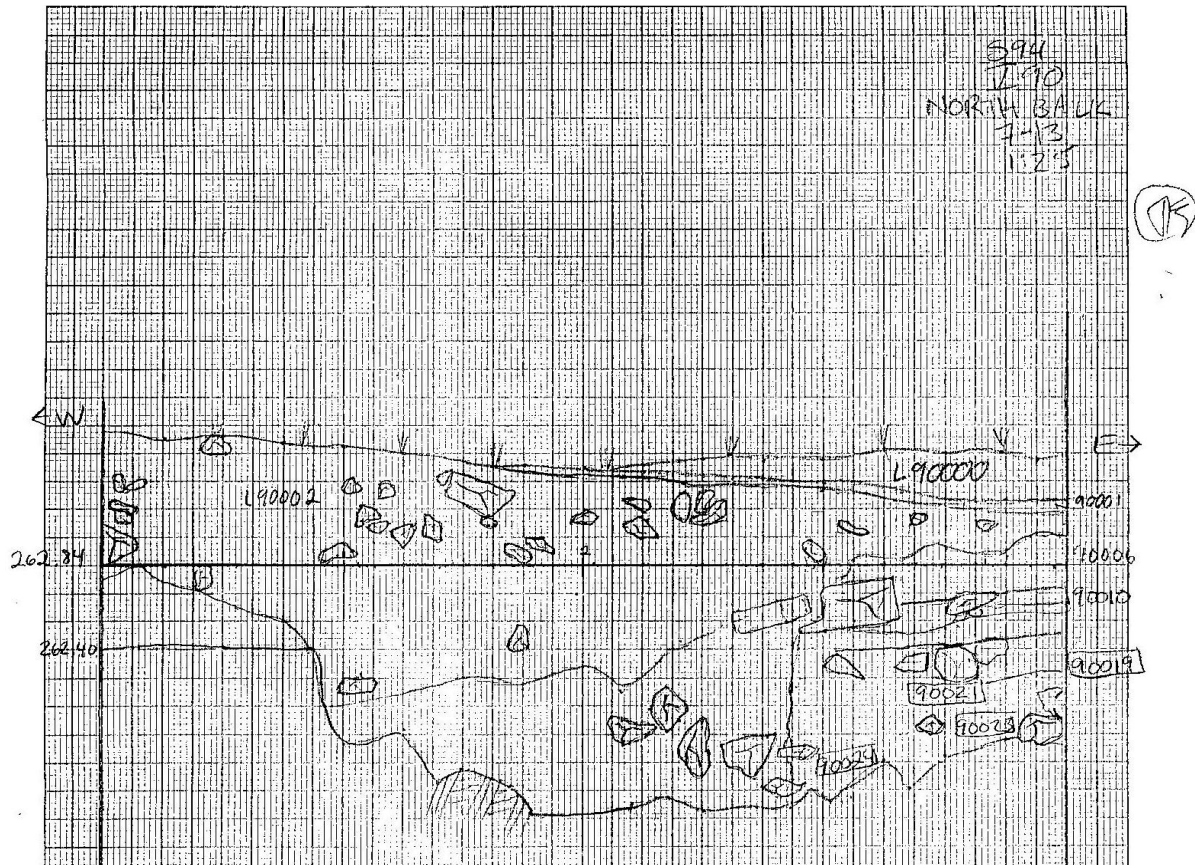
room wall?

APPENDIX 6: SAMPLE FINAL TOP PLAN



Note: this final top plan does not include many elevations for L21011. Your final TP will.

APPENDIX 7: SAMPLE BALK DRAWING



APPENDIX 8: SAMPLE WEEKLY REPORT

Sepphoris 1994

V.90 Weekly Report 7/4-7/8

Area Supervisor: Alysia Fischer

This week we excavated two main areas, and for simplicity's sake I'll explain things by area.

The first area is the circular workspace, which is defined by a ring of mortared stones which includes reused column drums. We began by excavating the central loose soil (90013) which dated to the Byzantine II period. In this locus we found pig bones.

Surrounding the central loose soil and bordered by the ring of stones was a much harder very compacted layer of soil in which we found 3 coins, glass, a lamp fragment, a sandal nail, a nail, and pig, chicken, and sheep/goat bones. This hard packed layer (90014) appears to have been laid during the Byzantine I period.

Underneath the hard packed layer we encountered a new locus (90018) defined at the top by a layer of broken pottery, and defined at the bottom by bedrock. In this locus we found glass and the pottery dated to the Late Roman period.

In the eastern section of the workspace, underneath 90014, we encountered an ashy locus (90022) which appears to be mortar laid on bedrock to create a smooth work surface. In this locus we found many burned olive pits, which suggest that a crude olive oil may have been produced here. The pottery was Late Roman.

We also excavated between the stones ring-ing the work surface (90017), and to the west of the stones (90020). Both of these loci yielded only un-distinguishable shards and no other information.

So, stratigraphically speaking, this area saw its first use in the Late Roman period as a mortar floor laid upon bedrock used for some sort of olive industry that involved burning. During the Byzantine I period a ring of stones was founded with a hard compacted surface to create a workspace. This workspace was still in use, or reused during the Byzantine II period. The only information we have concerning this workspace is the gold jewelry found directly over it (which creates more questions than answers), and the fact that during the Byz II period the ceiling of the workspace burned and fell in, presumably ending the use of this space.

The other area we excavated this week was associated with a trench to the west of the workspace. This trench appears to be roughly in line with the projected wall of the building. As we began to excavate the trench we encountered a large number of artifacts associated with the top locus (90016):

glass, 4 nails, lamp fragments, a glass bead, 3 glass tesserae, sheep /goat and chicken bones, and a fish stamped pottery fragment. This locus dated to the Byzantine II period. After this locus the trench was divided into two sections. In the northwest corner (90024) we found a coin and cow bones. One of three pottery buckets has been read and it dates to the Roman period (BS only). This locus ends on bed-rock. The southeast section of the trench ends in an ashy layer which contains burned olive pits and probably relates to the olive industry in 90022. The pottery for this locus has not yet been read.

Northeast of the trench was a separate area which was at first defined by a locus full of cobbles which dated to the Byzantine period. Directly beneath the cobbles was another locus which dated to the Byz I period. Both loci were pretty dry, artifactually speaking. The last soil layer prior to the trench and this northeast corner joining in 90023, contained lamp fragments and cow and chicken bones. The pottery on this locus has not yet been read.

As for this week, we photograph, draw balks and draw top plans. Our square has shown little to no information concerning the original building. In fact, in some ways it argues against the building having extended this far. The Late Roman olive industry is founded on bedrock, not on some earlier structure. We did find a trench which may line up with the building (and I understand some stones emerged late Friday, and they may be foundation stones--unfortunately I was sick, and so I am only hypothesizing). Anyway, look forward to more of this type of argument in my forthcoming final report...Was there an extension of the original building in this square, if so, when did it go out of use?

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