Chapter Six

Digging the site

When setting out an excavation, some care should be taken to consider the effective management of soil in relation to safety and the day-to-day running of the site. Much time and effort can be wasted in moving, and sometimes re-moving, soil. The first aspect to be considered will always be safety, then what is best for the archaeology of the site, and finally the most efficient way of moving and storing soil. From a safety point of view soil should never simply be dumped on the edge of the trench. Soil dumped in this way will not only increase the likelihood of trench-edge collapse but will also spill back into the trench, becoming particularly dangerous to site workers as the trench gets deeper. Archaeologically, it is also bad, as objects from the spoil (soil) heap can fall into earlier layers, potentially confounding their date.

Soil should never be dumped closer than one metre from the trench edge, but if any great depth is involved it should be dumped well away from the trench. That having been said, you must, however, consider what is going to happen to the soil at the end of the excavation. If trenches are to be backfilled, which is usual – except in salvage archaeology – then you need to consider whether backfilling is going to be done by hand or by machine. With shovel tests and test units the soil is usually piled close to the hole, but still over a metre away, so it can be easily backfilled. For big sites, particularly if machine-stripped, there may be one or two main spoil heaps away from the excavation (Figure 6.1).

When considering the location of these spoil heaps you should consider ease of access, sieving (screening) and photography. Ease of access includes the construction of short, safe barrow-runs or paths for carrying buckets. Steep barrow-runs can be extremely dangerous in wet conditions. Spiral barrow-runs up spoil heaps are safer than long, straight runs. Sieving should be done on or beside the spoil heap, so care should be taken to consider wind direction, or fine dust will be forever blowing over the excavation. It is also worth considering the location of spoil heaps in relation to photography. By constructing spoil heaps on only two sides of a rectangular excavation, for example, not only do you have ready-built photographic platforms, giving height, but also in photographing from the spoil heap you will avoid their appearance in the excavation photographs.

Restricted sites do, of course, have their own particular problems. On small urban sites, especially those to be followed by development, it may be worth paying, or negotiating with the developer to pay, for the soil to be removed from site by skip. Other sites may involve a multi-season excavation to resolve the soil dumping problem. During excavation of the top of the motte at Lewes Castle, Sussex, for example, not only did the soil have to be kept on the top of the motte, but also half the top had to be kept accessible for tourists paying to visit the castle. The area excavation therefore had to take place over four seasons. Each season

Figure 6.1 The layout of an excavation. Note particularly the position of soil dumps (spoil heaps)

one quadrant was excavated, while another quadrant was used for soil dumping. The remaining two quadrants remained open to the public. Each year the excavation and spoil heap moved around one quadrant (Figure 6.2). The location of site offices and facilities also has to be considered in relation to both the excavation and spoil heap, and also access into and out of the site for site huts, and so on. Usually these temporary buildings are best situated as near as possible to the road access.

The physical layout of the excavation will depend very much on how the site is to be dug. Do not expect machine drivers to be able to see thin string. If using machinery, it is often best either to lay out the trench roughly, and then cut back to its final shape by hand, or to dig a clear spade's-width trench inside the edge of the trench as a marker. Rough shapes for machining can be marked with sand, spray paint or ranging poles. If hand-digging a trench, then the edge should be clearly marked with string held down with 6in (15cm) nails – larger in sand. Remember that if you put a nail in the corner of a trench and then dig up to it, it will fall out. This problem can be avoided by placing the nails outside the trench and making sure the strings cross at the trench corner (Figure 6.3). The edge of the trench can then be started with a spade to mark the vertical cut. Finally the excavation is under way.

Excavation

The aim of excavation is to identify, define, uncover, date and – by understanding transformation processes – interpret each archaeological context on a site. Usually this process is carried out in the reverse order of the site's construction, cutting or deposition. I am using

Figure 6.2 Excavating a restricted site. Over four seasons one quadrant was excavated, a second being used to dump the soil

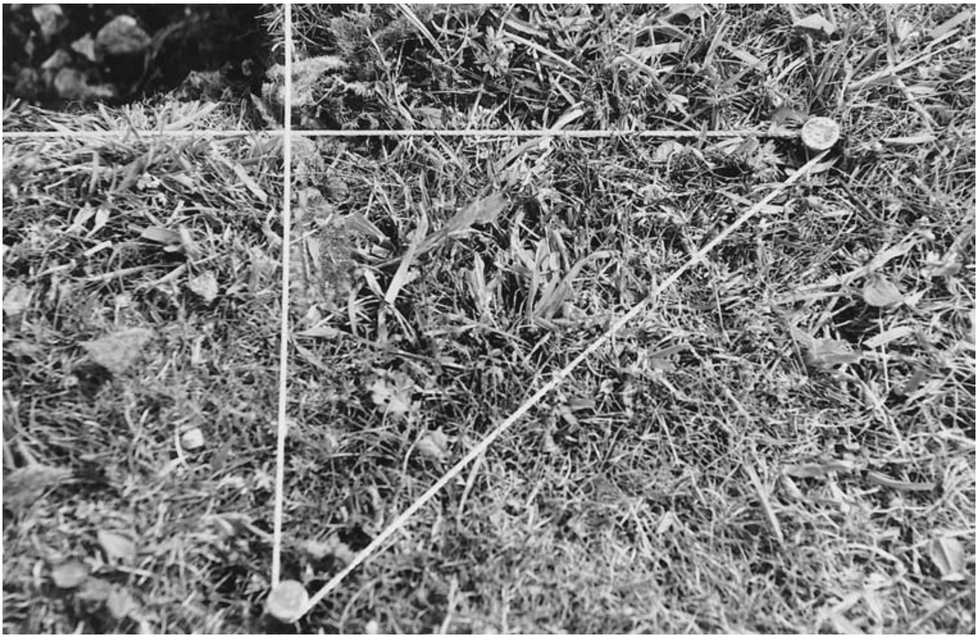


Figure 6.3 Stringing up the corner of a trench

the term ‘context’ as it is used widely in British archaeology today. A context refers to any discrete archaeological entity on site, and so could refer to a layer, a pit or a posthole. It is often the result of a single action, whether it leaves a positive or a negative record on the site. The cut of a posthole, for example, leaves a negative record (that is, something has been removed) whereas the fill of a posthole leaves a positive record (that is, the content of the posthole has been added to the sequence). Contexts were traditionally known as layers and features in Britain, and these terms are still widely used elsewhere in the world. In the USA the term ‘stratigraphic unit’ is used. Some archaeologists argue strongly for one term or another, but as these are simply labels of convenience it really does not matter. No prehistoric person said ‘Let’s go and make a context today’! For this discussion I will use the term ‘context’, as it is the shortest.

A context can consist of either a discrete archaeological entity or such an entity and its interfaces with other contexts (Harris 1979). A specific deposit of soil will be above something, below something (unless the top layer) and beside any number of other deposits. At each of the junctions there is an interface. By isolating interfaces, sequences – the stratification of the site – can be established. Not all contexts and their interfaces cover the whole site, hence one of the many problems of digging small holes which may, or equally may not, be typical of the stratigraphy of the whole site.

Contexts are basically the result of natural erosion and deposition (Pyddoke 1961) and of human activity operating within the context of these natural processes. The natural process of erosion and deposition is well known on a geologically large scale. All hills are gradually eroding and the resulting erosion products are deposited in low-lying areas, like valleys. This process also takes place on the very small scale. The soil dug out of a posthole, if left as a pile after the post is set in the hole, will erode down, mainly through the action of wind and rain. This soil will either wash into any hollows or spread out over a surface. Human activities like pit digging will cut into lower deposits, creating new contexts: the pit and pile of soil will be used and become transformed into the contexts the archaeologist isolates.

A crucial element of excavation is therefore the process of defining contexts. This may be easy or may be extremely difficult. It requires skill and experience. A wall, a hearth, a pit may be fairly easy to isolate, but the eroded pile of soil from a posthole may have simply blended away into adjacent contexts. To define a context one is essentially looking for differences, differences in colour, texture, consistency and coarse components, and the junction or interface of these differences. We will be returning to the description of these four elements when considering the record of contexts in Chapter 7. Here the importance is simply to define elements of the site that are different. At its very simplest, an area with black soil is different from an area with red soil, is different from an area of red soil with bits of stone in it. The context thus defined is recorded in plan (Chapter 7) and then decisions have to be made about how to excavate it. As this is an ‘introduction’ to field archaeology, clearly, more can be said on all aspects of what follows. You can take your reading further by looking at two excellent and more detailed texts by Steve Roskams (2001) and John Collis (2001).

Recurrent types of context and their excavation

One of the most important things to remember when excavating is that people rarely lived on walls, down pits, in postholes or in ditches, and yet excavations are often dominated by these contexts. People lived on surfaces, and much of what they did on surfaces will leave only the slightest trace or none at all. Some surfaces, like the tiled floor of a medieval hall, are relatively easy to isolate and excavate. Other surfaces will include the natural land surface during the period of occupation. These are much more difficult to define and excavate. They may be traceable only through changes in soil chemistry or magnetic susceptibility (Chapter 3), by areas of trampling or by artefact patterns.

Identification of living surfaces is made more difficult by post-depositional transformation processes (Chapter 2). Layers with low concentrations of artefacts (not middens or rubbish dumps) may represent the artefacts from a living surface that have been worm-sorted down the profile. The pattern of artefacts could still represent the activities on the occupation surface, but be 20cm or so below the surface that was actually lived on (Darwin 1881). Trampling on that surface may have been worm-sorted out of existence. The surface as such will survive only if it has been rapidly buried. Surfaces can really only be excavated in plan, hence the desirability of open-area excavation.

Black Patch (Drewett 1982), the bronze-age site in East Sussex, is an example of how careful plotting of worm-sorted artefacts made it possible to suggest where specific activities like weaving, leather-, wood- and bone-working, and cooking took place (Figure 6.4). The excavation technique employed was to grid the area under excavation into 1m squares. These were all excavated at the same rate, with every artefact and ecofact left *in situ*. At the end of each day all objects were recorded directly onto field plans, lifted and bagged by grid square and, in the case of specific objects like bronze pieces, by two-dimensional co-ordinates (see Chapter 7). Living surfaces will often merge into the surrounding landscape, making definition of extent almost impossible. Somewhat arbitrary decisions about extent may have to be made.

Figure 6.4 Excavating a hut floor by one-metre squares

Some types of archaeological context are much easier to define than are surfaces. These include recurrent contexts like pits, postholes, ditches and walls. These are the contexts traditionally – and often still – known as 'features'. Pits include a wide variety of holes dug from the living surface into underlying layers, and often into bedrock. Rarely are they actually dug as rubbish pits, although this may be their final use. Pits were dug for all sorts of reasons, including to store grain or other foodstuffs, for water storage, as quarry pits, cesspits, cooking pits, earth ovens, manure stores or for ritual functions. The purpose of excavating a pit is, like the excavation of the whole site, to establish sequence and event. When was the pit dug, used, abandoned and filled in? How was the pit dug, what were its size, shape and lining, and what events took place during its life? Then, how does it relate to other pits and contexts on the site?

To establish sequence, pits are often half-sectioned. The top edge of the pit is carefully defined and then divided into half with string and nails. Some excavators orientate all section lines north–south. Although this looks neat on the plan, it has no real advantage and orientation in relation to sunlight, both for photography and drawing, is worth consideration: drawing pit-sections is extremely difficult when half is in sun and half in shade. One half of the pit is then excavated following natural stratigraphic layers (Figure 6.5). Arbitrary spits should be dug only if no natural layers can be determined. The surface of each new layer should be carefully excavated in plan. Even if you consider the deposit to be just domestic rubbish thrown into an old storage pit, there may be structure within the rubbish, or specifically placed offerings. What we see as 'rubbish' today may have had all sorts of meanings and taboos in the past. The edges and bottoms of pits should be treated with extra care, as they may provide information concerning the primary function of the pit.

One half of the pit having been dug, it should be recorded as part of the written, photographic and drawn record (Chapter 7) and then the other half be carefully removed in the same way. Pits, because of their depth, often have good preservation of carbonized organic material, so their contents are often subjected to water flotation. Remember, however, that the contents of pits usually comprise secondary rubbish and tell you about activities elsewhere on the site, generally not about activities taking place in the pit itself (except, of course, the activity of rubbish disposal). An alternative way to excavate a pit is in plan. The top of each natural stratigraphic layer is carefully cleared and levels taken. From these levels sections can be reconstructed through the deposits on any line. Excavating in plan has the advantage of allowing whole surfaces as well as any activities (like votive depositions) to be viewed. In a half-sectioned pit these deposits have to be dug and recorded one half at a time.

If any pit cuts through another, it may be possible to establish a sequence of pit digging. Again, this can be done in plan, but the relationship is usually defined in section. To do this the edges of both pits should be defined in plan and then the section line laid out through both pits, rather than treating each as a separate pit (Figure 6.6). If you are lucky you may see how one pit cut through the fill of the other. Roots, worm-sorting or burrowing animals may, however, have removed this evidence, so if there is doubt, record the sequence as doubtful. The relationship may be resolved when other factors, like datable artefacts, are taken into consideration.

Timber posts set into the ground were, and in many areas still are, used for a wide variety of constructions, from the great Native American round houses to simple drying racks. The ability to recognize, define and excavate 'postholes' is essential on most excavations. There are three main elements to these contexts. Firstly, a hole is dug into the ground, often known as the 'post pit' although sometimes as the 'posthole'. Secondly, the post is put into the hole

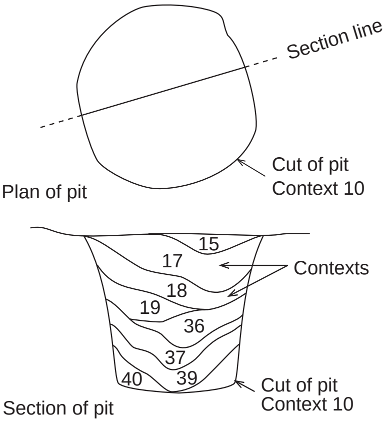


Figure 6.5 Half-sectioning a pit

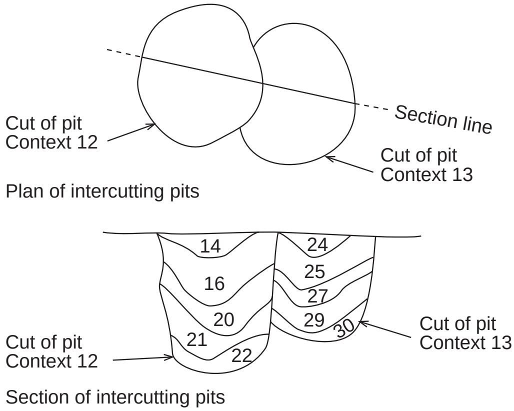


Figure 6.6 Sectioning intercutting pits

and then packed around with soil or rocks: the ‘post-packing’. Thirdly, if left to rot or pulled out, the post may leave an imprint in the packing. This is variously known as the ‘post mould’, ‘post pipe’, or ‘post socket’, or sometimes this element on its own is known as the ‘posthole’. For the erection of very large posts there may also be a ‘post ramp’ cut down into the post pit. Careful excavation of postholes is therefore essential as, firstly, they can be confused with many other holes, either humanly dug or natural, and secondly, the size of the post pit may or may not relate directly to the size of the post, and the size of the post is what matters when reconstructing buildings.

The most usual way to excavate a posthole is to half-section it. This is best done when all postholes from an individual structure, like a round house, are visible in plan. Carefully clean the top of the posthole in plan. If you are lucky, the post pipe or mould may be visible, or more usually an erosion cone above the top of the post pipe may be seen (Figure 6.7). If the position of the original post is visible in plan, then the half-section should be laid out through the post pipe and packing to the edge of the post pit. The half-section is then cut out carefully, keeping all finds from the post packing separate from any from the post pipe. The section can then be recorded (a written, drawn and photographic record) and the other half removed. If no post pipe is visible in plan, then the posthole could be quadranted, giving two cross-sections, or excavated in plan, with a section reconstructed from the plans. Usually, however, an intelligent guess is made and a single section is cut through the middle of the hole. This can, however, either miss the post pipe altogether or produce totally erroneous evidence (Figure 6.8).

The dating of postholes is not at all straightforward. The date of objects within a posthole will provide only a *terminus post quem* date, that is, the posthole is from the same date as the latest object within the hole or later. Clearly, in terms of sequence of deposition, the objects within the packing material will be earlier in date than those in the post pipe. Usually, however, objects within postholes bear little relationship to the date of the hole, especially on multi-period sites. This is hardly surprising. When a posthole is dug, the hole-digger will cut through earlier occupation layers (with their artefact assemblages). The post is then set in the hole and either the soil dug out is packed in again, or only the big bits dug out, like potsherds, bones and stone, are packed in to hold the post steady. A medieval post put in on

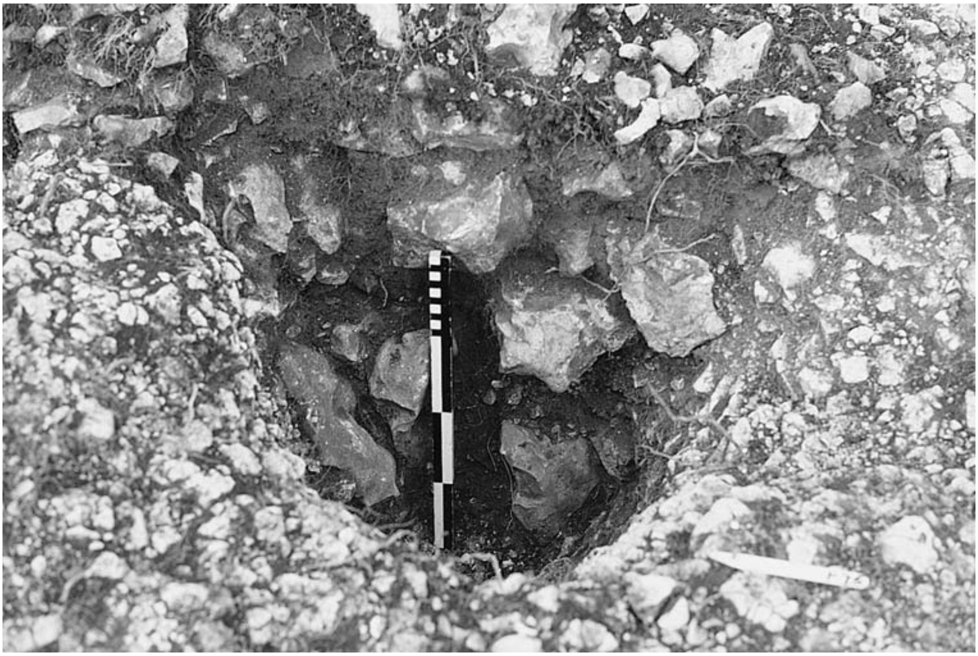


Figure 6.7 Half-sectioning a posthole

a site occupied in the neolithic period may therefore contain only neolithic artefacts in its packing.

The post may finally rot or be pulled out. If it rots *in situ*, fine particles of soil may fill in the void and no artefacts are likely to get into the post pipe. If, however, the post is pulled out, then surface rubbish may fall or be pushed into the hole. The material will provide a *terminus ante quem* for the removal of the post. The post has to have been removed at the time of the date of the latest object in the post pipe or later.

A safer way to date postholes is to attempt to date the surface from which they were dug. This is rarely easy on shallow sites, where postholes are generally not recognized until seen cut into bedrock. This is particularly the case on ploughed sites. Again, the surface from which the posthole was dug, if locatable, will provide only a *terminus post quem*, although the layer above the surface will provide a *terminus ante quem*. Generally, individual postholes are undatable, but fortunately postholes are often part of a larger structure which may be dated either by the plan of the structure or by its relationship to other contexts, like floors.

Ditches are, and were in the past, dug for a wide variety of reasons. Massive ditches could defend towns or hillforts. Little ditches or gullies could be dug around individual houses to prevent flooding. Whether big or small, they present the problem that, as linear features, the sequence at one spot may be totally different to the sequence at another. A single right-angled cross-section will give only the dimensions of the ditch, its sequence of filling and possibly recutting at that point. A section a metre away may give a totally different sequence. To fully understand a ditch sequence, it should ideally be excavated as a series of quadrants

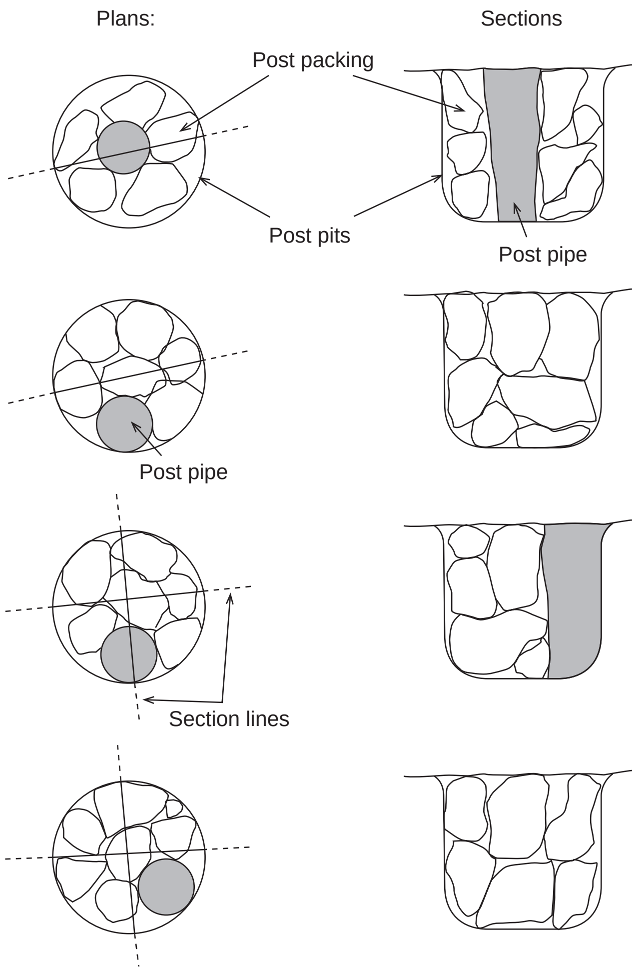


Figure 6.8 Problems with half-sectioning and quadranting postholes

so that you end up with sections across the ditch, but also a continuous longitudinal section (Figure 6.9). This process is, however, time consuming, so it may be better to spend time and resources on understanding what is happening within the ditched enclosure rather than working out minute sequences of ditch fills. The edges of ditches are usually quite clear if dug into bedrock, but if in doubt it is better to overcut, or even box-section, into the adjacent bedrock (Figure 6.10). This process, although often frowned upon in Britain, is widely used in some parts of the world.

When ditches are seen to cross in plan, it is essential to attempt to work out the sequence of digging, as this will be important in working out the development of the site. Sometimes the sequence of cutting can be seen in plan, but if not, sections must be carefully located to provide sections through both ditches, so cuts can be determined (Figure 6.11). As with pits and postholes, the date of objects within ditches can provide only a *terminus ante quem*.

Unlike the excavation of pits, postholes and ditches, which involve a cut-and-fill, walls present their own problems. Unless you are excavating standing structures, walls are generally

Figure 6.9 Sectioning a length of ditch (M. Redknap and M. Millett for Sussex Archaeological Field Unit)

Figure 6.10 Box-sectioning a ditch

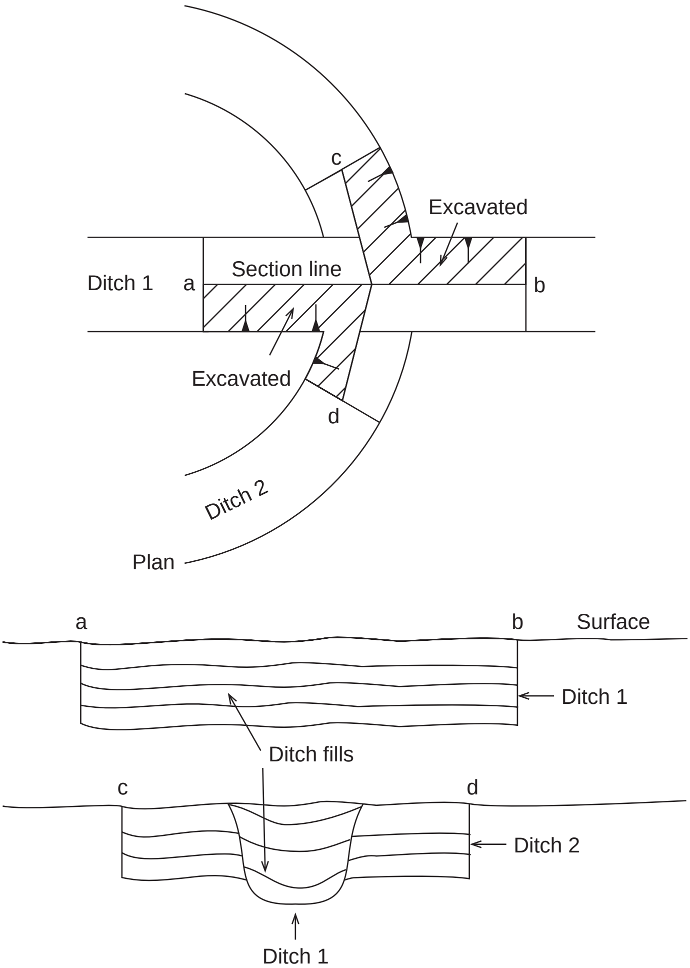


Figure 6.11 Sectioning intercutting ditches

represented archaeologically either by foundations, or even only by trenches left by stone robbers (robber trenches). It is rare for masonry structures to be built directly on the ground surface, except in the case of simple, low-walled buildings. Usually walls are built on something solid, like bedrock, or footings set in a foundation trench. Foundation trenches can be used in two ways. Either a trench the width of the wall footings is dug and filled with the footings, or the trench is dug wider than the footings, the footings are built, and the remainder of the trench is backfilled. Objects found in the foundation trench are likely to pre-date the wall by years or even centuries, and so again provide only a *terminus ante quem*. Every effort must be made to determine the layer from which the foundation trench was cut. The foundation trench has to be the date of that layer or later, but earlier than the date of the layer sealing the foundation trench cut (Figure 6.12).

Sequences of construction of wall footings can sometimes be determined by looking at points where bits of wall meet. A straight join – where one wall butts against another – usually suggests different periods. This can often be confirmed by differences in building

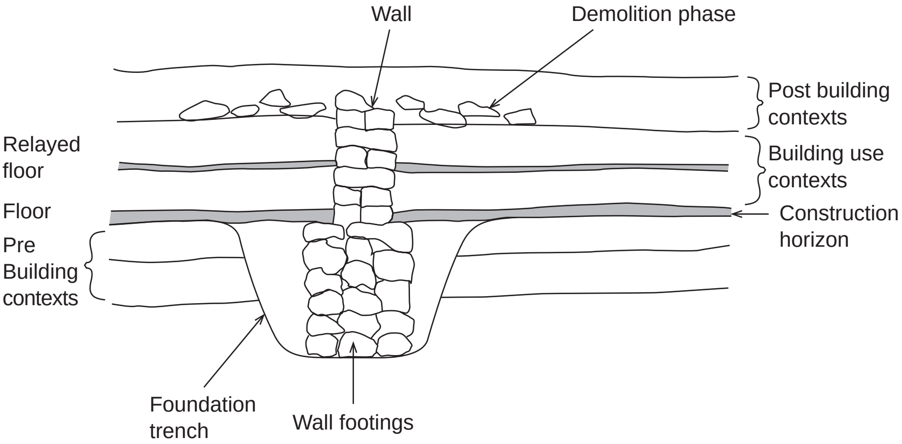


Figure 6.12 Excavation and dating of wall footings

material, relative depth of the foundations, and perhaps by differences in the mortar used. If the wall has been robbed completely, it may be possible to trace former walls only by the pattern of robber trenches. When excavating a robber trench, great care should be taken to determine its extent in relation to the original foundation trench (Figure 6.13). The robber trench is likely to be more or less the actual width of the wall. Masonry buildings should always be excavated in plan, with sections at right angles to walls.

The excavation of human burials presents legal, ethical and practical problems to field archaeologists. As mentioned in Chapter 5, the excavation of human remains in England (the position is somewhat different in other parts of the UK) requires a Licence for the Removal of Human Remains under the Burial Act, 1857. In the USA the 1990 Native American Graves Protection and Repatriation Act requires human skeletal material to be returned to tribal descendants for re-interment. Most countries have some legal control defining what can and what cannot be done to human remains. Regardless of what the law says, however, field archaeologists should always consider the ethical position of excavating what were, after all, human beings. Most people think that the dead, when laid to rest, should be allowed to do just that. Human remains are not put in the ground for the amusement of a minority group, however cleverly archaeologists wrap up their justification for what most people would see as desecration.

The removal of human remains during a rescue or salvage project can usually be justified, but on research excavations the ethics of the process must be considered in even greater detail. The main areas to consider are, firstly, what the real scientific justification is for the excavation. This should be explained clearly to all interested parties. Secondly, how the work can be done with due propriety and respect, and finally, what is the most appropriate way to dispose of the remains after study. Many archaeologists now consider reburial to be the most suitable way to conclude a burial excavation.

Having justified your proposal to excavate human remains, and having obtained all required agreements and consents, then you should treat the excavation of a burial, in many ways, as that of any other context. A burial is a specific discard process. The discard may, however, take place in a special area or special structure, for example, a graveyard or a round

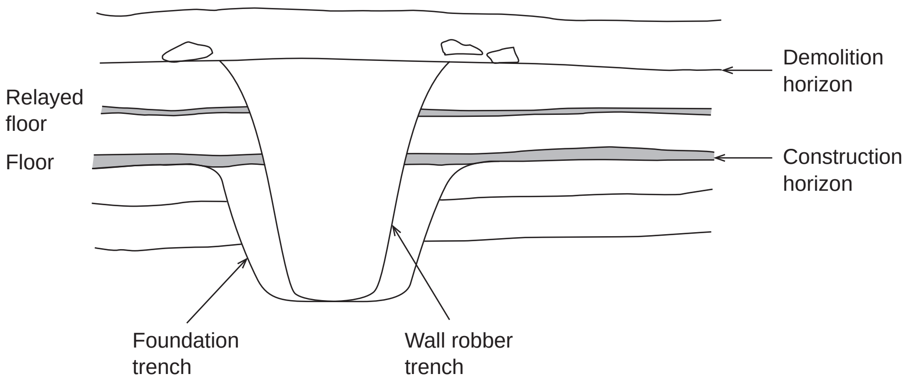


Figure 6.13 Excavation and dating of a robbed wall

barrow. In some cultures, however, the dead are not clearly separated from the living, and burials take place in living areas, inside houses, in yards or in middens. A key element of burial excavation is, therefore, to consider the context of the burial. Where are the burials in relation to other areas of human activity? Are the related structures burial structures – like a round barrow – or are they domestic structures – like a midden – also used for burial?

Human remains found by archaeologists usually consist of articulated bones, disarticulated bones or cremated bones. Very rarely do human bodies survive intact as a result of waterlogging, freezing or desiccation. The excavation of an articulated human body is, in many ways, the easiest, as one can predict the relationship between a human head and its associated arms, legs and torso. An extended inhumation is, however, much easier to excavate than a crouched burial which, in turn, is easier to excavate if laid on its side rather than sitting up in a pit.

When excavating an extended burial in a grave pit, the top or front of the skull is usually found first. This immediately gives some idea of the orientation of the rest of the body. Ideally, the excavator should work from planks resting on a scaffold frame positioned over, or carefully within, the pit. If the excavator is standing on the grave surface, bones and any associated grave goods could be crushed. The skull having been located, a centre line through the skeleton can be estimated and then the soil carefully peeled back from this line to reveal all the bones. Standard small tools, the mason's pointing trowel, paint brush, bucket and hand-shovel are usually used for skeleton excavation, but as bone often softens in the ground, softer brushes and even wooden spatulae are sometimes used, together with more delicate tools, like a plasterer's leaf or dental picks. A range of small spoons, perhaps with their handles bent at right angles to the bowl, are useful for extracting soil from between bones. However careful the excavation, odd small bones, especially ear, hand and toe bones, are often not where you may expect them, so the soil content of graves should always be sieved (screened).

The excavation of disarticulated burials is more difficult, as there may be no obvious relationship between bones. Here the excavation should proceed in the same careful, systematic way that any rubbish deposit would be excavated, each bone being revealed and recorded. Great care must be taken to establish whether the disarticulation is pre-burial or perhaps the result of post-depositional changes, like the scattering of bones by burrowing animals. Cremations, also disarticulated bone, are the result of bodies being burnt prior to burial. Bones may have been hand-picked from the cremation pyre and crushed before burial. The cremation may have been buried directly in a small pit, or contained in a pot, bag or box. Unless tightly contained in a surviving container, the bones are likely to be spread by post-depositional activity. Cremations usually, therefore, have a core deposit, with odd bones moved away from the core. Careful sieving is really the only way to attempt to recover a complete cremation. If the soil is too acid for the survival of human bone (bone being calcareous), then bodies can sometimes be traced as body-shaped stains, or even as changes in soil chemistry resulting in a body-shaped area of high phosphate surviving, for example, under a round barrow.

Sites without features

Not all archaeological sites or parts of sites produce features like pits, postholes, walls or burials. Sites, particularly very early ones, may survive only as spreads of artefacts and ecofacts representing activity areas. Others, like field lynchets and dry valley sediments, indicate human activity and produce considerable data about the past, but may have no features as such, although the lynchet itself is a feature.

Most activity areas without features can really only be thoroughly investigated through open-area excavation. The exact location of individual pieces of struck flint, for example, could indicate where on a site flint knapping took place, and also whether the person knapping was standing, sitting or crouching. Each knapping position could produce a distinct pattern of waste production. Negative areas within a site with no lithic waste may be equally important, indicating sitting areas or routes through the site. This sort of evidence will only be retrievable, however, when a site has been undisturbed since deposition. Usually this involves very rapid burial under sediment or a cliff collapse. Great care should be taken to establish whether the lithics are really *in situ* or not. Lithics deposited in flowing water, for example, have a single orientation in relation to the water flow, while all patterns may be lost through ploughing. Lithics with sharp edges are less likely to have moved far than those with rounded edges.

Two areas of mass soil movement which still have great archaeological significance, but require specific excavation techniques, are lynchets and dry valley sediments. I have linked these because their process of formation and methods of excavation can be similar. Both are the result of soil moving downslope and coming to rest at a specific spot in the landscape. Lynchets always, and dry valley sediments usually, involve some agricultural activity in the past. Lynchets are caused by soil moving down slopes as a result of agriculture and building up at the bottom of a field.

If they are part of a field system, as opposed to a single field, then the lynchets will have a positive and a negative element. At the bottom of the field the soil builds up as a positive lynchet, while at the top of the next field soil will be eroding away to create a negative lynchet. It is the positive lynchet which provides most archaeological information. The lynchet may have built up against an unploughed strip of soil or against a barrier, like a fenceline, wall or bank. If so, features like postholes may be involved. The usual way to excavate a lynchet is to cut a right-angle section through it (Figure 6.14). Open-area excavation would be considered only if a whole field, or even a field system, were being excavated, a luxury usually limited to salvage or rescue excavations.

Figure 6.14 Excavating a lynchet section

The purpose of lynchet excavations is to provide an agricultural history for the field or field system; this can be effectively done only where fields are regularly manured with domestic or farmyard manure which contains artefactual material, like potsherds. These move down the slope of the field and are deposited in the lynchet in more or less the sequence of their introduction into the field with the manure. By two-dimensionally plotting artefacts (along the section and down the section), horizons with datable artefacts can be located, indicating broad periods of ploughing. These can be tied to environmental sequences derived perhaps from molluscan analysis (see below), which could suggest phases of pasture within arable sequences.

Lynchet excavations can be undertaken entirely by hand from the surface downwards, recording the exact location of each artefact. Alternatively, to accelerate the process when digging at Bullock Down, Sussex, in 1976, I cut 1m-wide machine trenches through the lynchets. The section was then drawn and a 50cm section was cut back by hand on one side of the trench, with artefacts directly plotted onto the already-drawn section. This reduced the average time taken to section a lynchet by two-thirds, a considerable saving of time – and therefore of money.

Soil not stopped by lynchet formation will finally come to rest in the bottoms of valleys. These will, therefore, also preserve an agricultural and environmental history of the local area. Sections can be cut through dry valleys in the same way as through lynchets, with careful plotting of the artefacts to provide sequences of rapid soil accumulation suggestive of agriculture. The environmental history of the area can often be pushed back earlier than agricultural periods by studying the earlier, naturally accumulated valley sediments.

Artefacts and ecofacts, their recovery and treatment

The recovery of artefacts, ecofacts and associated environmental data is essential for the understanding of a site. Although finds, particularly artefacts, may be important in their own right, for example as art objects, their importance generally lies in their association and their context on the site. They can provide information about what happened on a site, where it happened on the site and when it happened on the site. How artefacts are excavated and recorded will depend very much on the type of site being excavated and the field archaeologist's assessment of the type of deposit involved, especially if it is primary or secondary rubbish (Chapter 2). Primary rubbish, discarded where it was generated, requires much more careful excavation and recording than secondary rubbish. Secondary rubbish is usually excavated, lifted and grouped by context, whereas the exact location of each bit of primary rubbish may be important for locating activity areas.

Unless the site being excavated is waterlogged, desiccated or frozen, most of the artefacts found are likely to be inorganic, particularly lithics and/or ceramics, depending on period. Both lithics and ceramics survive in most types of soil and can usually be safely excavated by carefully clearing the soil from around the object and, having established its full extent, carefully lifting it. Never pull an object out of the ground when first revealed; part of it may still be securely bedded in the ground and will break off. The object is then put into a finds tray or bag, clearly labelled with at least the site name or code and context number or, if exactly located, with three-dimensional co-ordinates (see Chapter 7). Large, complete or fragile pots will require greater care in excavation and may need specialist conservation treatment *in situ*, followed by special lifting techniques. On larger projects there is usually a site conservator, or one may be on call for particular problems. If a conservator is not available, then the field archaeologist should have enough basic conservation knowledge to deal with the problem.

The main aim of field conservation is to provide an environment for the object to be safely lifted and transported without sustaining any damage, and in such a way as not to impede future conservation (Payton 1992). Soft ceramics may require some consolidation before lifting. Polyvinyl acetate (PVA) in acetone is one of the most commonly used consolidants, but others, such as Paraloid B-72 and Butvar B98 are also available. If the object needs support during lifting, it is advisable to place a barrier between it and the support. Plastic food wrapping (cling film), aluminium foil or acid-free tissue paper can be carefully moulded around the object. This is then encased in plaster of Paris, aerosol or two-component polyurethane foam, or wrapped in plaster bandages. If the object is large or heavy, a board can be slid under it to facilitate lifting. Great care must be taken when consolidating and lifting an object on an excavation not to damage either the site or adjacent objects, particularly when trying to undercut the object being consolidated.

Lithics also require care when being excavated, lifted and removed from the site. The main problem with lithics is that careless treatment can create secondary retouch and apparent microwear. An *in situ* knapping floor must be treated with particular care. Fine-mesh sieving will be required to recover all the smallest chips of flint, but dry sieving may retouch many of the finest edges. Careful wet sieving of the soil will reduce the abrasive effect of the sieving. Lithics should then be packed separately to prevent retouch in transit. This is, of course, less of a problem when dealing with secondary or rolled contexts, like lithics in a lynchet section.

Most other artefactual materials require specific care during excavation, packing and storing. Metals are best lifted without touching them, and should be carefully sealed in aluminium foil with silica gel to keep them dry, in order to slow down corrosion. Wet organic artefacts, like wood, should, however, be kept wet, with sufficient fungicide to stop them going mouldy, and should then either be taken to a conservation laboratory as soon as possible or drawn, photographed and the wood identified prior to being thrown away. No museum will be prepared to take bits of mouldy, rotting wood!

Bone and shell will survive only in relatively calcareous soils or under special conditions. When first excavated they may be fairly soft, but often harden up when dry. If they are very soft, consolidation and careful lifting may be required but usually they can be treated in a similar way to ceramics. Again, date and context will determine an appropriate method of excavation and treatment. An *in situ* human bone of 400,000 BC is likely to be treated more carefully than a nineteenth-century horn core in a residual context.

The methods of excavation of environmental data are quite different to the methods of excavation of artefacts and ecofacts of food-refuse type. Two key types of environmental data that can be recovered are pollen, generally from acid sites, and land mollusca from alkaline sites. Both involve taking samples of soil away and extracting the evidence under laboratory conditions. Ideally, sampling on site should be undertaken by an environmental archaeologist in co-operation with the field archaeologist. Sampling is usually taken from standing sections, but in open-area excavation samples may need to be taken as the excavation progresses. Pollen samples are often obtained by taking columns of soil samples at 1cm or 2cm intervals through buried land surfaces (Figure 5.18). Molluscan samples need to be larger, and are taken from discrete contexts, like layers in a ditch. Soil samples, being damp, may well go mouldy if sealed in a plastic bag and kept in a warm site hut. Ideally, take the samples straight to the environmental laboratory. Otherwise, keep the bags cool or even add a small amount of fungicide.

Matrices, phasing and dating sites

To work out the development of an archaeological site through time the stratigraphical sequence needs to be determined. Individual elements of stratification (contexts) are put into sequence, a process known as phasing. Phases may be grouped together into periods. On complex sites this process can be aided by the construction of matrices. The principles of *terminus post quem* and *terminus ante quem* are then applied to aid the dating of the phases and periods.

Phases are established from the bottom of the sequence upwards. Traditionally, this would involve the careful study of standing sections to establish a sequence of deposits and any associated features or structures. In open-area excavation this is done through the context recording system. Each context is recorded as being below and above other contexts or having some other stratigraphical relationship with them (Figure 6.15). Those contexts stratigraphically associated can be considered as forming a phase. This element of phasing is based only on the study of the stratigraphic evidence, without any consideration of artefacts or dating. Phases can then be grouped into periods by considering elements like building levels and associated datable artefacts or ecofacts.

On complex sites sorting out the stratigraphic sequence and phasing can be greatly aided by producing a schematic diagram showing relationships between all contexts on the site (Harris 1979). Figure 6.16 is a simple example. Context 1 could be a plough soil resting on top of context 2, a layer, and contexts 3, 4 and 5, a pit cut and its fills. Context 2 overlays context 6 and all contexts overlay context 7.

Field Archaeology Unit

CONTEXT RECORD FORM

DESCRIPTION

CO-ORDINATES	SITE CODE	SITE SUB-DIVISION	CONTEXT NO.
CATEGORY			
LENGTH	WIDTH	DIAMETER	HEIGHT/DEPTH

SOILS	COLOUR
	TEXTURE
	CONSISTENCE
	COARSE COMPONENTS
STRUC.	BONDING AGENT
	CONSTITUENTS

DESCRIPTIVE TEXT

EXCAVATION

METHOD OF EXCAVATION
FINDS
SAMPLES

PHYSICAL RELATIONSHIPS

EARLIER THAN	BELOW
	FILLED BY
	CUT BY
	BUTTED BY (STRUCTURE)
CONTEMP. WITH	WITHIN
	CONTAINS
	BONDED WITH (STRUCTURE)
	SAME AS
LATER THAN	ABOVE
	FILL OF
	CUTS
	BUTTS (STRUCTURE)
UNCERTAIN	

INTERPRETATION

INTERPRETATIVE COMMENTS

CHECKLIST

DRAWING NOS.	PLAN	SECTION
PHOTO NOS.	MONOCHROME	COLOUR
RECORDER	CHECKED	CONTINUED

Figure 6.15 Example of a context record form

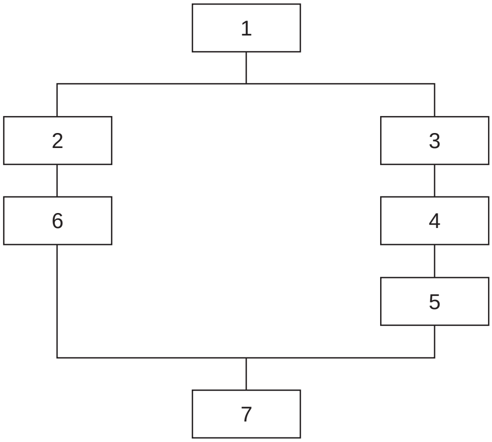


Figure 6.16 Stratigraphic matrix

The theory of stratification is an important tool in giving a sequence to phases and periods on a site. This layer is older than that layer. This gives a sequence to the site. What it does not do is date elements of the site. For this we need the additional theory of *terminus post quem* and *terminus ante quem*. We cannot simply say this layer has Clovis points in it so is, say, 9000 BC or has medieval pottery so is, say, AD 1400. We cannot simply get a radio-carbon date for a piece of charcoal in a layer and say the layer is 2000 BC. What we can do is apply the theories of *terminus post quem* and *terminus ante quem*.

Terminus post quem dating requires datable things to be found within a layer, say coins, pottery of a specific type, or organics suitable for radio-carbon dating. This theory then asserts that the layer is the same date as the latest datable object in the layer, or later. All layers above this 'dated' layer must therefore be younger than that date. This theory must, however, be applied in conjunction with theories of transformation processes outlined in Chapter 2. Is that datable object intrusive or residual? Have transformation processes like earthworms or tree roots moved the object? Consideration of one theory may need another one to qualify it.

Terminus ante quem dating is related in method to *terminus post quem* dating but relates to layers, deposits or features being earlier than a dated element rather than later. If an element within the sequence can be given an 'absolute' date by, say, scientific (for example, carbon-14 dating) or architectural means (a datable construction technique), then all layers and features below it must pre-date it even if only by seconds. An area may, for example, be covered with rubble and then a floor laid immediately upon it. Archaeologically, the rubble foundation and floor are contemporary, but in strict stratigraphic terms the rubble pre-dates the floor. The dated floor has provided a *terminus ante quem* for the foundations and everything below them.

The theory of *terminus post quem* and *terminus ante quem* dating is, in principle, therefore, relatively straightforward. In practice, however, there are many problems, the main one being how reliable the dating of anything in an archaeological sequence really is. Very rarely can objects be precisely dated, and even if they appear to be, like a post-medieval potsherd with an inscribed calendar date, can the date be believed, and how close to that date was deposition of the object? A commemorative pot inscribed AD 1650 might still be being produced years later if the market for that particular pot continued. The pot might then be kept as an heirloom (curated) for generations. It could be broken in, say, 1750. The sherds could then be thrown into a rubbish pit which, 50 years later, could be used to level land for a new house. The sherd dated to 1650 might, therefore, be the only dated object in a layer in fact deposited in 1800. In this context the anomalous date might be recognized, but would this be the case in a prehistoric context?

On prehistoric sites 'absolute' dates are more likely to come from scientific dates like carbon-14 or thermoluminescence. Even here, what are referred to as 'absolute' dates are not quite what they appear to be. Most scientific dating techniques require some form of calibration to bring them nearer to calendar dates, and even then we are left with an approximate date bracket for the material. How and when the material ended up in a particular archaeological context always remains a debatable question.

Excavation and the public

Gone are the days when archaeological excavation was the private preserve of an aloof, academic elite. The past belongs to everyone, and everyone should be allowed access to it. This should involve access to sites in the field, artefacts in museums and the excitement of archaeological discovery on excavations. Clearly, however, access to excavations must be carefully controlled, both for the safety of the public and for the protection of the site. Firstly, the field archaeologist should assess likely demand. Where is the site and what is likely to be found? Sites in areas of dense population or on tourist routes are more likely to generate large numbers of visitors than those in sparsely populated areas with no easy access. A Roman villa excavation is likely to attract more visitors than a lynchet section.

Basic visit provision could include a notice-board, site tours, public lectures and finds exhibition, together with special provision for school parties. The notice-board should say something more than 'Archaeological Excavation: Keep Out'. If such a notice is required, at least let it read 'For your own safety, please keep out unless on an organized tour'. Ideally, the notice should provide basic information about the site, and dates and times of site tours. In some areas one widely advertised site tour may be all that is required. A key site in a major city could, however, require almost continuous site tours, especially if a major discovery has been announced. Site tours are best run by carefully selected site workers who can instil in visitors something of their own enthusiasm. Keep the tour to a reasonable length, speak clearly and avoid too much jargon, though the use of some special terms, if adequately explained, adds to the special nature of the event: this is, after all, a 'scientific' operation.

Site tours can, of course, give only a 'snapshot' of the site at the moment of the visit, so a concluding public lecture is often a useful addition to site public relations. This is best organized in conjunction with the local archaeological or historical society, museum or college. Carefully selected objects should be put on show if this can be organized safely. Provision for school-children should be considered separately. School-children rarely like standing on the edge of a trench being lectured at. If possible, get them involved. Is there a bit of the site they can safely trowel? Maybe there are some shells or potsherds they can wash, or if part of the site is finished with, perhaps they could 'reconstruct' the buildings by standing in the postholes. Remember, they include the next generation of archaeologists and museum curators – even the politicians who could affect how archaeology develops in the future.

CHAPTER SEVEN

Recording archaeological excavations

The record of an archaeological excavation consists of four major elements: the written record, the drawn record, the photographic record and the materials taken away from the site, that is, the 'finds' consisting of artefacts, ecofacts and environmental samples. Finds will be considered further in Chapter 8.

The written record

Traditionally, the written record of an excavation was kept in field note-books, perhaps separated into site, area and trench (or unit) books. These were kept by those in charge of particular parts of the excavation. Site note-books should include details of every aspect of the excavation, from detailed notes about soil changes and structures to thoughts, ideas and interpretations. A well-kept field note-book can be a perfectly good written record of an excavation, but anyone who has attempted to write an excavation report from the field note-books of a dead archaeologist will be aware of the many inconsistencies and outright omissions that can creep into an unstructured field note-book. They may be fine for recording the sociology of an excavation but are rarely adequate for systematic recording of data.

For this reason pre-printed context or feature/layer forms are now favoured by many archaeologists. In Britain they are used on virtually all excavations. The advantage of a pre-printed 'context record form' is that one can see at a glance whether all the data that should have been recorded are there. Context record forms vary a little from site to site, but all should include location information, soil or structure information, methods of excavation, stratigraphic relationships, interpretation and cross-references to the drawn and photographic record. Some forms include finds information, while some archaeologists keep this separate. The redesign of context record forms has been something of a national sport in archaeological circles in Britain over the last 20 years or so, but usually it is only the detail and layout of the form which varies, rather than the real content. Figure 6.15 shows a fairly typical context record form. It could be completed in the following way.

Co-ordinates These enable you to locate the position of the context. They give a measurement along the base of the site grid and another up the axis at right angles. If the site grid is orientated north–south, then the co-ordinates are recorded as a measurement from west to east along the base line of the grid and then a second measurement from that point from south to north.

Site code Ideally, the site code should be clear, simple and designed to reduce future remarking of finds, as this code is marked on all finds. If the finds are to end up in a public museum, as all finds should, then it is sensible to use the museum accession number as the site code. This saves re-marking when accessioned into the museum collection. In Britain each museum accessions each object or group of objects by year and discrete number, so for 1999 objects are numbered 1999.1, 1999.2, 1999.3 and so on. The site code should then be the next number allocated by the museum, for example, 1999.51. Alternatively, the site name can be abbreviated to create a site code, for example, Off76 being the site excavated at Offham in 1976. Clearly, it is essential to establish that the code has not already been allocated in the region in which the finds will be stored.

Site sub-division This is recorded if the site is divided up in any way. For example, test pits or units may have their own numbers, or the site may be divided into areas by letter.

Category This describes the type of context represented. Is it, for example, a deposit or layer of soil, or is it the cut of a pit or ditch?

Length A measurement of the length of the context., This will follow national conventions, using imperial or metric measurements. Metric measurements may be in metres and centimetres or, following architectural conventions, all in millimetres.

Diameter If the context is a round pit or posthole, its diameter is recorded. Some forms do not have length, width and diameter on them as this repeats information available on the context plan.

Height/depth The vertical measurement of the context is given, usually as a range, for example, depth 50–25mm, or simply a maximum measurement.

Soils The four main elements when describing soils are colour, texture, consistency and coarse components. Fine analysis can really only be undertaken in the laboratory, but for archaeological purposes simple field descriptions based on physical methods are generally more than adequate. It is interesting to note how much effort is put into describing soils on excavations and yet how little these data are actually used by archaeologists. It generally remains as raw archive data, never reaching synthetic works of archaeology.

Soil colour Depending how this information is going to be used, colours can be either divided at a very general level visually – for example, light brown, dark grey, black – or more precisely using a colour chart. The Munsell Soil Color Charts were developed in the USA especially to describe soil colours. Colour is divided into hue, value and chroma. Hue divides the whole spectrum into ten parts from red-purple (RP), red (R), yellow-red (YR), yellow (Y), green-yellow (GY), green (G), blue-green (BG), blue (B), purple-blue (PB) to purple (P). Each of these divisions is then divided into ten parts so 1B is blue bordering on blue-green, 5B is mid-blue and 10B is blue bordering on purple-blue. Value divides the shade of the colour from dark to pale in ten divisions, so 1 would represent the darkest and 10 the lightest value. Chroma refers to the purity of the colour, as most soils contain some greyness, so 1 is close to grey while 10 is almost the pure colour. Any colour can therefore be given a simple code, for example, 9B 2/4. Blue soils are, however, not particularly common!

Soil texture For a basic textural description of soils, mineral particles can be divided into three size classes: sand (0.06–2.00mm), silt (0.002–0.06mm) and clay (less than 0.002mm). Although texture can be accurately ascertained only by laboratory analysis, general texture can be ascertained by rolling a soil sample in the hand. If the soil sample, when damp, can be rolled into long threads which can be bent into rings, then it is largely clay. If the threads will not bend to form a ring, then it is a silt, while sand cannot maintain any shape.

Soil consistency The consistency of a soil can again be determined by simple hand tests. A soil which is bound together with substances other than clay – calcium carbonate, for example – may be described as cemented, while a soil which adheres to fingers when wet is sticky. A plastic soil can be rolled into 'worms' between the palms of the hands, while a loose soil cannot be moulded into a cube. A friable soil, however, can be moulded into a cube, but the cube will collapse with simple pressure. A firm soil requires considerable force to collapse a cube squeezed between two fingers, while a cube of hard soil cannot be crushed between two fingers.

Coarse components Most soils contain some larger bits which are referred to as 'the coarse component'. These can be described as small (up to 8mm), medium (up to 16mm), large (up to 32mm) or very large (over 32mm). The shape of pebbles in soil may be significant, so that should be described according to a roundness index ranging from very angular, through angular, sub-angular, sub-rounded and rounded, to well-rounded.

If the context consists of a structure, such as a well, rather than a soil deposit, the boxes below the 'Soil' boxes are filled in. A structure usually consists of a material such as bricks (the constituents) held together with a bonding agent, like mortar. Many stone walls were, however, constructed 'dry' in the past, so have no bonding agent. An important element of recording masonry structures is to record both the finish of individual stones (for example, ashlar, squared, rough) and how, particularly bricks, they are laid (bonding). Bonds like English, Flemish or herringbone may provide dating information. The bonding agent should be described rather like soils, that is, colour, texture and coarse components. Samples of mortar can be taken for compositional analysis, which may be valuable in phasing masonry remains.

One of the early criticisms of context record forms was that they could be filled in mechanically and that there might be important observations which the excavator wanted to make that simply did not fit into any of the pre-printed categories. For this reason the 'Descriptive Text' box can be useful to describe anything else not recorded so far.

The second block on the form relates to the process of excavation, firstly, 'Method of Excavation'. It is clearly important to record whether a context has been machined out, shovelled, carefully trowelled or subjected to 1mm mesh sieving. To compare the bone assemblage from a fine-mesh sieved context with that from a shovelled context would clearly not be a good idea! Basic categories of find, like pottery, bone, metal, can be listed in the 'Finds' box and samples, for example soil, can be listed by sample number in the 'Samples' box.

The third major section on the context form describes physical relationships of the context, that is, its stratigraphic relationships. An alternative way of recording this is to show context numbers in little boxes above and below the context being described. This would be the first part of a stratigraphic matrix which could be constructed for the whole site. This particular form, however, groups relationships into 'earlier than', 'contemporary with' and 'later than'. There are four relationships which show that the context being described is earlier than others. Firstly, if it is sealed below another context, it is earlier than the overlying context. Secondly, if it is filled with another context, it has to be earlier than the fill. For example, the cut of a dug pit is earlier than the rubbish put into the pit. Thirdly, if the context being described is (say) a ditch, and a pit had been dug into the edge of the ditch, then the ditch is cut by (that is, earlier than) the pit. Finally, if the context is a piece of masonry and another piece is built up against it, the first structure is butted by (that is, earlier than) the second structure.

It is clearly important to try to establish which contexts are contemporary with which others on a particular site. Broadly, this can be done by establishing which groups of contexts are earlier and which are later than another group of contexts. However, to establish that one context represents an activity which took place at exactly the same time as another is more or less impossible. Some activities, like putting up a post, for example, can produce more or less contemporary contexts. All the posts of a single-phase round house are likely to have been put up at more or less the same time. The post packing will be 'within' the context of the posthole cut, and more or less contemporary with it. The posthole cut 'contains' the post packing context. In the case of a masonry or brick wall where two walls at right angles are bonded together, they represent contemporary construction. Sometimes a context being described turns out to be the 'same as' one already recorded. A ditch, for example, may be excavated at either side of a site and not seen to be the same until other layers in the centre of the site are removed.

Relationships of time are shown by the 'Later Than' box. The context being described is 'later than' any contexts it is above. Naturally, this box cannot be filled in until the context beneath is reached. The soil silting into a ditch is clearly later than the date of the ditch cut. Therefore the silt context is the 'fill of', that is, later than the ditch-cut. If, however, the ditch-cut cuts through a pit, then the ditch 'cuts', that is, is later than, the pit. Finally, if the context is masonry or brick and it 'butts' against another structure, then that structure must be earlier. In theory, all these relationships can be worked out by an experienced field archaeologist. In practice this is not always as easy as it sounds. Often natural transformation processes like worms, burrowing animals or roots destroy relationships which may never have been particularly clear in the first place. Further relationships may be established at the post-excavation stage when finds are dated, so if relationships are still uncertain in the field, say so in the 'Uncertain' box.

The fourth main section on this context record form concerns interpretation. The sections above are largely descriptive, though interpretation does enter into most sections. The 'Interpretative Comments' box, however, enables the excavator – or whoever fills in the form, with the context clearly visible in front of them – to consider its interpretation. Is it a rubbish deposit or could it be, or include, a ritual element? Is it deliberately laid to level the ground for building construction? Is it a naturally accumulating deposit resulting from erosion? Does the erosion have an anthropogenic cause? Leaving all interpretation to the post-excavation stage means that interpretation can be based only on the record, not on the actual context, and however good the record is, it is never as good as the *in situ* context when attempting interpretation.

The fifth and final section of this particular version of a context record form is a checklist enabling cross-reference to the drawn and photographic record. Each plan and section will be numbered, and the number filled in as 'drawing number', while each photographic image produced in either monochrome or colour is numbered and filled in as 'photo number'. The name of the recorder (and, if checked by a site supervisor, their name) is filled in along the bottom line. Sometimes more space may be needed for one or two categories on the form, so if continuation sheets are used, make sure that this is recorded. Some context record forms also have a reverse side to be filled in. This may include space for a sketch of the context and level information, although levels are often more appropriately put on the drawn record.

As each context is recorded on a separate loose-leaf sheet, these must clearly be kept together safely in a ring binder or folder and a single context register kept for each site. The context register simply records each context number as it is allocated, together with basic information about location of the context, by site subdivision for example, and what category of context it is. This way, information about all pits or all postholes can be easily recovered and you will also make sure no two contexts are ever given the same number.

The written record also includes forms recording drawings (the drawing register), photographs (the photographic record) and finds (general and special finds registers). These will be considered as appropriate below. Special types of site may also require specially designed record forms appropriate for particular circumstances. Burial and waterlogged sites, for example, generally warrant special recording forms. A skeleton form could have a preprinted drawing of a skeleton, so bones found can simply be coloured in on the form. A timber recording form would include information about tool marks, joints and type of wood. Remember, however, that forms can be designed for virtually anything and the multiplication of forms does not always lead to greater efficiency or better recording, just paper overload. Paper overload can, of course, be reduced by recording all this information directly onto hand-held computers, but information overload is still present if what is recorded is not carefully considered at all stages of the excavation.

The drawn record

The drawn record consists essentially of measured drawings of surfaces: vertical (sections) and horizontal (plans). Sections are created by archaeologists at specific points on the site to give information about sequences of events (the stratigraphy). These sequences may be long-term, like the whole sequence of a site over years or centuries, or very short-term, like the sequence revealed by a single posthole section. The method of drawing a section is essentially the same, however big or small it is. Plans can, however, be produced in different ways. The appropriate type of plan should be determined by the type of site being excavated rather than by any predetermined dogma. A shallow chalkland site ploughed into the chalk surface for centuries may survive largely, or only, as features dug into the bedrock (although see Chapter 3, Geophysical survey, on the archaeological potential of plough soil). These could best be illustrated as a multiple-feature plan (Figure 7.1) where each pit, posthole and ditch is clearly shown on the plan in relation to other features. With no surfaces other than the surface of the bedrock surviving, any sequence of features will have to be interpreted by the archaeologist, using intercutting features and attempts to date individual features.

Composite plans remain the most commonly produced archaeological plans (Figure 7.2). These attempt to record surfaces with contexts like walls and floors related to contemporary ditches, working areas and rubbish deposits. They create a clear ‘snapshot’ view of what the archaeologist considers to be a major surface, usually representing a specific phase of activity. On single-phase sites this is clearly a good way to produce a visual representation of a site at a particular point in time. Problems, however, arise on multi-period sites, especially deep urban sites. Occasionally major surfaces can be determined, but usually contexts overlap, are interleaved, are cut into and built upon. Any archaeologically produced surface will generally have revealed only bits of contexts of very different periods. In effect the surface is the creation of the archaeologists producing it: the trowellers somewhat arbitrarily decide where to ‘end’ a context which may be dipping under another on the produced surface.

One way around this problem is to record each context separately by producing single-layer (Harris 1979) or single-context (Spence 1990) plans (Figure 7.3). In this method each context is defined to its full extent and then drawn in plan separately. These form the archive plans but can be combined to produce either composite plans or multiple-feature plans for publication, as required. The only problem with the single-context plan system is the sheer volume of the archive produced. Much of the problem has, however, been reduced in recent

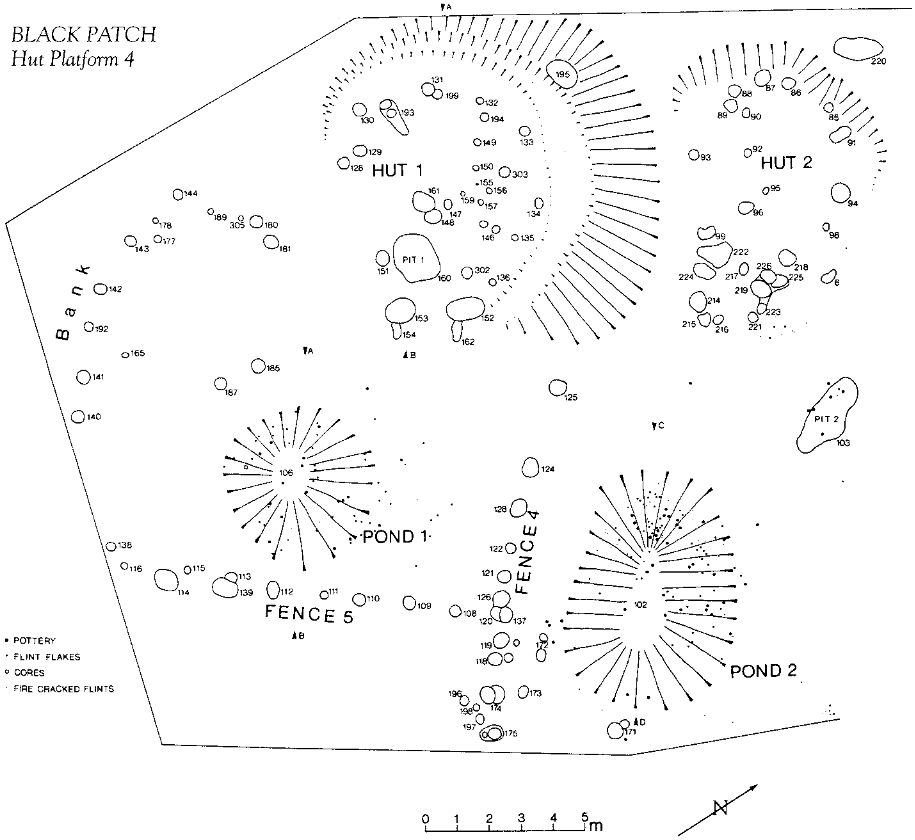


Figure 7.1 Multiple-feature plan

years by developments in computer-assisted cartography (CAC) and computer-aided design (CAD).

The actual process of producing plans in the field, whether multiple-feature, composite or single-context, is essentially similar. All plans must be related to fixed points which must remain constant throughout the excavation. This is usually achieved by establishing a site grid before the excavation starts and then maintaining it throughout the excavation. Physically, the site grid may be represented in the field by just three fixed points, accurately surveyed and marked – either by pegs or by steel rods driven or cemented into the ground outside the area to be excavated. One peg is set at each end of a baseline and one at right angles to the origin of the baseline. A right angle can be laid out in a variety of ways, as described in Chapter 4.

Site grids are usually laid out on true north, but on restricted sites other orientations could be considered, if more practical. From the basic three grid points any number of intermediate points can be established. These could be pegs at 1, 2, 5 or 10m intervals along two or all four sides of the excavation, or permanently established corners of grid squares across the site (Figure 7.4). If permanently marking the corners of squares within an excavation, then thin steel rods hammered right through the site are better than 6in (15cm) nails, which tend

Figure 7.2 Composite plan

to be loosened, and often moved about, as the excavation proceeds. Only very few types of sites, like *in situ* palaeolithic flaking floors, require permanent squares marked with string in the excavation area.

Plan drawing can be undertaken by offsets or triangulation from fixed points (Chapter 4), or by using a drawing frame, which is an extension of offset surveying. Alternatively, plan making within an excavation can be undertaken using a total station (Chapter 4); but this, like triangulation, is best for recording large contexts like ditches and pits, and the extent of areas of cobbles or demolition debris, rather than its actual detail. The detail is best drawn with a drawing frame. The drawing frame consists of a square (usually 1m) of wood or metal strung up into 20cm, or sometimes 10cm, squares (Figure 7.5). The area to be recorded is then gridded into 1m squares with string and nails. The relationship with the site grid is recorded. The drawing frame is then laid over the first square to be drawn and – with the plan maker's eye directly over a 20cm square – detail, like cobble stones, can be drawn by eye to scale on a drawing board mounted with plastic tracing film. As most plans are drawn at a

Figure 7.3 Single-context plan (illustrating hachures and spot-heights)

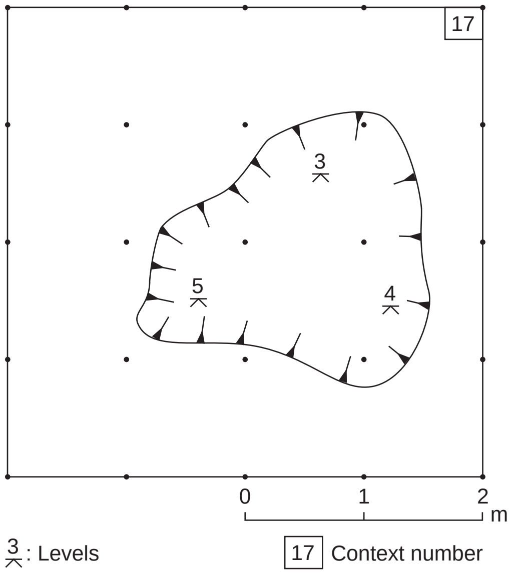
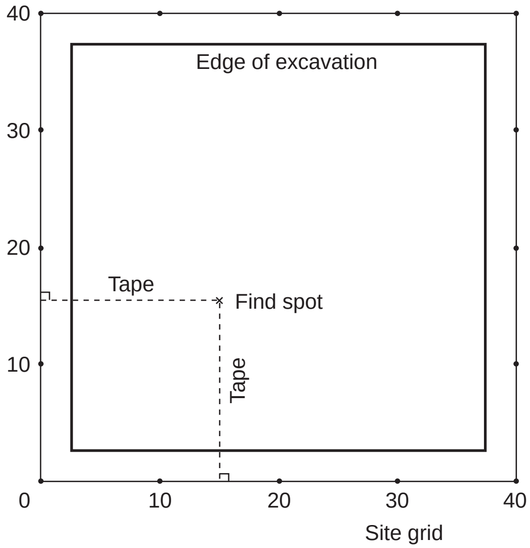


Figure 7.4 Site recording grid



scale of 1:20, each 20cm square on the ground is represented by 1cm on the drawing board. Accuracy of 1cm or less on the ground is therefore perfectly possible using a drawing frame. Inaccuracy will, however, creep in the further away the frame is from the surface being drawn – if, for example, large rocks are involved, or if drawing is done at an angle rather than from directly above each square.

Plans should, ideally, be drawn with north at the top of the plan, but whether or not the plan is drawn this way, a north point should be added into the plan. If possible, everything

Figure 7.5 Drawing frame

should be drawn as seen from directly on top. Individual stones should be drawn, not just blocks of masonry. Different types of stones used in a wall or elsewhere can be recorded with different coloured pencils. Slopes, however, like a ditch edge, require conventions. Slopes are usually illustrated by using hachures (Figure 7.3).

In order to relate plans vertically, contexts should be levelled in relation to the site datum. This is a fixed point outside the area to be excavated. It can either be tied into ordnance datum using a level or total station (Chapter 4) or simply be given an arbitrary value of, say, 50 and referred to as a temporary bench-mark (TBM). The level is usually set up outside the excavation and a reading taken on the TBM. If this back sight reads 1.2m, then the plane of collimation is 51.2m (that is, the TBM value of 50 plus 1.2m). A foresight is then taken to the context being levelled. The staff is held on the context and read. This example could read, say, 1.5m, so the reduced level in relation to the TBM is 49.7m (that is, the plane of collimation value of 51.2minus the reading of 1.5m). This process of reducing levels was described in Chapter 4. Spot heights (levels) can be recorded across the surface of the context and clearly marked on the plan above the level of a bar on an inverted V (Figure 7.3).

An alternative method of producing a site plan is to use photographs, but unless complex piles of stones (like a cairn) are involved this process is rarely cheaper or much quicker than conventional plan making. To produce reasonably accurate plans a mosaic of vertical photographs with 40–50 per cent overlap should be taken. This can only be done using a quadripod, bipod or monopod to raise the camera vertically above each section of the site (Dorrell 1989). The basic problem is one of distortion resulting from the rounded shape of the camera's lens. The image produced by a camera becomes more oblique towards the edge of the photograph, but by overlapping and using only the central part of the photograph, this problem is reduced (but never entirely removed). The image can then either be simply traced directly onto plastic tracing film, or digitized and plotted by computer.

Vertical sections are usually drawn in the field at a larger scale than plans. Where any detail is present, 1:10 is the usual scale, although large sections with little detail can be drawn at 1:20. Sections should be drawn from a horizontal datum fixed to the surface of the soil face, not above it, where it can be slackened in the wind or tripped over. As measurements are taken at right angles from the datum it is best to fix it halfway up the section (Figure 7.6). The datum is set up by firstly putting a 6in (15cm) nail or surveyor's arrow into one end of the section. Thin string is then tied to this and pulled tight along the section so it is approximately level. It can then be precisely levelled using a simple line level hung from a string. This is best done by two people, one to look at the level and tell the other to raise or lower the string. When level, the string is nailed into the other end of the section.

This process can also be done with a dumpy level, theodolite or transit. This is set up away from the face of the section, and then the staff is held on the face midway down the section. A nail is put in the face below the staff. The staff can then be moved along the section and nails are put in wherever the staff has exactly the same reading. If all the readings are the same, then the line of nails must be horizontal. They can then be joined with string to create a horizontal datum. The height of the datum should be recorded in relation to the site datum. A measuring tape is then fixed parallel to the datum string either just above or, more generally, just below it. It should be fixed to separate nails. Remember

Figure 7.6 Section drawing from a horizontal datum

never to tie the tape but only to bend it once over the nail and clip it with a bulldog clip or peg.

The datum line is scaled down and drawn on plastic tracing film mounted on a drawing board. If the weather is wet or windy the tracing film should be sealed all around with drafting tape. Otherwise, a strip across each corner is usually adequate. If the tracing film is not pre-printed with graph squares, then a sheet of graph paper may be mounted under the tracing film to give a framework of guidelines. Usually sections are drawn using two people, one to draw and one to measure. Measurements are taken by creating a vertical from the datum, either by eye or using a plumb-bob. Two measurements are read, one along the datum and one at right angles above or below the datum. It is generally best to plot the top and bottom of the section first. This gives a framework which is then filled in by following individual contexts, marking top and bottom of each context (the top of one usually being the bottom of the next) together with cuts, such as a pit edge.

The extent of all contexts visible in the section should be recorded, but then how much detail within a context should be drawn is a matter of opinion. Larger fragments of stone, bricks, pottery and the like should certainly be plotted on sections, but how small a piece should be recorded depends very much on the period and type of site being recorded. Generally, good sections involve a combination of convention and pictorial representation (Figure 7.7). Each context drawn on a section must be given its context number, clearly marked on the section drawing. Do not try to describe contexts on the section: all the written description appears on the context record form. Cardinal points at each end of the section should be recorded, together with site name, section number, scale, name of recorder and date of drawing.

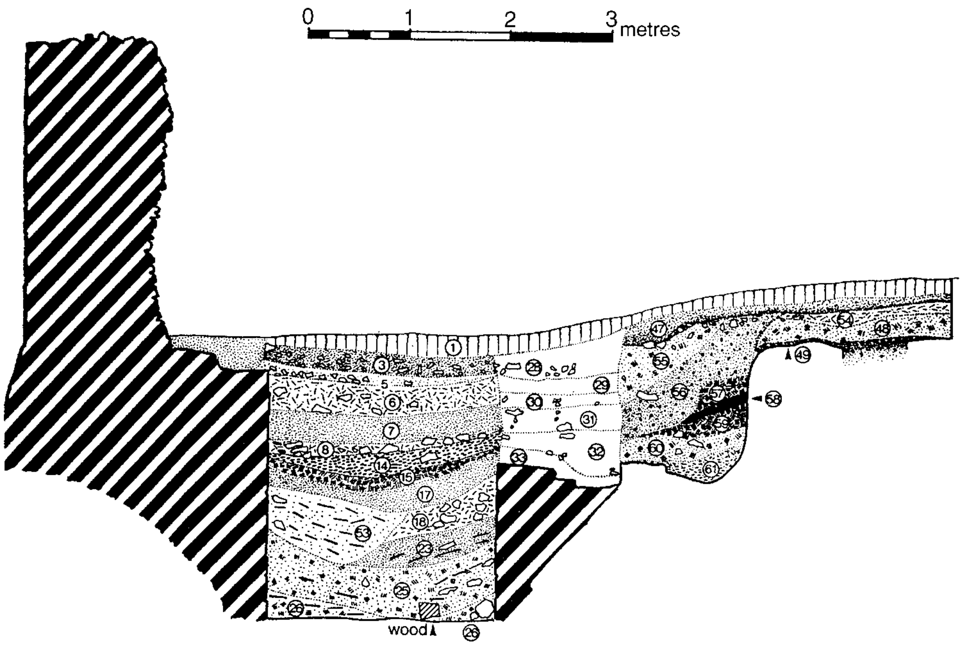


Figure 7.7 Example of section drawing combining convention and pictorial representation

The photographic record

Most site photography is now undertaken using digital cameras (see Chapter 4), although traditional cameras may still be used for a black and white archive. The most important addition to the basic field photographic equipment outlined in Chapter 4 is a strong, well-built tripod. Avoid those which may be damaged by dust. Simple clamp legs and pan-and-tilt heads are best. For vertical photography or general site views tripod towers, quadripods, bipods or monopods (Figure 7.8) may be added to the excavation photographer's equipment (Dorrell 1989). Digital video cameras should also be considered.

Figure 7.8 Photographic monopod (Photo: Lisa Fisher)

Photography, together with the drawn record and the written record, is one of the key forms of excavation record. Ideally, a specialist archaeological photographer should be on site throughout the excavation. On smaller excavations this role may be combined with others. It is essential, however, that one person has responsibility for the site photography, the equipment and record keeping: only in this way can consistency be maintained. If no specialist archaeological photographer is available, a photographer without archaeological training can be used, but he or she will require continuous advice as to what is required archaeologically. An archaeologist without photographic training may, of course, produce even worse results.

The photographic record of an archaeological excavation should start with general photographs of the site before work begins, together with details of any archaeological features visible. These should be taken in the same way as field survey photographs (described in Chapter 4). As with field survey photography, the basic record should be digital, but traditional black and white photographs may be required for the main site archive. Each stage of the excavation should then be photographed, and each context and group of related contexts photographed for permanent record.

Some archaeologists separate photographs for record from photographs for publication; this sort of division is often ill advised. In many cases the distinction is not always clear during the excavation, and a roughly cleaned context photographed for record may be the context you finally wish to publish. It is generally better to take all photographs to publication standard. On a well-run excavation this should be no great problem, as the site is always kept clean and tidy, but even on the best-run site, some preparation for photography will be required.

M. B. Cookson, in his classic – though now technically very dated – book *Photography for Archaeologists* considers the importance of 'Cleanliness of the subject with a capital C'. How this is done depends on the type of site and soil conditions, but it remains the basis of a good archaeological photograph. Firstly, remove everything that does not need to be in the photograph. This includes loose soil, buckets, trowels, shovels and, generally, people. However, occasionally, on a big site, carefully placed people may both aid visualization of scale and add interest.

The context to be photographed should then be well cleaned, together with the whole area to be included in the shot. If the site is difficult to keep permanently clean, for example leaves or dust are constantly blowing onto it, it is well worth defining the actual area for detailed cleaning by viewing it through the viewfinder of the camera. Do not, however, leave the camera set up, or dust may ruin it. The area to be photographed should then be cleaned from the centre outwards, or from one side to the other. Stiff brushing is often good for masonry or hard surfaces, but skimming with a trowel is better for soils, particularly damp soils, as brushing will smear different colours.

Ideally, edges of contexts should be defined simply by cleaning, and then colour differences enhanced by spraying with water. Some archaeologists, however, define contexts by differential digging, lowering the top fill of a pit by a centimetre or two, for example. Cutting lines between layers in sections, however, should probably be avoided as it makes any reinterpretation from photographs very difficult. A possible exception could be the junction between fills in a pit or ditch and the natural bedrock. Slightly undercutting this junction does make the shape of the fill clearer (Cookson 1954, plate 2). Contrast, however, is better emphasized by dampening the soil. The soil should be dampened using a very fine spray of the type often used in gardens, but take great care. If too much water is applied, colours may merge, and if it is applied too violently, the splash effect may mask all contrast. For publication, the whole area to be photographed should be sprayed, although for lecturing some differential spraying, for example just of the context under consideration, may be justifiable, though you could be accused of ‘faking’.

Traditional (film) cameras used filters to modify colour and intensity of light. With digital cameras this can be done in camera or using the computer program into which you download the images. Most filters used in digital photography are special-effect filters not suitable for archaeological photography. However, polarizing filters, which increase contrast as well as darkening blue sky in the background, may still be useful. A UV filter to block ultraviolet light, although not essential, remains useful to protect the lens of the camera in the dusty conditions of an excavation.

Some form of scale is essential for virtually all photographs. If no scale is used, a small posthole can look like a huge pit when photographed to fill the frame. The scale does, however, give only an approximation, due to distortion inherent in the photographic process. The round lens causes distortion and the scale appears smaller the further away the subject is from the camera. Photographed obliquely, a pit is smaller in scale at the top of the photo than where it is closer to the camera, at the bottom of the photo. Scales can therefore never be used to take measurements off a photograph. For that kind of detailed information, use the plans and section. Scales should be clear and an appropriate size for the image. Remember that it is the context or site you are photographing, so the scale should be clear but not dominant. A good variety of scales is needed for any excavation, varying from 2m ranging poles, through 40cm or 50cm scales, down to 10cm, 5cm or even smaller (Figure 7.9). Red-and-white graduations stand out best in colour photographs, but black-and-white are better for monochrome. Ranging poles are normally only red-and-white, so unless you repaint them they will have to do for black-and-white photos.

Some archaeologists like to have an indication of orientation on their photographs, as opposed to simply recording details in the photographic record. If required, it is better to have a scale with a north point laid in the right orientation, than to clutter up the image with a separate scale and north point although this may be appropriate in vertical shots covering a large area (Figure 7.10). A photograph will look even more cluttered if an information board is introduced as well. These are essential for the disorganized field archaeologist, but it is generally better to record all valuable information about site, year, feature number, level and so on, on the photographic record sheet, rather than try to cram it into the photograph. By the time you have laid out information board, scale and north point, there will not be much room left in the frame for the context itself! If information boards are considered essential, at least combine the scale into one edge and perhaps lay the board oriented north–south.

When photographing sections, especially – although also most contexts – the scale looks much better if parallel to the frame of your photograph, either vertically or horizontally. To achieve this effect, do not try to use a plumb-bob or spirit level, as distortion means that your frame edges are very rarely vertical or horizontal. The effect should be achieved by looking through your view finder and having someone move the scale until it appears vertical or horizontal. Do not worry that in reality the scale may be 30° or more off vertical; it will produce a much better-looking photograph than one with scales at crazy-looking angles.

Recording the image you have created is almost as important as creating it in the first place. For video, a spoken commentary can be used, perhaps with information boards relating to specific contexts. For still photography, a detailed photographic record is required

Figure 7.9 Vertical photo taken from monopod (Photo: Lisa Fisher)

even if information boards are used. Each frame should then have its own information recorded, including frame number, subject, context number, direction viewed from, date, time and photographer's initials.

The finds record

The finds record overlaps with the written, drawn and photographic record, but is perhaps best considered as a record in its own right. This is the site record covering all elements of the site that are removed, so it includes artefacts, ecofacts and environmental samples. Basically, this record includes no quantification or analysis, but in practice there may be an advantage in undertaking extra work on particular classes of material, like plain roof-tiles, so that they can be discarded on site. This could save huge amounts of time and money.

The location of artefacts and ecofacts can be recorded in two basic ways: either by context or by specific location. To record the exact position of every artefact and ecofact on a site when huge numbers are present is generally not practical, and is only really worth

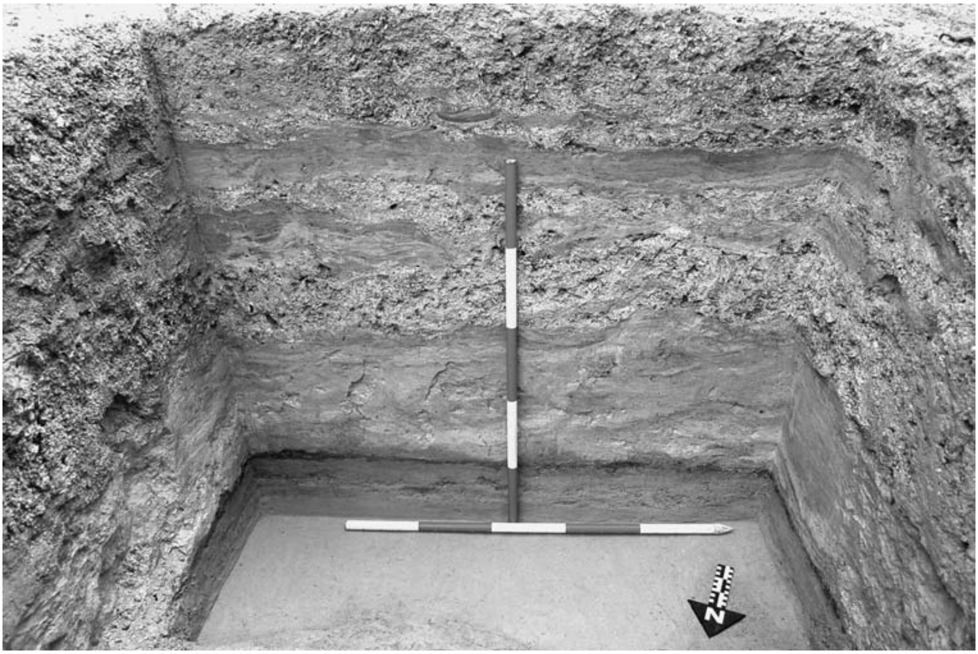


Figure 7.10 Section photo with ranging pole scales (Photo: Lisa Fisher)

considering when there is good evidence that the objects are still in their area of primary use (Chapter 2). Redeposited rubbish generally needs only to be recorded by context. Specific rare objects may, however, also be worth locating precisely. Such objects are generally called ‘special’ or ‘small’ finds. General finds and special finds are treated differently, from the moment of their location, and each type has its own record.

General finds are grouped together by context on site. They are put in a clearly labelled finds tray or finds bag. The minimum of information recorded on the label should be the site name and/or number and the context number. If bags are used on site, each bag should be given a discrete bag number. If finds are bagged from trays at the end of the excavation of a context or finish of the working day, the bag should be numbered then. This is the only way to be certain that no bags of finds have been lost. When a numbered finds bag is issued it should be recorded in a Finds Register. This Finds Register should record bag number, context number, grid reference from site grid to locate the context, date, brief field comments (if required) and then some indication of the range of material in the bag, for example, pottery, stone or bone.

Special finds are kept separately, from the moment of their location. If possible they should be left in place in the ground until a special finds bag has been labelled and the Special Finds Register completed. The bag needs to be labelled with, at a minimum, the site name and the special finds number (issued centrally from the Special Finds Register). The Special Finds Register records the special finds number, the context number, broad object type (for example, metal or coin), the site grid reference locating its horizontal location, and the level to locate its depth in relation to the site datum (and ultimately Ordnance datum). If the find is recorded on a drawing or on site photographs, cross-references can be made to drawing and photograph numbers. There may also be a section for general description of the object, whether it requires conservation, and the form-filler's initials and date. The last two enable mistakes to be followed up. Environmental samples have their own Environmental Sample Register, with each sample being given a sample number and then being recorded in a similar way to special finds.

The aim of on-site finds processing and recording is essentially to enable finds to be got from the site to the post-excavation laboratory or workshop in a safe way so that each object or sample, or group of objects or samples, can be readily located. They should also be in a suitable state for the post-excavation work to begin. Generally, but not always, the excavation stage of a project has more available labour than the post-excavation stage. If this is the case, it is essential to get as much of the basic processing as possible done on site. This will include finds washing and marking (to be considered further in Chapter 8).