

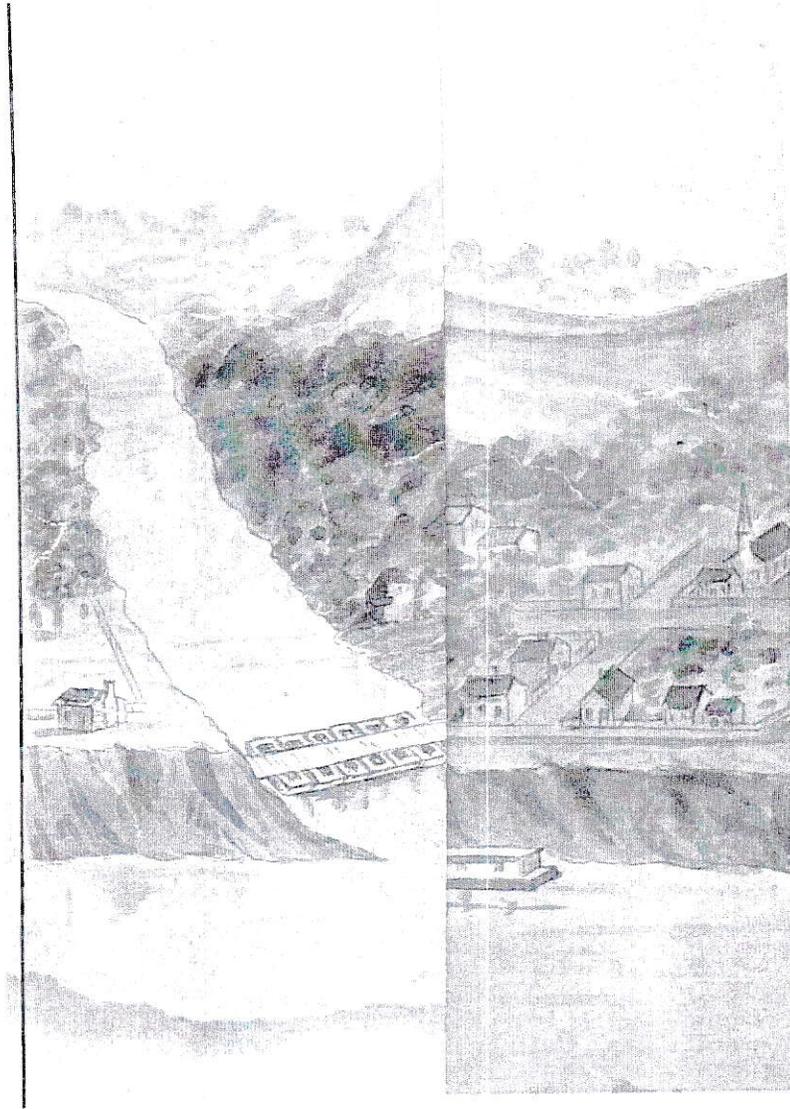
CHAPTER 3: Structural Features of the Fortification and Encampment

Fort Duffield contains well-preserved fortifications that conform to standards and guidelines used by Civil War military engineers. The standard manual for the construction of fortifications was written by D. H. Mahan, Professor of Military and Civil Engineering at the United States Military Academy (Mahan 1863). The first edition of this work was published in 1836 and was revised and reprinted twice. *A Treatise on Field Fortification*, the third and last edition published in 1863, contained explicit instructions and diagrams showing all aspects of laying out, constructing, defending, and attacking entrenchments, and was a standard text for students at West Point. No contemporary military map of Fort Duffield has been located nor has any detailed official description of the fortifications been found. Nevertheless, the site was planned and laid out by a professionally trained army engineer named Capt. Nathaniel Michler who was assigned to a unit of Topographical Engineers (Col. Hazzard L. Howland, general order, RG 393, Pt. 2, entry 6465, vol. 149/DO, 6 November 1861, U.S. Archives, Washington, D.C.). Clues in various documentary records, including letters between Col. Duffield and General John Robertson, dispatches sent by Capt. Charles Victor DeLand to various newspapers, soldiers' letters to home, and postwar memoirs provide details that help to identify and interpret the architectural features visible at the site today. A very useful drawing was made by one of the soldiers, Charles Kelley, after the war and shows the distribution of tent structures inside the fort enclosure (Figure 6).

The purpose of Fort Duffield was to provide protection and repel attack against the supply depot established in West Point as well as

serve as a deterrent to Confederate advance toward Louisville. Its location on Pearman's Hill gave it a commanding position over major roads, the railroad, and the two rivers that confluenced at West Point (Figure 7). Mahan (1863:xxi) stipulated that field batteries should be positioned with a view to "its suitability for annoying the enemy and...as to its being favorable for limiting the effects of the enemy's fire aimed at the battery." To that end, artillery should "overlook all the ground over which an enemy might advance, the pieces of heaviest calibre being placed on the most commanding points" (Mahan 1863:xxii). Rough ground was preferred because it "breaks the effects of the enemy's ricochet shots, and when it presents bluffs or perpendicular faces towards the enemy it will stop the balls that strike those parts" (Mahan 1863:xxiii).

In these respects, Pearman's Hill was an ideal location. The topographic character of Pearman's Hill (also called Mistletoe or Muldraugh Hill) facilitated an unenclosed fortification that faced south toward the old Elizabethtown Road (see Figure 7). The southern slope of the hill was quite steep and deterred an attacking force coming from the south because they would have had to move uphill in direct line of fire from the entrenchments at the top of the hill. The rear of the fort was bounded by a nearly vertical bluff face overlooking the town of West Point and the Ohio River. Because of the topography, the fort's location was virtually impregnable after fortifications were complete. As an added precaution, more fortifications were begun but probably not finished on ridges on the opposite side of the old Elizabethtown Road. These entrenchments are still visible today but have yet to be studied.



d Briggs, personal collection).

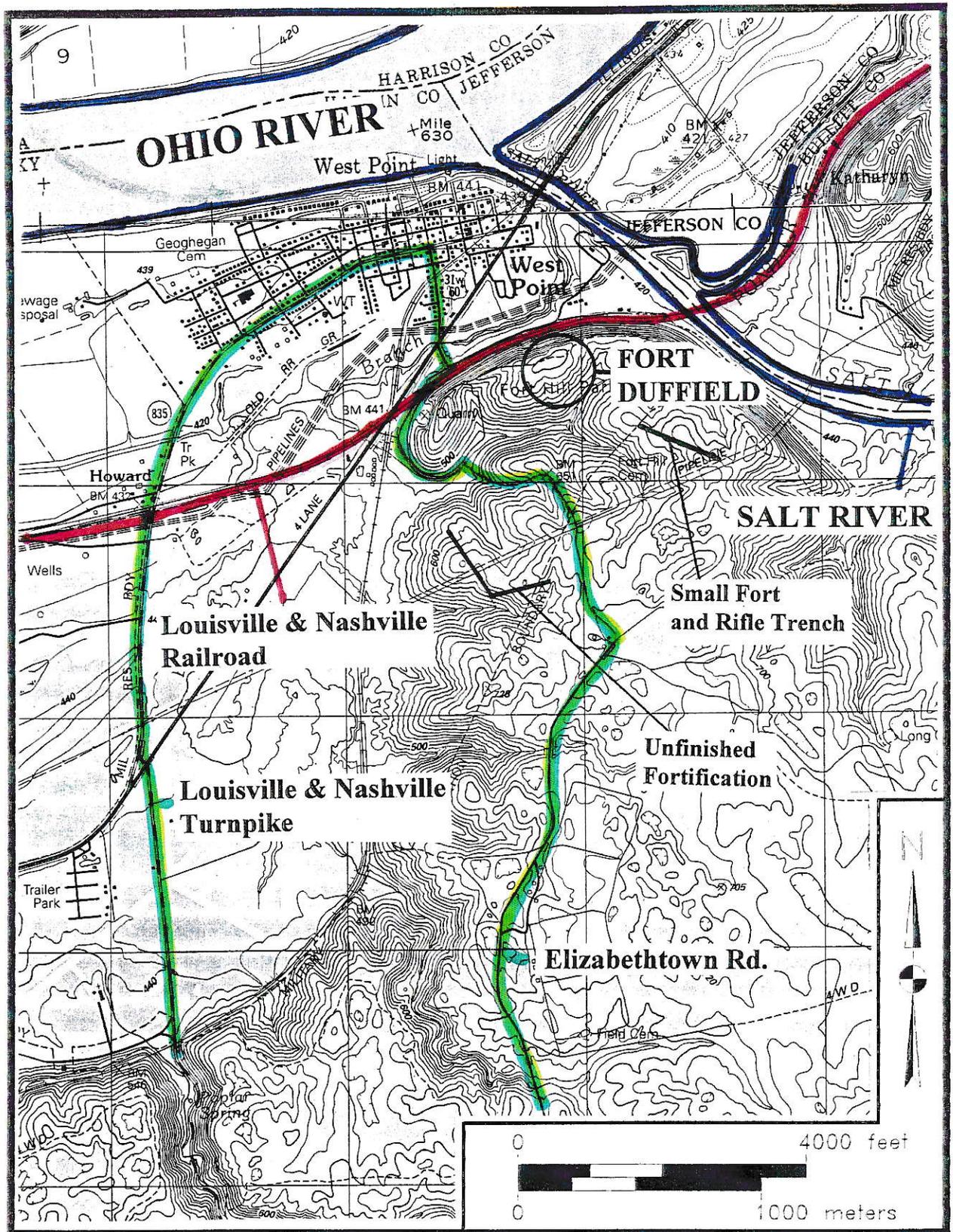


Figure 7. Strategic location of Fort Duffield relative to major transportation routes (U.S.G.S. 7.5-min. quadrangle, Fort Knox, Ky./Ind., 1991; U.S.G.S. 7.5-min. quadrangle, Kosmosdale, Ind./Ky., 1960 [photorevised 1971]).

The manpower needed to build the fort was substantial. On November 7, 1861, John C. Love of Company C, 9th Michigan Infantry, wrote his parents that (J.C. Love to Parents, letter, November 7, 1861, Bentley Collection, University of Michigan, Ann Arbor):

there is two hundred men from our regiment and two hundred from the Indiana regiment to work upon Mistletoe [sic] Hill, they are throwing up breast works....We have six cannon with us which will be placed upon the hill as soon as possible. Then we shall have a commanding range of the Ohio of four miles and all the roads this side of the hill.

Detailing 400 men to work on fortifications strained available labor resources for other military duties, largely because of the high rate of illness that plagued the regiments in the fall of 1861. On November 7, 1861, Col. Duffield reported to Brigadier General John Robertson in Louisville that (W.W. Duffield to Brig. Genl. John Robertson, letter, November 7, 1861, U.S. Archives, Washington, D.C.):

we are somewhat pulled down with sickness having over 150 men unfit for duty. If you could assign us 100 men from the surplus in Mays Regiment it would help us very much...We are building a large field work upon Muldraughs Hill and this takes 400 of our men, so that we cannot make much progress in Battalion Drill.

The process of constructing a fortification began with profiling and laying the outline of the embankment on the ground. The profile was established by placing "poles in the ground at the

various angles and profiles of the elements of the rampart, with the respective heights of the elements marked on the poles" (Wright 1982:29). The profile was extended by the use of cords attached to other poles similarly placed every twenty to thirty yards. Organization and placement of the work parties was quite precise, comprising a "series of teams and positions in relation to their type of work" (Wright 1982:29). For instance, one man with a pick worked with two men with shovels. Working four to six feet apart in a specified area, one man used a pick to remove three foot layers of soil from what would become the ditch. The two men with shovels removed the dirt to the rampart where one of them would spread the earth in layers while the other packed it firm. During this process, the proper angles of the walls were maintained, readying them for the application of revetments.

Details of the internal features of the fort were provided by Capt. Charles DeLand, a journalist in civilian life, to a newspaper in Jackson, Michigan (*Jackson American Citizen*, November 21, 1861).

On the top of the mountain 100 feet above us we have a constructed a strong earth work fort, which will mount twelve guns, with redans on each flank, and breastworks for the infantry. These works are occupied by two companies from our regiments, and command the roads and rivers perfectly.... We have passably good living and the only unpleasant thing is sleeping on the cold damp clay ground.

The two companies in the fort totaled 90 men, according to a report by Col. Duffield on November 14, 1861 (W.W. Duffield to Brig. Genl. John Robertson, letter, November 14, 1861, U.S. Archives, Washington, D.C.). A dispatch to the

editor of the *Detroit Tribune*, dated Dec. 21, 1861, described the fort as follows (*Detroit Tribune*, December 21, 1861):

When about five miles from Salt River, Muldrough's Hill begins to lift itself up and stretch itself away off to the left and eastwards while the Ohio, no longer vexed by thousands of busy keels, reveals itself on the right and west, and beyond it the high hills of Indiana frown down upon its silent waters. A nearer approach shows the fortifications on the hill, some 450 or 500 feet above the plain, with cannon pointing Southward, and sentinels pacing along the perilous edge of the rocky bluff...we wind along a road to the left for a quarter of a mile or more, and suddenly, by an abrupt turn in the same direction, begin to climb the hill by the road upon its western side. Soon we reach the headquarters of the Quartermaster's Department, where horses, wagons, mules, black-topped and gloomy looking ambulances, guard tents and heaps of forage, are promiscuously grouped under heavy old oaks, whose branches are here and there ornamented with the green mistletoe bough, which abounds through all this region. Betaking ourselves to the well cut roadway, we climb, and pant, and climb, upward and onward, and still upward, until we strike another row of sentinels, outside the trenches of the fort, which crosses the summit of the hill and spreads itself over five acres or more to the right. Cannon frown from the parapets, one rifle and six

smooth-bore, and all the earth works of a fortification capable of holding 1500 men stretch off to the southward; while on the left and north you turn your eye directly down the cliff, upon the town, the river, and the wide expanse of field and wood that, like a panorama, unfold a scene as beautiful as it is tranquil...A few more steps [to the] crest of the hill, leading us to the newly reared huts, brought us to Headquarters, where we were cordially received by Col. Duffield and his staff, Lieut. Col. Parkhurst, Maj. Fox and Adj. Henry M. Duffield.

Some of the seven guns mentioned in the preceding account were probably mounted in embrasures cut into the parapet in the central section of the berm overlooking the southern slope. Others may have been mounted on barbettes which enabled guns to fire over the parapet. On December 20, 1861, John Love wrote that "the fort is nearly completed. They have all of the guns mounted, seven in number, six smooth bore and one rifled cannon. They are savage looking things I tell you, and when one is fired when you are in the Fort it will almost raise him of [sic] his feet" (John C. Love to Parents, letter, December 20, 1861, Bentley Collection, University of Michigan, Ann Arbor).

As the fortifications were nearing completion, Gen. Robertson ordered Col. Duffield to "hut your men by their own labor as efficiently as practicable" (Gen. John Robertson to Col. W.W. Duffield, letter, December 2, 1861, U.S. Archives, Washington, D.C.). Most of the regiments assigned to West Point and Fort Duffield were encamped on bottomland near West Point. Their "tent city" conformed fairly well to military standards concerning the layout of parallel company streets, with separate rows of quarters for officers and enlisted men. The camp

was described by Lt. Col. Parkhurst to his daughter Kittie on November 10, 1861 (John Parkhurst to Kittie Parkhurst, letter, November 10, 1861, University of Michigan Archives, Ann Arbor):

Papa will try to tell you how our camp is laid out & to describe his tent to you & you can see how comfortable it is.

Tents for Soldiers

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Tents for Noncommissioned Officers

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Tents for Company Officers

Papa's Col. Duffield's
Tent [both shown as 2 room tents]

Kitchen & Servants [2 smaller tents or structures flanking larger tent or structure]

These tents are placed in rows & each one of the tents in front are occupied by the men & hold about 16 men each--there are streets running between the tents & the doors open into the streets--the fires are where the men cook their dinner--then after all the officers of the Regiment comes the Tents of the Field officers & behind them the Kitchens & servants tents etc. etc. etc.

Now Papas tent has two rooms like this--[inserted a drawing showing 2 rooms with an entry door into the tent and into the rear room; table and stove in front room and bed in rear room] in the front room is a box for a table and a stove & stools, which I use for an office--The other room I use for a bedroom & let my body servant sleep in the front room--he is a boy who went from Coldwater but I never saw him to know him then but he is good to your papa--The weather is not very cold here, but I have a fire most everyday in my tent--don't you think you would like to visit papa & sleep in his little bedroom with him. Sometimes I have my bed made up on the stools--& sometimes on the ground--but if we stay here long I mean to have a little rough bedstead made.

By December 4, 1861, Col. Duffield was able to report that he was progressing with the construction of log huts for his men at the fort. The topography of the hill did not facilitate as orderly a plan for a camp as was possible on the flat bottomland. Charles Kelley's drawing of the fort interior showed numerous tents and canvas-covered huts distributed in a rather haphazard way, owing largely to the limited extent of flat ground at the top of the hill (see Figure 6). The southern slope outside the fortifications supported additional hut locations. These are visible today as stacked stone chimney bases built into the uphill edge of artificially leveled areas that appear to be the actual living space. The typical quarters for winter encampments is described by Nelson (1987:81) as the stockaded wedge or wall tent pitched on a low platform of boards that formed a floor. The walls of the tent were often sheathed with lumber to make them rigid and more resistant to the chilling effects of wind and rain. The southern exposure of the hill also took advantage of warmth from the sun and protection from wind. Another form of winter house that would have been a good choice at Fort Duffield was "the single-room log hut of horizontally laid, end-notched log walls with a single doorway set in the gable end or the side wall.... An exterior chimney protruded from an opposite wall" (Nelson 1987:83). Loose joints between the logs were chinked with mud. The huts were often roofed with tent canvas, boards, or trimmed saplings covered with canvas (Figure 8). A typical hut measuring 8 x 12 ft. housed four men. At Fort Duffield, logs were readily available for construction according to John Love, who wrote on December 1, 1861, that "there is about fifty acres of timber slashed down and there is about 50 acres more to cut" (J.C. Love to Parents, letter, December 1, 1861, Bentley Collection, University of Michigan, Ann Arbor). A correspondent for the *Detroit Advertiser* described how soldiers heated their tents in a dispatch published January 16, 1862 (*Detroit Advertiser*, January 16, 1862).

Our men have rather a novel way of manufacturing stoves. They dig a trench across their tents,

about a foot wide, and cover it over with flat stones, having an opening for the draught on one side of the tent, out side, while on the other end they set up a couple of barrels, or build a stick chimney. In this way they have furnaces that heat up the tents so that they are very comfortable on a cold day.

Kelley's detailed drawing also indicates that Pearman's Hill on which the fort was built was almost completely clear of trees (only three being shown) (see Figure 6). Timber removal was done by the soldiers with the dual purposes of providing lumber for construction and creating an unobstructed view and line of fire of the roads, railroad, and rivers. The covering mass or embankment was built along the southern brow of the hill and was not enclosed since the steep bluff on the north side of the hill served as adequate defense without further entrenchments being built. The embankment at Fort Duffield is similar to an alignment termed a converging cremaillere line, an earthwork adaptable to irregular topography (Mahan 1863:Figure 51). Capt. Deland commented that the combination of angles, salients, and redans presented "18 points or fronts of defense to the enemy" (*Jackson American Citizen*, November 24, 1861). All of the embankment or earthwork lines shown in Kelley's drawing are visible today with the exception of the easternmost right angle.

Kelley illustrates a total of nineteen structural components in the enclosure formed by the entrenchment (Figure 9). These appear to include three unreinforced wedge tents, two "bell" or Sibley tents, five flat roofed tents with a square or rectangular floor plan, and nine gable roofed structures that were probably log huts with tent canvas or plank roofing. Five of the gable roofed structures are distinguished by dark roofs that probably were more substantial than canvas. These structures are located nearer to the flag pole flying the American flag in the southeast corner of the fort. The western half of the enclosure is

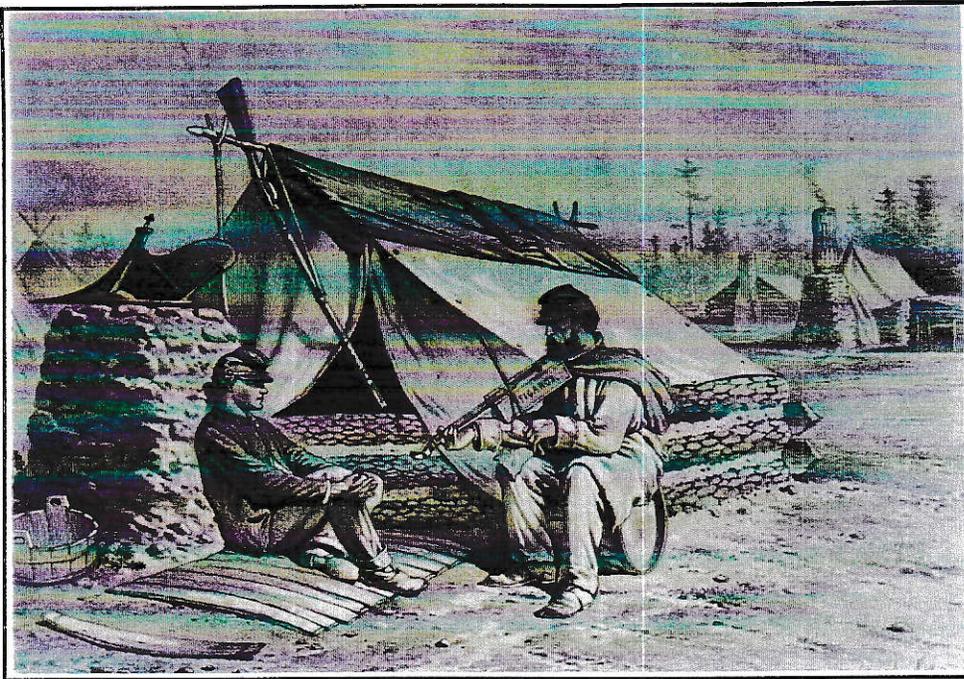


Figure 8. Drawing of a winter hut (Edwin Forbes Collection, LC-USZ62-14188, Library of Congress, Washington, DC).

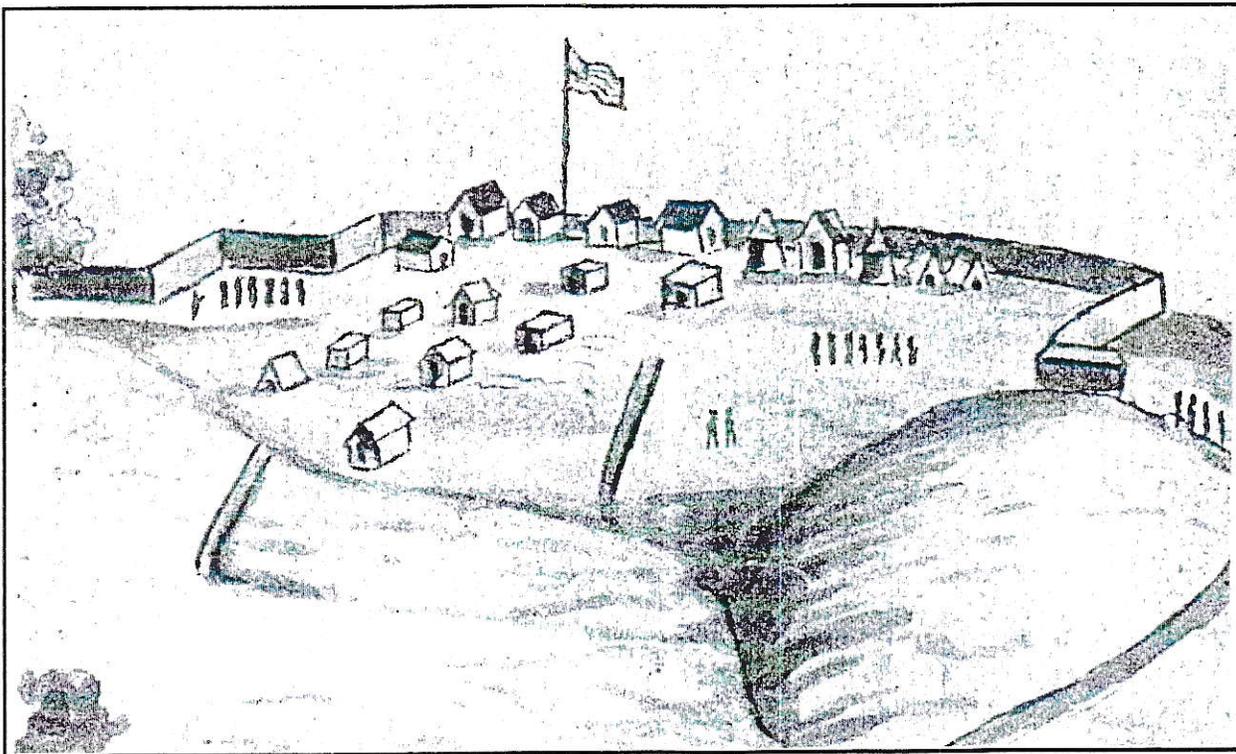


Figure 9. Detail of Charles Kelley's drawing of Fort Duffield showing structures in the fort interior (Richard Briggs, personal collection).

largely open and clear of tents or other structural features. Another open area is apparent on the east side in the first interior right angle.

The purposes of these structures are not known; available documentation only mentions the headquarters for Col. Duffield and his staff. Some of the grade officers, particularly those in command of the companies at the fort, may have moved up to the hill and occupied log huts or tents inside the enclosure. A powder magazine was probably present for the storage of ammunition. Powder magazines were usually constructed near a salient (an angular point of a fortification). A previously quoted newspaper account placed the quartermaster's area on the road leading up to the fortification.

While no contemporary military map has yet been located for Fort Duffield, available documents such as the dispatches from Col. Duffield to headquarters, soldiers' letters home, and newspaper reports offer tantalizing clues into the construction and outfitting of the fort, as well as the activities that took place in and around the fort. This information, coupled with the archaeological features on the site, form the data base for reconstructing the plan and layout of the fort as well as identifying areas where specific activities took place.

CHAPTER 4: Archaeological Investigations of Fort Duffield

Archaeological investigations of Fort Duffield included a variety of field techniques designed to efficiently gather data on structural features and artifacts associated with the fortification. A necessary first step was the preparation of a topographic map of the fortification and the immediate environs, including the spring on the north bluff face and the southern slope of the hill outside the entrenchments where soldiers' huts were built. The map, prepared by teams of professional surveyors using a total station, shows the entire extent of the entrenchments, visible features in the fort enclosure, all archaeological excavations, the spring in the north bluff face, and all visible remains of the soldiers' huts on the south slope outside the entrenchments (Figure 10). Hut locations on the southern slope were identified by pedestrian reconnaissance conducted by Ms. O'Malley and Dr. Linebaugh. Each location was marked with flagging tape so that the surveying team could map them. A total of 15 possible hut locations were identified. Calculation of topographic variation allowed for precise measurements of aspects of the entrenchments that could then be compared and contrasted with standards and guidelines for constructing military fortifications that were in use at the time of the Civil War.

Archaeological investigations in the enclosure formed by the embankment focused on areas where Kelley's drawing depicted tent structures. The fort interior contains the largest area of level ground since it encompasses the crest of the hill; soils in this area correspond to Crider silt loam (12 to 20 percent slopes). The soil survey publication for Hardin County describes a typical soil profile for this soil type as well-drained with a brown silt loam plowzone averaging 8 in in thickness, and a subsoil consisting of brown silt

loam to a depth of 26 in where it becomes a reddish brown silty clay loam to 38 in. Below 38 in is a red, very firm, plastic silty clay (Arms et al. 1979:16).

The southeast section inside the fourth or southernmost right angle line was surveyed with a remote sensing device that measured magnetic susceptibility and earth conductivity. The remote sensing survey was conducted by Dr. R. Berle Clay of Cultural Resource Analysts, Inc., Lexington. A larger area that included the section subjected to remote sensing and extended to the middle of the enclosure was surveyed with metal detectors and each target was flagged, mapped, and then hand excavated, with all fill being screened to retrieve the metal targets as well as any associated non-metallic artifacts. This procedure allowed a spatial analysis of artifacts, particularly nail, that was useful in determining the location of structural components.

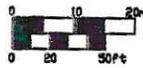
The center of the enclosure was once occupied by a structure built for a hunting camp that operated in the early twentieth century. Used primarily as a dining hall, the building probably was of frame construction with a stacked stone foundation. Physical evidence in the area where the building had stood took the form of scattered limestone blocks and a depression. One of the volunteers cleaned out and trenched the depression with a shovel. A sample of the fill was screened and the more diagnostic artifacts were collected. The excavation identified this feature as a cistern that once had a mortared brick cap and concrete cover with a central hole to accommodate a pump. Subsequently, Richard Briggs learned from the daughter of an African-American woman who had served as the club's cook that the facility was indeed serviced by a cistern.



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TOPOGRAPHIC SURVEY
 OF
 FT. DUFFIELD
 WEST POINT

UNIVERSITY OF KENTUCKY
 LEXINGTON, KENTUCKY 40508



SEPTEMBER 25, 1997

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Other archaeological investigations inside the enclosure included the excavation of 4 1-x-2 m and 2 1-x-1 m units in two areas that appeared to be good candidates for log hut sites and an additional area that appeared to be used as a dump. These units were excavated in arbitrary 10-cm levels and all fill was screened. A total of 12 50-x-50 cm screened shovel probes were excavated in various areas to sample the deposits and look for evidence of additional log huts or residential locations and areas of artifact concentration. The first 8 probes were excavated in 10 cm levels. Stratigraphic data extracted from these probes indicated that the fill was quite mixed and artifacts from the Civil War occupation were intermingled with items dating to later in the nineteenth and twentieth centuries. The remaining four probes were excavated as single levels. A trench measuring .75 x 2.0 m was hand excavated into the southern line of the berm to look for evidence of revetments that may have been built on the interior slope of the parapet. None of the soil from this trench was screened; however, artifacts encountered during the excavation were collected.

Outside the embankment on the southern slope, a barely discernible shallow trench more or less paralleled the main ditch and connected two circular depressions that probably were the redans mentioned by Captain Deland in a dispatch to the *Jackson American Citizen* in November of 1861 (*Jackson American Citizen*, November 12, 1861). This linear feature may have been intended as a rifle trench. It was cross-sectioned with a hand excavated trench to expose its stratigraphic profile. The circular shape of the depression, measuring 35 ft. in diameter, is suggestive of an enclosed fortification like a redoubt rather than the unenclosed form that a redan takes; however, no other documentary clues were found to suggest that Deland used an incorrect term for this feature. Mahan (1863:12) defines a redan as a "work consisting of two faces" with the entrance in the rear (called the gorge) being open. They were frequently used to improve the defense of the ditch by being built at each end as was done at Fort Duffield. A redan in this location would also

have strengthened the defense of the gate by providing an overlook of the road leading up to the fort.

All artifacts and documentation were taken to the PAR laboratory at the University of Kentucky in Lexington for processing and analysis. Artifacts were washed and catalogued, then analyzed using a classification system based on artifact function. Artifact analytical data were entered into computerized files using the *Paradox* data base management system. A copy of this report and all field notes, artifacts, maps, photographs, and other materials pertaining to the project will be curated at the University of Kentucky's William S. Webb Museum of Anthropology in Lexington.

Fortification Features - The Entrenchment and its Components

The principal manmade feature visible at Fort Duffield is the massive earthen berm that forms the covering mass or embankment, and its component parts, namely, the parapet and the ditch. Capt. Deland described the main trench as "about 1800 feet in length, 12 feet wide and 9 feet deep, 15 feet thick at the bottom and 9 feet thick at the top" (*Jackson American Citizen* November 24, 1861). Its appearance today, while well preserved from an archaeological perspective, obscures the essential features associated with an embankment. Figure 11 illustrates the elements of a typical fortification overlaying two cross-sectional views of the embankment at Fort Duffield. The interior slopes of the parapet were intended to "intercept the enemy's missiles, and to shelter the assailed" (Mahan 1863:18), requiring that the crest of the parapet be at least 6.5 ft. above the parade level. The elevation of the parapet at Fort Duffield is only about 3 to 5 ft. above parade level which may be indicative of some erosion of the berm downslope. The contour of the berm tends to support this conclusion as well. The vertical interior slope of the parapet was usually faced with a revetment made of sod, pisa (earth mixed with clay and water), sand bags, fascines (closely bound twig bundles), hurdles

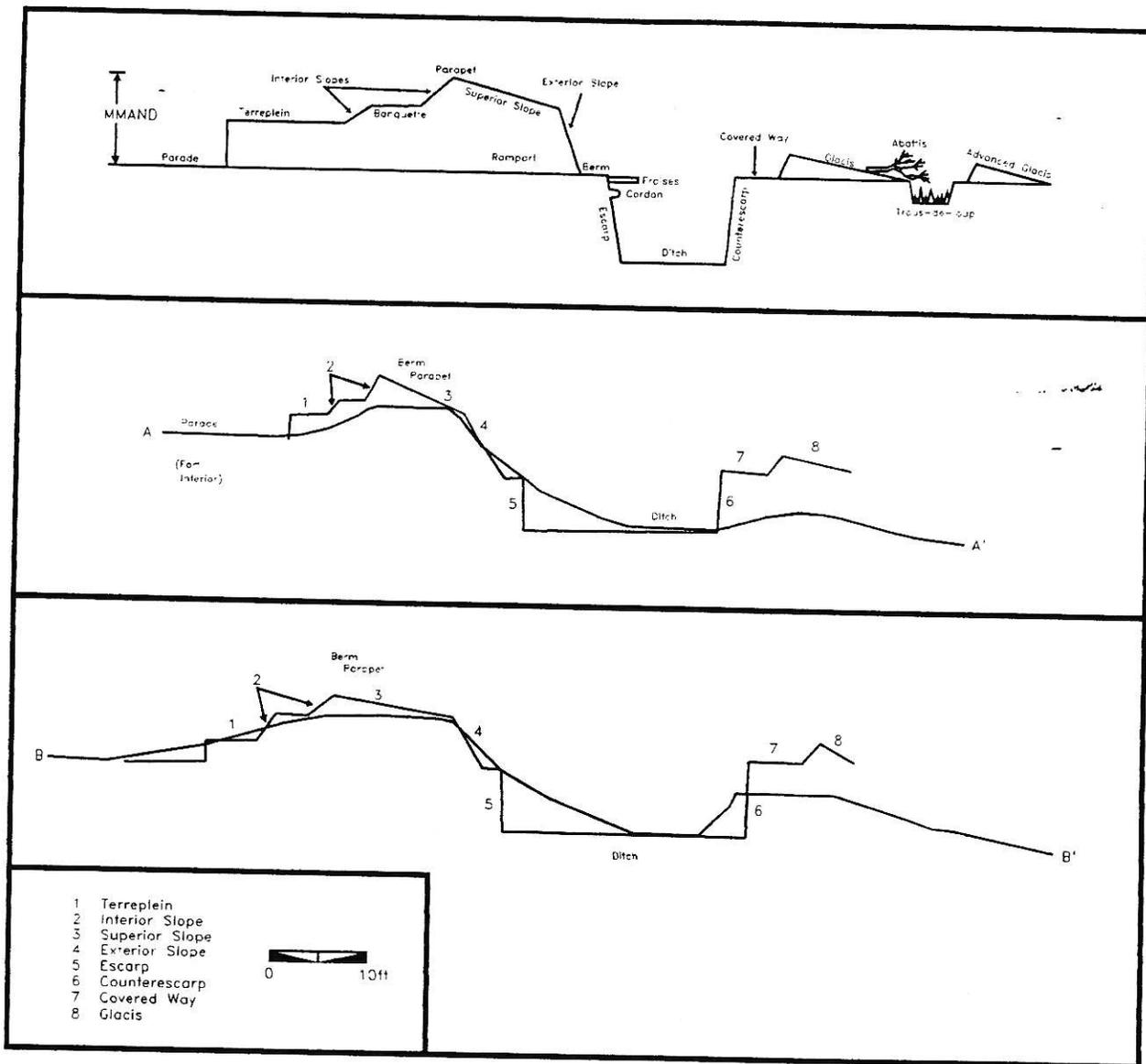


Figure 11. Typical elements of fortification compared to two cross-sections of the main embankment (see Figure 10 to reference these cross-section locations).

(vertically set poles interlaced with twigs), gabions (circular wickerwork), or planks. Unfortunately, none of the available documentary evidence indicates what may have composed the revetments. Of the choices available, revetments formed of fascines, wooden planks, gabions, hurdles, or pisa were the easiest and least time consuming to make. The abundance of wood in the Fort Duffield area provided plenty of raw material for revetments; Capt. Deland identified beeches, maple, cucumber, oak, and cherry trees in the vicinity (*Jackson American Citizen*, November 24, 1861). Sand bags could also have been used but they were not particularly durable and would have entailed transporting thousands of pounds of sand from the Ohio River to the top of the hill.

The ditch from which the soil that formed the embankment was derived would have had nearly vertical walls called the scarp and counterscarp. The scarp wall was the side or slope of the ditch adjacent to the parapet and below the berm (see Figure 11). It usually was faced with a timber revetment. Although the scarp wall at Fort Duffield was not excavated, the slope of the ditch suggests that the scarp wall has eroded somewhat. The counterscarp was the slope opposite the scarp on the far side of the ditch from the parapet. Mahan (1863:22) recommended that the ditch be at least 6 ft. in depth, and less than 20 ft. in width. The ditch at Fort Duffield exceeded 6 ft. in depth at the scarp wall but was less than 6 ft. deep at the counterscarp, again possibly due to erosion of the glacis (a natural or manmade slope from the top of the counterscarp which gave the defenders a clear field of fire).

Fort Duffield had 6 smoothbore and 1 rifled cannon mounted on embrasures built on the parapet. These guns were probably maintained in stationary position on wooden platforms that prevented their wheels from forming ruts and allowed them to be operated in wet weather. The exact positions have not been determined archaeologically. Breaks in the line of the parapet suggest where some of the embrasures were located; reconstructed wooden platforms have

been erected in some of these areas. The original platforms were usually rectangular in shape unless a wide field of fire was needed in which case they were trapezoidal (Wright 1982:48). Platforms for field pieces measured 15 ft. in length and 9 ft. in width. The base of the platform was constructed of three to five sleepers (depending on the shape of the platform) countersunk into the ground and covered with boards.

Results of Remote Sensing in the Fort Interior

Two methods of remote sensing, geophysical survey and metal detecting, were utilized to investigate a portion of the fort interior thought to contain a concentration of tents. Initially, a soil conductivity survey was conducted of a 40-x-50 m area in the southeast quadrant of the fort interior. Subsequently, metal detecting was conducted over an area measuring 30 x 75 m that included most of the conductivity survey area. Each metal detector target was flagged, mapped, and then excavated.

The Geophysical Survey

Geophysical survey at Fort Duffield collected two types of geophysical information on the interior of the fort, earth conductivity and magnetic susceptibility. The instrument used was a Geonics Ltd. EM38 which is an electromagnetic (EM) class of geophysical sensors. The EM38 measures the ability of the ground to conduct a 14.6 kHz radio signal. A limited area of the fort was chosen for survey where operation of the geophysical instruments was not limited by the presence of construction. This covered approximately 800 m² at the upriver (relative to the Ohio River) corner of the main enclosure (see Figure 15). A portion of the main embankment was included in the survey for future reference. A total of 2492 measurements of conductivity, measured in millisiemens per meter (mS/m), were collected along transects one meter apart at intervals of 50 cm. Conductivity is the reciprocal of earth resistivity measured in milliohms. While the total range of mS/m for the surveyed area was high due to measurements in the vicinity of an

iron pipe, for display purposes mS/s was clipped to a range of 5 to 15 mS/m to concentrate on the range of conductivity of interpretive interest. Magnetic susceptibility, measured in "parts per thousand (ppt)," was collected in a similar manner. The measurement file included 2492 measurements with a range between -1.51 and 1.61 mS/s. They were not clipped for graphic purposes.

The combined results of the conductivity and magnetic susceptibility surveys are presented in Figure 12. In this illustration conductivity is presented as a gray scale image upon which is superimposed a contour map of the same data points. Superimposed over this is a contour map in red of magnetic susceptibility. Certain features in this graphic are immediately recognizable. The northwest corner of the map is dominated geophysically by the signature of a metal pipe which runs down the hill, presumably from the late nineteenth to early twentieth-century hunting camp. This was perhaps a water intake pipe leading from a spring further down the slope of the hill. This intense metal signal has the effect of "blanking" out features around it, a failing of many geophysical survey techniques.

At the southeast corner of the survey area, the embankment is clearly indicated by a linear alignment of lower conductivity. This appears to reflect the lower conductivity of the soil which was used to build the embankment, in contrast to the natural "surface" of the fort interior. Within the fort are a number of metal signals generally indicated by sharp conductivity "sinks." These could represent a variety of metal objects, both dating to the use of the fort during the Civil War and to use of the enclosure after the war. Two interesting signals are centered at approximately gridpoints N215 E215 and N230 E210. While both involve metal, they also involve larger and more general areas of higher conductivity (note gray scale). These might represent structure loci.

The Metal Detector Survey

The metal detector survey identified numerous metal artifacts (n=184). Nonmetallic artifacts (n=19) made of glass, ceramic, or other materials were also collected during the excavation of the metal detector targets (Table 1). Excluding undatable artifacts or those attributable to post-Civil War and modern times (n=133), the metal detector survey recovered a total of 70 artifacts datable to the Civil War occupation; these were distributed among three major concentrations (Table 2) (Figures 13 and 14).

Concentration 1 was located in the southeast corner of the surveyed area. It was contained within four 5-x-5 m mapping units. Artifacts in this concentration (n=13) include cut nail fragments and cut nails measuring 2d, 3d, 8d, and 9d (see Table 2). Concentration 2 was located in two 5-x-5 m mapping units, approximately 15 m west of Concentration 1. This small concentration (n=9) yielded cut nail fragments, a cut nail measuring 8d, a 16d cut spike, a Williams bore-cleaning bullet, harmonica parts, and a bayonet sheath tip (see Table 2). Concentration 3 was identified in the north central section of the surveyed area and was distributed over all or part of ten 5-x-5 m mapping units. Civil War artifacts recovered from this cluster (n=35) include cut nail fragments, cut nails measuring 4d, 5d, 6d, 7d, 8d, and 12d, and a 40d cut spike (see Table 2).

The locations of the artifact concentrations identified during the metal detector survey may correspond to some of the log huts or tents that were erected within the fort interior to serve as a headquarters for Col. Duffield and his staff or for other purposes. Since most if not all of the enlisted men stationed on duty at the fort itself lived outside the fortifications in log huts on the south side of the hill, only a small complement of men probably lived within the area enclosed by the entrenchment. As mentioned above, Charles

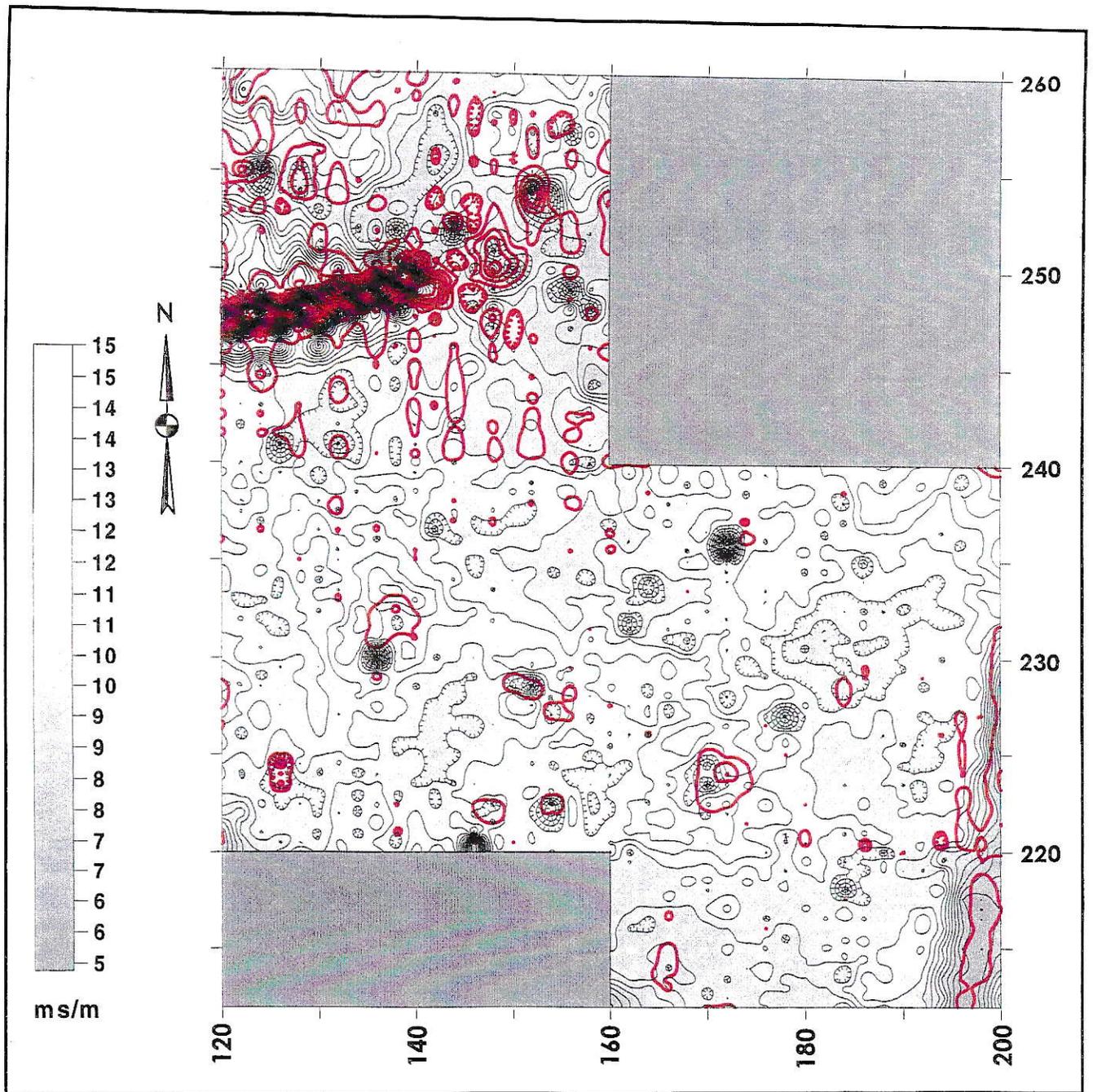
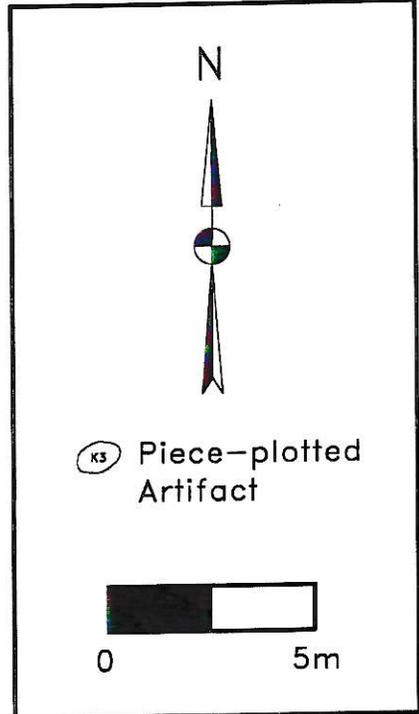
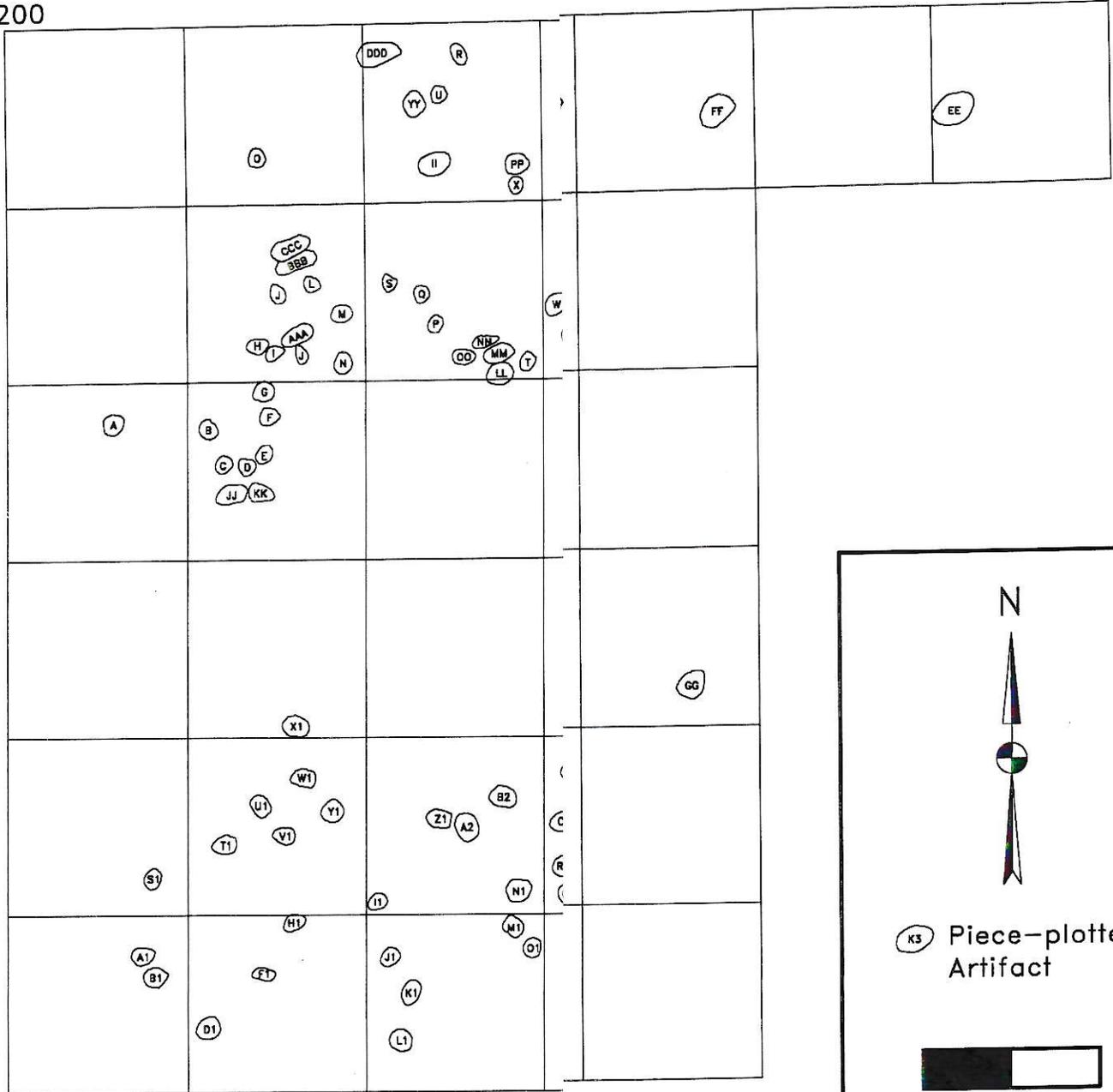


Figure 12. Geophysical survey results (conductivity in gray scale and contours, magnetic susceptibility in red contours).

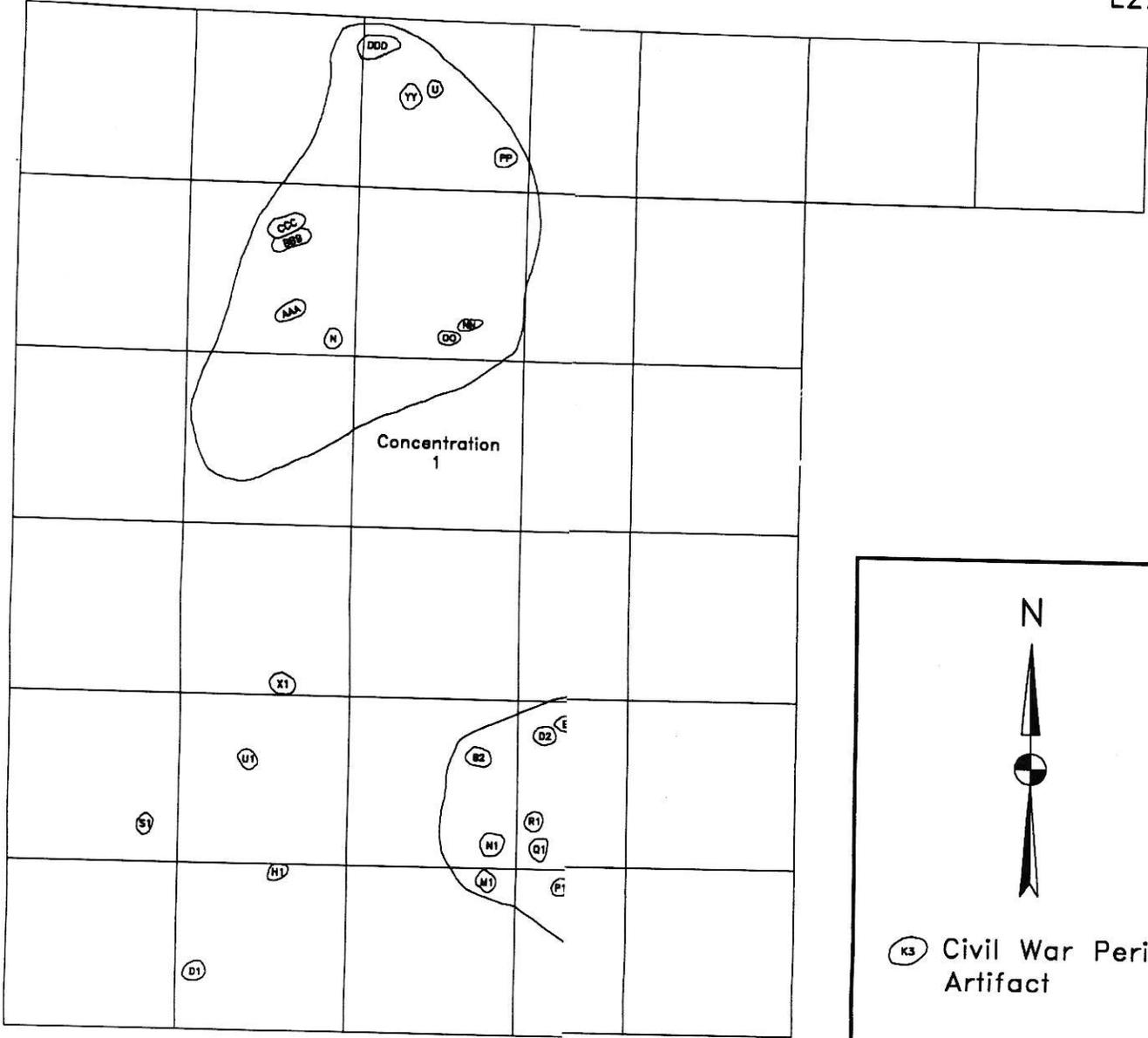
N230
E200

N230
E270



N230
E200

N230
E270



Concentration
1



(K3) Civil War Period
Artifact



0 5m

Figure 14. Distribution of Civil War artifacts in r

Table 1. Artifacts Recovered by Metal Detector.

Provenience	Artifact Type	Frequency
		3
A	unidentified nail fragments	1
B	wood screw	1
C	wire fragment	1
D	shotgun shell brass (centerfire)	1
E	wire fragment	1
F	wire fragment	1
G	wood screw	1
H	wood screw	1
I	wood screw	1
J	wood screw	1
	zinc fragment	
K	wire fragments	2
L	wire fragment	1
M	wood screw	1
N	cut nail fragment	1
O	barbed wire fragments	3
P	wire nail fragment	1
Q	U.S. penny, minted 1989	1
R	artifact missing	
S	twisted strips of copper alloy	2
T	screw	1
U	9d cut nail	1
	9d wire nail	1
V	20d wire spike	1
W	30d wire spike	1
X	aluminum can fragments	2
Y	30d wire spike	1
	metal button	1
Z	iron rod	1
BB	unidentified spike fragment	1
CC	iron strap hinge	1
DD	unidentified nail fragments	2
	30d wire spike	1
	U.S. dime, minted 1970	1
	U.S. dime, minted 1995	1
EE	unidentified nail fragment	1
FF	unidentified nail fragment	1
	aquamarine flat glass fragment	1
	amber beer bottle fragments	2
	machine made bricks	2
GG	zinc fragment	1
HH	double strand wire fragment	1
II	unidentified nail fragments	2
	clay pigeon fragments	3
JJ	barbed wire fragment	1
KK	barbed wire fragments	3
LL	barbed wire fragment	1
	5d wire nail	1

Table 1. Artifacts Recovered by Metal Detector.

Provenience	Artifact Type	Frequency
MM	barbed wire fragment	1
	unidentified iron fragments	2
NN	2d cut nail	1
OO	cut nail fragments	2
PP	12d cut nail	1
QQ	cut nail fragment	1
RR	iron rod fragment	1
SS	8D cut nail	1
TT	shotgun shell brass	1
UU	melted aluminum can fragments	3
	burned clear glass fragments	1
VV	16d cut spike	1
WW	iron nut	1
	D-shaped buckle part	1
XX	unidentified nail fragment	1
YY	cut nail fragment	1
ZZ	aluminum foil	1
AAA	cut nail fragment	1
BBB	cut nail fragments	2
CCC	8d cut nail	1
DDD	cut nail fragments	2
EEE	3d cut nail	1
FFF	cut nail fragments	2
GGG	missing	
HHH	cut nail fragments	2
III	cut nail fragment	1
A1	iron wire fragment	1
B1	iron wire fragment	1
C1	12d wire nail	1
D1	8d cut nail	1
E1	unidentified nail fragments	1
F1	clay pigeon fragments	4
G1	cut nail fragment	1
H1	cut nail fragment	1
	plaster	1
I1	looped wire fragment	1
J1	aluminum foil	1
K1	wire spike fragment	1
L1	barbed wire fragment	1
M1	7d cut nail	1
N1	cut nail fragment	1
O1	cut nail fragment	1
	clay pigeon fragment	1
P1	cut nail fragments	2
Q1	cut nail fragment	1
R1	cut nail fragment	1
S1	cut nail fragment	1
T1	clay pigeon fragment	1

Table 1. Artifacts Recovered by Metal Detector.

Provenience	Artifact Type	Frequency
V1	iron fragment	1
W1	modern percussion cap	1
X1	cut nail fragments	3
X1	20d cut spike	1
Y1	clay pigeon fragment	1
Z1	aluminum pull tab	1
A2	cut nail fragment	1
B2	iron fragment	1
C2	cut nail fragment	1
D2	cut nail fragment	1
E2	modern aluminum beer can fragment	1
F2	screw	1
G2	5d cut nail	1
H2	iron nut	1
I2	cut nail fragment	1
J2	cut nail fragment	1
K2	40d cut spike	1
L2	cut nail fragment	1
M2	cut nail fragment	1
N2	cut nail fragment	1
O2	cut nail fragment	1
P2	cut nail fragment	1
Q2	6d cut nail	1
R2	Pepsi-cola screw cap	1
S2	wire fragment	1
T2	cut nail fragment	1
U2	cut nail fragment	1
V2	iron buckle	1
W2	cut nail fragment	1
X2	6d cut nail	1
Y2	12d cut nail	1
Z2	cut nail fragment	1
A3	cut nail fragment	1
B3	flawed salt glazed stoneware sherd	1
C3	cut nail fragment	1
D3	cut nail fragment	1
E3	missing	
F3	cut nail fragment	1
G3	8d cut nail	1
H3	cut nail fragment	1
I3	cut nail fragment	1
J3	4d cut nail	1
K3	6d cut nail	1
L3	cut nail fragment	1
M3	lead ball	1
N3	cut nail fragment	1
O3	cut nail fragment	1
P3	pull tab	1

<i>Table 1. Artifacts Recovered by Metal Detector.</i>		
Provenience	Artifact Type	Frequency
	wire fragment	1
S3	cut nail fragment	1
T3	nut/bolt/washer in wood	1
U3	burned clear glass fragment	1
V3	melted aluminum	1
W3	burned clear glass fragment	1
X3	melted aluminum fragment	1
Y3	40d wire spike	1
Z3	knapsack hook	1
A4	cut nail fragment	1
B4	cut nail fragment	1
C4	.58calibre Williams bore-cleaning bullet	2
	harmonica parts	1
D4	unidentified nail fragment	1
E4	shotgun shell brass	1
	bayonet sheath tip (Springfield rifle)	1
F4	undecorated whiteware sherd	1
G4	shotgun shell brass (Winchester repeater)	1
H4	aluminum strip	1
I4	shotgun shell brass	1
J4	shotgun shell brass	1
K4	.40 calibre conical ball	1
L4	burned aluminum can	1
M4	cut nail fragment	1
N4	cut spike fragment	1
O4	melted aluminum fragment	2
P4	aluminum can fragments	1
Q4	screw	1
R4	4d cut nail	1
S4	horseshoe fragment (with nails)	1
T4	melted aluminum	1
Provenience Total		203

Table 2. Civil War Artifact Concentrations 1-3 in Metal Detector Survey Area.

PROVENIENCE LABEL	ARTIFACT	TOTAL
Concentration 1		
N	cut nail fragment	1
U	9d cut nail	1
NN	2d cut nail	1
OO	cut nail fragments	2
PP	2d cut nail	1
YY	cut nail fragment	1
AAA	cut nail fragment	1
BBB	cut nail fragments	2
CCC	8d cut nail	1
DDD	cut nail fragments	2
Concentration 1 Total		13
Concentration 2		
A4	cut nail fragment	1
B4	cut nail fragment	1
C4	.58 calibre Williams bore cleaning bullet	1
	harmonica parts	2
Concentration 2 - Cont'd.		
F4	bayonet sheath tip	1
SS	8d cut nail	1
VV	16d cut spike	1
Z3	knapsack hook	1
Concentration 2 Total		9
Concentration 3		
PROVENIENCE LABEL	ARTIFACT	TOTAL

Table 2. Civil War Artifact Concentrations 1-3 in Metal Detector Survey Area.

M1	7d cut nail	1
N1	cut nail fragment	1
P1	cut nail fragments	2
Q1	cut nail fragment	1
R1	cut nail fragment	1
B2	cut nail fragment	1
D2	cut nail fragment	1
E2	cut nail fragment	1
H2	5d cut nail	1
J2	cut nail fragment	1
K2	cut nail fragment	1
L2	40d cut spike	1
M2	cut nail fragment	1
N2	cut nail fragment	1
O2	cut nail fragment	1
P2	cut nail fragment	1
Q2	cut nail fragment	1
R2	6d cut nail	1
U2	cut nail fragment	1
V2	cut nail fragment	1
X2	cut nail fragment	1
Y2	6d cut nail	1
Z2	12d cut nail	1
A3	cut nail fragment	1
B3	cut nail fragment	1
D3	cut nail fragment	1
E3	cut nail fragment	1
G3	cut nail fragment	1
H3	8d cut nail	1
I3	cut nail fragment	1
J3	cut nail fragment	1
K3	4d cut nail	1
L3	6d cut nail	1
M3	cut nail fragment	1
Concentration 3 Total		35
Civil War Artifacts Outside Concentrations		
X	metal button	1
QQ	cut nail fragment	1
EEE (berm)	3d cut nail	1
FFF (berm)	cut nail fragments	2
HHH	cut nail fragments	2
III	cut nail fragment	1
D1	8d cut nail	1
G1	cut nail fragment	1
H1	cut nail fragment	1
U1	5d cut nail	1
X1	cut nail fragment	1

Table 2. Civil War Artifact Concentrations 1-3 in Metal Detector Survey Area.

Total Civil War Artifacts Outside Concentrations		13
---	--	-----------

Kelley's drawing of the fort included nineteen structures of various kinds within the fortification (see Figure 9). Three gable roofed structures stood near a flag pole in the southeast corner of the fort. These structures probably included some nails in their construction and may be the origins of the nail concentrations identified by the metal detector survey.

When the cut nail concentrations are compared to the geophysical survey results, Concentrations 1 and 2 do appear to correlate with some of the conductivity "sinks" as well as metal indicators identified by magnetic susceptibility signals. Excavation in these areas of overlap may reveal subsurface features such as postmolds, trenches dug for chimneys or other indications of temporary structures built inside the fort. Concentration 3 is located mostly outside the geophysical survey area and therefore cannot be reliably correlated.

Results of Shovel Probing in the Fort Interior

A total of 12 screened shovel probes were excavated in the fort interior to investigate artifact concentrations that likely represent activity areas (Figure 15). Locations for shovel probes were chosen by referring to Charles Kelley's drawing and extrapolating the location of tents or structures, and by identifying level areas suitable for the erection of tents or for conducting activities that had the potential to generate archaeological deposits. Shovel Probe 1 was located in what later became Test Unit 5. Shovel Probe 2 was located near Test Unit 1. Shovel Probes 3, 4, and 5 were located in small, flat areas on the northern slope leading down to the vertical bluff of the hill. Shovel Probes 6, 7, and 8 were located in the area where the hunt club had previously stood. Shovel Probes 9, 10, 11, and 12 were excavated along part of the northern slope where a local metal detector enthusiast indicated

that he had found a high density of artifacts (Craig Seabolt 1997, personal communication). Artifacts recovered from the probes include machine-made glass, a 1905 Liberty head nickel, architectural debris such as bricks, copper conduit wire, plaster, concrete, clay pigeon fragments and other twentieth-century artifacts as well as older materials such as cut nails, lead glazed redware sherds, metal can fragments, and a round lead ball that may be attributable to the Civil War occupation (Table 3).

Shovel Probe 1 was excavated to a depth of 20 cm. It was characterized by a loose dark brown (7.5YR3/2) silty loam that clearly had migrated downslope from higher elevations. No Civil War era artifacts were identified from this probe (see Table 3).

Shovel Probe 2 was excavated to a depth of 30 cm. The first 28 cm of soil was characterized by medium brown (7.5YR4/3) loam with yellowish brown (10YR5/6) mottling that became more compact with depth (Figure 16). At 28 cm below surface, the soil became more clayey and was yellowish brown (10YR6/8) in color. Most of the artifacts from this probe date to the twentieth century (see Table 3). One cut nail fragment can be attributed to the Civil War occupation.

Shovel Probe 3 was excavated to a depth of 30 cm. The first 20 cm of soil was a medium brown (7.5YR4/3) silt loam (Figure 17). At 20 cm below surface, the soil transitioned to a yellowish brown (10YR6/8) clay. Very few artifacts were recovered from this probe; however, two cut nails (one fragmentary; one 5d) were collected that are attributable to the Civil War occupation (see Table 3). Shovel Probe 4 was excavated to a depth of 50 cm. The first 20 cm of soil was a medium brown (7.5YR4/3) silt loam that gave way to a dark yellowish brown (10YR4/6) silt loam

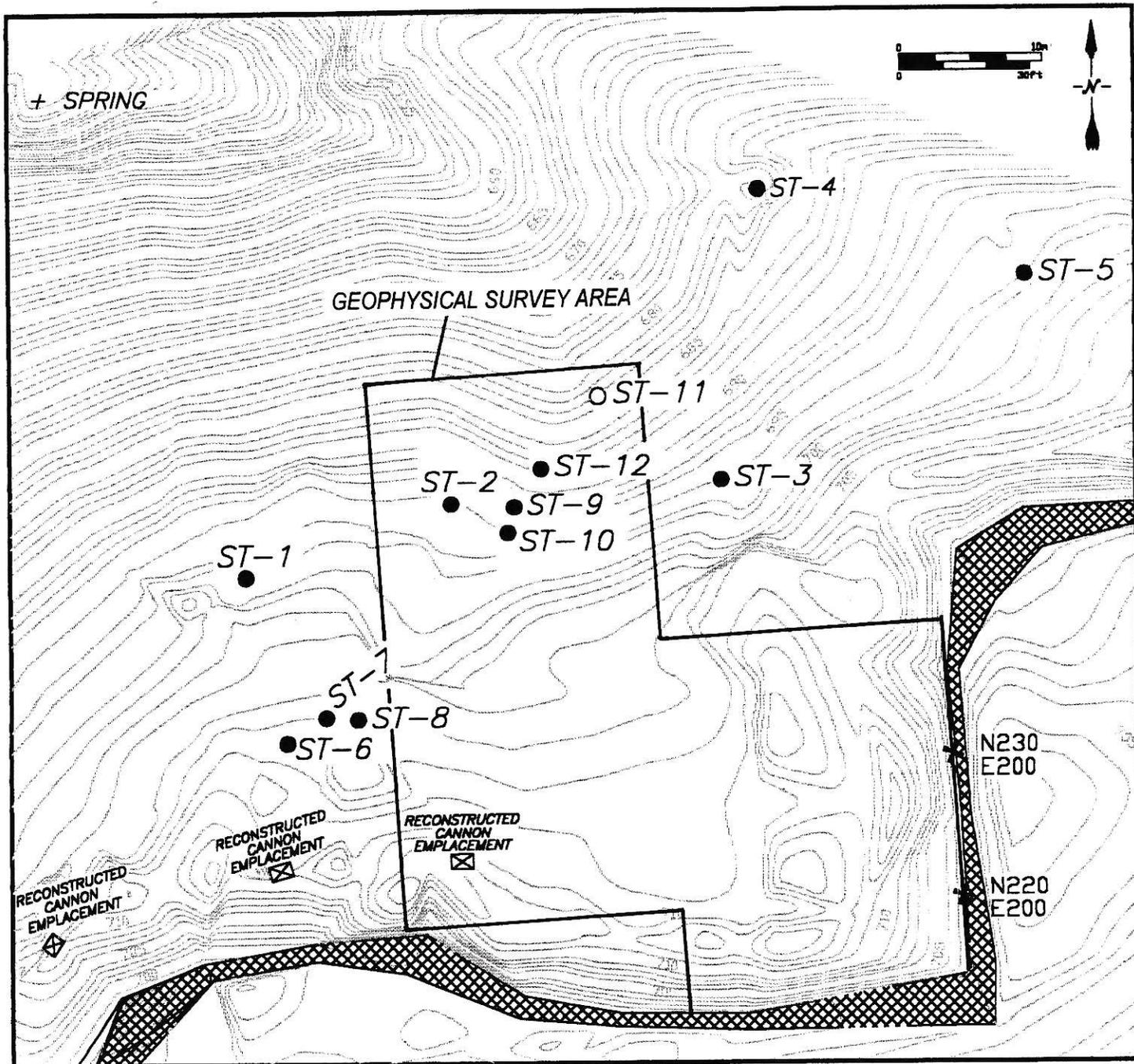


Figure 15. Detail of topographic map showing shovel probe locations.

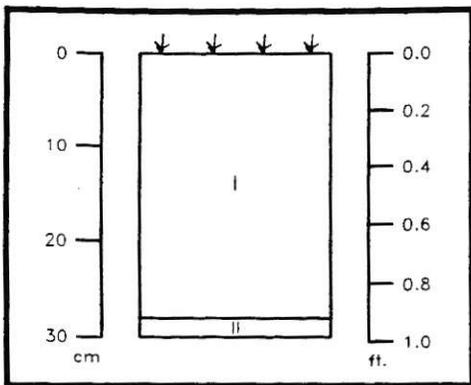
Table 3. Artifacts Recovered From Shovel Probes.

PROVENIENCE	ARTIFACT	TOTAL
Shovel Probe 1	unidentified nail fragments	2
	machine made clear glass salad dressing bottle fragments (Durkee & Co.; bottle patented April 17, 1877)	5
	machine made aquamarine glass beer bottle fragment (OLD STYLE LAGER/GHEI-/LA or LN)	1
	aquamarine glass bottle fragments	3
	machine made amber glass beer bottle fragments	1
	Provenience Total	
Shovel Probe 2	unidentified nail fragments	3
	cut nail fragment	1
	blue flat glass fragment	1
	aquamarine flat glass fragments	16
	copper conduit wire	1
	brick fragments	2
	charcoal fragments	5
	burned animal bone	1
	Liberty Head nickel, minted 1905	1
Provenience Total		31
Shovel Probe 3	5d cut nail	1
	cut nail fragment	1
	unidentified nail fragments	8
	aquamarine flat glass fragments	2
Provenience Total		12
Shovel Probe 4	8d cut nail	1
	12d cut nail	1
	cut nail fragments	2
Provenience Total		4
Shovel Probe 5	cut nail fragment	1
Provenience Total		1
Shovel Probe 6	plaster fragments	3
	unidentified nail fragment	1
	prehistoric chert flake	1
	prehistoric chert core	1
Provenience Total		6

Table 3. Artifacts Recovered From Shovel Probes.

PROVENIENCE	ARTIFACT	TOTAL
Shovel Probe 7	cut nail fragments	5
	wire nail fragments	2
	2d wire nails	2
	unidentified nail fragments	41
	concrete fragments	6
	coal fragment	1
	aquamarine glass bottle fragment	1
	clear glass stopper	1
	clear glass bottle fragment	1
	clear glass container rims	2
	amber glass beer bottle fragments	5
	whetstone fragment	1
Provenience Total		68
Shovel Probe 8	wire nail fragments	2
	unidentified nail fragments	3
	clay pigeon fragments	3
	amber glass beer bottle fragment	1
	prehistoric chert flake	1
Provenience Total		10
Shovel Probe 9	3d cut nail	1
	cut nail fragments	6
	unidentified nail fragments	9
	aquamarine flat glass fragment	1
	brick fragments	2
	green glass bottle fragments	1
	aquamarine glass bottle fragments	3
	clear glass bottle fragment	1
	lead glazed redware preserves jar sherds	2
	metal can fragments (2 cans)	42
	animal bone	2
	lead ball	1
	prehistoric chert flakes	4
Provenience Total		75
Shovel Probe 10	cut nail fragments	4
	aquamarine flat glass fragments	1
	brick fragments	4
	charcoal fragments	2
	aquamarine glass bottle fragments	1
	amber glass beer bottle fragment	1
Provenience Total		13
Shovel Probe 11	no artifacts	

<i>Table 3. Artifacts Recovered From Shovel Probes.</i>		
PROVENIENCE	ARTIFACT	TOTAL
Shovel Probe 12	cut nail fragments	7
	aquamarine flat glass fragment	1
	white porcelain 4-holed button	1
	burned animal bone	1
	amber glass beer bottle fragment	1
Provenience Total		11
ARTIFACT TOTAL		242

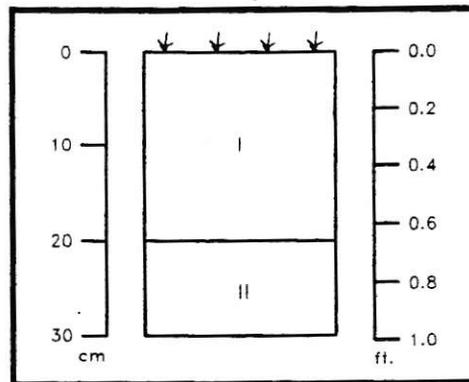


KEY

- I - Medium Brown (7.5YR4/3) Loam with Yellowish Brown (10YR5/6)*
- II - Yellowish Brown (10YR6/8) Clay Loam*

Figure 16. Profile of Shovel Probe 2.

containing many tree roots and continued to the depth of the probe (Figure 18). Although only four artifacts were recovered, all of them were cut nails, including single examples of 8d and 12d cut nails (see Table 3). Shovel Probe 5 was excavated to a depth of 20 cm. The first 10 cm was characterized by a medium brown (7.5YR4/3) silt

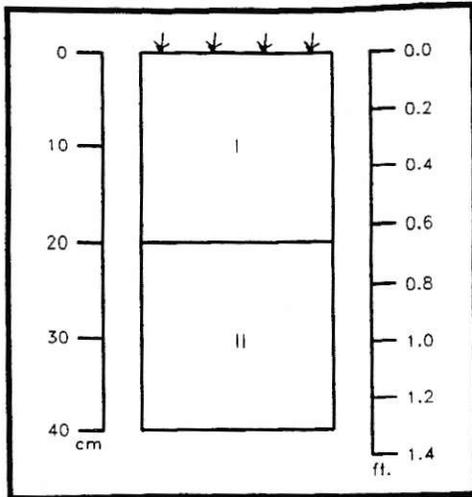


KEY

- I - Medium Brown (7.5YR4/3) Silty Loam*
- II - Yellowish Brown (10YR6/8) Clay*

Figure 17. Profile of Shovel Probe 3.

loam (Figure 19). Below this lay a yellowish brown (10YR6/8) compact clay. Only a single cut nail fragment was recovered from this probe (see Table 3). This probe was placed in an area which appeared to have once been an old road.

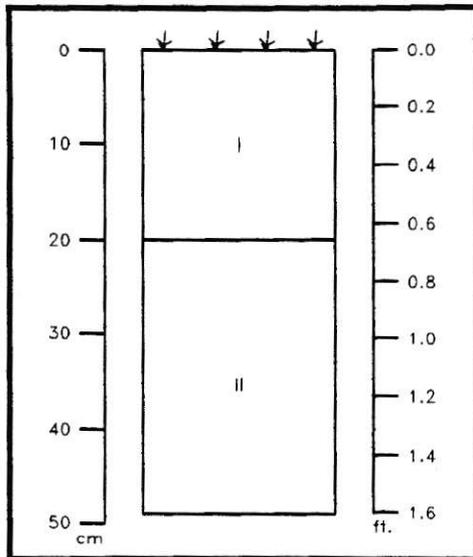


KEY

- I - Medium Brown (7.5YR4/3) Silt Loam*
- II - Dark Yellowish Brown (10YR4/6) Silty Loam*

Figure 18. Profile of Shovel Probe 4.

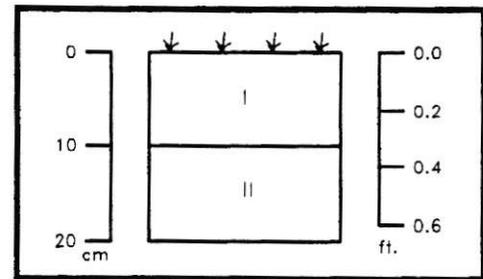
Shovel Probe 6 was placed in an area that had many large limestone rocks lying on the surface; rocks that probably were once part of the foundation of the early twentieth-century hunting camp foundation. The probe was excavated to a depth of 20 cm. A medium brown (7.5YR4/3) silt loam characterized the first 10 cm. At 10 cm below surface, a compact yellowish brown (10YR6/8) clay was encountered. No Civil War era artifacts were recovered; plaster and unidentified nail fragments probably derive from the hunting camp building. Two prehistoric chert artifacts indicate that Native Americans have visited the site in the distant past. Shovel Probe 7 was excavated to a depth of 40 cm. The upper 20 cm were characterized by a light brown (7.5YR6/4) silt loam (Figure 20). The deposits below this top level were similar except for being more clayey.



KEY

- I - Medium Brown (7.5YR4/3) Silty Loam*
- II - Yellowish Brown (10YR6/8) Compact Clay*

Figure 19. Profile of Shovel Probe 5.



KEY

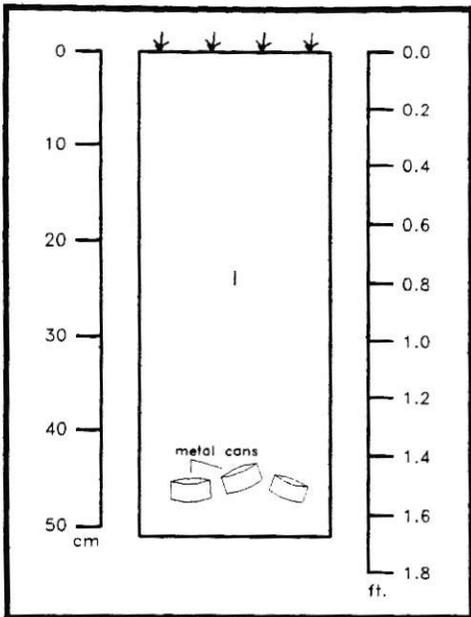
- I - Light Brown (7.5YR6/4) Silty Loam*
- II - Light Brown (7.5YR6/4) Silty Clay Loam*

Figure 20. Profile of Shovel Probe 7.

Most of the artifacts (n=63) recovered from the probe date to the twentieth century (see Table 3); however, five cut nail fragments were collected that probably date to the Civil War occupation. Shovel Probe 8 was excavated to a depth of 20 cm. The entire probe was characterized by medium to yellowish brown (7.5YR4/3 to 10YR6/8) silt loam that became more mottled

with depth. All of the recovered artifacts except for a single prehistoric chert flake date to the hunting camp occupation (see Table 3).

Shovel Probe 9 was placed near the top of the north slope. It was excavated to a depth of 50 cm. The deposits in the probe consisted of a dark brown (7.5YR3/2) loose silt loam mottled with gray (2.5Y7/2) and orange (5YR5/8) silty clay (Figure 21). Artifacts (n=75) were mostly recovered from the first 45 cm and declined beyond that depth. Several metal can fragments were encountered in the final five cm of the probe



KEY

I - Dark Brown (7.5YR3/2) Loose Silt Loam Mottled with Gray (2.5Y7/2) and Orange (5YR7/8) Silty Clay

Figure 21. Profile of Shovel Probe 9.

(see Table 3). These cans probably held preserved meat of some kind and are likely to date to the Civil War occupation. Other Civil War era artifacts from Probe 9 include cut nails, sherds from a preserves jar, and a lead ball. The remaining artifacts are either nondiagnostic, prehistoric, or date to the hunting camp era. Shovel Probe 10 was placed downslope from Probe 9. This probe was inadvertently filled before the deposits and total depth could be recorded, however, artifact information is available. Except for four cut nail fragments, none of the artifacts (n=9) could be unequivocally assigned to the Civil War era occupation. Shovel Probe 11 was dug to a depth of 50 cm. It was devoid of artifacts except for one aquamarine glass fragment from a small bottle that was observed but not collected. Like the other shovel probes located in sloping areas, this probe's fill consisted of medium brown (7.5YR4/3) loose silt loam that had eroded downslope. Shovel Probe 12 was dug to a depth of 50 cm. Its deposits consisted of dark brown (7.5YR3/2) slightly mottled loose silt loam typical of soil that has eroded from a higher elevation. All of the recovered artifacts were from the upper half of the probe. Artifact density was low (n=11) and only the cut nail fragments can be unequivocally assigned to the Civil War period although the button may also date to the military occupation.

Results of Test Unit Excavations

Archaeological excavation units (Test Units 1-8) were placed in three areas: on the lower north slope, adjacent to and inside of the main berm, and across the possible rifle trench on the south slope outside the embankment (Figure 22). This section describes the results of these excavations including a description of stratigraphy and artifacts recovered from each unit. The area enclosed by the main entrenchment consisted of a relatively flat piece of ground that runs from the berm approximately 80 ft. (measuring from the midpoint of the entrenchment line) north, where a topographic break gives way to much steeper, down sloping ground. Figure 23 shows an

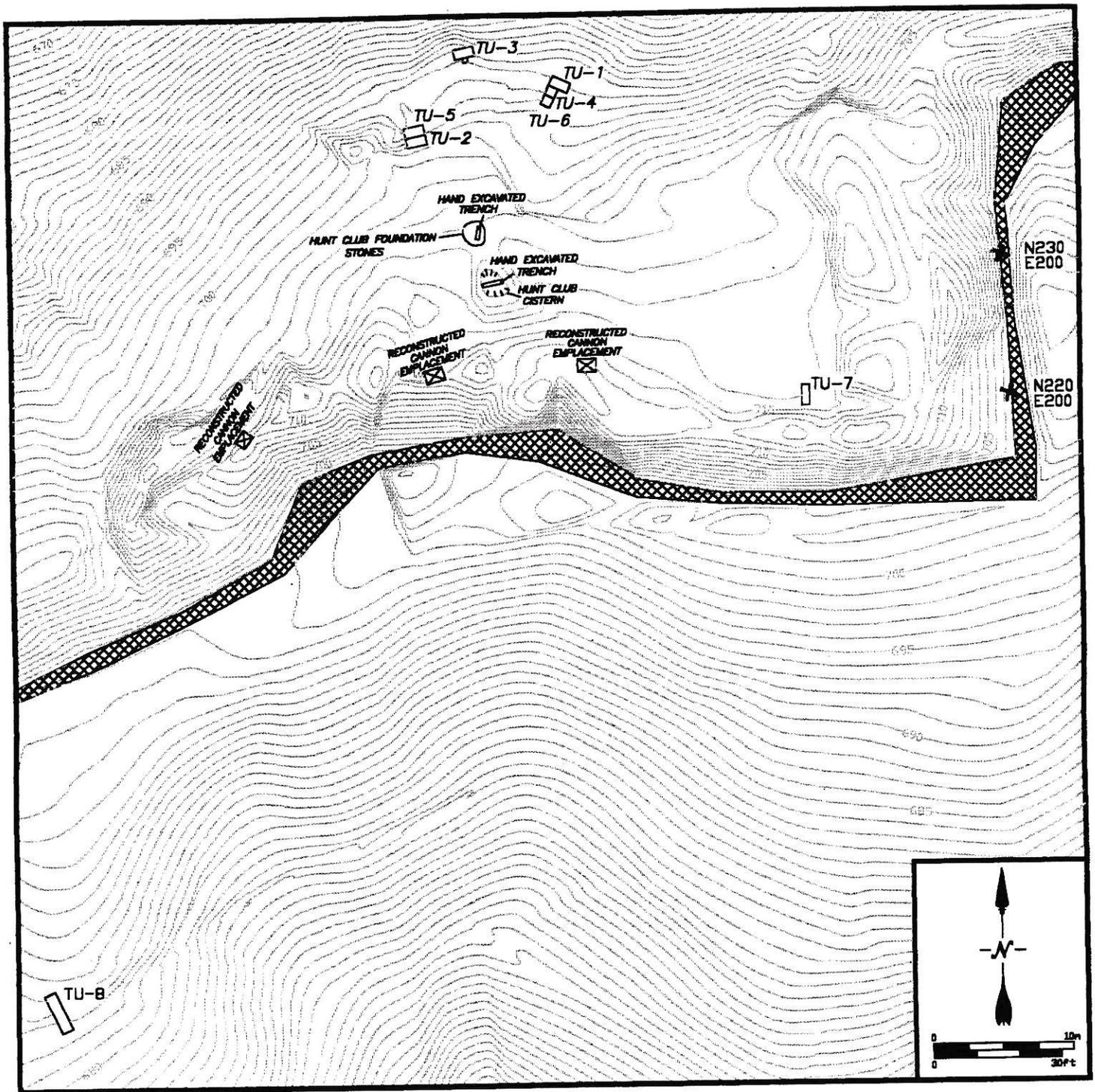


Figure 22. Detail of topographic map showing test unit locations.

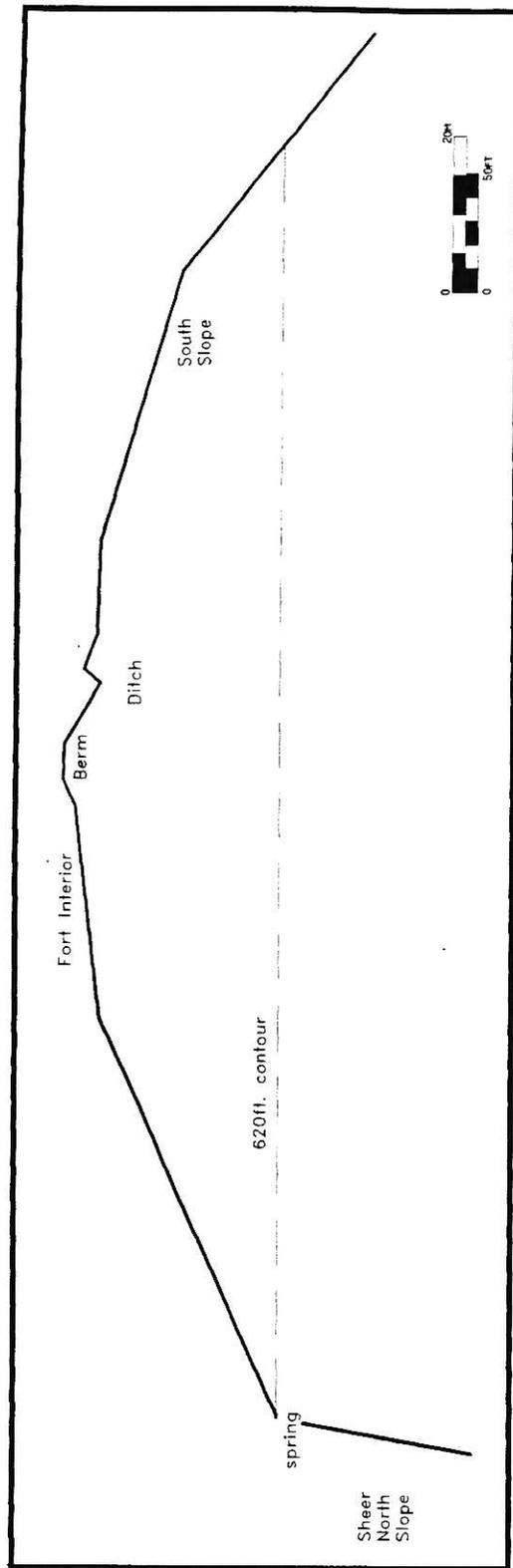


Figure 23. Generalized cross-section of the fort site topography.

elevational cross section of the interior of the fort. The topographic break is characterized by a rapid decrease in elevation over a short distance of approximately ten feet, then a fairly narrow flat bench of approximately twenty feet, and finally a steep downward descent to the edge of the cliff. Area 1, the narrow bench of flat ground, appeared to be a good candidate for some of the tent huts that were built inside the fort. In fact, several reproduction huts have been placed in this area. The flat bench may have been partly natural and partly modified by the soldiers to create an area suitable for their tents or huts, since flat ground within the fortifications was limited and some of it had to be left open for a parade ground.

Area 1: Test Units 1, 4, and 6

Test Unit 1 (N189 E220), measuring 1 x 2 m and oriented east-west along its longest dimension, was placed in the north slope at a topographic break that was thought to have been manmade. This area may be the result of digging into the original slope to level an area for one of the huts. The vertical face of the slope would have served as a support for a chimney while the level area would have been where the living space was located.

The ground surface of the unit was not level, with the result that the first level of soil removed varied in thickness across the north-south dimension. Sufficient soil was excavated to level the floor to 10 cm below the southeast corner. The unit was excavated in four arbitrary 10 cm levels. The stratigraphy of Test Unit 1 consisted of a layer of loose, dark brown (7.5YR3/2) silt loam with many roots and scattered pieces of limestone that extended from the surface to an average depth of approximately 28 cm but varied considerably in thickness from 25 to 52 cm because of the slope (Figure 24). This zone gave way to a yellowish brown (10YR4/3) silty clay but the boundary between the two zones was not sharp or distinct. The lower zone was culturally sterile.

The upper zone yielded a variety of artifacts (n=370) dating from the Civil War era to the twentieth century. Artifacts increased in frequency from Level 1 through Level 3, then decreased in Level 4 (Table 4). Cut nails and nail fragments, an amber glass flask fragment, and possibly two milk glass buttons and picture frame glass fragments date to the Civil War occupation but the remaining artifacts are either nondiagnostic or clearly date to the twentieth century. For instance, much of the bottle glass is machine made, dating to the twentieth century and suggestive of an association with the hunt club. Likewise, the clay pigeon fragments indicate that skeet shooting took place at the site, again probably by hunt club members.

The loose texture of the upper zone in Test Unit 1 is indicative of secondary deposition by downslope erosion, and the mixed temporal characteristics of the recovered artifacts tend to support the conclusion that soil from higher elevations has eroded downslope. However, the profile of the south wall exhibited an area of grey mottling in the center at the transition between the upper and lower zone. Sticking out of the wall was a metal rod that was initially thought to be a ramrod for a muzzleloading rifle. Test Unit 4, (another 1-x-1 m unit), was opened to uncover this artifact and further investigate the area upslope of Test Unit 1 (see Figure 22).

The surface of Test Unit 4 was steeply sloped and necessitated differential removal of soil across the unit to level the floor. Using the elevation of the southeast corner as a guide, soil was removed from the remainder of the unit until the floor was level. This involved removing 27 to 39 cm of secondarily deposited soil that was identical to the upper zone in Test Unit 1. Artifacts from Level 1 included cut nails, a red clay tobacco pipe fragment, an iron buckle part and a metal button that probably date to the Civil War occupation (Table 5). A wire nail, flat glass fragments, bottle glass, and modern ammunition (including a modern percussion cap from Civil

Table 4. Artifacts from Test Unit 1.

PROVENIENCE	ARTIFACT	TOTAL
Unit 1, Level 1	12d wire nail	1
	cut nail fragments	11
	unidentified nail fragments	6
	flat aquamarine glass fragments	7
	flat clear glass fragments	3
	4-holed milk glass button	1
	unidentified bone fragment	1
	light green fluted glass fragment	1
	dark green bottle glass fragments (machine made)	4
	amber glass flask fragment	1
	clay pigeon fragments	3
PROVENIENCE TOTAL		39
Unit 1, Level 2	4d cut nail	1
	cut nail fragments	10
	unidentified nail fragments	7
	flat aquamarine glass fragments	54
	clear oval or round picture frame glass fragments (with rim)	8
	unidentified burned animal bone fragment	1
	fluted clear glass fragment	1
	fluted green glass fragments	2
	burned dark green glass bottle fragments (machine made)	2
	amber glass beer bottle fragment (machine made)	1
	patinated aquamarine glass bottle rim (packer finish)	1
	clay pigeon fragments	3
Provenience Total		91
Unit 1, Level 3	cut nail fragments	13
	unidentified nail fragments	9
	flat aquamarine glass fragments	152
	unidentified burned bone fragments	4
	dark green bottle glass fragments	3
	aquamarine glass fragments	3
	clear glass fragments	2
clay pigeon fragment	1	
Provenience Total		187

<i>Table 4. Artifacts from Test Unit 1.</i>		
PROVENIENCE	ARTIFACT	TOTAL
Unit 1, Level 4	3d cut nail	1
	12d cut nail	1
	16d cut nail	1
	cut nail fragments	11
	unidentified nail fragments	15
	flat aquamarine glass fragments	15
	brick fragments	5
	4-holed milk glass button	1
	charcoal fragment	1
	dark green bottle glass fragment	1
	clear glass fragment	1
Provenience Total		53
ARTIFACT TOTAL		370

War reenactments) are indicative of post-Civil War activities. The second level was 10 cm in thickness and included the mysterious metal rod. Subsequent examination indicated that it was a curtain rod, not a ramrod. Very few artifacts (n=7) were recovered from Level 2; these included some cut nails that probably date to the Civil War occupation (Table 5). However, these were associated with a prehistoric chert fragment, the curtain rod, and a flat glass fragment that were deposited at other times. An area of bright orange mottled soil and limestone was exposed in the northwest corner of the unit at approximately 47 cm below datum. Test Unit 6 was opened to further investigate this possible feature.

Test Unit 6, measuring 1 x 1 m, was opened to the south of Unit 4 to determine if buried chimney foundations occurred in the steeper part of the bank (see Figure 22). The first level was identical to that of Test Unit 4, colluviated soil from further upslope. Since an artifact sample of this disturbed zone had already been recovered from the other two units and time for excavation was running short, Level 1 of Test

Unit 6 was not screened. Time constraints prevented the excavation of the entire unit. At the base of Level 1 (40 cm below datum), little evidence was observed of a possible feature. The east half was excavated to 60 cm below datum at which point stiff red (2.5YR5/8) clay subsoil was encountered. No significant quantities of rock were encountered nor were artifacts recovered. Since the evidence for a chimney feature was lacking, the three units were closed.

Although the units in Area 1 yielded artifacts that date to the Civil War occupation, stratigraphic evidence indicates that considerable downslope erosion and redeposition of soil from higher elevations has taken place. The artifacts dating to the Civil War era were mixed with prehistoric artifacts as well as items associated with the turn-of-the-century hunting camp, modern Civil War reenactment activities, and twentieth-century hunters and visitors. No cultural features such as chimney bases or hut foundations were encountered in any of the three units.

Table 5. Artifacts from Test Unit 4.

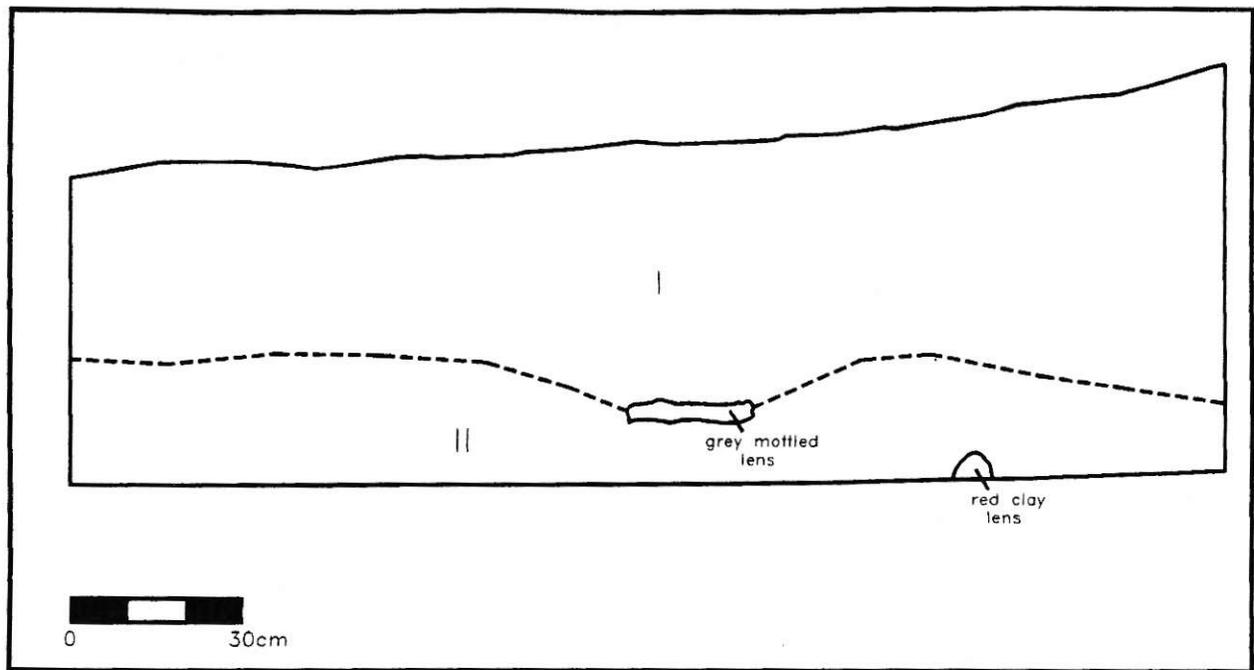
PROVENIENCE	ARTIFACT	TOTAL
Unit 4, Level 1	6d wire nail	1
	16d cut nail	1
	cut nail fragments	18
	unidentified nail fragments	7
	flat aquamarine glass fragments	4
	metal button	1
	red clay pipe bowl sherd (molded decoration)	1
	iron buckle part	1
	.22 cal bullet	1
	modern percussion cap	1
	dark green bottle glass fragments	14
	amber glass beer bottle fragment	1
	aquamarine glass fragments	5
	clear glass fragments	2
Provenience Total		58
Unit 4, Level 2	prehistoric chert fragment	1
	cut nail fragments	4
	flat aquamarine glass fragment	1
	metal curtain rod fragment	1
Provenience Total		7
ARTIFACT TOTAL		65

Area 2: Test Units 2 and 5

Area 2 was located along the same topographic break as Area 1 but approximately 16 m further west near one of the reproduction huts erected by the Fort Duffield Heritage Committee. Test Units 2 and 5, adjacent 1-x-2 m units, were placed near a modern fire hearth built of limestone. Initially, it was hypothesized that the stones comprising the modern hearth might have originally been part of a chimney for one of the Civil War structures (a reason for placing units here) but as investigations continued at this and other areas of the fort site, it was realized that the stones could also have been taken from the remains of the hunting camp building foundation. The modern hearth was built into the slope at the same topographic break as encountered at the location of Units 1, 4, and 6. Unit 2 (N193 E242) was opened first, and was nearest to the steeper

part of the topographic break. The unit was excavated in arbitrary levels rather than by natural zones. The first level removed differential thicknesses of soil from across the unit to level the floor, terminating at 45 cm below the southeast corner datum. Excavation of this level removed most of the dark brown (7.5YR3/2) silty colluviated topsoil, identical to that excavated in the previously described units. Toward the base of the first level, charcoal, rock, a brick, and an increase in nails were observed. Artifacts from Level 1 (n=118) included a mixture of nineteenth- and twentieth-century artifacts as well as two prehistoric chert flakes (Table 6). Only the cut nail fragments recovered from Level 1 are likely to date to the Civil War period.

Level 2, a standard 10 cm level (45-55 cm below datum), was characterized by a mottled dark yellowish brown (10YR5/6) silty clay loam



KEY

I - Loose, Dark Brown (7.5YR3/2) Silty Loam

II - Yellowish Brown (10YR4/3) Silty Clay

Figure 24. Profile of Test Unit 1 (south wall).

Table 6. Artifacts from Test Unit 2.		
PROVENIENCE	ARTIFACT	TOTAL
Unit 2, Level 1	prehistoric chert flakes	2
	2d wire nail (roofing)	1
	cut nail fragments	16
	unidentified nail fragments	73
	brick fragments	3
	flat light blue glass fragments	2
	flat aquamarine glass fragments	14
	.32 cal cartridge	1
	snail shell fragment	1
	fluted aquamarine glass fragment	1
	fluted light green glass fragments	2
	iron fragment	1
	clay pigeon fragment	1
Provenience Total		118

Table 6. Artifacts from Test Unit 2.

PROVENIENCE	ARTIFACT	TOTAL
Unit 2, Level 2	prehistoric chert flakes	3
	cut nail fragments	27
	unidentified nail fragments	15
	flat aquamarine glass fragments	6
	brass button	1
	red clay pipe bowl sherd (molded decoration)	1
	bolt and nut	2
	lead fragment	1
	dark green glass bottle fragments	2
	clear glass bottle rim fragments	1
	green glass fragment	1
Provenience Total		60
Unit 2, Level 3	6d cut nail	1
	8d cut nail	1
	cut nail fragments	80
	cut spike fragments	2
	unidentified nail fragments	35
	brick fragments	5
	flat aquamarine glass fragments	2
	4-holed milk glass button	1
	mirror fragment	1
	red clay pipe bowl fragment (molded decoration)	1
	leather boot sole fragments	10
	shotgun shell brass (Winchester)	1
	blue glass bottle fragments (including empontilled base)	3
	dark green bottle glass fragments	3
	amber glass beer bottle fragments (including a machine made bottle base)	3
	clear glass fragment	1
	green glass fragment	1
	iron fragments	7
clay pigeon fragment	1	
Provenience Total		159
Unit 2, Level 4	4d cut nail	1
	6d cut nail	1
	cut nail fragments	27
	unidentified nail fragments	13
	flat aquamarine glass fragments	2
	red clay pipe bowl sherd (molded decoration)	1
	leather fragments	9
	thin brass sheet metal enclosing layers of paper	1
	small calibre lead shot (with spine)	1
	clear glass fragment	1
	green glass fragment	1
	clay pigeon fragment	1

<i>Table 6. Artifacts from Test Unit 2.</i>		
PROVENIENCE	ARTIFACT	TOTAL
Provenience Total		59
ARTIFACT TOTAL		396

with large flat limestone rocks concentrated in the west end closest to the modern fireplace. Artifacts from the level (n=60) decreased in frequency from Level 1, a decrease that was notable because the underlying Level 3 yielded a much higher density of artifacts. Artifacts associated with the Civil War occupation include a red clay pipe bowl sherd, a lead fragment, and possibly a metal button (see Table 6). Except for two prehistoric chert flakes, the remaining artifacts date to the twentieth century and are probably associated with either the hunting camp or later visitors to the site.

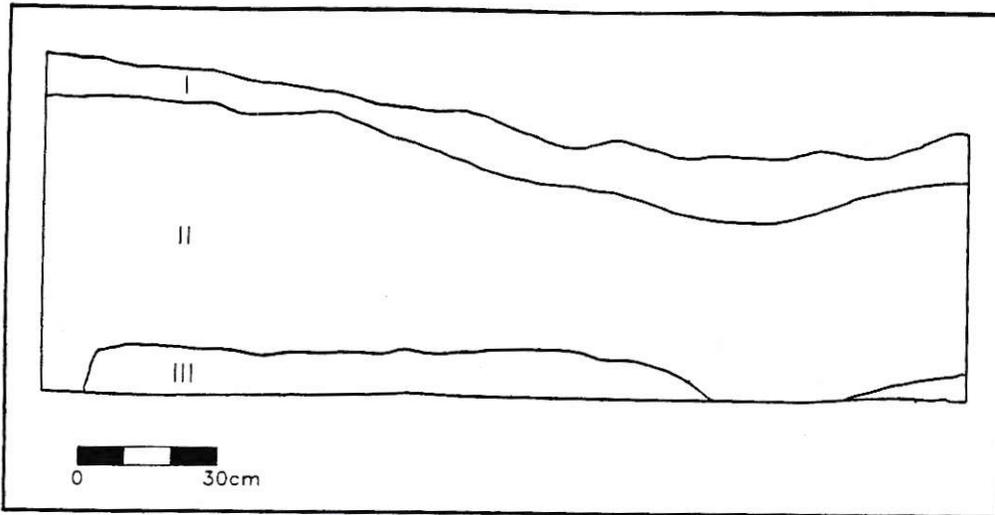
Level 3, measuring 10 cm (55-65 cm below datum), was characterized by the same soil as Level 2 but clay content increased with depth. Artifact frequency was more than twice that of any other level (n=159). The remnants of a leather boot sole, cut nails and spikes, an empontilled bottle base, a mirror fragment, and a red clay tobacco pipe bowl fragment date to the Civil War occupation (see Table 6). Other artifacts indicate that twentieth-century activities at the site also contributed to the artifacts recovered from this level.

Level 4, measuring 10 cm (65-75 cm below datum), was characterized by the same soil as Levels 1-3 but artifact content dramatically decreased; all of the artifacts were recovered from the first few centimeters of the level (n=59). Civil War era artifacts from this level include cut nails, a red clay tobacco pipe bowl sherd, and a specimen of buckshot (still retaining a sprue from the molding process) (see Table 6). An unidentified artifact consisting of thin sheet brass enclosing several layers of paper may also be related to the Civil War occupation. As in higher levels, artifacts dating to the twentieth century

were also recovered. Since artifact density declined and no features were encountered, this unit was closed. A profile of the south wall revealed three zones, including a colluviated, loose silt loam topsoil, a fairly thick midden with much admixture of Civil War era and later artifacts, and a silty clay sterile subsoil (Figure 25).

Since the midden yielded a fair number of Civil War era artifacts, Test Unit 5 was opened adjacent to the north wall of Test Unit 2. Four 10 cm levels were excavated in this 1-x-1 m unit. The soil profile consisted of a yellowish brown (10YR5/6) silty clay loam midden, occasionally mixed with more clayey subsoil (Figure 26). Limestone slabs were encountered within the midden but appear to have been secondarily deposited, perhaps when the modern fire hearth nearby was built. The unit was terminated when subsoil was reached. Artifacts from the unit (n=186) were dominated by specimens dating to the twentieth century, including part of a curtain rod that probably is the missing end of the rod recovered from Test Unit 4 (Table 7). Probable Civil War era artifacts were limited to cut nail fragments which were recovered in small quantities from each level (see Table 7). No features were encountered.

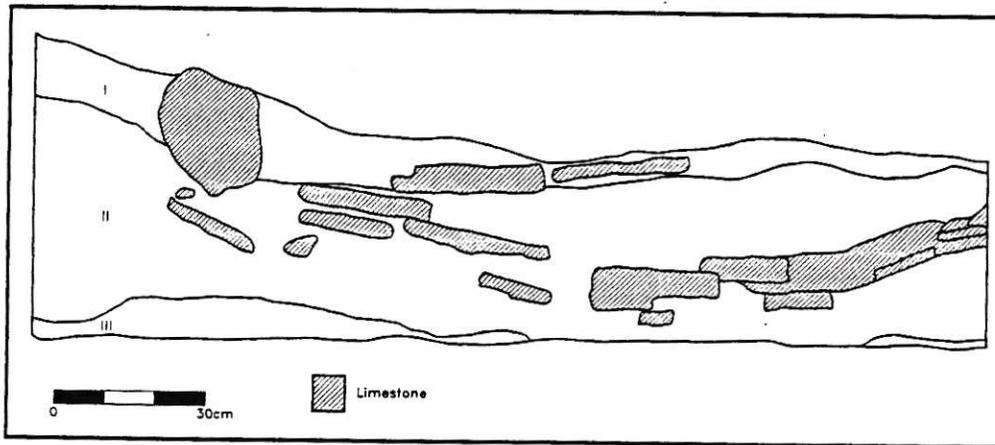
Area 2 yielded additional evidence of the Civil War occupation in the form of artifacts but no cultural features were encountered. Admixture of artifacts from prehistoric, late nineteenth- and twentieth-century activities was evident in both Test Units 2 and 5. As in Area 1, downslope erosion of soil from higher elevations occurred in Area 2, and many of the artifacts may have been secondarily deposited as a result of this erosion.



KEY

- I - Colluviated Dark Brown (7.5YR3/2) Silty Loam*
- II - Dark Yellowish Brown (10YR5/6) Mottled Silt Loam*
- III - Yellowish Brown (10YR6/8) Silty Clay*

Figure 25. Profile of Test Unit 2 (south wall).



KEY

- I - Colluviated Dark Brown (7.5YR3/2) Silty Loam*
- II - Dark Yellowish Brown (10YR5/6) Mottled Silt Loam*
- III - Yellowish Brown (10YR6/8) Silty Clay*

Figure 26. Profile of Test Unit 5 (west wall).

Table 7. Artifacts from Test Unit 5.

PROVENIENCE	ARTIFACT	TOTAL
Unit 5, Level 1	prehistoric chert flake	1
	cut nail fragments	3
	flat aquamarine glass fragment	1
	metal curtain rod	1
	machine made aquamarine glass bottle fragments	5
	machine made clear bottle glass fragments	4
	machine made green bottle glass fragments	2
	machine made amber glass beer bottle fragments	3
	very light green glass fragment with embossed "6"	1
	Provenience Total	
Unit 5, Level 2	prehistoric chert flake	1
	cut nail fragments	6
	unidentified nail fragments	16
	machine made clear glass salad dressing bottle fragments (E. R. DURKEE)	9
	machine made aquamarine glass bottle fragments (LEMAN BRO. CO./-CROSSE, WIS-)	7
	machine made aquamarine glass bottle rims (threaded)	2
	machine made amber glass bottle fragments	11
	green glass bottle fragments	3
	clear glass fragments	2
	clay pigeon fragments	2
Provenience Total		59
Unit 5, Level 3	prehistoric chert fragment	1
	cut nail fragments	7
	unidentified nail fragments	31
	flat aquamarine glass fragments	4
	shotgun shell brass (Winchester, No. 12)	1
	amber glass bottle fragments	4
	clear glass fragment	1
Provenience Total		49
Unit 5, Level 4	cut nail fragments	26
	unidentified nail fragments	23
	machine made amber glass bottle fragments	2
	light blue glass fragments	2
	clay pigeon fragment	1
Provenience Total		54
ARTIFACT TOTAL		186

Area 3: Test Unit 3

Area 3 was located on the northern edge of the topographic break in an area where surface artifacts were visible in densities suggesting the presence of a dump. Test Unit 3, measuring 1 x 2 m and oriented east-west along its longest dimension, was placed here to sample these deposits. Levels 1 and 2 were removed as a single level (0-20 cm) because of the slope of the unit. Dark brown (7.5YR3/2) silt loam that appeared to be secondarily deposited slope wash characterized the first 17-20 cm of the unit. Artifacts from four levels (n=186) included a mixture of nineteenth- and twentieth-century artifacts (Table 8). Artifacts associated with the Civil War occupation include cut nails, mirror fragments, lead shot, and possibly an eyeglass lens fragment (see Table 8). The remaining artifacts are either nondiagnostic or date to the twentieth century and probably are associated with the hunting camp or later tourism.

Artifact density continued to be relatively high in the next three 10 cm levels (3, 4, and 5), which were characterized by a dark yellowish brown (10YR5/6) silty clay. This fill appeared to be a mixture of slope wash and historic midden. Artifacts from the three levels (n=333) include specimens dating from the Civil War occupation as well as later in the nineteenth and twentieth centuries (see Table 8). The Civil War occupation was represented by the recovery of cut nails, mirror fragments, metal canteen fragments, an aquamarine glass bottle rim with a hand applied finish, and perhaps the four-holed porcelain buttons, an undecorated whiteware sherd, and a salt glazed stoneware sherd. Twentieth-century activity is represented largely by machine made bottle glass, flat glass (windowpane), brick fragments, and clay pigeon fragments. One interesting find that might have been identified as a Civil War era artifact was a brass percussion cap. The untarnished condition of the percussion cap recovered in Test Unit 3, however, suggests that it was discarded by a twentieth-century reenactor. Reenactments of Civil War camp life are commonly held at Fort Duffield as part of its tourism programming, and participants carry

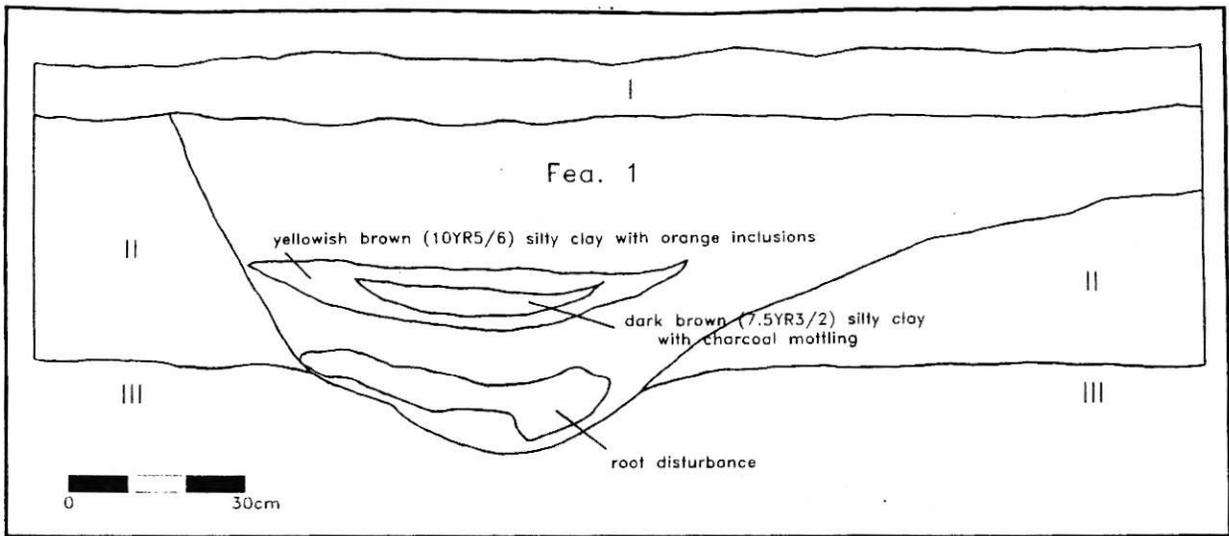
reproduction firearms that operate in all respects as original Civil War examples. Percussion caps were used for firing the guns commonly used by Civil War soldiers and their twentieth-century imitators.

Level 5 was somewhat different from Levels 3 and 4 in that it exhibited greater densities of charcoal and burned clay mottling incorporated within the dark yellowish brown (10YR5/6) silty clay loam. Limited excavation in the southeast corner encountered yellowish brown (10YR6/8) clay subsoil at approximately 55 cm below datum. The east half of the unit was taken down to 55 cm below datum to determine if a feature was observable in profile. The resulting profile of the south wall exhibited the outline of a filled depression designated Feature 1 (Figure 27). The shallow depression, measuring approximately 1.6 m in diameter and 58 cm in depth, was filled with dark yellowish brown (10YR5/6) silty clay loam mottled with charcoal and burned clay. Artifact frequency in the feature was very low (n=17), and most of this material was twentieth century in date (see Table 8). The most likely explanation for this feature is that it represents a relatively recent episode of redepositing burned wood and/or trash, perhaps from cleaning out a hearth used by reenactors, or other visitors to the site. Slope wash subsequently mixed and covered the deposit.

Main Entrenchment Berm: Test Unit 7

Test Unit 7, a trench measuring .75 x 2.1 m, was excavated into the main entrenchment berm to document the stratigraphy of the feature and look for evidence of revetments that would have lined the interior slope to prevent it from collapsing. The fill from the trench was not screened; however, a few artifacts were recovered during the course of excavation. These artifacts included 2 clay pigeon fragments, an iron chain link, a metal button fragment, and a lead ball; all but the clay pigeon fragments are probably from the Civil War occupation at the site.

The stratigraphic cross section of the berm exhibited varying soil types in its south



KEY

- I - Colluviated Dark Brown (7.5YR3/2) Silty Loam*
- II - Dark Yellowish Brown (10YR5/6) Silty Clay*
- III - Yellowish Brown (10YR6/8) Silty Clay*
- Fea. 1 - Grayish Brown Silty Clay*

Figure 27. Profile of Test Unit 3 showing Feature 1 (south wall).

Table 8. Artifacts from Test Unit 3.		
PROVENIENCE	ARTIFACT	TOTAL
Unit 3, Levels 1&2	4d cut nail	1
	5d cut nail	1
	6d cut nail	1
	8d cut nail	1
	10d cut nail	1
	cut nail fragments	41
	unidentified nail fragments	27
	flat light green glass fragments	2
	glazed brick fragment	1
	glass lens fragments	2
	mirror fragments	2
	lead shot ("buck and ball)	1
	burned animal bone	11
	green glass bottle fragments	5
	dark green glass bottle fragments	2
	amber glass beer bottle fragment	1
	clear glass fragments (1 burned)	3
	aquamarine glass fragments	1
	undecorated whiteware sherd	1
	clay pigeon fragment	1
	Provenience Total	

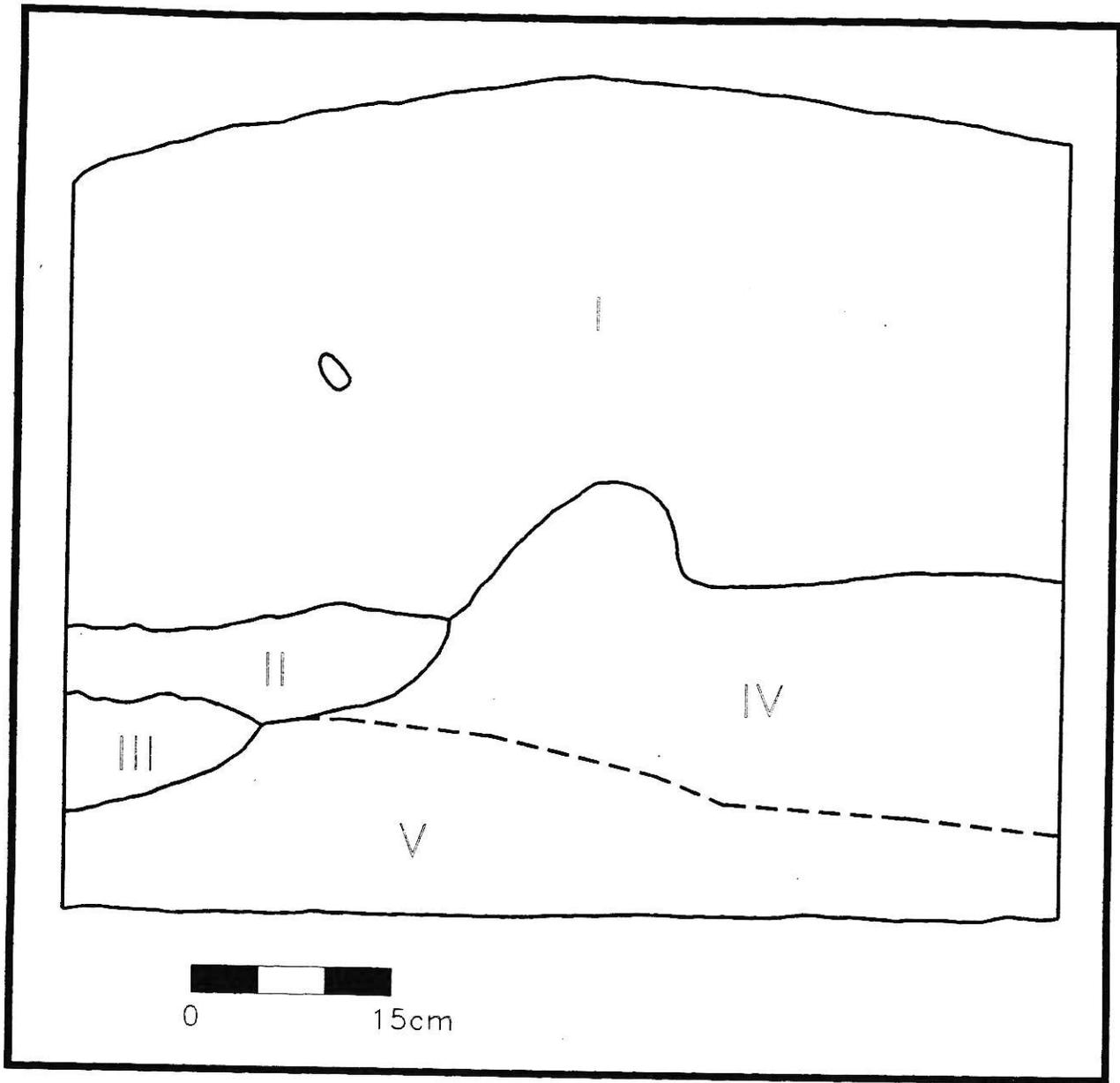
Table 8. Artifacts from Test Unit 3.

PROVENIENCE	ARTIFACT	TOTAL
Unit 3, Level 3	prehistoric chert biface	1
	8d cut nails	2
	6d wire nail	1
	cut nail fragments	62
	unidentified nail fragments	22
	flat aquamarine glass fragments	6
	machine made brick fragments	5
	mirror fragments	2
	modern percussion cap	1
	burned animal bone fragments	12
	amber glass beer bottle fragments	4
	green glass bottle fragment	1
	clear glass fragments (4 burned)	6
	aquamarine glass fragments	8
	dark green glass fragments	1
	iron fragment	1
	clay pigeon fragment	1
Provenience Total		126
Unit 3, Level 4	3d cut nail	1
	5d cut nail	1
	8d cut nail	1
	9d cut nail	1
	cut spike fragments	2
	cut nail fragments	51
	unidentified nail fragments	30
	flat aquamarine glass fragment	1
	4-holed porcelain buttons	3
	metal canteen fragments	18
	burned animal bone fragments	2
	aquamarine glass bottle fragments (1 machine made; 1 rim with hand applied finish)	4
	dark blue glass fragment	1
	machine made green glass bottle neck and rim	1
	salt glazed stoneware spall	1
	coal	1
	iron fragment	1
wire fragment	1	
Provenience Total		121

<i>Table 8. Artifacts from Test Unit 3.</i>		
PROVENIENCE	ARTIFACT	TOTAL
Unit 3, Level 5	prehistoric chert flakes	2
	10d cut nail	1
	cut nail fragments	23
	unidentified nail fragments	8
	flat aquamarine glass fragments	3
	metal canteen fragments	39
	lead fragment	1
	burnt animal bone fragment	1
	aquamarine glass fragments	5
	green glass fragment	1
	blue glass fragments	2
Provenience Total		86
Unit 3, Feature 1	cut nail fragments	3
	brick fragments	9
	plaster fragments	2
	flat aquamarine glass fragment	1
	burned animal bone	1
	amber glass beer bottle fragment	1
Provenience Total		17
Unit 3, Fill above Feature 1	2d cut nail	1
	3d cut nail	1
	6d cut nail	1
	8d cut nail	1
	9d cut nail	1
	cut nail fragments	30
	unidentified nail fragments	22
	brick fragments	5
	flat aquamarine glass fragment	1
	burnt animal bone fragments	19
	clear glass fragment	1
	iron fragment	1
	black plastic fragments	2
Provenience Total		86
ARTIFACT TOTAL		542

profile, indicative of the loads of earth that were shoveled out of the exterior ditch to form the berm (Figures 28 and 29). A light brown (10YR7/3) clayey silt constituted the bulk of the fill that formed the berm. Beneath this zone were lenses of mottled yellow and gray (2.5Y8/4; 2.5Y7/2), yellowish brown (10YR5/6), and grayish brown

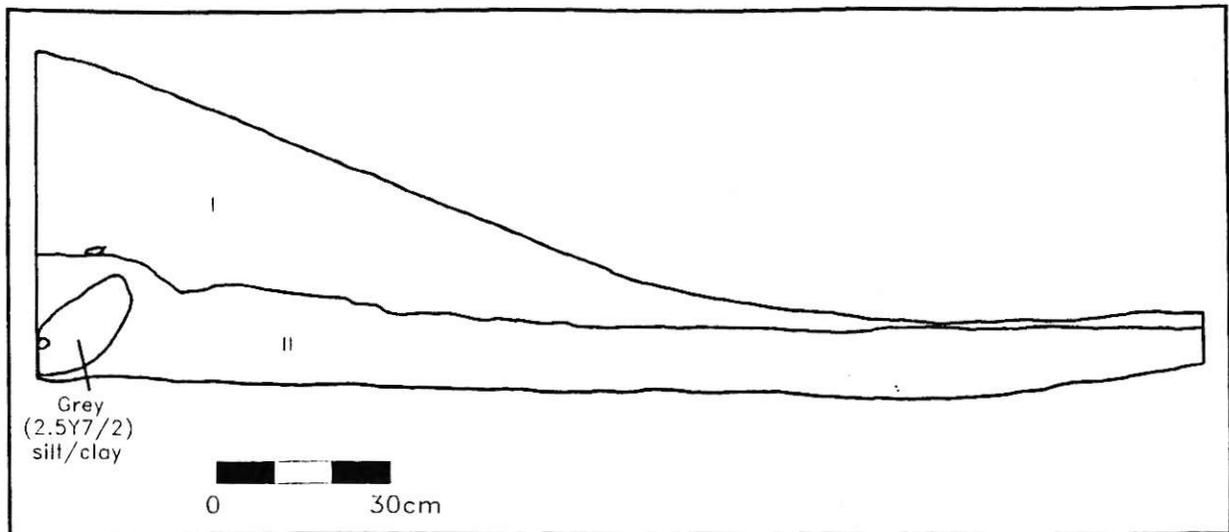
(2.5Y6/2) silty clay. The profile of the west wall of the trench indicated that the upper zone of light brown (10YR7/3) clayey silt probably had eroded downslope after the fortifications were abandoned and the revetments deteriorated (see Figure 29). This zone covered a yellowish brown (10YR5/6) mottled silty clay. Unfortunately, no evidence was



KEY

- I - Light Brown (10YR7/3) Clay/Silt*
- II - Yellow (2.5Y8/4) Clay/Silt*
- III - Grey (2.5Y7/2) Clay*
- IV - Yellow Brown (10YR5/6) Mottled Clay/Silt*
- V - Grey/Brown (2.5Y6/2) Mottled Clay/Silt*

Figure 28. South profile of Test Unit 7, main entrenchment berm.



KEY

- I - Light Brown (10YR7/3) Clay/Silt*
II - Yellowish Brown (10YR5/6) Mottled Silt/Clay

Figure 29. West profile of Test Unit 7, main entrenchment berm.

observed concerning the type of revetment used to support the interior wall of the entrenchment. The most likely type of revetment used would have been constructed of wood which was locally abundant. As mentioned previously, fifty acres of forest were “slashed down” and fifty more were available for use if needed. C. W. Bennett, who served in the 9th Michigan Infantry and wrote an account of the unit’s wartime activities, commented that a corn field had occupied the top of the hill when the military first took possession, but “all around there were large trees which were cut down to give free range to the guns” (Bennett 1913:7). Similarly, a newspaper reporter commented on the large oaks, many with mistletoe, that grew on the hillsides around the fort (*Detroit Tribune*, December 29, 1861). Wood was needed for construction purposes (revetments, huts and artillery platforms, for instance) as well as for fuel to cook meals and heat living quarters during the winter. Mature forest in this area of Kentucky could easily yield 4000 or more board feet of saw timber and 5-10 cords of firewood and

polesize timber per acre (Mathew Smidt 1998, personal communication).

Revetments constructed of wood included fascines, hurdles, gabions, and planks. Each has the potential to leave traces in the archaeological record. Fascines are composed of straight twigs “between the thickness of the little finger and thumb, the longer the better,” that are bound together with withes (slender, flexible bands) made of tough twigs or stout rope (Mahan 1863:38). A loop is tied into the wither at one end to receive an anchoring picket. The revetment is formed by laying the fascines horizontally and embedding the first row of fascines about half its thickness below the tread of the banquette and securing it with the anchoring pickets and additional pickets driven through the fascine itself. The revetment is built up by the addition of more rows of fascines. The top is generally finished off with a course of sod. Archaeological evidence of a fascine revetment may be rather subtle since the twigs and pickets were small in

diameter and the trench in which the first row was embedded would probably have been relatively shallow.

A hurdle revetment was built by driving poles (1.5 inches in diameter) at 9-inch intervals into the banquette then using twigs to weave a wickerwork around the poles (Mahan 1863:39). Archaeological evidence of hurdles would probably be difficult to recognize because of the small diameter of the poles. A gabion revetment was formed of wickerwork cylindrical baskets secured in place with pickets and often filled with earth (Figure 30). Like the hurdle revetment, evidence of the pickets would be subtle but might be preserved. However, gabion revetments were not particularly common (Mahan 1863: 40). Plank revetments were made by "driving pieces of four-inch scantling about three feet apart, two feet below the tread of the banquette.... Behind these pieces, boards are nailed to sustain the earth" (Mahan 1863:40) (Figure 31). As with the previously described revetments, archaeological evidence may be difficult to recognize.

Revetments can also be made from sod and pisa (clay mixed with water and sometimes chopped straw). These types are unlikely to leave any physical evidence in the archaeological record. Given the abundance of wood around the fort site, these options seem unlikely.

Possible Rifle Trench: Test Unit 8

A shallow ditch running slightly north-east to southwest from the circular depression, identified by Charles Deland as one of two redans on either end of the fort, remains visible. As a topographic anomaly, the ditch feature is very subtle and best observed in the winter when the trees have lost their leaves and the undergrowth has died. Even under optimal viewing conditions, the feature is evident only by a somewhat flatter section along the slope of the hill. The feature was cross sectioned with a hand excavated trench measuring 2.1 m in length and approximately .5 m in width. The fill from Test Unit 8 was not screened. The profile of the east wall exhibits two

zones of soil consisting of an upper zone of yellowish brown (10YR6/8) clayey loam overlying a bright yellowish orange (7.5YR7/8) clayey loam mottled with lighter yellow (10YR8/6) clay (Figure 32). A slight depression measuring approximately 60 cm in width is discernible; however, this is not particularly compelling evidence for identifying a rifle trench. Since the feature was only sampled in one location, additional investigation in other places along its length may recover more demonstrative evidence.

Reconnaissance of the South Slope

As part of the site mapping effort, the south slope was surveyed to locate physical evidence of soldiers' huts. These huts were built by either choosing more level areas or creating level areas on the slope. The small log huts constructed on these leveled areas included chimneys with stone bases built into the uphill slope. Nelson (1987:83) describes this type of winter house as a "single-room log hut of horizontally laid, end-notched log walls with a single doorway set in the gable end or the side wall." The loose joints between the logs were frequently chinked with mud. Physical remains of the huts at Fort Duffield consist of piles of stone, representing the chimneys, at the uphill side of the leveled areas. The level areas averaged about 10 x 12 ft. in size. Nelson (1987:84) described basic hut dimensions for a group of four men as 8 x 12 ft. which would fit within the flat areas identified as hut locations at Fort Duffield. Each hut location was flagged with flagging tape so that it could be mapped. A total of 15 possible hut locations were flagged and mapped (Figure 33). A very similar situation was documented at Site 44ST302, located in Stafford County, Virginia, on the Quantico Marine Corps Base. This site consists of a series of intentionally leveled, rectangular dugout areas that are believed to be part of an 1861-1862 Confederate encampment (Huston et al. 1996:87). The dugouts were located on a southeast-facing slope very similar to the setting at Fort Duffield. The complex contains at least 60 dugouts arranged in rows of six to seven dugouts



Figure 30. Interior of Fort Sumter, Charleston, South Carolina, with Gabion reinforcement, 1865 (LC-B811-3460, Library of Congress, Washington, DC).

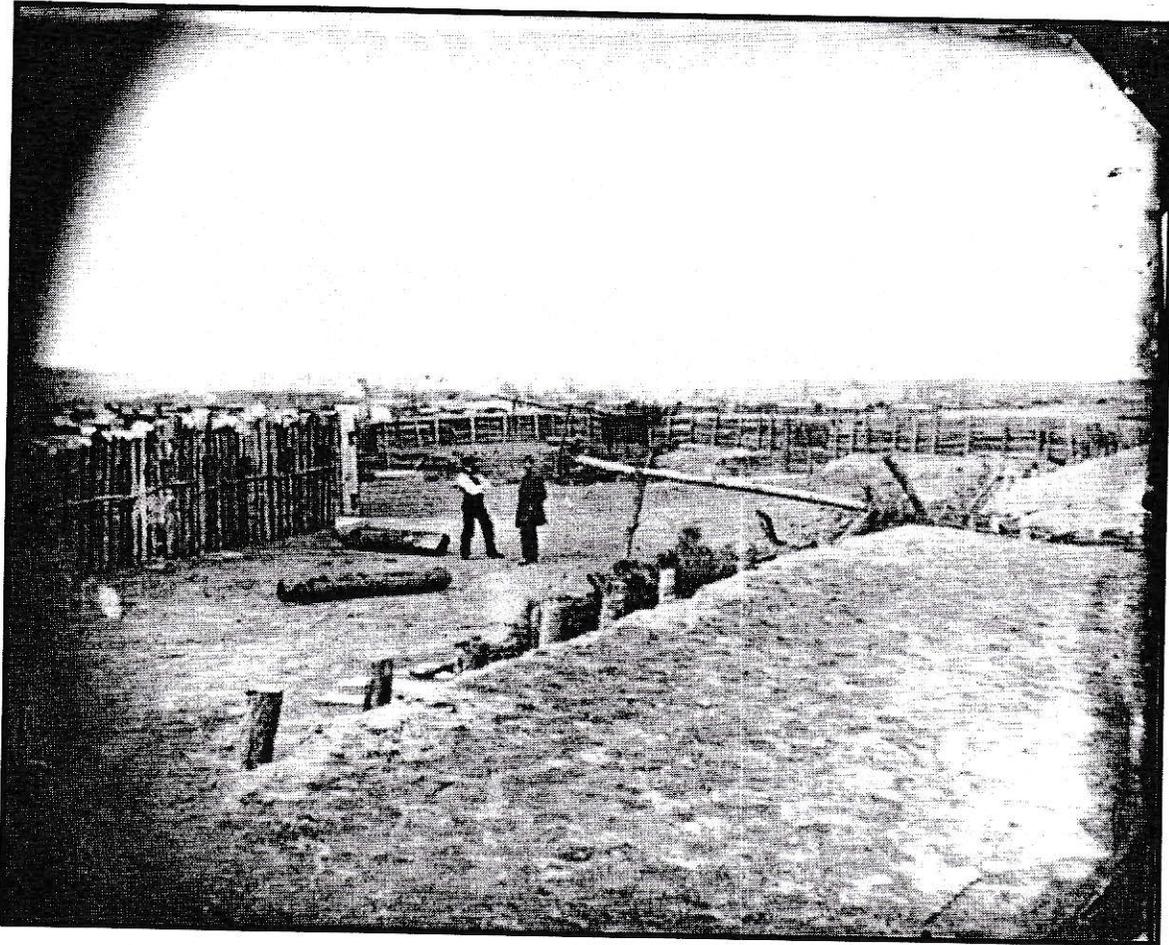
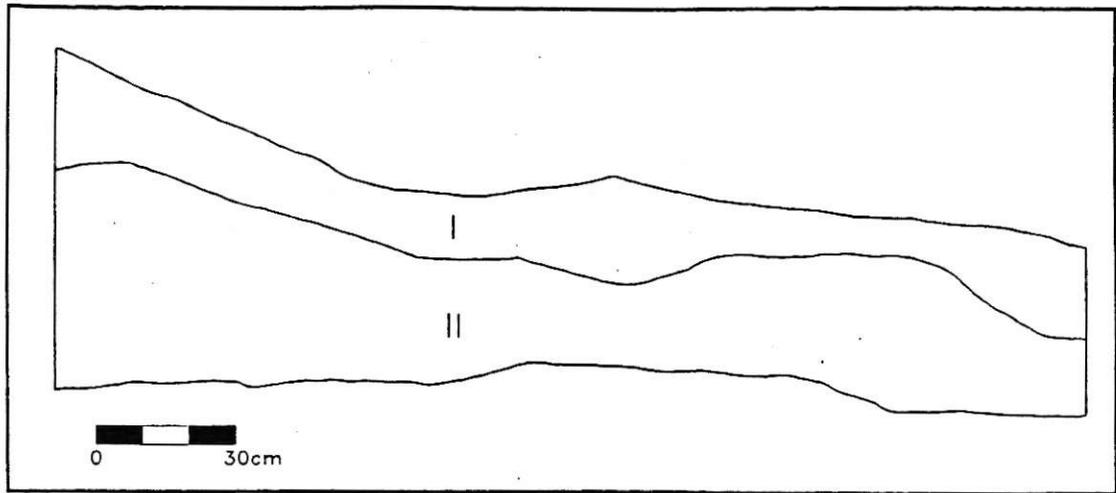


Figure 31. Revetments at Centreville, Virginia, March 1862 (George N. Barnard, photographer, LC-B815-0333, Library of Congress, Washington, DC).



KEY

- I - Light Yellowish Brown (10YR6/8) Silty Clay*
- II - Bright Yellowish Orange (7.5YR7/8) Mottled Clay*

Figure 32. East profile of Test Unit 8, possible rifle trench.

each. In contrast, the hut locations at Fort Duffield are fewer in number and the linearity of their alignment is less evident. No further investigation of these hut localities at Fort Duffield was undertaken; however, they remain a potentially valuable resource for further research into the challenges of daily life at the fort.

were no longer in alignment; however, a line of partially buried stacked rock that probably is part of the original foundation for the hunt club was identified along the E240 line (Figure 34).

Investigations of the Hunt Club Building

A concentration of limestone rocks (measuring approximately 8 x 10 m) was visible in the center of the fort enclosure where the hunt club building was thought to have stood. A depression was also observable near the stone concentration. Removal of the obscuring vegetation and the excavation of a trench in the depression confirmed that this area had been the location of the hunt club building. The depression yielded mortared brick and concrete that originated from a vaulted roof and cap that covered a cistern. A hand operated pump probably served to transport water for use in the hunt club's kitchen. Most of the exposed foundation stones

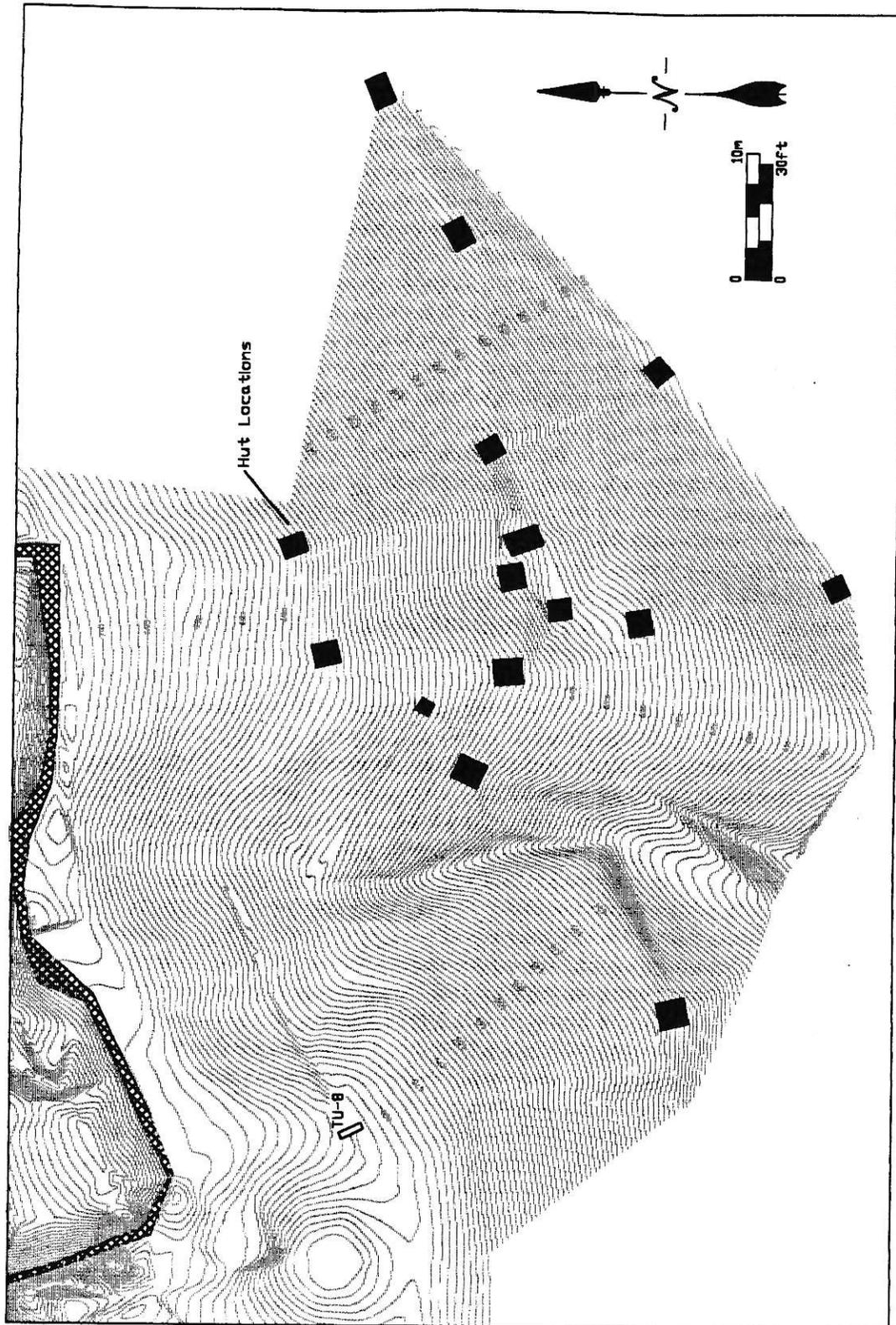


Figure 33. Detail of topographic map showing possible soldiers' hut locations.

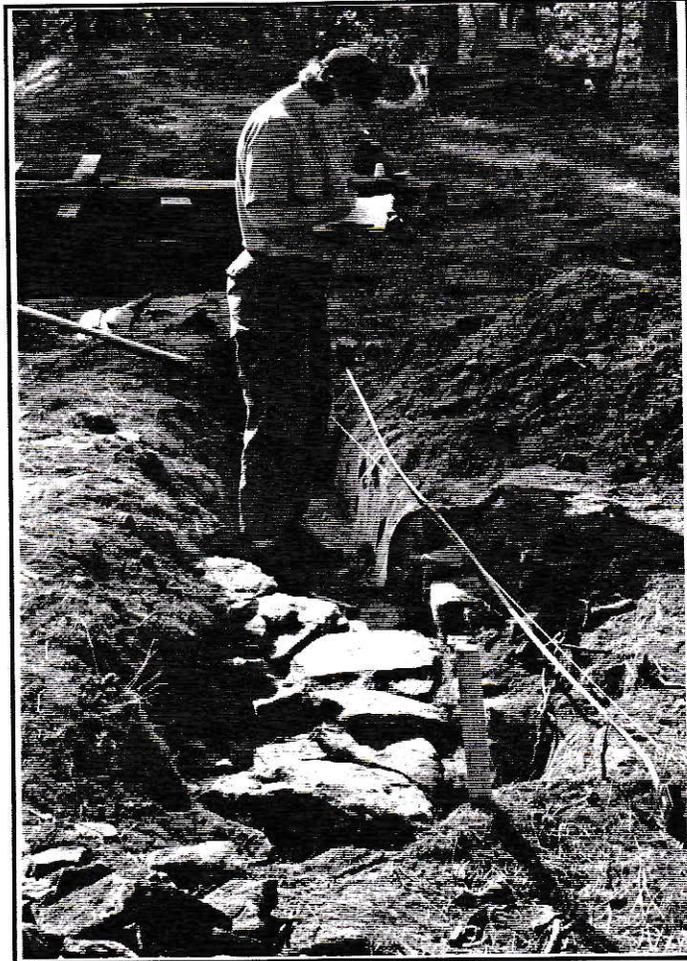


Figure 34. Stacked foundation stones associated with the hunting camp building.

CHAPTER 5:

Artifacts Recovered from Fort Duffield

Artifacts recovered from the excavations at Fort Duffield reflect the human activities that have taken place on the site over a long span of time, and include evidence of the presence of prehistoric Native Americans, military occupation during the Civil War, reunion of Federal Army veterans, tenure of the hunting camp around the turn of the century, and the reenactment events and tourist visits of the present. Discussion of the artifacts focuses only on the items that are thought to be associated with the military occupation of the site during the Civil War. Artifacts that clearly date to other periods in the site history or cannot be dated specifically are presented in tabular form with no further discussion (Table 9).

Artifacts associated with the military occupation of the fort are classified under the major categories of Food Preparation and Consumption, Medicine and Hygiene, Architecture, Arms and Military, Clothing, Personal, Smoking, and Miscellaneous. Each of these categories are discussed separately below.

Food Preparation and Consumption

Three patinated amber glass flask fragments were recovered that probably date to the Civil War period. The small size of the fragments precludes any further identification of the flask type, but two of the fragments appear to have been pattern molded.

Medicine and Hygiene

A single aquamarine glass empontilled bottle base was recovered (Figure 35). The bottle was cylindrical and probably quite small in capacity. It is placed in this category because medicines were frequently packaged in small containers of this type during the nineteenth century. The empontilled base indicates that the

bottle was made by using a pontil rod to blow the molten glass in a mold. When the bottle was detached from the pontil rod, a characteristic scar was left on the base. This method of producing bottles began to be superseded by other bottle making technologies around the time of the Civil War.

Architecture

Artifacts placed in the architecture category include cut nails and spikes and flat glass fragments that measure .085 inches or less, based on flat glass research conducted by Roenke (1976:116). The cut nails and spikes were likely used in a variety of contexts, ranging from revetments and cannon platforms to reinforced tent and log hut construction. The use of nailed wooden crates and boxes for fuel also may be a source of some of the nails. A total of 605 cut nails and eleven cut spikes were recovered during the archaeological investigations; 548 of the cut nails were fragmentary; the 57 that could be identified ranged from 2d to 12d in size (Table 10). Cut spikes were recovered in low frequencies, numbering only eleven out of the total cut fasteners. These large fasteners were probably used for heavy framing tasks such as cannon platforms.

A total of 67 flat glass fragments ranging in thickness from .04 to .085 inches were identified out of a total frequency of 308 specimens. Eighteen specimens measured from .04 to .059 inches which corresponds with a date range prior to 1845, according to Roenke (1978). However, as Moir (1987) has demonstrated, range in flat glass thickness can be affected by several factors, including production methods, size of the sample, inclusion of specialty glass in the sample, and construction date. Three mirror fragments were recovered that measure .035 and .052 inches,

Table 9. Artifacts Excluded from Detailed Discussion.

ARTIFACT	TOTAL
Prehistoric chert manufacturing debris	17
Prehistoric chert biface	1
Salt glazed stoneware spall	1
Coarse earthenware sherd with flawed salt glaze	1
Coarse earthenware sherd with brown glaze	2
Undecorated whiteware sherds	3
Clear glass tableware fragments (twentieth-century manufacture)	5
Clear glass stopper	1
Clear glass bottle fragments	4
Clear glass salad dressing bottle fragments (E.R. Durkee; patent date 4/17/1877)	14
Aquamarine/blue glass bottle fragments	26
Light and medium green glass bottle fragments	16
Dark green glass bottle fragments	52
Amber glass bottle fragments (beer)	70
Pepsi screw cap	1
Pull tabs	2
Aluminum can fragments (beer and/or soda water)	51
Flat glass fragments (probably window pane)	
Unidentified nail fragments	440
Wire nails and spikes	22
Iron strap hinge	1
Curtain rod parts	2
Brick fragments	43
Plaster fragments	4
Concrete fragments	8
Copper conduit wire	1
Clay pigeon fragments	31
Shotgun shells	8

.22 calibre bullet	1
.32 calibre cartridge	1
Modern percussion caps	3
Liberty head nickel, minted in 1905	1
Pennies, minted in 1989 and 1995	2
Dime, minted in 1970	1
Barbed wire fragments	11
Horseshoe fragment	1
Nuts and bolts	5
Screws	10
Strips of copper alloy	2
Wire fragments	12
Zinc fragments	2
Aluminum fragments	6
Aluminum strip (possibly part of a window frame)	1
Iron fragments	19
Lead fragments	2
Leather fragments	19
Coal	2
Black plastic fragments	2
Unidentifiable clear glass fragments	28
Unidentifiable aquamarine/blue glass fragments	32
Unidentifiable green glass fragments	11
Unidentified bone fragments	56
Snail shell fragment	1
Charcoal fragments	8

Table 10. Cut Nails and Spikes.

ARTIFACT	SIZE	TOTAL
cut nail	fragmentary	
cut nail	2d	548
cut nail	3d	5
cut nail	4d	7
cut nail	5d	5
cut nail	6d	8
cut nail	7d	1
cut nail	8d	13
cut nail	9d	5
cut nail	10d	2
cut nail	12d	5
TOTAL		605
cut spike	fragmentary	5
cut spike	16d	3
cut spike	20d	2
cut spike	40d	1
TOTAL		11
TOTAL ARTIFACTS		616

suggesting that some of the other thin glass sherds may originate from mirrors rather than window panes. The remaining 50 specimens measure from .061 to .085 inches with the majority (n=33) falling within the range of .061 to .069 inches. These measurements are closer to flat glass thickness ranges associated with the decades bracketing the Civil War period. The frequency and size of the flat glass fragments are quite small, suggesting that only a few panes of glass are represented. Considering the temporary nature of the quarters built at the fort, finding evidence of windows is somewhat unexpected. No window glass was identified at Fort Pillow, and specimens from the Sevierville Hill site were attributed to houses built after the military occupation (Mainfort 1980; Bentz and Kim 1993:88). It is possible, perhaps even probable, that the flat glass fragments originate from the hunting camp building and are not associated with the Civil War occupation; however, the occurrence of mirrors among the soldiers' personal belongings remains an alternative source for some of the flat glass.

Arms and Military

Artifacts attributed to the arms and military category include ammunition, gun accoutrements, and canteens. Ammunition included three lead balls and one buckshot from "buck and ball" cartridges used in .69 calibre muskets, a .40 calibre lead conical ball, a .50 calibre lead round bullet, and a .58 calibre lead Williams bullet (see Figure 35).

Prior to their arrival at Fort Duffield, the Michigan troops were first issued old Belgian muskets which were "examined and condemned [sic]" (John C. Love to Parents, letter, December 1, 1861, Bentley Collection, University of Michigan, Ann Arbor). Col. Duffield complained to Headquarters that "our arms are miserable and it is unsafe to send men into the field with such miserable weapons as those we have" (William W. Duffield to Gen. John Robertson, letter, November 7, 1861, U.S. Archives, Washington, D.C.). Captain Deland characterized the muskets

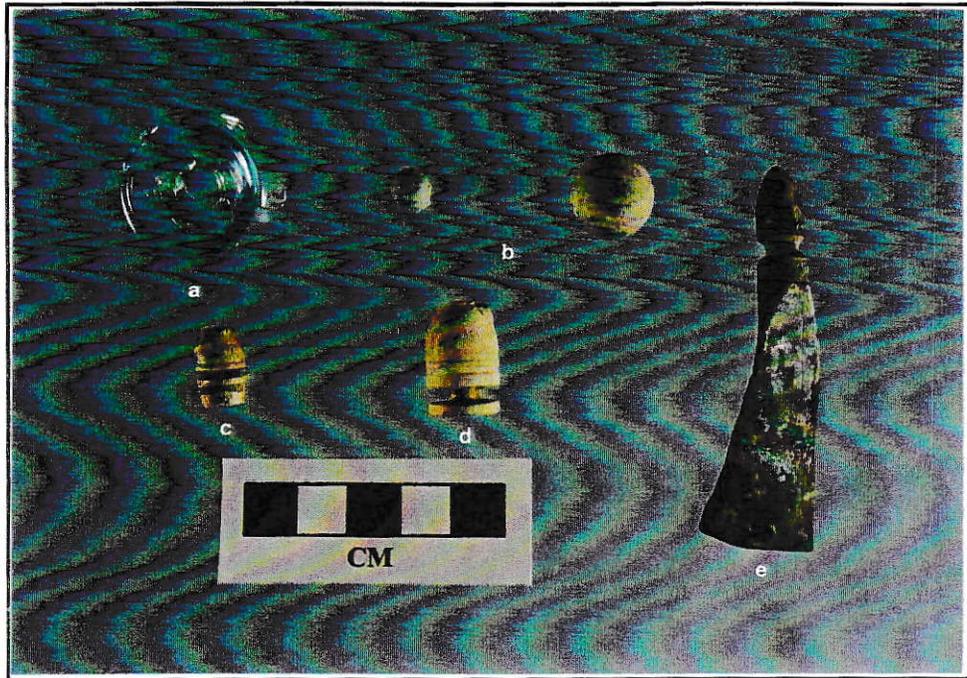


Figure 35. Artifacts dating to the Civil War occupation (a - empontilled bottle; b - buckshot and ball from a buck-and-ball cartridge; c - 40 cal. conical bullet; d - 55 cal. Williams bullet; e - Springfield bayonet scabbard tip).

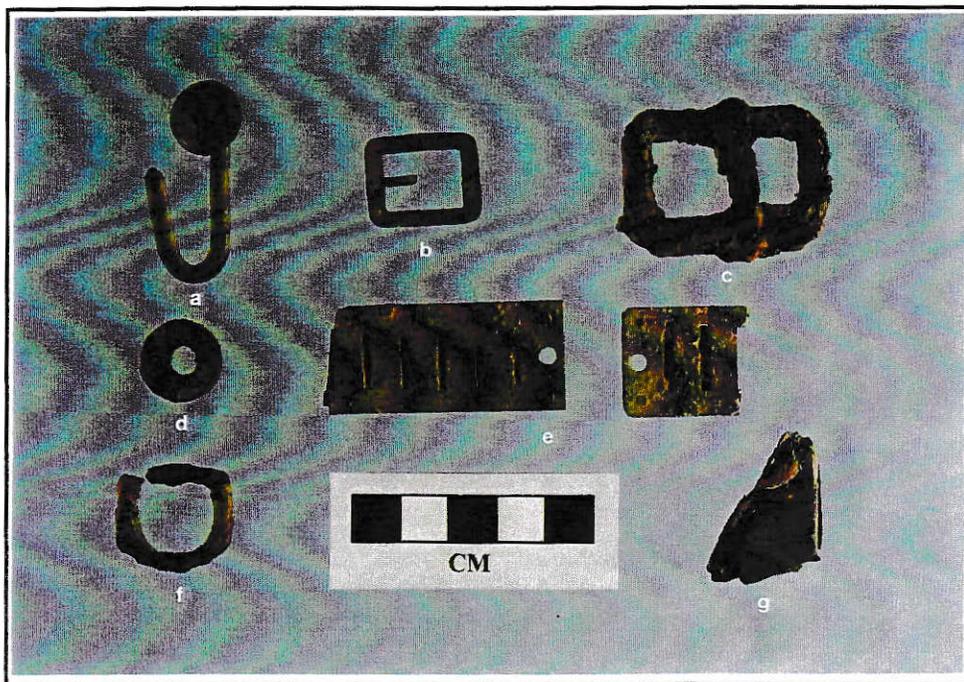


Figure 36. Artifacts dating to the Civil War occupation (a - knapsack hook; b - knapsack buckle; c - cartridge box buckle; d - washer; e - harmonica parts; f - haversack loop; g - unidentified metal tip).

as "heavy, clumsy, old-fashioned things that are unfit for a Russian to carry" (*Jackson American Citizen*, November 12, 1861). In a dispatch to the *Detroit Daily Advertiser*, the writer stated that within a three week period, 20 of the muskets had been returned to the Quartermaster, "nearly all having either the breach-pin or the cylinder blown out, or the locks torn off" (*Detroit Daily Advertiser*, January 16, 1862). However, another dispatch to the *Detroit Free Press* on January 8, 1862, indicated that continued practice and repair of the muskets improved the soldiers' attitudes about them. "We supposed when we first received these old rusty muskets, that we were badly armed, but the more the boys labor on them, the more they like them" (*Detroit Free Press*, January 8, 1861). The muskets used .69 calibre round balls or "buck and ball" cartridges that were only effective up to 200 yards. Three .69 calibre round balls and one .32 calibre ball with the manufacturing sprue still attached were recovered (see Figure 35). The "buck and ball" cartridge consisted of a .69 calibre round ball and three pieces of .32 calibre buckshot that were packaged together in a cartridge.

The .40 calibre lead conical ball is a two-ring type with an unhollowed base (see Figure 35). Lord (1980:16-17) does not include any .40 calibre models in his list of arms types; the smaller calibres he does list are associated with revolvers. The Fort Duffield specimen may have been used in a revolver or pistol that was not issued by the military.

The .50 calibre round bullet does not exhibit any of the opaque patination that characterizes the other bullets. Its round shape also suggests that it was not part of a cartridge but was loaded separately and in sequence with gunpowder and a patch. It may be a reenactor's bullet that was lost during one of the many reenactment events that have taken place at the fort site over the years.

A .58 calibre Williams bullet was also recovered during the archaeological investigations (see Figure 35). The Williams elongated bullet

was patented by Elijah D. Williams in December 1862 (Lord 1995:14-17) and consisted of

the combination expand-bullet of a headed pin and a concave expanding disc, the disc having its concave side against the base of the bullet and the pin entering the cavity thereof, and operating to produce the flattening of the disc by which it was caused to expand against the walls of and enter the rifling of the gun.

The specimen recovered at Fort Duffield was an unfired "cleaner" bullet which was designed "to improve the accuracy of rifles by removing powder residue from the bores" (Smith 1994:71). One or more of these cleaner bullets were put in every package of .58 calibre ammunition with the intent that they would be used to help keep the barrel from becoming fouled. However, they were unpopular with the troops who claimed that their use damaged the bore. They were eventually discontinued late in the war. The Fort Duffield specimen conforms most closely to Type III which was introduced sometime in 1863 (Smith 1994:71; Lord 1980:16). This date is rather late for Fort Duffield which was occupied most heavily in 1861 and 1862. However, various companies from Wisconsin, Ohio, and Kentucky, apparently occupied the fort periodically until war's end (Glesner n.d.).

Evidence of the use of Springfield rifles is indirectly indicated by the recovery of the tip of a bayonet scabbard (see Figure 35). The specimen is made of brass and is three inches in length. It was attached to a leather scabbard, and had a cone shaped finial at the end.

Other military equipment indicated in the assemblage include 57 tinned iron fragments that were once part of a canteen. One of the fragments has an iron loop to hold a carrying strap. The fragments were too poorly preserved to unequivocally determine the shape of the canteen, but the curvature and width of several pieces suggest that it was circular, possibly a U.S. Regulation canteen (Lord 1995:71). A hook and a

lightweight buckle that originated from knapsacks were also identified in the assemblage (Figure 36). The hook was made of a nonferrous metal and used on the shoulder straps (Lord 1995:148). The small lightweight buckle was also made from a nonferrous metal and probably was used to fasten a flap or in some area of the knapsack that was not meant to be subjected to strain by weight. An illustration of a Drake's coat sling exhibits buckles very similar in shape to the Fort Duffield specimen (Lord 1995:149). Another iron buckle may have come from a cartridge box (see Figure 36). The buckle is D-shaped, has a tongue attached to the straight side, and is made of iron. It is identical in form to the buckle on an Enfield cartridge box, illustrated by Lord (1995:4). A D-shaped iron loop recovered from the site may have come from a haversack (see Figure 36). Very similar loops are part of an officer's haversack illustrated by Lord (1995:120). The loops were attached to the top of the haversack and the shoulder strap was attached to them by clips.

Clothing

Artifacts associated with clothing include seven white four-holed porcelain buttons commonly used on underwear, and four metal buttons, none of which appear to be military. All of these buttons may have been used on undergarments. Their association with the Civil War occupation is not certain but their manufacturing date range includes the nineteenth century. Five of the porcelain buttons measure .44 inches and are usually found on shirt cuffs or collars. Two porcelain buttons measure .63 inches and were commonly used on undergarments or shirt fronts.

The metal buttons include two heavily corroded iron fragments that cannot be further identified. They measure approximately .7 and .55 inches in diameter. A nonferrous button measures .59 inches in diameter and has a bar across a central hole. A brass button back with traces of gilding was also recovered. It measures .54 inches in diameter and probably once had an eyelet. This specimen may have had a cloth or metal front. An

inscription is present on the inside surface but it could not be deciphered.

Personal Artifacts

Personal artifacts that may be associated with the Civil War occupation include two metal parts of a harmonica and two eyeglass lens fragments. The harmonica parts form part of the reeds that make up the interior of the instrument and produce the musical notes (see Figure 36). Nine fragments of flat light green glass that may have once been glass for a framed image such as a photographic portrait were also recovered. The fragments measure .1 inch in thickness and exhibit the same degree of patination. One of the fragments has a edge that has been ground smooth; the curvature of the edge indicates that the original glass was oval in shape. Association with the Civil War occupation is uncertain for these glass specimens; however, there are many precedents for the practice of soldiers bringing images of their loved ones with them.

Tobacco-related Artifacts

Four fragments of a molded and glazed red clay tobacco pipe were recovered from the site. The pipe was probably of the stub stem variety. The fragments are very small; only one retains evidence of a tassel as a decorative motif. Smoking and chewing tobacco was a favored pastime of Civil War soldiers, despite the difficulty and expense of procuring tobacco. Lord (1995:196) states that tobacco was one of the most desired items in a soldier's list of necessities, despite strong prejudice against tobacco use in many communities. "Smoking was highly recommended by all surgeons at New Bern, North Carolina, as a preventative against 'congestive chills,' which caused many deaths among the troops. Tobacco was also considered beneficial in combatting other diseases in the South" (Lord 1995:196).

Miscellaneous

Three artifacts were placed in the miscellaneous category. One is a fragmentary specimen, consisting of thin sheets of brass that enclose numerous layers of paper (see Figure 36). The item appears to be part of something that had a pointed tip. Its association with the Civil War occupation is very unclear since it cannot be functionally identified; however, it was recovered from Level 4 of Test Unit 2 in association with other artifacts of Civil War date.

A heavy duty iron chain link was also recovered in association with the main entrenchment berm. It could have been used in conjunction with the cannon that were mounted on the parapet.

Finally, a fragment of rock that appears to be a fine grained sandstone was recovered from Shovel Probe 7 (see Figure 20). It originally was circular in shape and may have been either spherical or flattened. The exterior cortex is smooth. It has fractured, either naturally or by human means, so that it has flat sides, as if it had been cross-sectioned. One edge is characterized by a jagged fracture. Its function is problematical. One suggested function is that it served as a whetstone.

Evaluating the Material Culture of the Civil War Occupation

It is not surprising that many of the recovered artifacts from the excavations date from times far removed from the brief Civil War occupation of 1861-1865. Despite the hundreds of soldiers who moved through Fort Duffield, material evidence of their presence was limited by several factors. First, many of the soldiers actually lived outside the fort, in log huts on the south slope or in a camp next to West Point. Their presence in the fort interior, therefore, was mainly when they were on duty and they would not have had many personal possessions with them, other than what they wore or carried on their person and their weapons. Secondly, Fort Duffield, like many

Civil War sites, has been subjected to searches by metal detector enthusiasts over the years whose activities have removed many artifacts. Thirdly, the 9th Michigan Infantry was stationed at Fort Duffield for the longest period but were only in actual residence in the fort from November 1861 to March 1862. Other regiments occupied the fort periodically throughout the war but the actual number of men may have varied considerably. Therefore, opportunities for artifacts to be added to the archaeological record by loss, discard, or other means may have been relatively limited. Trash disposal may have taken place outside the fort following military regulations for keeping sites clean. Latrines (which may have served also as trash receptacles) were generally built at some distance from the fortifications. The single most common artifact type associated with the military occupation of Fort Duffield are nails which were deposited in the soil when the log huts, gun platforms, and revetments deteriorated and decomposed. Archaeological investigation of the log hut locales identified on the south slope has a good potential for recovering artifacts and documenting features associated with the everyday lives of the soldiers. These areas probably have not been affected by hunt club activities, like many portions of the fort interior.

CHAPTER 6: Summary, Conclusions, and Recommendations

Fort Duffield is a well-preserved military fortification dating to the Civil War and associated with the Union Army. Situated on a prominent hill overlooking the town of West Point in Hardin County, Kentucky, the fort was manned by various regiments throughout the war. The 9th Michigan Infantry spent the greatest amount of time at the site and were largely responsible for the construction of the earthworks. Other regiments associated with West Point and Fort Duffield included the 37th Indiana Volunteers, the 1st Wisconsin, the 1st and 18th Ohio Infantry, and the 16th and 28th Kentucky Infantry. Although the fort was never involved in any major battles, it was strategically located to guard the approach to Louisville, the Louisville & Nashville Railroad, and the Ohio River. Its mere presence acted as a deterrent to Confederate troops as well as providing protection for the large supply base that General William Tecumseh Sherman established in West Point.

The fort interior was relatively limited in area, covering only a few acres. Documentary evidence suggests that Civil War soldiers built at least nineteen structural features inside the fort, including tents of various kinds and reinforced tents or log huts. Log huts were also built on the south slope outside the main fortification to house soldiers assigned to the companies that were actually occupying the fort. Confederate guerrillas burned some of the cabins after the Union forces abandoned the site. After the war, part of the fort interior was cultivated but the earthworks became covered in dense forest. After passing through several owners including a local stone quarrying company, the site became the property of a consortium of wealthy Louisville businessmen headed by Pendleton Beckley. They built a hunting camp building on the site for their own use and for leasing out to such groups as the Fort

Hill Chautauqua. In 1895, the Grand Army of the Republic held a reunion at West Point and sponsored a visit to the old fort site. Newspaper articles writing about the event noted that stone chimneys and fireplaces for the cook-house and officers' headquarters, cannon balls, and other military relics were still visible on the site.

The site was acquired by the United States government in 1918 and added to the Fort Knox Military Reservation. It was never used for training, and as years passed it became heavily overgrown. The hunt club building either burned or fell into disrepair, and the cistern that provided water to the club collapsed or may have been destroyed by the U.S. Army as a safety measure. The log huts disintegrated and Civil War relics were gradually collected by local people until the only visible evidence that remained were the massive entrenchments themselves. The City of West Point acquired the property in 1978 and restoration efforts began in 1992.

Part of the restoration involved archaeological investigations to assess the nature of intact resources related to the military occupation of the site. Archaeological investigations at the site of Fort Duffield examined areas of the fort interior where structural features may have stood, the main entrenchment, a possible rifle trench, and the southern slope outside the fortification, using a variety of methodologies including remote sensing, metal detecting, screened shovel probing, hand excavated trenching, test unit excavation, and pedestrian reconnaissance. The project also produced a topographic map of the site, showing the main fortification features, the spring used for drinking water, and visible remnants of the soldiers' huts that were built outside the fort on the south slope.

Artifacts dating to the Civil War occupation as well as to the late nineteenth-century hunt club, tourist visits, and modern reenactments were recovered during the investigations. Cut nail distributions marked the location of some of the Civil War structures. Civil War artifacts such as bullets, personal items, and domestic artifacts were recovered in limited quantities. Later activities that took place at the site also left their evidence. The hunt club foundation stones (which may have been recycled stones from the Civil War chimneys) were concentrated in the middle of the fort interior, and a depression marked the spot where a cistern was built to provide water for the lodge. Episodes of plowing and cultivation gave rise to some erosion and displacement of soil and artifacts along the northern edge of the enclosure where the ground sloped rapidly downward. No physical evidence of revetments on the interior slope was found but the cross section of the entrenchment and ditch suggests that the fort was built according to standard specifications outlined by Mahan and in general use by the U.S. Army during the nineteenth century. A possible rifle trench outside the main berm was investigated as well.

Civil War artifacts collected from the site reflect the daily lives of the soldiers. Smoking tobacco, musical entertainment, and target practice all helped to pass the time. Documentary evidence speaks to the soldiers' correspondence with their loved ones, and the conditions under which they lived. A pharmaceutical bottle offers mute evidence of the physical ailments that soldiers suffered as a result of living in camp. Documents associated with the fort indicate that measles killed many men of the 9th Michigan Infantry along with typhoid, pneumonia, and diarrhea. Those who avoided or survived the more serious illnesses still complained of "neuralgy in the head," colds, and other complaints for which they were dosed with "quinine, epicac and opium and sometimes Calomel" (Henry Oscar Rice to Parents, letter, January 1862, Earl M. Hess Collection, U.S. Army Military History Institute, Carlisle Barracks, Pennsylvania; John C. Love to

Parents, letter, December 20, 1861, Bentley Collection, University of Michigan, Ann Arbor).

Recommendations

While the archaeological investigations of Fort Duffield were preliminary in nature, the evidence they recovered suggest several fruitful avenues for more research to further contribute to the interpretation of the site and its presentation to the visiting public, Civil War researchers, students of history, and other interested individuals, as well as to the general body of knowledge about Civil War sites. To this end, recommendations focus on the development of a long term research plan that includes documentary and archaeological field research. Information gained as a result of this additional research can then provide the basis for an interpretative plan that is historically accurate, and contributes significantly to the visitor experience. A first priority is additional documentary research.

Documentary Research

Documentary research that has been compiled for Fort Duffield includes several collections of letters from Col. William W. Duffield and soldiers who served in the 9th Michigan Infantry, general military orders, a drawing of the fort made shortly after the Civil War ended, and newspaper accounts. While the documentary information presently available has provided a great many descriptive details about the fort and the military occupation there, many other documentary sources remain to be systematically reviewed. Additional military records undoubtedly remain to be located and reviewed. The most logical place to start is in the military history section of the U.S. Archives in Washington, D.C. Civil War regimental records take the form of bound order books as well as loose papers that can include letters, dispatches, and other informative documents. Regimental records for the other regiments that spent time at Fort Duffield may also contain useful information. These regiments include the 16th Kentucky

Volunteer Infantry, the 1st Wisconsin Volunteer Infantry, the 1st and 18th Ohio Volunteer Infantry, and the 37th Indiana Volunteer Infantry. Another potential source of information is historic records of the U.S. Army Corps of Engineers who were responsible for laying out the plan of the fort and directing its construction. Maps housed in the Cartographic Branch of the U.S. Archives in College Park, Maryland, and the Geography and Map Division at the U.S. Library of Congress also should be checked to see if any maps of Fort Duffield are on file.

Information gleaned from documentary sources can then be used to more accurately reconstruct features specific to Fort Duffield. For instance, information on the type and composition of revetments, the types of gun emplacements, the nature of the redans, and the presence of other fortification features such as a rifle trench, a powder magazine, or an abatis, is currently very limited. Additional documentary research has the potential to more specifically identify various fort constructions, and provide guidance on reconstruction efforts.

Archaeological Excavation in the Fort

The archaeological investigations reported here examined only very limited areas of the fort's features and more extensive excavations are needed to gather additional information on how the site appeared at the time of its occupation by the federal army. More extensive excavation of the main embankment is warranted to gather information on the type and composition of the revetments, and the gun emplacements that were built. Excavations in the ditch and the rampart are particularly critical to gather information on the angles of the scarp, counterscarp, superior and exterior slope and the glacis for reconstruction purposes. Other external features such as the redans and the possible rifle trench also should be examined in more detail.

The area inside the fort also warrants additional investigation in spite of, or perhaps, because of the impact that post-Civil War

activities have had on the archaeological deposits. Additional excavations in the fort interior should focus on opening up block excavations to identify such features as Sibley tent locations which are not readily identifiable by metal detection, and to search for areas of the fort interior that are well preserved and less affected by post-Civil War impacts to the site. While the currently standing reproduction huts lend a certain air of verisimilitude to the fort site, and care has been taken to avoid disturbance of the archaeological deposits beneath them, their presence prevents any archaeological investigation of the area where they stand. It is recommended that an archaeological evaluation of any areas slated for construction be completed before construction begins. Also, in absence of descriptive information specific to Fort Duffield, these reconstructions run the risk of presenting a less than accurate representation of how the fort looked, and where various features were located. For instance, one of the log huts is labeled as a hospital even though it is documented that sick soldiers were treated in buildings commandeered for the purpose in the town of West Point. While a long term interpretative plan may justify the reconstruction of features generally typical of Civil War forts, efforts should be made to determine what Fort Duffield looked like in as much detail as is feasible.

Another potential problem area concerns tourist events that take place within the fort. Reenactment events that take place on the site have already introduced modern reproduction artifacts such as lead bullets, and brass percussion caps into the archaeological deposits. While these modern artifacts are now identifiable by their lack of weathering, they will eventually tarnish and come to resemble authentic artifacts of the Civil War, thus having the potential to confuse the archaeological record. Reenactment events should be carefully monitored to prevent or restrict introduction of modern reproduction artifacts in the site deposits, at least until such time as sufficient archaeological investigation has been completed to assess the preservation potential of the fort as a whole.

Metal detector enthusiasts constitute both a threat and a valuable source of information for the interpretation of Fort Duffield. The threat lies in the removal of many artifacts of Civil War age from the site, a situation that has already occurred to a significant degree in some areas of the fort. Acquisition of artifact collections that can be reliably documented as coming from Fort Duffield is one way to mitigate this impact by making the artifacts available for analysis, interpretation, and exhibition. At least one artifact collection is currently held by local collector, Craig Seabolt, who has expressed interest in donating the collection to the Fort Duffield Heritage Committee. Every effort should be made to acquire this collection. Private metal detection should be prohibited on the site; any future metal detection that takes place should be under the supervision of a professional archaeologist.

The log huts built by the soldiers for their own use on the south slopes were identified by surface indications but were not investigated further. These features hold great promise for future excavation efforts to gather information concerning the soldiers' daily routines and adaptation to camp life. It is recommended that several of these hut locations be completely excavated. More intensive survey should also be conducted to identify additional hut locations or other features such as the "sinks" (toilets) that were routinely built for human waste.

The recommendations presented here are quite ambitious and entail a considerable commitment of time, funding, and professional and local resources. By incorporating them into a long range research and interpretative plan, however, they are realizable goals. Fort Duffield is one of the best preserved Civil War forts in Kentucky. It deserves protection and careful development and management so that its place in history is assured. The achievements of the Fort Duffield Heritage Committee are laudable ones but much more could be done to develop Fort Duffield into an informative, and educational site that adds an important chapter to the story of Kentucky's

involvement in one of the most significant conflicts of her history.

REFERENCES CITED

Primary Sources

Newspapers

Detroit Daily Advertiser, 16 January 1862.

Detroit Free Press, 8 January 1861.

Detroit Tribune, 21 December and 29 December 1861.

Jackson American Citizen, 21 November 1861.

Letters/Orders

Duffield, Col. William W

1861 Letter to Brig. Gen. John Robertson, 7 November 1861 and 14 November 1861, U.S. Archives, Washington, D.C.

Howland, Col. Hazzard L.

1861 General order, RG 393, Pt. 2, entry 6465, Vol. 149/DO, 6 November 1861, U.S. Archives, Washington, D.C.

Love, John C.

1861 Letters dated 7 November, 1 December and 20 December to his parents. Bentley Collection, University of Michigan, Ann Arbor.

Parkhurst, John

1861 Letter to his daughter Kitty, November 10, 1896. University of Michigan Archives, Ann Arbor.

Rice, Henry

1862 Letter dated January 27th from Rice to his parents. Earl M. Hess Collection, U.S. Army Military Institute, Carlisle Barracks, Pennsylvania.

Robertson, Brig. Gen. John

1861 Letter to Col. William W. Duffield, 2 December 1861, U.S. Archives, Washington, D.C.

Secondary Sources

Arms, Fred S., Michael J. Mitchell, Frank C. Watts and Byron L. Wilson

1979 *Soil Survey of Hardin and Larue Counties, Kentucky*. United States Department of Agriculture Soil Conservation Service, Washington, D.C.

Bennett, Charles G.

1913 *Historical Sketches of the Ninth Michigan Infantry*. Daily Courier Print, Coldwater, Michigan.

- Eentz, Charles and Yong W. Kim
 1993 *The Sevierville Hill Site: A Civil War Union Encampment on the Southern Heights of Knoxville, Tennessee*. Tennessee Anthropological Association Miscellaneous Paper No. 17. The University of Tennessee Transportation Center Report of Investigations No. 1. Knoxville, Tennessee.
- Briggs, Richard
 1993 *West Point and the Civil War*. Top's Books, West Point, Kentucky.
 1998 Historical Owners of Fort Duffield Property. *Fort Duffield Dispatch*, October issue, p. 2. Fort Duffield Heritage Committee, West Point, Kentucky.
 1999 *Saga of Fort Duffield*. Published by the Friends of Fort Duffield, West Point, Kentucky.
- The Corradino Group
 1993 *Fort Duffield Management and Interpretation Plan*. Planning document prepared for The Fort Duffield Heritage Committee, West Point, Kentucky.
- Gesner, Anthony Patrick
 n.d. "To Honor the Dead: Past and Present in West Point, Kentucky". Unpublished manuscript on file at the William S. Webb Museum of Anthropology, University of Kentucky, Lexington.
- Huston, Clifton A., Donald W. Linebaugh, Charles M. Downing and Veronica L. Deitrick
 1996 *The Cultural Legacy of Quantico, Volume 2: Part 2 - Additional Archaeological Survey, Marine Corps Base, Quantico, Fauquier, Prince William, and Stafford Counties, Virginia*. The William and Mary Center for Archaeological Research, Department of Anthropology, The College of William and Mary, Williamsburg, Virginia.
- Linderman, Gerald F.
 1987 *Embattled Courage: The Experience of Combat in the American Civil War*. Free Press, New York.
- Lord, Francis A.
 1995 *Civil War Collector's Encyclopedia*. Volumes 1-5. Blue & Grey Press, Edison, New Jersey.
- Mahan, D.H.
 1863 *A Treatise on Field Fortification Containing Instructions on the Methods of Laying Out, Constructing, Defending, and Attacking Intrenchments, With the General Outlines also of the Arrangement, the Attack and Defence of Permanent Fortifications*. John Wiley, New York.
- Manfort, Robert C., Jr.
 1980 *Archaeological Investigations at Fort Pillow State Historic Area: 1976-1978*. Division of Archaeology, Tennessee Department of Conservation, Nashville, Tennessee.

- Moir, Randall W.
1987 Socioeconomic and Chronometric Patterning of Window Glass. In *Historic Buildings, Material Culture, and People of the Prairie Margin: Architecture, Artifacts, and Synthesis of Historic Archaeology*, edited by David H. Jurney and Randall W. Moir, pp. 73-81, Richland Creek Technical Series, Volume V. Archaeology Research Program, Institute for the Study of Earth and Man, Southern Methodist University, Dallas, Texas.
- Nelson, Dean E.
1987 "Right Nice Little House[s]": Impermanent Camp Architecture of the American Civil War. In *Perspectives in Vernacular Architecture, I*, edited by Camille Wells, pp. 79-93. University of Missouri Press, Columbia.
- Roenke, Karl G.
1978 Flat Glass: Its Use as a Dating Tool for Nineteenth Century Archaeological Sites in the Pacific Northwest and Elsewhere. *Northwest Anthropological Research Notes* 12(2)(pt. 2), Memoir No. 4, University of Idaho, Moscow.
- Seabolt, Craig
1997 Personal communication.
- Smidt, Matthew
1998 Personal communication.
- Smith, Samuel D.
1994 Excavation Data for Civil War Era Military Sites in Middle Tennessee. In *Look to the Earth: Historical Archaeology and the American Civil War*, edited by Clarence R. Geier, Jr. and Susan E. Winter, pp. 60-75. The University of Tennessee Press, Knoxville.
- Wright, David Russell
1982 *Civil War Field Fortifications: An Analysis of Theory and Practical Application*. M.A. Thesis, Middle Tennessee State University, Nashville.
- Yelvington, Rube
1993 Fort Duffield, Today and Tomorrow. In *West Point and the Civil War*, by Richard Briggs. Top's Book, West Point, Kentucky.

APPENDIX A
Artifact Inventory



Artifacts from Fort Duffield (15HD465)

Unit Type/Number	Zone/Level	Artifact Type	Frequency
BERM TRENCH		ball from a buck and ball shot	1.00
BERM TRENCH		metal button fragment (not found in bag)	1.00
BERM TRENCH		chainlink	1.00
BERM TRENCH		clay pigeon fragments	2.00
MD A		unidentified nail fragments	3.00
MD A1		iron wire fragment	1.00
MD A2		modern pull tab from a drink can	1.00
MD A3		cut nail fragment	1.00
MD A4		cut nail fragment	1.00
MD AAA		cut nail fragment	1.00
MD B		wood screw	1.00
MD B1		iron wire fragment	1.00
MD B2		cut nail fragment	1.00
MD B3		cut nail fragment	1.00
MD B4		cut nail fragment	1.00
MD BB		unidentified spike fragment	1.00
MD BBB		cut nail fragments	2.00
MD C		wire fragment	1.00
MD C1		12d wire nail (broken)	2.00
MD C2		iron fragment	1.00
MD C3		coarse earthenware with flawed salt glaze	1.00
MD C4		.58 cal. Willams bore-cleaning bullet	1.00
MD C4		harmonica parts	2.00
MD CC		iron strap hinge	1.00
MD CCC		8d cut nail	1.00
MD D		base of shotgun shell (centerfire)	1.00
MD D1		8d cut nail	1.00
MD D2		cut nail fragment	1.00
MD D3		cut nail fragment	1.00
MD D4		unidentified nail fragment	1.00
MD DD		4d cut nail	1.00
MD DD		30d wire spike	1.00
MD DD		unidentified nail fragments	2.00
MD DD		U.S. dime minted in 1970	1.00
MD DD		U.S. penny minted in 1995	1.00
MD DDD		cut nail fragments	2.00
MD E		wire fragment	1.00

Artifacts from Fort Duffield (15HD465)

Unit Type/Number	Zone/Level	Artifact Type	Frequency
MD E1		unidentified nail fragment	1.00
MD E2		cut nail fragment	1.00
MD E3		cut nail fragment	1.00
MD E4		base of a shotgun shell	1.00
MD EE		unidentified nail fragment	1.00
MD EEE		3d cut nail	1.00
MD EEE		4d cut nail	1.00
MD F		wire fragment	1.00
MD F1		clay pigeon fragments	4.00
MD F2		beer can top (...ANHEUSER-BUSCH INC.) (Pitch In!)	1.00
MD F3		missing	
MD F4		whiteware fragment	1.00
MD F4		tip of a bayonet sheath (Springfield rifle)	1.00
MD FF		amber beer bottle (?) fragments	2.00
MD FF		aqua flat glass fragment	1.00
MD FF		unidentified nail fragment	1.00
MD FF		machine made brick	1.00
MD FF		machine made brick, glazed	1.00
MD FFF		cut nail fragments	2.00
MD G		wood screw	1.00
MD G1		cut nail fragment	1.00
MD G2		screw	1.00
MD G3		cut nail fragment	1.00
MD G4		base of shotgun shell (Winchester Repeater)	1.00
MD GG		zinc	1.00
MD GGG		missing	
MD H		wood screw	1.00
MD H1		cut nail fragment	1.00
MD H1		plaster	1.00
MD H2		5d cut nail	1.00
MD H3		8d cut nail	1.00
MD H4		aluminum strip, curled on one side, w/ 2 holes drilled in it	1.00
MD HH		double strand wire; no barbs present	1.00
MD HHH		cut nail fragments	2.00
MD I		wood screw	1.00
MD I1		wood fragment	1.00
MD I1		wire fragment, looped and tied off	1.00

Artifacts from Fort Duffield (15HD465)

Unit Type/Number	Zone/Level	Artifact Type	Frequency
MD I2		iron nut, 6 sided	1.00
MD I3		cut nail fragment	1.00
MD I4		base of shotgun shell	1.00
MD II		unidentified nail fragments	2.00
MD II		clay pigeon fragments	3.00
MD III		cut nail fragment	1.00
MD J		wood screw	1.00
MD J		zinc	1.00
MD J1		aluminum foil	1.00
MD J2		cut nail fragment	1.00
MD J3		cut nail fragment	1.00
MD J4		base of shotgun shell	1.00
MD JJ		barbed wire fragment	1.00
MD K		wire fragments	2.00
MD K1		wire spike fragment	1.00
MD K2		cut nail fragment	1.00
MD K3		4d cut nail	1.00
MD K4		bullet (.44 cal Henry flat ball?)	1.00
MD KK		barbed wire fragments	3.00
MD L		wire fragment	1.00
MD L1		barbed wire fragment	1.00
MD L2		40d cut spike	1.00
MD L3		6d cut nail	1.00
MD L4		aluminum can (burned?) part of bar code is visible	1.00
MD LL		5d wire nail	1.00
MD LL		barbed wire fragment	1.00
MD M		wood screw	1.00
MD M1		7d cut nail	1.00
MD M2		cut nail fragment	1.00
MD M3		cut nail fragment	1.00
MD M4		cut nail frag.	1.00
MD MM		barbed wire fragment	1.00
MD MM		unidentified iron fragments	2.00
MD N		cut nail fragment	1.00
MD N1		cut nail fragment	1.00
MD N2		cut nail fragment	1.00
MD N3		ball part of a buck and ball shot	1.00

Artifacts from Fort Duffield (15HD465)

Unit Type/Number	Zone/Level	Artifact Type	Frequency
MD N4		cut spike fragment	1.00
MD NN		2d cut nail	1.00
MD O		barbed wire fragments	3.00
MD O1		cut nail fragment	1.00
MD O1		clay pigeon fragment	1.00
MD O2		cut nail fragment	1.00
MD O3		cut nail fragment	1.00
MD O4		melted aluminum fragment	1.00
MD OO		cut nail fragments	2.00
MD OO		8d cut nail	1.00
MD P		wire nail fragment	1.00
MD P1		cut nail fragments	2.00
MD P2		cut nail fragment	1.00
MD P3		cut nail fragment	1.00
MD P4		aluminum can fragments (melted?)	2.00
MD PP		12d cut nail	1.00
MD Q		U.S. penny minted in 1989	1.00
MD Q1		cut nail fragment	1.00
MD Q2		cut nail fragment	1.00
MD Q3		pull tab	1.00
MD Q3		melted aluminum?	1.00
MD Q4		screw	1.00
MD QQ		cut nail fragment	1.00
MD R		missing	
MD R1		cut nail fragment	1.00
MD R2		6d cut nail	1.00
MD R3		crown cap	1.00
MD R4		4d cut nail	1.00
MD RR		iron rod fragment	1.00
MD S		twisted strips of copper alloy	2.00
MD S1		cut nail fragment	1.00
MD S2		Pepsi screwcap, w/ "S" under the lid (probably part of a contest)	1.00
MD S3		wire fragment	1.00
MD S4		half a horseshoe w/ nails still attached	1.00
MD SS		8d cut nail	1.00
MD T		screw	1.00
MD T1		clay pigeon fragment	1.00

Artifacts from Fort Duffield (15HD465)

Unit Type/Number	Zone/Level	Artifact Type	Frequency
MD T2		wire fragment	1.00
MD T3		cut nail fragment	1.00
MD T4		melted aluminum fragment	1.00
MD TT		shotgun shell base	1.00
MD U		9d cut nail	1.00
MD U		9d wire nail	1.00
MD U1		5d cut nail	1.00
MD U2		cut nail fragment	1.00
MD U3		small wire bolt w/ nut, washer and chunk of wood still attached	1.00
MD U4		missing	
MD UU		aluminum can fragments, melted	3.00
MD UU		clear glass fragment, burned	1.00
MD V		20d wire spike	1.00
MD V1		iron fragment	1.00
MD V2		cut nail fragment	1.00
MD V3		burned clear glass fragment	1.00
MD VV		16d cut spike	1.00
MD W		30d wire spike	1.00
MD W1		modern percussion cap	1.00
MD W2		belt buckle	1.00
MD W3		melted aluminum ?	1.00
MD W3		burned clear glass fragment	1.00
MD WW		D-shaped buckle part	1.00
MD WW		nut	1.00
MD X		aluminum can fragments, gold colored logo?	2.00
MD X		30d wire spike	1.00
MD X1		cut nail fragments	3.00
MD X2		cut nail fragment	1.00
MD X3		melted aluminum(?) fragment	1.00
MD XX		unidentified nail fragment	1.00
MD Y		metal button	1.00
MD Y1		20d cut spike	1.00
MD Y2		6d cut nail	1.00
MD Y3		40d wire(?) spike	1.00
MD YY		cut nail fragment	1.00
MD Z		iron rod	1.00
MD Z1		large iron nut	1.00

Artifacts from Fort Duffield (15HD465)

Unit Type/Number	Zone/Level	Artifact Type	Frequency
MD Z1		clay pigeon fragment	1.00
MD Z2		12d cut nail	1.00
MD Z3		9d wire nail, w/ large round head	1.00
MD ZZ		aluminum foil	1.00
ST 01	LEVEL 1	amber beer bottle(?) frag.	1.00
ST 01	LEVEL 1	fluted aqua glass frags.	3.00
ST 01	LEVEL 2	"Durkee & Co."; bottle pat. 4.17.1877; salad dressing	5.00
ST 01	LEVEL 2	aqua beer bottle frag. (Old Style Lager/GHEI/LA or LN)	1.00
ST 01	LEVEL 2	unid. nail frags.	2.00
ST 02	LEVEL 1	aqua flat glass frags.	9.00
ST 02	LEVEL 1	unid. nail frag.	1.00
ST 02	LEVEL 1	bone frag. (burned?)	1.00
ST 02	LEVEL 2	aqua flat glass frag.	1.00
ST 02	LEVEL 2	blue flat glass frag.	1.00
ST 02	LEVEL 2	cut nail frag.	1.00
ST 02	LEVEL 2	copper conduit wire	1.00
ST 02	LEVEL 2	Liberty head 5-cent piece; 1903; US	1.00
ST 02	LEVEL 3	aqua flat glass frags.	6.00
ST 02	LEVEL 3	unid. nail frags.	3.00
ST 02	LEVEL 3	brick frags.	2.00
ST 02	LEVEL 3	charcoal frags.	5.00
ST 03	LEVEL 1	aqua flat glass frag.	1.00
ST 03	LEVEL 1	5d cut nail	1.00
ST 03	LEVEL 2	blue-green flat glass frag.	1.00
ST 03	LEVEL 2	cut nail frag.	1.00
ST 03	LEVEL 2	unid. nail frags.	5.00
ST 03	LEVEL 3	unid. nail frags.	3.00
ST 04	LEVEL 4	cut nail frags.	2.00
ST 04	LEVEL 4	8d cut nail	1.00
ST 04	LEVEL 4	12d cut nail	1.00
ST 05	LEVEL 1	cut nail frag.	1.00
ST 06	LEVEL 1	plaster	1.00
ST 06	LEVEL 2	chert flake and core	2.00
ST 06	LEVEL 2	unid. nail frag.	1.00
ST 06	LEVEL 2	plaster	2.00
ST 07	LEVEL 1	clear glassware rim fragments	2.00
ST 07	LEVEL 1	clear glass stopper	1.00

Artifacts from Fort Duffield (15HD465)

Unit Type/Number	Zone/Level	Artifact Type	Frequency
ST 07	LEVEL 1	amber glass beer bottle fragment	1.00
ST 07	LEVEL 1	cut nail fragments	3.00
ST 07	LEVEL 1	wire nail fragments	2.00
ST 07	LEVEL 1	2d wire nails (roofing?)	2.00
ST 07	LEVEL 1	unidentified nail fragments	26.00
ST 07	LEVEL 1	20d cut spike	1.00
ST 07	LEVEL 1	concrete fragment	1.00
ST 07	LEVEL 1	aqua glass fragment	1.00
ST 07	LEVEL 2	amber glass beer bottle fragments ("ZS.")	4.00
ST 07	LEVEL 2	cut nail fragments	2.00
ST 07	LEVEL 2	unidentified nail fragments	14.00
ST 07	LEVEL 2	cement fragments	5.00
ST 07	LEVEL 2	clear glass fragment	1.00
ST 07	LEVEL 3	unidentified nail fragment	1.00
ST 07	LEVEL 3	whetstone fragment	1.00
ST 07	LEVEL 3	coal fragment	1.00
ST 08	LEVEL 1	unidentified nail fragments	2.00
ST 08	LEVEL 1	16d wire spike	1.00
ST 08	LEVEL 1	20d wire spike	1.00
ST 08	LEVEL 1	clay pigeon fragments	2.00
ST 08	LEVEL 2	amber beer bottle (?) fragment	1.00
ST 08	LEVEL 2	unidentified nail fragments	3.00
ST 08	LEVEL 2	clay pigeon fragment	1.00
ST 08	LEVEL 3	missing	
ST 09		chert flakes	4.00
ST 09		coarse earthenware fragment, w/ brown (lead?) glaze	1.00
ST 09		coarse earthenware rim w/ brown (lead?) glaze	1.00
ST 09		green bottle fragment	1.00
ST 09		fragments of 2 cans	42.00
ST 09		aqua flat glass fragment	1.00
ST 09		cut nail fragments	6.00
ST 09		3d cut nail	1.00
ST 09		unidentified nail fragments	9.00
ST 09		brick fragments	2.00
ST 09		ball from buck and ball shot	1.00
ST 09		aqua glass fragments	3.00
ST 09		clear glass fragment	1.00

Artifacts from Fort Duffield (15HD465)

Unit Type/Number	Zone/Level	Artifact Type	Frequency
ST 09		unidentified bone fragments	2.00
ST 10		amber glass beer bottle fragment	1.00
ST 10		aqua flat glass fragment	1.00
ST 10		cut nail fragments	4.00
ST 10		brick fragments	4.00
ST 10		aqua glass fragment	1.00
ST 10		charcoal fragments	2.00
ST 12		patinated amber glass bottle fragment	1.00
ST 12		aqua flat glass fragment	1.00
ST 12		cut nail fragments	7.00
ST 12		white 4-holed porcelain button	1.00
ST 12		unidentified burned bone fragment	1.00
TRENCH NEAR CIST	UNDER ROCKS	amber glass beer bottle base fragments	3.00
TRENCH NEAR CIST	UNDER ROCKS	amber glass beer bottle fragments	18.00
TRENCH NEAR CIST	UNDER ROCKS	aqua flat glass fragments	2.00
TRENCH NEAR CIST	UNDER ROCKS	8d cut nail	1.00
TRENCH NEAR CIST	UNDER ROCKS	clay pigeon fragment	1.00
TRENCH NEAR CIST	UNDER ROCKS	clear glass fragment	1.00
UNIT 1	LEVEL 1	dark green bottle frags.	4.00
UNIT 1	LEVEL 1	amber flask frag. (pattern moulded?)	1.00
UNIT 1	LEVEL 1	aqua flat glass frags.	7.00
UNIT 1	LEVEL 1	clear flat glass frags.	3.00
UNIT 1	LEVEL 1	cut nail frags.	11.00
UNIT 1	LEVEL 1	12d wire nail	1.00
UNIT 1	LEVEL 1	unid. nail frags.	6.00
UNIT 1	LEVEL 1	4-holed milk glass button	1.00
UNIT 1	LEVEL 1	clay pigeon frags.	3.00
UNIT 1	LEVEL 1	light green fluted glass frag.	1.00
UNIT 1	LEVEL 1	unid. bone frag.	1.00
UNIT 1	LEVEL 2	aqua glass rim fragment, frosted (Packer finish)	1.00
UNIT 1	LEVEL 2	dark green glass fragments, burned	2.00
UNIT 1	LEVEL 2	amber glass beer bottle fragment	1.00
UNIT 1	LEVEL 2	aqua flat glass fragments	54.00
UNIT 1	LEVEL 2	clear oval or round picture frame glass with rim	8.00
UNIT 1	LEVEL 2	cut nail fragments	10.00
UNIT 1	LEVEL 2	4d cut nail	1.00
UNIT 1	LEVEL 2	unidentified nail fragments	7.00

Artifacts from Fort Duffield (15HD465)

Unit Type/Number	Zone/Level	Artifact Type	Frequency
UNIT 1	LEVEL 2	clay pigeon fragments	3.00
UNIT 1	LEVEL 2	fluted light green glass fragments	2.00
UNIT 1	LEVEL 2	fluted clear glass frag.	1.00
UNIT 1	LEVEL 2	unidentified burned bone fragment	1.00
UNIT 1	LEVEL 3	dark green bottle fragments	3.00
UNIT 1	LEVEL 3	aqua flat glass fragments	152.00
UNIT 1	LEVEL 3	cut nail fragments	13.00
UNIT 1	LEVEL 3	unidentified nail fragments	9.00
UNIT 1	LEVEL 3	clay pigeon fragment	1.00
UNIT 1	LEVEL 3	aqua glass fragments	3.00
UNIT 1	LEVEL 3	clear glass fragments	2.00
UNIT 1	LEVEL 3	unidentified burned bone fragments	4.00
UNIT 1	LEVEL 4	dark green bottle fragment	1.00
UNIT 1	LEVEL 4	aqua flat glass fragments	15.00
UNIT 1	LEVEL 4	cut nail fragments	11.00
UNIT 1	LEVEL 4	3d cut nail	1.00
UNIT 1	LEVEL 4	12d cut nail	1.00
UNIT 1	LEVEL 4	unidentified nail fragments(many with pieces of charcoal on them)	15.00
UNIT 1	LEVEL 4	16d cut spike	1.00
UNIT 1	LEVEL 4	brick fragments	5.00
UNIT 1	LEVEL 4	4-holed milk glass button	1.00
UNIT 1	LEVEL 4	clear glass fragment	1.00
UNIT 1	LEVEL 4	charcoal fragment	1.00
UNIT 1	LEVEL 5	amber glass beer bottle fragments (1 patinated)	2.00
UNIT 1	LEVEL 5	aqua flat glass fragments	3.00
UNIT 1	LEVEL 5	unidentified nail fragments	1.00
UNIT 2	LEVEL 1	chert flakes	2.00
UNIT 2	LEVEL 1	undecorated whiteware tableware frag.	1.00
UNIT 2	LEVEL 1	clear glass rim fragments (screw closure)	3.00
UNIT 2	LEVEL 1	green glass fragment	1.00
UNIT 2	LEVEL 1	light green glass fragment	1.00
UNIT 2	LEVEL 1	dark green bottle fragments	35.00
UNIT 2	LEVEL 1	amber beer bottle (?) frags. ("W"; "S &")	6.00
UNIT 2	LEVEL 1	patinated amber flask frag. (pattern moulded?)	1.00
UNIT 2	LEVEL 1	aqua flat glass fragments	14.00
UNIT 2	LEVEL 1	light blue flat glass fragments	2.00
UNIT 2	LEVEL 1	cut nail fragments	16.00

Artifacts from Fort Duffield (15HD465)

Unit Type/Number	Zone/Level	Artifact Type	Frequency
UNIT 2	LEVEL 1	2d wire nail (roofing nail?)	1.00
UNIT 2	LEVEL 1	unidentified nail fragments	73.00
UNIT 2	LEVEL 1	brick fragments	3.00
UNIT 2	LEVEL 1	.32 cal. cartridge case w/ wood & graphite insert	1.00
UNIT 2	LEVEL 1	screw	1.00
UNIT 2	LEVEL 1	iron scrap metal frag.	1.00
UNIT 2	LEVEL 1	clay pigeon	1.00
UNIT 2	LEVEL 1	aqua fluted glass fragment	1.00
UNIT 2	LEVEL 1	light green fluted glass fragments	2.00
UNIT 2	LEVEL 1	snail shell frag.	1.00
UNIT 2	LEVEL 2	chert flakes	3.00
UNIT 2	LEVEL 2	dark green bottle fragments	2.00
UNIT 2	LEVEL 2	aqua flat glass fragments	6.00
UNIT 2	LEVEL 2	cut nail fragments	27.00
UNIT 2	LEVEL 2	unidentified nail fragments	15.00
UNIT 2	LEVEL 2	brass button	1.00
UNIT 2	LEVEL 2	red clay pipe bowl fragment (molded decoration)	1.00
UNIT 2	LEVEL 2	bolt w/ nut	1.00
UNIT 2	LEVEL 2	lead fragment	1.00
UNIT 2	LEVEL 2	green glass fragment	1.00
UNIT 2	LEVEL 2	clear glass rim fragment	1.00
UNIT 2	LEVEL 3	blue glass bottle fragments	2.00
UNIT 2	LEVEL 3	blue glass bottle base (empontilled)	1.00
UNIT 2	LEVEL 3	dark green bottle fragments	3.00
UNIT 2	LEVEL 3	amber glass beer bottle base fragment	1.00
UNIT 2	LEVEL 3	amber glass beer bottle fragments	2.00
UNIT 2	LEVEL 3	aqua flat glass fragments	2.00
UNIT 2	LEVEL 3	cut nail fragments	80.00
UNIT 2	LEVEL 3	6d cut nail	1.00
UNIT 2	LEVEL 3	8d cut nail	1.00
UNIT 2	LEVEL 3	unidentified nail fragments	35.00
UNIT 2	LEVEL 3	cut spike fragments	2.00
UNIT 2	LEVEL 3	brick fragments	5.00
UNIT 2	LEVEL 3	Shotgun shellbase (Winchester)	1.00
UNIT 2	LEVEL 3	4-holed milk glass button	1.00
UNIT 2	LEVEL 3	mirror fragment	1.00
UNIT 2	LEVEL 3	red clay pipe bowl fragment (molded decoration)	1.00

Artifacts from Fort Duffield (15HD465)

Unit Type/Number	Zone/Level	Artifact Type	Frequency
UNIT 2	LEVEL 3	leather scraps	10.00
UNIT 2	LEVEL 3	iron sheet metal fragments	7.00
UNIT 2	LEVEL 3	clay pigeon fragment	1.00
UNIT 2	LEVEL 3	green glass fragment	1.00
UNIT 2	LEVEL 3	clear glass fragment	1.00
UNIT 2	LEVEL 4	aqua flat glass fragments	2.00
UNIT 2	LEVEL 4	cut nail fragments	27.00
UNIT 2	LEVEL 4	4d cut nail	1.00
UNIT 2	LEVEL 4	6d cut nail	1.00
UNIT 2	LEVEL 4	unidentified nail fragments	13.00
UNIT 2	LEVEL 4	small caliber lead bullet with sprue	1.00
UNIT 2	LEVEL 4	red clay pipe bowl fragment (molded decoration)	1.00
UNIT 2	LEVEL 4	leather fragments	9.00
UNIT 2	LEVEL 4	thin sheet metal enclosing layers of paper	1.00
UNIT 2	LEVEL 4	clay pigeon fragment	1.00
UNIT 2	LEVEL 4	green glass fragment (highly fractured)	1.00
UNIT 2	LEVEL 4	clear glass fragment	1.00
UNIT 3	0- 30 CM BS	aqua flat glass fragment	1.00
UNIT 3	0- 30 CM BS	cut nail fragments	30.00
UNIT 3	0- 30 CM BS	2d cut nail	1.00
UNIT 3	0- 30 CM BS	3d cut nail	1.00
UNIT 3	0- 30 CM BS	6d cut nail	2.00
UNIT 3	0- 30 CM BS	8d cut nail	2.00
UNIT 3	0- 30 CM BS	9d cut nail	1.00
UNIT 3	0- 30 CM BS	unidentified nail fragments	22.00
UNIT 3	0- 30 CM BS	brick fragments	5.00
UNIT 3	0- 30 CM BS	black plastic fragments	2.00
UNIT 3	0- 30 CM BS	iron fragment	1.00
UNIT 3	0- 30 CM BS	clear glass fragment	1.00
UNIT 3	0- 30 CM BS	burnt unidentified bone fragments	19.00
UNIT 3	40 CM N WALL	green glass bottle rim and neck	1.00
UNIT 3	FEATURE 1	amber glass beer bottle fragment	1.00
UNIT 3	FEATURE 1	aqua flat glass fragment	1.00
UNIT 3	FEATURE 1	burned bone fragment	1.00
UNIT 3	FEATURE 1 EXT.	cut nail fragments	3.00
UNIT 3	FEATURE 1 EXT.	brick fragments	9.00
UNIT 3	FEATURE 1 EXT.	concrete fragments	2.00

Artifacts from Fort Duffield (15HD465)

Unit Type/Number	Zone/Level	Artifact Type	Frequency
UNIT 3	LEVEL 3	undecorated whiteware fragment	1.00
UNIT 3	LEVEL 3	green glass bottle fragments	5.00
UNIT 3	LEVEL 3	dark green glass bottle fragments	2.00
UNIT 3	LEVEL 3	amber glass beer bottle(?) fragment	1.00
UNIT 3	LEVEL 3	light green flat glass fragments	1.00
UNIT 3	LEVEL 3	4d cut nail	2.00
UNIT 3	LEVEL 3	5d cut nail	1.00
UNIT 3	LEVEL 3	6d cut nail	1.00
UNIT 3	LEVEL 3	8d cut nail	1.00
UNIT 3	LEVEL 3	10d cut nail	1.00
UNIT 3	LEVEL 3	unidentified nail fragments	27.00
UNIT 3	LEVEL 3	cut nail fragments	41.00
UNIT 3	LEVEL 3	glazed brick fragment (not found)	1.00
UNIT 3	LEVEL 3	ball from a buck and ball shot	1.00
UNIT 3	LEVEL 3	lens fragments	2.00
UNIT 3	LEVEL 3	mirror fragments	2.00
UNIT 3	LEVEL 3	iron fragments	2.00
UNIT 3	LEVEL 3	clay pigeon fragment	1.00
UNIT 3	LEVEL 3	aqua glass fragment	1.00
UNIT 3	LEVEL 3	clear glass fragment (burned)	1.00
UNIT 3	LEVEL 3	clear glass fragments	2.00
UNIT 3	LEVEL 3	burned animal bone fragment	11.00
UNIT 3	LEVEL 4	biface	1.00
UNIT 3	LEVEL 4	salt glazed stoneware spall	1.00
UNIT 3	LEVEL 4	aqua glass bottle fragment	1.00
UNIT 3	LEVEL 4	aqua glass bottle fragment	3.00
UNIT 3	LEVEL 4	aqua flat glass fragment	1.00
UNIT 3	LEVEL 4	cut nail fragments	51.00
UNIT 3	LEVEL 4	3d cut nail	1.00
UNIT 3	LEVEL 4	5d cut nail	1.00
UNIT 3	LEVEL 4	8d cut nail	1.00
UNIT 3	LEVEL 4	9d cut nail	1.00
UNIT 3	LEVEL 4	unidentified nail fragments	30.00
UNIT 3	LEVEL 4	cut spike fragments	2.00
UNIT 3	LEVEL 4	sheet metal fragments (canteen)	18.00
UNIT 3	LEVEL 4	4-holed buttons	3.00
UNIT 3	LEVEL 4	chunk of coal	1.00

Artifacts from Fort Duffield (15HD465)

Unit Type/Number	Zone/Level	Artifact Type	Frequency
UNIT 3	LEVEL 4	iron fragment	1.00
UNIT 3	LEVEL 4	wire fragment	1.00
UNIT 3	LEVEL 4	dark blue glass fragment	1.00
UNIT 3	LEVEL 4	burnt bone fragment	2.00
UNIT 3	LEVEL 5	chert flakes	2.00
UNIT 3	LEVEL 5	aqua glass fragments	4.00
UNIT 3	LEVEL 5	aqua flat glass fragments	3.00
UNIT 3	LEVEL 5	cut nail fragments	23.00
UNIT 3	LEVEL 5	10d cut nail	1.00
UNIT 3	LEVEL 5	unidentified nail fragments	8.00
UNIT 3	LEVEL 5	tinned iron sheet metal fragments (canteen); one has loop for strap	39.00
UNIT 3	LEVEL 5	lead	1.00
UNIT 3	LEVEL 5	aqua glass fragment	1.00
UNIT 3	LEVEL 5	blue glass fragments	2.00
UNIT 3	LEVEL 5	green glass fragment	1.00
UNIT 3	LEVEL 5	unidentified burnt bone fragment	1.00
UNIT 3	LEVELS 1,2	amber glass beer bottle fragments	4.00
UNIT 3	LEVELS 1,2	green bottle fragment	1.00
UNIT 3	LEVELS 1,2	aqua flat glass fragments	6.00
UNIT 3	LEVELS 1,2	cut nail fragments	62.00
UNIT 3	LEVELS 1,2	8d cut nails	2.00
UNIT 3	LEVELS 1,2	6d wire nail	1.00
UNIT 3	LEVELS 1,2	unidentified nail fragments	22.00
UNIT 3	LEVELS 1,2	machine made brick fragments	5.00
UNIT 3	LEVELS 1,2	modern percussion cap	1.00
UNIT 3	LEVELS 1,2	mirror fragments	2.00
UNIT 3	LEVELS 1,2	unidentified iron fragment	1.00
UNIT 3	LEVELS 1,2	clay pigeon fragment	1.00
UNIT 3	LEVELS 1,2	clear glass fragments, burned	4.00
UNIT 3	LEVELS 1,2	aqua glass fragments (a few fluted)	8.00
UNIT 3	LEVELS 1,2	dark green glass fragment	1.00
UNIT 3	LEVELS 1,2	clear glass fragments (1 fluted)	2.00
UNIT 3	LEVELS 1,2	unidentified burned bone fragments	12.00
UNIT 4	LEVEL 1	dark green glass bottle fragments	14.00
UNIT 4	LEVEL 1	amber glass beer bottle fragment	1.00
UNIT 4	LEVEL 1	aqua flat glass fragments	4.00
UNIT 4	LEVEL 1	cut nail fragments	18.00

Artifacts from Fort Duffield (15HD465)

Unit Type/Number	Zone/Level	Artifact Type	Frequency
UNIT 4	LEVEL 1	6d cut nail	1.00
UNIT 4	LEVEL 1	unidentified nail fragments	7.00
UNIT 4	LEVEL 1	16 cut nail	1.00
UNIT 4	LEVEL 1	.22 cal(?) bullet	1.00
UNIT 4	LEVEL 1	modern percussion cap	1.00
UNIT 4	LEVEL 1	buckle part	1.00
UNIT 4	LEVEL 1	metal button	1.00
UNIT 4	LEVEL 1	red clay pipe bowl fragment (molded decoration)	1.00
UNIT 4	LEVEL 1	aqua glass fragments	5.00
UNIT 4	LEVEL 1	clear glass fragments	2.00
UNIT 4	LEVEL 2	chert fragment	1.00
UNIT 4	LEVEL 2	aqua flat glass fragment	1.00
UNIT 4	LEVEL 2	cut nail fragments	4.00
UNIT 4	LEVEL 2	curtain rod part	1.00
UNIT 5	LEVEL 1	chert flake	1.00
UNIT 5	LEVEL 1	aqua glass bottle fragments	3.00
UNIT 5	LEVEL 1	aqua glass bottle rim fragments, threaded	2.00
UNIT 5	LEVEL 1	clear bottle base fragments	2.00
UNIT 5	LEVEL 1	clear bottle fragment	1.00
UNIT 5	LEVEL 1	clear bottle rim fragment	1.00
UNIT 5	LEVEL 1	green bottle fragments	2.00
UNIT 5	LEVEL 1	amber glass beer bottle fragments	3.00
UNIT 5	LEVEL 1	aqua flat glass fragment	1.00
UNIT 5	LEVEL 1	cut nail fragments	3.00
UNIT 5	LEVEL 1	curtain rod part	1.00
UNIT 5	LEVEL 1	very light green glass fragment ("...E")	1.00
UNIT 5	LEVEL 2	chert flake	1.00
UNIT 5	LEVEL 2	clear (salad dressing?) bottle fragments (E. R. D...)	8.00
UNIT 5	LEVEL 2	clear glass (salad dressing?) bottle rim and neck fragment	1.00
UNIT 5	LEVEL 2	aqua glass bottle fragments ("...LEMAN BRC CO."; "CROSSE, WIS.")	7.00
UNIT 5	LEVEL 2	aqua glass bottle rim and neck fragment	1.00
UNIT 5	LEVEL 2	aqua glass bottle rim fragment, threaded	1.00
UNIT 5	LEVEL 2	amber glass beer bottle fragments	9.00
UNIT 5	LEVEL 2	amber glass beer bottle neck fragments	2.00
UNIT 5	LEVEL 2	cut nail fragments	6.00
UNIT 5	LEVEL 2	unidentified nail fragments	16.00
UNIT 5	LEVEL 2	green glass bottle fragments	3.00

Artifacts from Fort Duffield (15HD465)

Unit Type/Number	Zone/Level	Artifact Type	Frequency
UNIT 5	LEVEL 2	clay pigeon fragments	2.00
UNIT 5	LEVEL 2	clear glass fragments	2.00
UNIT 5	LEVEL 3	chert	1.00
UNIT 5	LEVEL 3	amber glass beer bottle fragments	4.00
UNIT 5	LEVEL 3	aqua flat glass fragments	4.00
UNIT 5	LEVEL 3	cut nail fragments	7.00
UNIT 5	LEVEL 3	unidentified nail fragments	31.00
UNIT 5	LEVEL 3	shotgun shell base ("Winchester, No 12, Nobl...)	1.00
UNIT 5	LEVEL 3	clear glass fragment	1.00
UNIT 5	LEVEL 4	amber glass beer bottle fragments	2.00
UNIT 5	LEVEL 4	cut nail fragments	26.00
UNIT 5	LEVEL 4	unidentified nail fragments	23.00
UNIT 5	LEVEL 4	clay pigeon fragment	1.00
UNIT 5	LEVEL 4	light blue glass fragments	2.00

