ARCHAEOLOGICAL INVESTIGATIONS OF THE KIOWA AND COMANCHE INDIAN AGENCY COMMISSARIES 34-Cm-232

BY

DANIEL J. CROUCH

Contributions of the Museum of the Great Plains, Number 7. Lawton, Oklahoma

DISCLAIMER NOTICE

THIS DOCUMENT IS BEST QUALITY AVAILABLE. THE COPY FURNISHED TO DTIC CONTAINED A SIGNIFICANT NUMBER OF PAGES WHICH DO NOT REPRODUCE LEGIBLY.

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	1978	Final

4. TITLE AND SUBTITLE
Archaeological Investigations of the Kiowa and Comanche Indian Agency Commissaries, 34-Cm-232.

5. FUNDING NUMBERS
C
DACA63-76-C-0256

6. AUTHOR(S)
Couch, Daniel J.

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
Museum of the Great Plains
Lawton, OK

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
US Army
HQ, USAFACFS
Fort Sill, OK 73503-5100

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release: Distribution is unlimited.

12b. DISTRIBUTION CODE

13. ABSTRACT *(Maximum 200 words)*

In order to mitigate the adverse effects of barracks construction on archeological site 34-Cm-232 at Fort Sill, archeological excavations were undertaken at the site in order to recover information that remained at the site concerning the late 19th century Kiowa and Comanche Indian Agency Commissaries. A number of artifacts and features related to the commissaries were recovered and documented as a result of the excavations.

14. SUBJECT TERMS
Fort Sill, cultural resources, Kiowa and Comanche Agency

15. NUMBER OF PAGES
233

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	UL

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89)
Prescribed by ANSI Std Z39-18
298-102

ARCHAEOLOGICAL INVESTIGATIONS OF THE KIOWA AND COMANCHE INDIAN AGENCY COMMISSARIES, 34-Cm-232

by

Daniel J. Crouch

Submitted in partial fulfillment of
Contract No. DACA63.76-C-0256
Corps of Engineers, Fort Worth District

Contributions of the
Museum of the Great Plains
Number 7
Lawton, Oklahoma
1978

ACKNOWLEDGMENTS

Many have contributed toward the completion of this project. Mrs. Sue Hazen acted as the contracting agent for the Ft. Worth District Corps of Engineers while Colonel R. G. Huber, Director of the Fort Sill Directorate of Facilities Engineering, and Captain Art Lupien, Fort Sill's Chief of the Environmental and Natural Resources Conservation Division, provided much valuable assistance. Mr. Joe Saunders and Miss Laura Gerwitz were responsible for the direction of the excavation in the field. Mr. Wayne Henson who had been a member of the field crew stayed on to help with the artifact processing. He was joined by Mrs. Bette Franken who not only is largely responsible for the drawings as well as the analysis of the bone and tin cans, but with Mr. Larry Gee aided in the preparation of the photographs. The typing of the manuscript was accomplished by Mrs. Deanna Patterson and Mrs. Mari Adams while Mr. John Northcutt helped with the laborious job of proof-reading.

The information contained herein came from many different sources. I would like to thank all those contributing individuals and in particular Mr. W. H. Jones of the Fort Sill Museum who offered freely of his knowledge of military history and equipment. In addition, Mr. Reid Ferring acted not only as Principal Investigator, but also is responsible for the analysis of the ceramics from the site.

Finally, I would like to thank those staff members of the Morris Swett Technical Library (Fort Sill), the Fort Sill Museum Library, the Lawton Public Library, the Museum of the Great Plains Library, the Indian Archives of the Oklahoma Historical Society and the National Archives from whom I received many kind considerations.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

INTRODUCTION

The excavations at site 34-Cm-232 during the summer of 1977 constituted assessment and mitigation of impacts to be made by plans to construct barracks for soldiers receiving their Basic Combat Training at Fort Sill, Oklahoma. It constitutes an addendum to a project of archaeological reconnaissance of that same Military Reservation conducted under the supervision of the Principal Investigator, C. Reid Ferring. The Fort Worth District, U.S. Army Corps of Engineers constituted the contracting agency acting for the Fort Sill Directorate of Facilities Engineering.

Although a blacktopped equipment parking lot had existed over the site since the Second World War, information from local oral traditions, written documents relating to the period, and a commemorative marker erected on the site probably in the 1930's indicated that this was the likely location of structures associated with the original Kiowa, Comanche, and Kiowa Apache Indian Agency. As will be shown, significant remains confirming this location did exist.

CHAPTER I
HISTORICAL BACKGROUND

As early as the Louisiana Purchase, it had been planned that an area should be set aside in the west so that Indian tribes displaced by white settlers might have a place to which to retire. Rapid colonization of much of that potential area during the early years of the nineteenth century greatly restricted where such a reserve might be located. That area was at first only vaguely defined but with the pioneers' westward movement, a more formal designation became necessary. The first such definition set boundaries to include lands west of the states of Missouri and Arkansas and between the Platte and the Red Rivers. It was called the "Indian Territory." However, with the designation of Kansas and Nebraska as territories in 1854, the only portion of "Indian Territory" yet remaining closed to white settlement was that which later became known as Oklahoma.

In the following years many different tribes from different parts of the country and with varying cultural backgrounds were resettled here. Southwestern Oklahoma, already granted to the Choctaws and the Chickasaws residing in eastern Oklahoma, was needed for the use of certain Plains tribes, notably the Kiowa and Comanche. These latter groups in fact already occupied the area, avoided by the Choctaws and Chickasaws because of the warlike tendencies of the Plains groups. However, the payment of monies provided the government with the legal basis whereby they established the so-called "Leased District." It extended from the 98th to the 100th Meridians and from the Red to the Canadian Rivers. Two military posts were established within it to prevent its use as a sanctuary for raiding into Texas and into Mexico. These included Camp Radziminski and Fort Cobb established in 1858 and 1859 respectively.

In 1859 a number of small tribes including the Tonkawa, Caddo, and others were moved into the Leased District after threats of extermination by Texans who disliked their presence in that state. The first Indian Agency in Southwestern Oklahoma was that which had served those groups in Texas and had accompanied them on their entry. The Wichita, who already lived in Indian Territory, were also included. Fort Cobb was established at the site of this new Indian Agency, redesignated for the Brazos River groups and for the Wichita. Because of intertribal conflicts already alluded to, Fort Cobb was intended for protection of these peaceful Indians as much as for the

Texas whites (Wright, 1968:29). Although the later site of Fort Sill had been recommended, the Superintendent of Indian Affairs, Elias Rector, felt the location was unhealthy and chose instead a more northerly one on the Washita River.

Because of the failure of the Choctaws and Chickasaws to support the Union during the ensuing Civil War, they forfeited their claim to the Leased District. The years following the Civil War saw many concerted attempts to bring into being a system of clearly defined Reservations assigned to a tribe or group of tribes, formalizing white-Indian territorial claims to a degree never before achieved but perhaps intended for over half a century. The Plains tribes including the Kiowa, Comanche, Cheyenne, and Arapahoe were considered especially troublesome because of their raiding of settlements in surrounding areas. This had been encouraged when the Civil War had forced military abandonment of the area. In an attempt to reestablish boundaries restricting the movements of such groups, the Little Arkansas Treaty was signed at a ceremony near Wichita, Kansas. Very quickly, however, it was realized that the borders of the areas designated therein were already badly eroded by white settlement and trespassing. Subsequently, the Medicine Lodge Treaty was signed in 1867 redefining the tribal areas on a smaller scale while in addition specifying certain obligations which the government in return owed these tribes. These obligations included the presence of an appointed Indian Agent. The area of the Kiowa and Comanche and the Plains Apache was to be between the Washita River, the 98th Meridian, and the North Fork of the Red River. At first this was also shared with the Wichita and those smaller tribes previously mentioned who had been brought in from Texas. However, in 1870, a portion of the Cheyenne and Arapahoe Reservation to the immediate north was given over to their needs (Figure 1-1). Once again, military posts were maintained to keep order.

This system of Reservations lasted only a short time, however. Content only while new lands were being made available to desirous white settlers, the government gradually began forcing a turn over of Reservation lands and the acceptance of individual allotments by the Indians. This was an unhappy time and these moves were restricted legally and otherwise, but certain Indian leaders who saw no further value in resisting, cooperated.

The Jerome Agreement, signed in 1892, was the legal basis whereby the Kiowa, Comanche, and Apache Reservation was opened to white settlement. Although the system of Indian Agencies continued after this time, the Reservation way of frontier life ended. The

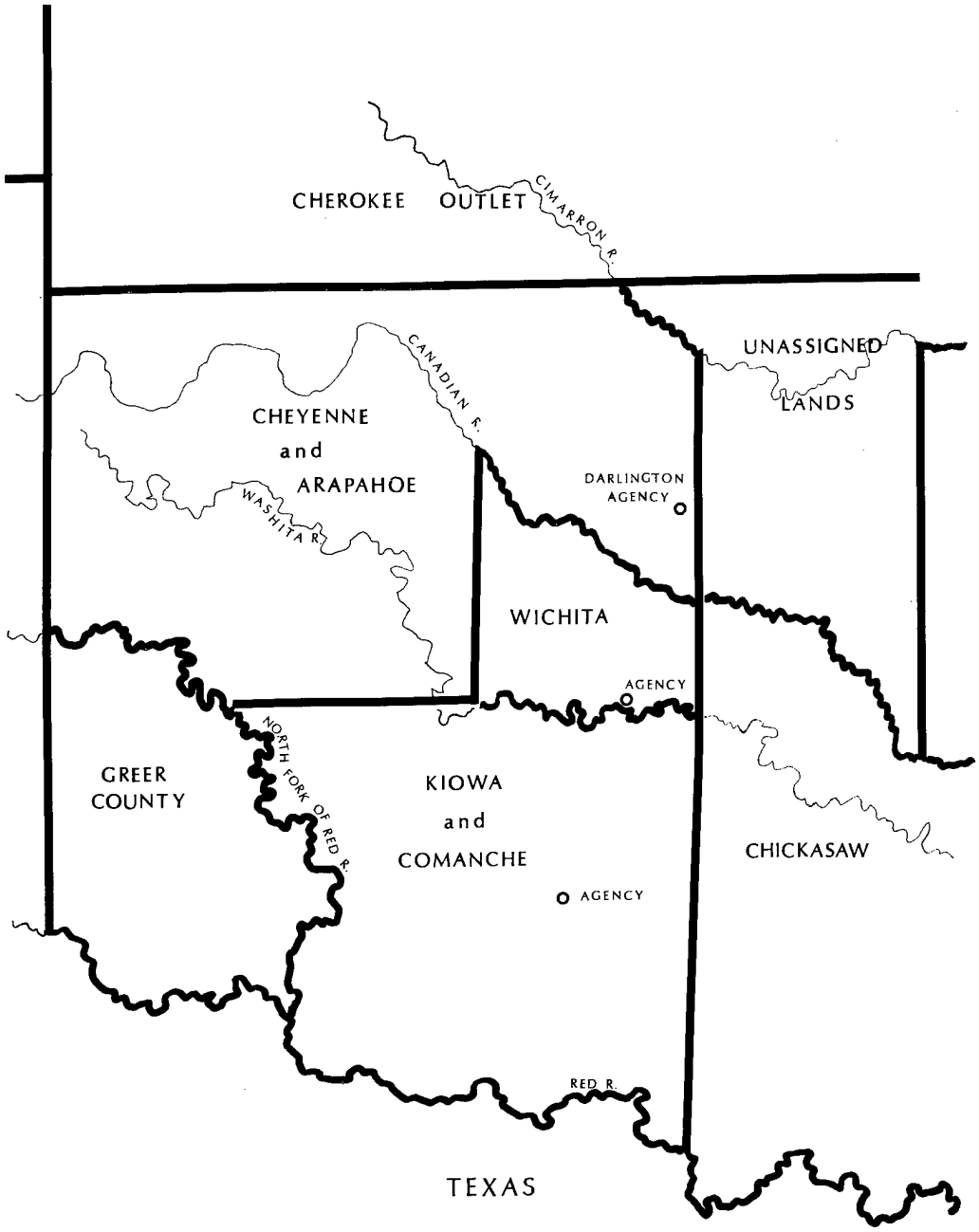


Figure 1-1. Indian Agencies and Reservations in Southwest Oklahoma.

Indians became individual land owners under the Agent's protection rather than members of a territorially and legally sovereign group. (The foregoing discussions are based primarily on facts as presented in Gibson's 1965 treatment of Oklahoma history.)

The activities and events which surrounded the Agency Commissaries at Cm-232 encompass a brief yet significant portion of those frontier Reservation years. It begins following the winter campaign of 1868-1869 during which military units operating from many different posts outside of the Reservation entered into the Panhandle of Texas and the Reservation itself in order to bring the tribes to Fort Cobb and to restrict their future movements off of the Reservation. It did this latter by once again asserting the possibility of imminent retribution. It brought about the former both by violent force, as with the "Battle of the Washita," but more importantly, simply by keeping the Indian so constantly on the move that they were exhausted logistically and spiritually. This initial effort was largely successful. It was decided that a strong military force should be reestablished locally in order to more quickly bring force to bear. Fort Cobb, the garrison active during the years prior to the Civil War, was now found unacceptable for many reasons. This new military force was therefore established at the location rejected earlier by Superintendent Rector and now selected for the winter encampment of General Phillip H. Sheridan, commander of the military units involved in the campaign. At first known as "Camp Wichita" and renamed "Fort Sill" at the suggestion of General Sheridan, it became a permanent military garrison. It was similarly decided that this was to be the location of the Indian Agency both because of the military protection nearby and because of the logistical and the communications facilities which would thereby be available.

It had always been accepted practice that Agents be politically appointed. This had in the past led to corruption and inept administration. The newly elected President Grant decided that this might be avoided by revising the method of Agent selection and hopefully the type of individual selected. He subsequently decided to turn over to the Quaker church responsibility for selecting men to act as Indian Agents to reservations in the Indian Territory and in the states of Kansas and Nebraska. This was the first part of an experiment in trying to apply the so-called "Peace Policy." The Quakers selected an Iowa farmer, Lawrie Tatum, to be the new Agent to the Kiowa and Comanche Reservation. Tatum was to replace Colonel Albert G. Boone who acted as the Agent to the Kiowa, Comanche, Wichita and affiliated bands out of Fort Sill under Colonel Hazen, Superintendent of all the tribes in Indian Territory (Nye, 1969:99). After receiving his appointment, Tatum travelled to Fort Sill to begin the direction of the agency. Before he arrived, however, his needs were anticipated by General Hazen who began construction of two frame Commissary warehouses and an Agency headquarters of adobe (Nye, 1969:102). These buildings played an important role in the following years (Figure 1-2).

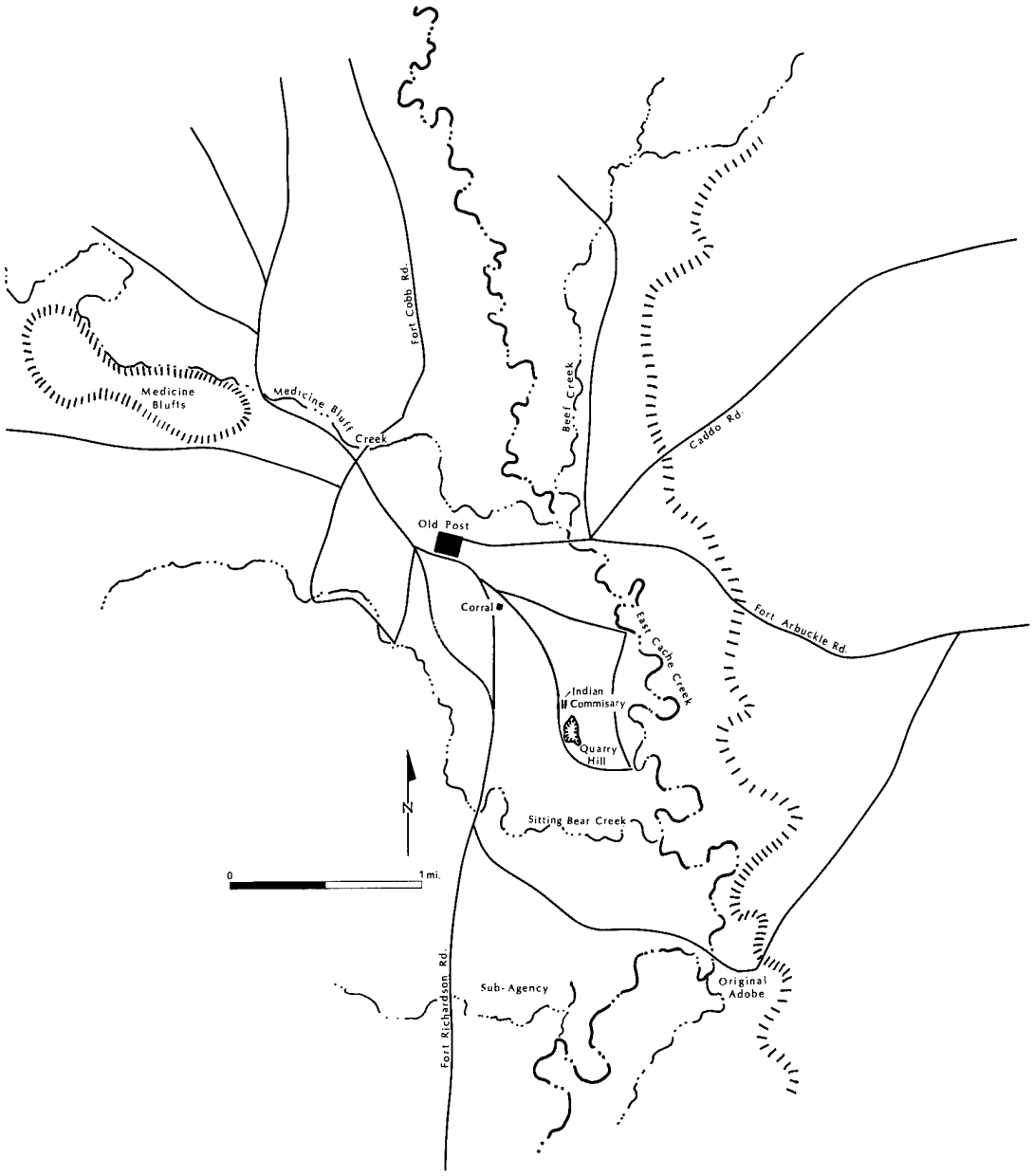


Figure 1-2. The Kiowa-Comanche Agency and Surrounding Area.

Details of the actual construction of the two warehouses at Cm-232 are not known. According to Nye (1969:102),

> As long as the Indians remained under the military agent few arrangements could be made to erect agency buildings. Hazen and his assistants issued supplies to the Indians from tents located near Grierson's house. Pending the arrival of the new Quaker agent, Colonel Hazen awarded a contract to John Shirley to build two agency warehouses on the ridge immediately north of Quarry Hill. The site selected for the agency itself was farther south,

> in the neighborhood of the stores operated by Evans and Mathewson. Hazen constructed an adobe house for himself on the east bank of Cache Creek, opposite Mathewson's store.

It is known that letters from Boone as late as March of 1869 indicated that the goods were stored in "taurpaulin houses" (Letters Received, Office of Indian Affairs; Microcopy 234, Roll 376, #0114)* and that they were still living in tents (Letters Received, Office of Indian Affairs; Microcopy 234, Roll 376, #0134). According to Tatum (1970:27),

> On July 1st, 1869, the care of the agency, with the Government property belonging to it, was transferred to me, except the commissary stores in charge of the Military Department, which were not transferred until a year later.

Arriving here on 15 June, by 29 June (see Appendix A, #1) he had already contracted for lime for plastering "the Agency house." On 7 July he wrote complaining of the condition of the roof of the "ware house for Indian goods" (Appendix A, #2). Apparently it did not take long for the inadequacy of his facilities to be manifest. Indicated also is the essential completion of the Commissaries between March when Boone last indicated storage in tents and July when Tatum complained of rain ruining the goods kept in the Commissaries. Apparently the adobe building was still being erected when he arrived in June (Tatum, 1970:26). Except for the possible need for plastering, his earliest known complaint about the adobe building is in his letter of 18 August mentioning its unhealthful and inopportune location. These are conditions he had had time to experience personally.

The reason for the division of responsibilities for Agency stores noted above is not known. In other areas at this time, the military still acted as the government's agent in care of their Indian charges and perhaps it seemed only natural for them to still retain some control here. According to Barbara Fisher (1963:69-70 footnote),

> After passage of the Army Appropriation Act of July 15, 1870, which prohibited the appointment of Army officers in any civil capacity, military personnel at the agencies relinquished their control and other religious groups became active in Indian management.

*"Letters Received, Office of Indian Affairs" refers to documents in the National Archives.

This one-year retention of military control, however justified, may have ceased under the provisions of this Appropriations Act. In the meantime, Tatum, his family, and some of his employees are known to have occupied the adobe building on the east side of Cache Creek which Tatum had considered so unhealthy. As stated by Josiah Butler, who, with his wife Lizzie as matron, was to conduct the Agency's Indian school (Butler, 1928:494-495),

> After Colonel Lee left, the Agent, Lizzie and I moved from the adobe house on the farm up to the south end of the west commissary building. The buildings are about 200 feet long with a corral between them and stand north and south.

Butler's diary records that event as taking place on 19 August 1870. This move does not precisely correspond to the transfer of responsibilities, however. According to Tatum (1970:36),

> On the 1st of July the commissary stores, including 4,299 head of fat cattle, had been transferred to me from the Military Department.

Tatum's wife, Mary Ann, and a number of the Agency personnel had shortly before left the Reservation (according to Butler, 1928:494, on 5 July 1870) after several deprivations. One of these included the shooting of a quartermaster employee named Levi Lucans only 200 yards from the adobe Agency where Tatum and his wife slept. This was on 22 June 1870 (Butler, 1928:493; Nye, 1969:110). Until that move, the adobe building appears to have been the functioning headquarters of the Agency.

Disregarding the many unanswered questions of the erection of the Commissary buildings, it is known that they were finally occupied by Tatum the next year. What living accommodations were like prior to his arrival is not known, nor to what extent he had to make alterations to suit his needs. But he did attempt to make it a home. Rooms at the end of each building were used as quarters. With the number of employees residing there and with visitors such as Israel and Ruth Negus from the Darlington Cheyenne Agency to the north, fairly substantial room might be assumed. In the evening, religious services were held in the council room (Conover, 1927:47). With his farming background, it seemed only natural that Tatum keep chickens. They did not bother the peach trees he had planted in the Commissary yard. However, because of the lack of fencing lumber, the chickens might have been what prevented him from planting the flower garden Tatum wanted although they did not prevent his planting of roses (Tatum, 1967:52, 54, 57).

The business of the Agency was carried on both in Tatum's office and in the large council room. A number of important conferences were held in the latter. One in particular received attention from many different sources. With Colonel Grierson, Horace Jones, and Matthew Leeper, Tatum met with important chiefs following an outbreak from the Reservation during the summer of 1870. (According to Conover, he and John Warren were present, but not Leeper. Conover, 1927:23.) The Indians tried to insure acceptance of their demands with many implied threats. They emptied and reloaded their weapons, strung bows, and sharpened knives as the talks progressed. As Tatum states (1970:43),

> After the council closed an Indian came to me and ran his hand under my vest over my heart to see if he could "feel any scare." But it was beating calmly as usual.

Conover (1927:23-26), who also gives a description of the meeting, adds "the council was held in the east Commissary building." Further, he states it was Lone Wolf who checked Tatum for signs of fear. Nye (1969:115-117) summarizes these eyewitness accounts of the meeting.

Another noteworthy meeting took place in the council room. According to Nye (1969:134) Tatum called the Indians into the council room in order to question them about the Warren Wagon Train Massacre. It was then that Satanta first claimed credit for helping lead the attack.

Accounts of the incidents surrounding the arrest of three of the most important Kiowa leaders following the Warren Wagon Train Massacre do differ. Conover, for example, places Sherman at the Commissary during or immediately prior to that meeting.

> Sherman was walking back and forth upon the porch of the Commissary with his hands behind him in meditative attitude, when Sa-tan-ta with Horace P. Jones approached, and Jones introduced Sa-tan-ta, but the General paid but scant attention, did not offer to shake hands, but merely remarked, "Yes, I have heard of him," and continued his meditative walk. The Indians were anxious to hold a council, and when they got together in the commissary council room an inquiry was made concerning the raid in Texas. . . . (Conover, 1927:29-31).

Conover's remembrance of this event many years after its occurrence is, however, not substantiated elsewhere.

The issuing of rations every other week and the issuing of the yearly annuities were scenes most commonly associated with the Commissaries. These have been described in many sources, although always without specific details. Goods issued included beef, bacon, flour, coffee, soda, soap, tobacco, and sugar (Conover, 1927: 2-3; Tatum, 1970:73). Annuities included certain hardware, clothing, beads, etc. (Conover, 1927:62). These were generally festive events. Many of the Fort Sill garrison turned out to watch and the Indians enjoyed themselves.

> During the time that it took to issue rations, the braves held pony races or engaged in shooting matches with bow and arrows. Ration day to them was almost like a circus day in civilized sections (Barbara Fisher, 1963: 92).

These were not always so pleasant for everyone, however. During one such issue Big Bow and Satanta, at odds over the former's theft of Satanta's wife, met and almost came to violence but for the intercession of Horseback, a Comanche. The Agency employees in the meantime remained in hiding until the problem was settled (Butler, 1928:496).

At times the Indians were hard to manage and even ran amock. Following one such incident Tatum was forced to ask that soldiers be present at the "issue door" (Tatum, 1970:48). While this did have pacifying results, it was looked upon by the other Quakers with some disapproval. In time such practical applications of force, implied or otherwise, on Tatum's part led to a split which caused his resignation. (For other descriptions of such issues see Battey, 1968:141 and Butler, 1928:519.)

Tatum's resignation took effect 31 March 1873. His replacement was James H. Haworth. The latter was the last of the Quaker Agents who would represent an attempt to apply the "Peace Policy" initiated in 1869. Little is known of the daily life at the Agency under him. He made less use of the military authority than had Tatum. Haworth claimed, as did Battey (1968:141) and others, that this was at his own request. However, Colonel Davidson, Post Commander, and documents written at the time indicate that Davidson was responsible for dismissal of the military guard at the Agency in order to better comply with what Haworth had touted as a need to show more confidence in the brotherhood of the Indians. Haworth had strenuously objected to the action.

The years which followed Haworth's assumption of the position of Agent saw an increase in raiding off of the Reservation. Some accredited this to his weakness and to his inability to get along with the military. Be this as it may, 1874 saw initiation of the largest military campaign against the Indians since that of winter, 1868-1869.

During this time there was increasing talk of the possibility of merging the Kiowa and Comanche Agency with that of the Wichita and Affiliated bands which had been established in 1870 (Figure 1-1). Such a move had been advocated by Tatum and Haworth. Their reasons were that the military occupation of so much of the terrain near the Agency made for that much less room for the Indians to permanently settle. In addition, the Indians resented the proximity of what they considered to be a threatening force. Subsequently, in spite of requests for monies to maintain the Agency buildings at Fort Sill, these were largely left uncared for and rapidly deteriorated. This move was eventually made after Agent Haworth had been succeeded by Philemon B. Hunt. Appointed in March, he replaced Haworth on 1 April 1878.

Strangely, it was only just prior to the move that the authorities decided to make improvements on the Commissaries which by that time were nearly collapsing. This work will be examined in more detail in the discussions of architecture. Proposals for the reconditioning of the Commissaries were accepted in November and December of 1877, and the work appears to have been completed before the end of the year. Shortly thereafter in a letter dated 18 June 1878, George Hunt (who was acting as Agent during the absence of his brother) was ordered to select the site of the new Agency and to call it Anadarko. The move itself was finalized by July of 1879 although P. B. Hunt, now Agent to the entire consolidated Agency, frequently visited Fort Sill where a subagency was maintained.

It appears that with this move the Commissaries and most of the other Agency buildings at Fort Sill were left vacant. Exactly what became of the Commissaries is not known. However, circumstantial evidence is present.

Beginning as early as 1878, the Agent was required to file with the Indian Service a Descriptive Statement of all properties belonging to the Agency (Appendix A, #6). These records are available in the Kiowa Indian Agency files in the Indian Archives of the Oklahoma Historical Society. Through that Statement of 1884 the notation is repeatedly made that the buildings are vacant. Although prior interest had been shown in them by local civilians (e.g., Appendix A, #8) their requests were apparently never allowed.

Some buildings were, however, occupied by Indians during the summer although never in the winter (Appendix A, #9). Following 1884, those buildings still on the Agency rolls were either disposed of or issued for Indian occupancy.

The two commissary buildings were carried on these Descriptive Statements through the year 1881. They do not appear on that of the following year and no mention is made of the reason for this change. The question remains as to what did become of them. The archaeological record discussed in the conclusions has something to offer along these lines. As to the historical documentation, the record is also circumstantial. In a letter dated 16 September 1880 (Appendix A, #7), Hunt suggests that some use be made of the abandoned buildings near Fort Sill. Of "the two Commissary warehouses," he says, "it would be to the interests of the Service to tear down and dispose of the lumber for use of the Indians." Although this was put off with a request that he forward to his superiors a further descriptive statement of the buildings present, this is the last known reference to their possible demise just prior to their deletion from the Descriptive Statement. A few years later in a letter dated 15 January 1884, Hunt suggests that the remainder of the buildings at Fort Sill are in such a dilapidated condition that they "could be issued to the Indians as they stand and they could haul off the lumber and help build houses near their fields, which I respectfully recommend" (see Appendix A, #9). In a reply dated 26 January, the Office of Indian Affairs gives him permission to carry out his plans (Appendix A, #10). The fact that a lumber salvage solution was applied to the remaining wooden buildings upon the Agent's request further implies that it might also have been authorized following his similar recommendation some years earlier with regard to the Commissaries. In all likelihood, then, sometime between 1881 and 1882, the two Commissary buildings were razed so that their wood might be salvaged, probably for the use of Indians in construction elsewhere. As will be seen in later discussions, however, this was not the final use of the site.

CHAPTER II
SITE DOCUMENTATION

The evidence relating to the actual architectural details of the Agency Commissaries of Cm-232 are of two types, those present in historical documentation of the period and those revealed by the excavations. The latter is treated in discussion both of the features present on the site and of other indications which did not receive feature designation (Chapter VI).

The documentary evidences relating to the Commissaries come from widely divergent sources which contain little continuity. Certain of these have already been mentioned elsewhere.

Those references which contain the most substantive information include photographs, the Agent's Descriptive Statements, and the details relating to the improvement efforts taken in 1878 in order to recondition the building.

Three photographs are known to exist. Two were taken by the photographer Soule. These are a distant view, looking to the east as taken from the Post Guardhouse (Figure 2-1), and that which shows the Tatum family and employees standing in front of what is probably the south end of the west Commissary (Figure 2-2) where Butler (1928:495) states they resided. That taken from the Guardhouse shows little because of the photograph quality and because of the distance to the buildings themselves. However, apparent are the two parallel Commissaries (note the arrow in Figure 2-1) and a small house to the north of the Agency.

The second Soule photograph (Figure 2-2) was taken obviously before Tatum left in 1873 and sometime after he had moved into the Commissary in August of 1870. Mrs. Tatum had temporarily left the Territory in June of 1870 with others including Tatum's first clerk, Mahala Jay. His position was filled by George Smith, identified as the man leaning against the fence at photo left. This photograph was likely taken no earlier than 1871, by which time Mrs. Tatum (identified as the woman standing in the center of the porch) is thought to have returned. The picture clearly shows board and batten construction. The front porch consists of a raised portico. A large door and what appears to be a loading dock are roughly midway along the west wall

Figure 2-1. Soule Photograph of Fort Sill Showing Commissaries. (Courtesy of Fort Sill Museum)

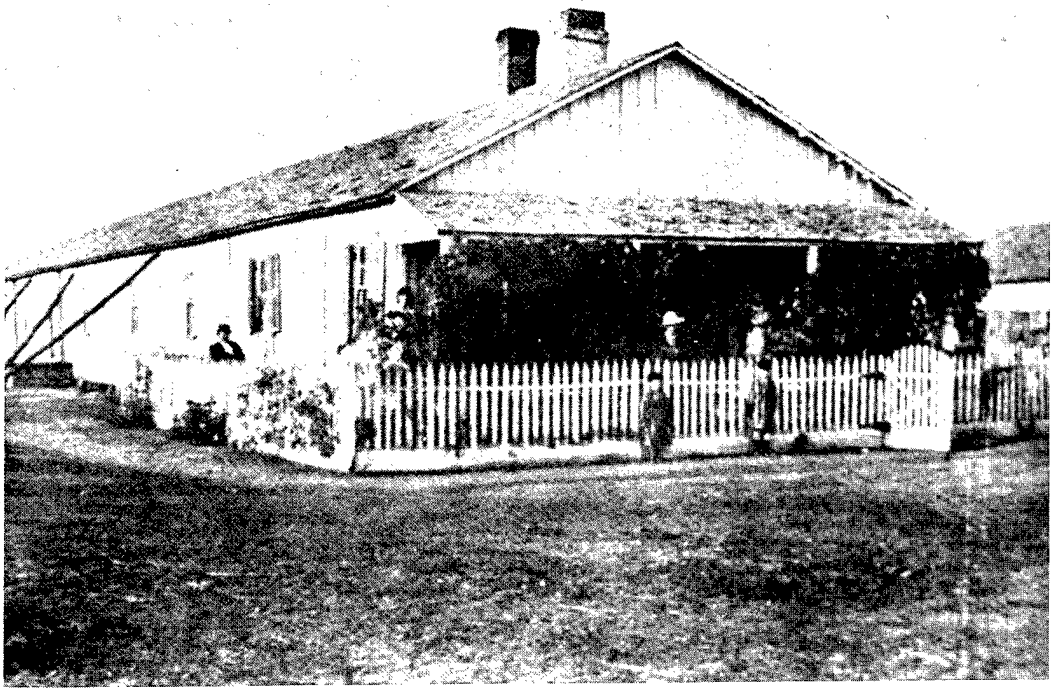


Figure 2-2. Soule Photograph of Tatum Family and Employees in Commissary Yard. (From Nye, 1969; Courtesy of University of Oklahoma Press)

of that west building. Little is visible of the east building although the high fence discussed later is apparent. The front yard of the house is surrounded by a white picket fence. Only two chimneys protrude through the shingled roof, those at the southern end of the building. It is further of interest to note that both chimneys show brick although the most southern of the two also has either a mortar plaster over it or simply has a brick capping. The door is centrally located in the middle of the south wall while what may be a window is present to the east of that. The building appears to rest on piers of some sort and the sheathing boards appear to be about 12 inches wide.

A third photograph also shows something of the Agency (Figure 2-3). It reconfirms what all of the textual descriptions say of the building being long, parallel, and oriented north and south. In addition it is possible to determine that 9 windows were present in the west wall of the western building while the door and loading dock apparent in the family photograph just described are between the 5th and 6th windows (Figure 2-4). Chimneys are also visible.

The small white building to the north of the Commissaries can be seen here as well as in the photo taken from the Guardhouse. It drew attention because of its almost completely unknown nature or associations. Indications of its presence were looked for during the excavations. Nothing of it was seen, its location and what might yet remain of it probably having been farther to the north than was possible to investigate under the limitations of this project. It is not thought at this time to have any direct association with the Commissaries. The only documentary record which has been found which gives some possible clue to its nature was made in one of Tatum's letters (Tatum, 1967:58) dated 21 April 1871 to his wife:

> We all go to Smith's at 8 o'clock in the evening to read a chapter in the Bible. I believe we all enjoy it, and B. Seiser, the Post Commissary clerk, who lives in the house near by, mostly goes there too.

The Smiths are taken to mean George and Margaret Smith who, with their two small boys (probably those seen against the fence in Figure 2-2), lived at the Agency following George's replacement of Mahala Jay as Agency clerk in 1870.

Nothing at all is known of the white, amorphous form between the house and Commissaries (Figures 2-3 and 2-4). The Descriptive Statements filed each year by the Agent itemizing Agency buildings give some significant detail:

Figure 2-3. "Fort Sill, I.T. View from Roof on Forage House. 5-6-1871." (National Archives Photo #111-SC-87878)

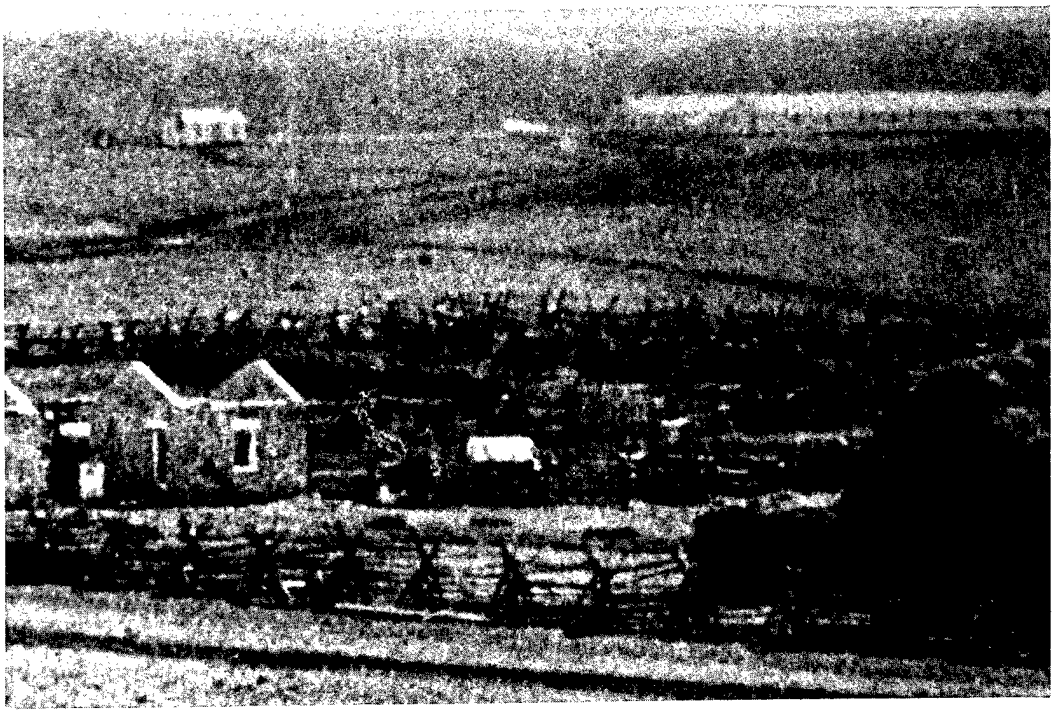


Figure 2-4. Enlargement of Commissaries from Figure 2-3.

Store house- Commissary, Council room, and Quarters; 30' x 200'; box frame; whitewashed; cottonwood shingles; Quarters lathed and plastered; 7 rooms; 19 doors; 25 windows.

Store house- Annuities, Office, and Quarters; 30' x 200'; box frame; whitewashed; cottonwood shingles; Quarters and Office lathed and plastered; 8 rooms; 15 doors; 19 windows. (see Appendix A, #6)

Both are always described as being in bad condition, to have been built by the military in 1869 (a fact already known), and of one 10' 8" story (Appendix A, #6). It is particularly significant that a distinction is made in the use of the two buildings with likely concordant structural and floorplan differences.

With the above mentioned room numbers and uses, the actual floorplan becomes the more tantalizing because of the fleeting and inconclusive references to such uses. This difficulty is compounded by the inability mentioned above to adequately distinguish between one building and another. Some of these references include:

of the dining room-

> 16 sits at the table at once and there are from 2 to 5 tables full; near half of whom are Indians, who drew rations for themselves, and then come here to eat (Tatum, 1967:59).

of the bedrooms-

> On the fourth night, a band of Comanches prowled around the sleeping apartments, and tried the window of the room where these ladies slept, but failing in their purpose, they stole a mule and a pony and went their way (Conover, 1927:45).

of the kitchen-

> The little fellow ate a hearty supper, and while eating he had no use for knife or fork. When the test question was put to him, he said that he would like to go to his own people. The tears immediately started in the eyes of Parry-o-coom, one of the prominent chiefs of the Quahadas. I told the interpreter to take the boy into the kitchen (Tatum, 1970:149).

of the pantry and other rooms-

> After he talked to them in the office he went out, and told me that one of them expected to leave the Indians and the other intended to return with them. I told him to take them into the bedroom after they had eaten dinner and talk to them again. A clerk at J. S. Evans' store, who understood Mexican, went into the room with them. He afterwards told me that the little fellow first took them into the pantry and showed them the stores there, and when he took them into the room he stood in front of them and with appropriate gestures made an eloquent little speech. . . . Never had to quit eating while they (the Indians) were hungry because the food was exhausted, and at night I roll myself up in blankets and sleep so comfortably right here on the floor. . . . We then accompanied them into the office (Tatum, 1970:149-150).

Other than remarks such as quoted above, this report is able to add little to what is known of the precise interior layout.

It is still presently unknown as to which was the "Commissary building" and which was the "Annuity building" (Appendix A, #6). As mentioned before, occasional references have been made to one or the other building without their definite distinction. It is already known that quarters existed in the ends of both and that Tatum's were in the western building (Butler, 1928:494-495). However, the fact that the Council room was in one (the Commissary) while the Office was in the other (the Annuity) may prove useful in helping to provide this determination. For example, in his discussions of the meeting with the Indians following the 1870 raiding season, the meeting at which Tatum had been tested to see if he showed any "scare," Conover (1927:23) states that the meeting took place in the eastern building. This is likely to have been in the Council room.

The call for proposals to recondition the Commissaries asked that bids include both the costs of reshingling with shingles supplied by the Agency sawmill, and the cost of straightening the walls which had settled out of plumb (Appendix A, #4). It has been possible to find only two responding bids. That which is thought to have been accepted is that of William Wykes (Appendix A, #5), mentioned in other sources as having done much carpentry work for the Agency. What must be remembered in this is that although the use of saddle boards and shingles that he would replace is of interest, it is not new.

Further, the use of the braces, while new, were only applied to the buildings immediately prior to their abandonment.

Some details concerning the architecture are more inferential. It might be assumed, for example, that as it was the military that contracted with John Shirley for the construction of the buildings that whatever specifications were laid down (although none have yet been found) followed those of current military practice. So far as the author knows this was the Regulations Concerning Barracks and Quarters for the Army of the United States, 1860 (U.S. Army, 1861). Set forth in this document are general building designs and means by which construction requirements of those designs may be estimated. Leeway is given within it so as to allow accommodation to local conditions. It is assumed that in application even more leeway was occasionally practiced. From what is known of the Agency Commissaries, it appears that these were most similar to the military Storehouse. For example, Storehouses are recommended to be built "of the same breadth and height as the Soldiers' quarters (i.e., 29 feet width, inside measure; variable height) and of such length as may be necessary to give the requisite amount of room" (U.S. Army, 1861: 5). The information which such documents hold concerning practices of the day may in the future be a valuable guide to the reconstruction and understanding of details of construction of the Agency Commissaries. However, the tentative application of the Regulations as well as the nature of this report makes further pursuit of such detail here unwarranted.

Additional comments are pertinent but again convey information by implication. In his letter of 18 August 1869 (Kiowa Indian Agency Records, Indian Archives Division, Oklahoma Historical Society), complaining of the conditions at the adobe building erected for use as an Agency, Tatum requests information as to the costs of its original construction. One of the costs which he mentioned to have been included in the total building costs is that of the plasterers. However, on 29 June 1869, before he actually took over as Agent on 1 July, he contracted with Lew Hutson and John J. Dibble for lime for the plastering of "the Agency house" (Appendix A, #1). He also complains in a letter dated 7 July 1869, to his superiors that the warehouse had been roofed with boards which in the meantime had warped. He asks authorization to have it shingled as the rain is ruining the Agency stores (Appendix A, #2). It would seem then that the buildings prepared for him were not in a completed condition and that he put substantial effort into making them habitable. This implies that the Commissaries might also have been unplastered or otherwise unfinished during their early use.

Certain documented features were not found archaeologically. One of these is the basement mentioned by Nye (1969:118):

> A basement was dug under the north end of the Commissary building, where the soldiers could gather around a stove in the winter time, and thus be close at hand, yet not too obviously in view.

This was done following the 1870 summer raiding season. Nye does not reference this remark making it difficult to assess its reliability and impossible to trace the document in order to discover more details. Nye is quite specific as its placement at the north end of one of the buildings, but it is not possible to determine at this time to which of the two buildings this refers.

Another feature looked for archaeologically but not adequately distinguished was the high fence visible in Figure 2-2. This fence was one of two by which the area between the two buildings was enclosed.

> There were too [sic] large commissary buildings several hundred feet long which stood north and south, parallel to each other and about one hundred feet apart. At each end of this space between the two buildings a secure enclosure was built, forming an open court or enclosure upon which the buildings opened (Conover, 1927:17-18).

It must be noted that Conover's estimate of distance is greater than that suggested by other sources and by the results of the excavation. However, his accuracy about less metric details is such that he is overall a quite reliable source. Unfortunately, no direct indications of this fence could be found during the excavations. (The proximity of the roughly east-west line of stone across the 60-62 rows of squares [Map 1] is such as to suggest a possible association. However, the absence of additional supporting evidence such as postholes, the nearby presence of tread marks in the subsoil, and the possibility of fortuitous placement make such a suggested association less conclusive.) Other references present the possibility that this area may have served as something of an outdoor center for Agency activities. For example, it has already been indicated that Tatum might have had a garden or chicken house here. Further, accommodations for the Agency horses and related equipment were likely in the vicinity and although documentation is poor, the central courtyard could have been involved. Some of this documentation includes the following:

> I did not know it when I finished my job I rode back to the agency and was safely in, not being discovered by the warriors (Conover, 1927:61).
>
> On the fourth night, a band of Comanches prowled around the sleeping apartments, and tried the window of the room where these ladies slept, but failing in their purpose, they stole a mule and a pony and went their way (Conover, 1927: 45).
>
> The buildings are about 200 feet long with a corral between them and stand north and south (Butler, 1928:495).

Finally, there is suspected to be evidence of architecture which was neither supported by findings in the field nor by documentation. This suggestion is based rather on the need of the biological community of man to eliminate waste and by cultural practices of the day. While this may manifest itself as a portion of one of the larger buildings, it may represent a separate structural entity as well, still however, a vital member of the Agency community. Since a portion of this would doubtless have been subterranean, evidence of it would be expected to have survived the damages to which the site as a whole had been subjected. Unfortunately, no such evidence was found and precise location at this time is unknown.

CHAPTER III
EXCAVATION STRATEGY AND METHODOLOGY

The investigations of the Kiowa and Comanche Indian Agency Commissaries were conducted in two phases. As the parking lot was still in use this first phase entailed blacktop removal with the following purposes:

1. Attempt to confirm the previously mentioned evidences for the location of these structures.
2. Since it was not known to what later uses the site had been put or what earthmoving operations had been conducted in conjunction with the initial surfacing of the area, attempt to determine the nature of the recoverable information held by the site.
3. Because of the large size of the structures it was necessary to make an assessment of those areas most likely to yield significant information.

As will be shown in the following discussions, the commemorative marker did accurately pinpoint the structures.

The second phase constituted excavation of selected areas. The basis for their selection was likely yield of information pertinent to certain research goals. These latter include the following:

1. Determine more precisely building locations.
2. Reveal architectural features either unknown or incompletely known.
3. Confirm what is known of occupants identities and building utilization and to expand upon it, if possible.
4. Attempt to isolate activity areas within the structures.
5. Reveal something of building demise and later site uses.

These are the questions addressed in the following analyses and discussions.

Phase 1 of the project excavation constituted removal of the blacktop surface in such a manner as to provide the information necessary to formulate the excavation strategy. It was conducted by the author and C. Reid Ferring, project Principal Investigator, immediately prior to the summer months when a full crew composed

of area college and high school students would become available. Blacktop removal went forward with the assistance of the Ft. Sill Directorate of Facilities Engineering which provided a Gradall, dump truck, and trained operators. The Gradall (Figure 3-1) had a scooplike bucket of 165 cm. width on the end of a boom and was capable of relatively facile control so as to minimally disturb the archaeological materials while still being able to remove the overburden.

Because historical documentation revealed these to be two long structures, parallel to one another on a north-south axis, testing proceeded in trenching on a roughly east-west axis. These trenches were the width of a single Gradall blade. Because of prior publicity and of unlimited access to the site area, these trenches were numbered so that materials which could not be left unattended might be collected with some regard for their location. The first three trenches were numbered from 1 through 3 from north to south. These actually extended from the northwest to the southeast. The fourth was more closely east-west and crossed over the first three. The stone marker which had commemorated the location of the buildings was removed and was turned over to the Fort Sill Museum.

Phase 1 showed clearly that potentially significant material was recoverable in spite of its ever questioned context. Found were indications of architectural remains such as cut nails, plaster fragments, possible stone piers, etc. showing similarities to what was expected of the Agency buildings. The fact that such fragile material as plaster fragments were present helped to confirm that although disturbance was likely, it was not so extensive that some information pertinent to the research goals already discussed might not yet remain. Further, the artifactual material appeared to be concentrated in the vicinity of the plaster and other architectural debris and not homogeneously distributed across the site.

All of this material was concentrated in the area of the suspected west building (Figure 3-2). The trenching more than adequately indicated that little if anything was to be gained by further explorations into the area of the east building and that nothing at all was present to the west of the structure defined as the west Commissary. Hand excavation therefore, was oriented almost entirely toward maximum recovery from the west building area. Within that area, the density of artifacts was highest toward the south end, known to have been the location of the Agent's residence. It seemed appropriate then that excavations should begin here.

Figure 3-1. Removal of Blacktop by Gradall.

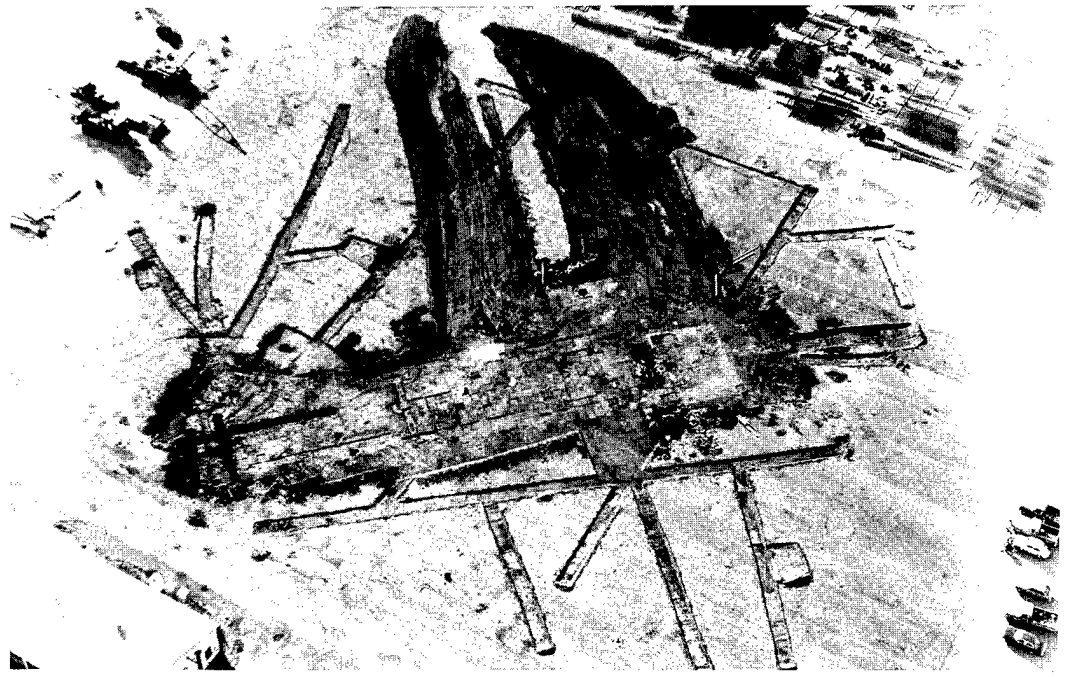


Figure 3-2. Aerial View of Site.

The stratigraphy of the site as a whole was relatively simple. Uppermost was a single thin (about 2.5 cm.) layer of blacktopping composition which, in spite of its age and the use to which it was put, showed no evidence of repairing stages or replacement. This lay upon a crushed limestone fill that varied in thickness from 12 to 20 cm. and was distinguishable from other limestone thought to have been brought to the area for construction purposes in its size and angular conformation. At the north end of the site this fill was supplemented by up to 11 cm. of non-native gray-green clay. In areas where the gray-green clay mentioned above was not present, the lower portion of the chat fill sometimes contained unusually large rock fill. The purpose of this is unknown but it was a source of concern where size of the limestone fragments was important to considerations of architectural associations.

Beneath this limestone fill lay a thin (2 to 3 mm.) layer of brown sand which was used by those guiding the Gradall clearing operation as the horizon marker separating the chat fill from that level containing primarily artifactual remains.

The level containing artifactual material averaged about 4 cm. in thickness before giving way to sterile orange clay subsoil. It quickly became apparent that no level distinctions could be applied to this mixed occupational zone, a fact reflected in the use of levels only in the Feature 8 pit. This homogeneity likely resulted from three factors. First is the thinness of the original occupation level. In some instances, for example, grass was found which had been growing when the original chat fill was brought in. At the same level were artifacts dating to the earliest periods of occupation. It would appear then, that when the marker was erected in the 1930's, there was a great deal of evidence for the presence of the buildings yet remaining in full view. Another reason for this is the obvious compression to which the entire site had been subjected. Engineers who visited the site stated that the parking lot had been designed to handle equipment only up through that of the modern medium tank; that the heavy battle tank would quickly destroy it.

[According to Mr. Floyd Freeman of Lawton, Oklahoma, who from 1940 through 1952 worked with the office of the Constructing Quartermaster at Fort Sill, the paving over the site was laid in two stages. The area was first gravelled and roughly a year later was treated to a double bituminous asphalt treatment. Prior to the carpeting of the ground surface with a 6-inch bed of crushed limestone, the ground surface was watered and then rolled for compaction. Some blading was also necessary. The surface of this limestone

bed was similarly rolled prior to the application of the blacktopping. This final treatment was completed in either late 1941 or early 1942 by the Standard Paving Company of Oklahoma City at a cost to the government of one dollar per square yard.

According to Mr. George Muller of the Ford Motor Company, computation of the likely surface pressures generated by all of the possible vehicles which might have passed over the site shows that most of the effects of compaction were likely derived from the rolling to which the site was subjected during the parking lot construction. Indeed, the greatest part of this would be ascribable in turn to the rolling which was done prior to the gravelling of the site.]

Finally, it must also be noted that some churning disturbance of the area had occurred. Not only was this apparent in the wide dispersion of some artifacts (noted later) but also in the presence of tracked vehicle marks in the clay subsoil.

Particularly because of this churning, any suggestions of interpretations based on horizontal distributions must be qualified. However, because of the concentration of artifacts in the area thought to represent the western Commissary building as well as the survival of objects as fragile as wall plaster, it was hoped that the disturbances to which the site had been subjected had resulted in vertical compression with more limited damage to the horizontal context. To a degree, these hopes were fulfilled. The sterile subsoil beneath this occupational level was very distinct. With the exception of test units early in the summer, excavation was not conducted into this level.

For some reason that area of slope to the south and east of the main excavation (Figure 3-3) was particularly compact and proved quite difficult to remove. The source of the brownish sand mentioned above is not precisely known but it may have been brought in with the limestone fill.

The second phase of excavations were conducted under the supervision of Joe Saunders of Southern Methodist University for most of the summer and under Laura Gerwitz of the University of Illinois for the final two weeks. During the second phase, a grid of one meter squares to act as the basic unit of excavation was laid out on a magnetic north axis. These were designated by letters from the west to the east. As the site area uncovered extended further east than had been initially anticipated, the alphabet was repeated in double following "Z" (e.g., AA, BB, etc.). Similarly, units were numbered from south to north. During the excavation the numeral "1" was placed before

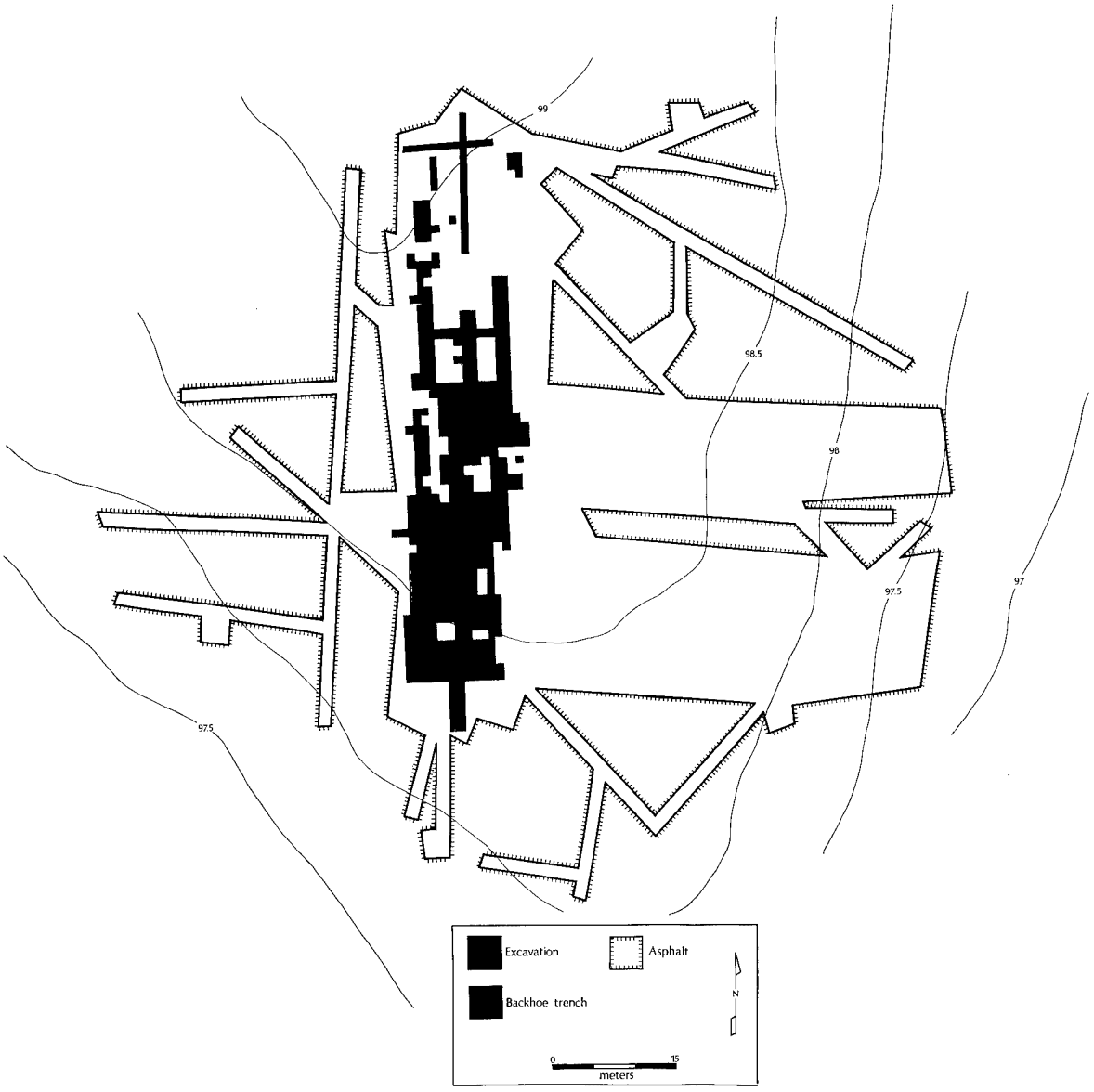


Figure 3-3. Topographic Map of Cleared and Excavated Areas of 34-Cm-232.

unit provenience so as to identify this material as coming from the west building area. Since all of the excavation took place here, the designation has not been used in provenience notations in this report. Similarly arbitrary excavation levels were utilized, each level within each excavation unit being given a number as that level was removed.

However, for reasons already suggested, material from all periods was found mixed into one thin, undifferentiated level. The only levels which have therefore been carried over into this report are in those units which apply to Feature 8, a stratified pit discussed later. They will be occasionally noted herein in an abbreviated form, the level being separated from the square designation by a slash (e.g., M64/2). The scale used in the field photographs is marked into 5 cm. units.

Feature designations were assigned to items of particular interest which required some recognition as a whole. Only five of these are of a nature requiring attention in this report. These are Feature 5 (a stone alignment), Feature 6 (the sidewalk), Feature 8 (the pit), Feature 9 (plaster flooring), and Feature 10 (the well). They receive fuller treatment in Chapter IV. Features were assigned numbers as found.

Use of the heavy equipment did not stop with the Phase 1 portion of the excavation. At first it had been used to open an area large enough to lay out the grid and initiate hand excavation. However, the Gradall was to prove to be a continuing companion on the site. It was found that upon exposure, the underlying soil was dried to a concrete-like hardness quickly breaking and wearing out trowels, often necessitating the use of pick-maddocks, a number of which were likewise unable to bear up. It was necessary thereafter to expose areas to be excavated in a piecemeal fashion and to limit drying by keeping as much as possible covered with black plastic sheets and by frequent applications of water. However, the unusually hot, dry Oklahoma weather and the many years of compaction under the heavy weight of military equipment made relatively inconsequential these efforts and throughout the excavators were faced with a most difficult situation. The fact that they were able to accomplish so much under these circumstances does them credit.

Additional heavy equipment was called upon toward the end of the excavation when it became necessary to resort to deep trenching. Historical mention (Nye, 1969:118) is made to a basement located in what was the north end of one of the two Agency buildings. Exposure of the area had revealed no surface indications of such a feature and with the little time left in which to conduct investigations of any sort, it was decided to deep trench using a backhoe supplied by the Ft. Sill Directorate of Facilities Engineering. The width of the backhoe trenches averaged 75 cm. This procedure failed to yield positive results. The existence and/or location of this basement has yet to be established.

The artifact discussions are presented in Chapters V through XII in a scheme roughly approximating that recently put forward by South (1977). It is not intended to carry with it implications of philosophical orientation or to indicate the author's acceptance of the approach to Artifact Patterns through the use of artifact frequencies. Rather it is used as a format more convenient than many which have been utilized in the past and which it is hoped will allow more ready appreciation of the activities which might be reflected in the artifacts found. Because of the disturbed context of the site and because of the apparent use of the site for dumping from largely unknown sources in the area, the potential of such an activity-oriented approach could not be fully realized.

The artifacts have been placed into one of eight Group categories. These include the following:

Kitchen
Architectural
Small Arms
Military Ordnance
Clothing
Furniture
Personal
Activities

Each of these have been further subdivided into subgroups which with increasing detail become more reflective of individual artifacts. In certain cases this could not be easily avoided because of the number of items which were included within that category.

As the overall approach receives more use, it is hoped that the difficulties inherent in it will be ameliorated and that it may be made more adaptable to temporal and to local conditions as necessary. However, for the present, the approach remains basically that of South and reference should be made to his statements concerning the subject and the reasoning behind its divisions. In some instances, this scheme divorces itself from South. This represents possibly something of the author's misunderstanding of South, of basic inconsistencies in the system, and of the requirements of the site. For example, the abundance of material relating to artillery was considered to be such as to warrant treatment as a Group level. On the other hand, group level categories utilized by South, such as Tobacco Pipe, did not here seem to warrant such treatment. Some subgroup categories, such as bale seals, had no applicability at all and so were excluded altogether.

These modifications are not meant to represent a recommended alternative to South's approach. Neither is the author unaware of the inadequacies present. Rather it represents his attempts to grapple with an approach which is a potential contribution to archaeology and at the same time to attempt to allow the readers of this report a chance to more easily understand the artifacts found and some of their implications.

CHAPTER IV
EXCAVATED FEATURES

In spite of damages to the site, information useful to reconstruction of Agency physical plant and activities was derived. These major findings are represented primarily in the designated Features. The features were numbered as they were recognized and totalled 10 for the site as a whole. These were as follows:

Feature 1: mortar concentrations, square N69
Feature 2: concentration of brickbats and mortar in the area of square K69
Feature 3: stain in the southwest corner of square K69
Feature 4: a large stone with some associated mortar from square N-O68
Feature 5: a rock alignment in squares R-U59-62
Feature 6: a rock alignment through squares O-P47-53
Feature 7: a concentration of window glass fragments in squares R-S59
Feature 8: a pit in squares M-S62-64
Feature 9: a plaster concentration in squares V-X79-82
Feature 10: the well, square CC67

Of these, Features 5, 6, 8, 9, and 10 warrant further treatment at this time (Map 1).

Feature 5

This was an alignment of thin tabular limestone blocks in an arrangement implying association both with the building itself and with Feature 8, discussed below. The south-north arm of this alignment is directly along what is thought to have been the east wall of the west building apparent also in the distribution of plaster over the site (Map 1; Figure 3-2). This alignment (Figure 4-1) turns 90 degrees to the west immediately below the Feature 8 pit. The stones themselves are laid so as to present a faced edge to the north and to the east. It is only one stone in thickness with no obvious mortar or other binder between and has been laid directly on the clay subsoil with no apparent preparation. Measurements were made of the thickness of these. The two stones at the east end of the alignment measured 3.3 inches (85 mm.) and 2.6 inches (65 mm.) in thickness. That in the northeast corner was 4.13 inches (105 mm.) in maximum thickness.

Figure 4-1. Feature 5.

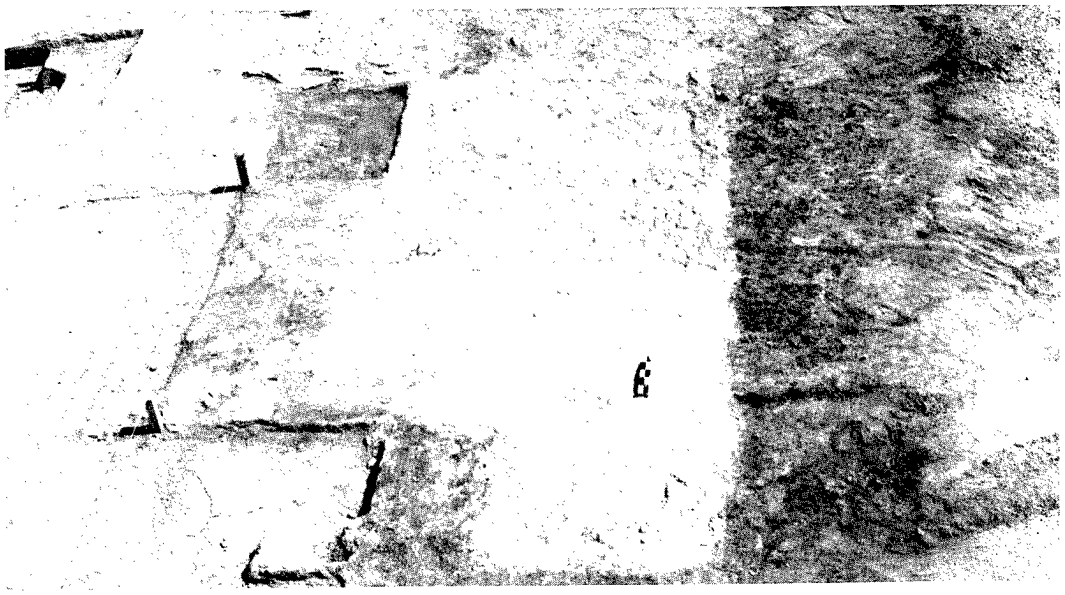


Figure 4-2. Feature 9.

The east-west portion of the Feature 5 rock alignment was parallel to the pit edge and approximately 10.2 inches (26 cm.) to the south of it.

A feature which did not receive recognition but resembles Feature 5 is present on the north central lip of Feature 8. It consists of limestone blocks faced inward to the pit. These lay at the immediate pit edge. Unlike those of the Feature 5 alignment, however, these were underlain by mortar rubble with additional mortar between the individual stones as well as mortar between the rock courses. Two of these stones are variable in both thickness and in length. A third which lay disconnected some 27.6 inches (70 mm.) to the east also appears to have once been a member of this alignment. The construction, etc. of these implies that they formed a course of what has been interpreted to be a fallen fire hearth or chimney.

That wall in Feature 8 appears to have fallen to the north. The similarity of that fall and the location of the Feature 5 alignment is readily apparent. The fall within Feature 8 was located appropriate to association with Feature 5. The apparent absence of mortar binder in the latter, however, and the extension of Feature 5 to the outside wall of the building are unexplained. A possible conclusion is that these somehow represent portions of hearths or chimneys which can be seen above the Commissary roof in the Soule photograph, Figure 2-2 .

Feature 6

This double alignment of upright limestone tablets was a walk leading across the front yard and up to the front of the building (Figure 4-3). It had not been previously known because of the fence around the Commissary yard shielding it from view. From the inside of upright to the inside of upright, width was 37.4 inches (95 cm.). These are oriented north-south, that is along the same axis as the building itself. These uprights had begun to split but those which were measured varied from 2.0 to 3.0 inches (50 to 75 mm.) in thickness and appear to have been deliberately faced to the inside of the walk and perhaps to the outside as well. Tabular limestone was laid between the uprights. These appear to have been originally emplaced larger stone with some smaller fill between but when examined the larger were fragmented and unevenly distributed. There was a wide range of sizes but the largest was about 12.6 by 7.9 inches (32 by 20 cm.).

Figure 4-3. View Across Site Looking North. Note Feature 6 in foreground and Features 5, 8, and 9 in background.

This sidewalk caused some concern because no evidence was found for the presence of the porch (Figure 2-2). Rather the sidewalk continued up to the edge of the area covered by mortar and plaster remains whereupon it abruptly ended. While other possibilities may exist, this was taken to indicate that originally the building may have had no porch as such and that the sidewalk terminated immediately at the building south wall. The porch was added later and because it likely stood above the ground, the sidewalk was not disturbed.

Feature 8

Feature 8 is the only excavated portion of the site showing any stratigraphy. When initially found it was not recognized as a pit as such but as a concentration of miscellaneous debris. Pit outline was not readily apparent. Quickly recognized, however, was that a depression of some sort was involved. Initially, it was considered possibly to have been a deliberate excavation for trash disposal. Its nature became more apparent when one square within it was taken down to sterile orange clay at pit bottom. Subsequent excavation was conducted by excavation unit but in keeping with the quite obvious level distinctions represented within it. Against the north wall of the pit and extending as low as level 3, was the remains of a heavy wall constructed of large limestone blocks laid with mortar. It was left in place and as excavation progressed it became obvious that this wall had collapsed northward into the open pit and lay undisturbed until excavated (Figure 4-4).

Five levels were defined for Feature 8 (Figures 4-5 and 4-6). Level 1 was in actuality a continuation of the chat brought into the site for the construction of the initial gravel parking lot. At that time some smoothing operation was also likely undertaken as it also contained some mortar chunks, as well as a mixture of artifacts. Up until that time the pit probably had continued to manifest itself as a slight depression.

Level 2 was a light brown soil with charcoal flecking, some bone, many small rocks, and an abundance of heavy gauge steel cable, barbed wire and other scrap. It may represent some deliberate although incomplete filling efforts as it still left something of a ground swale.

Level 3 contained a wide mixture of artifacts in high density in conjunction with remnants of the collapsed stone wall. Among

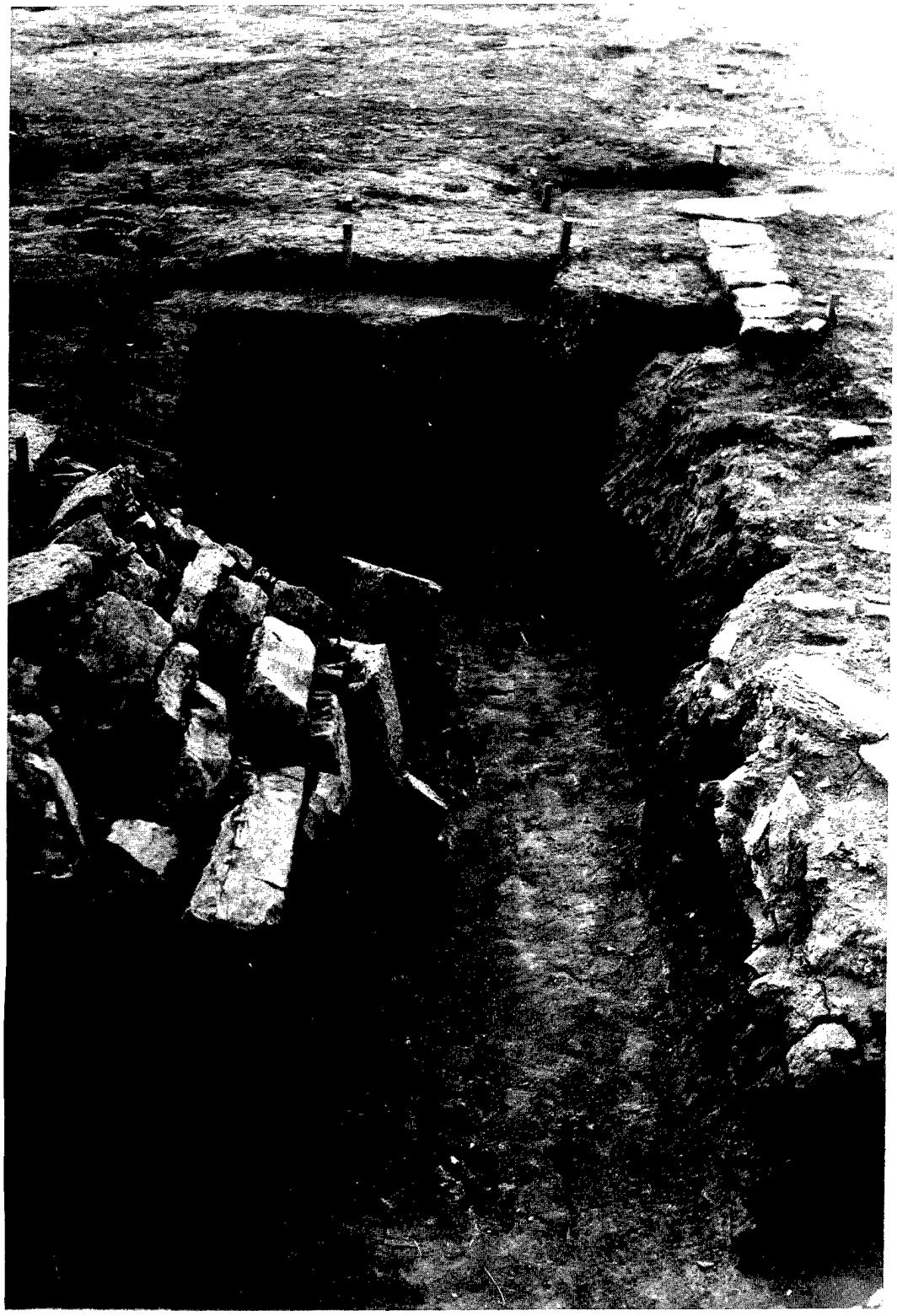


Figure 4-4. Feature 8.

these artifacts were a collection of bottles, primarily beer, which appear to have been placed whole in the pit and at times in loads. It is thought that this was the period during which the area was being used as a dump and deliberate deposit was greatest. Such deliberate deposit in Feature 8 need not necessarily have been directed at filling it but simply to take advantage of a convenient receptacle.

Level 4 proved to be at first somewhat puzzling. When the pit was first opened to its full extent in the upper levels, it was thought to be bowl-shaped and that level 4 was composed of a dark brown silty soil, largely sterile, which lay in a line down the long axis of the pit. The cross-section of the pit (Figures 4-5 and 4-6) as seen immediately after the excavation to pit floor, reflects this. However, it was found that level 5 (quite distinct because of its plaster content) continued under the orange shoulders which had originally been considered to represent the pit walls. It was possible to more accurately define the true pit walls by cutting back on these shoulders to the outside termination of level 5 (Figure 4-4). A possible reason for this difficulty is that following the first exposure of the pit itself to the elements, the vertical clay walls began to "melt" and to flow into the pit filling it from the sides. That area along the center which was at first interpreted to be level 4 was in actuality only the central portion of the level which had been mixed with suitable organic materials, debris, etc. so as to give it the light brown, fine texture which made it stand out from the wall melt. In some areas the true walls of the original pit could further be substantiated by the detection of lines of cleavage. The pit was rectangular with straight, vertical walls and a flat floor. It was approximately 33.8 inches (86 cm.) deep, 22.67 feet (6.91 meters) long, and 7.84 feet (2.39 meters) wide. However, it is possible that these walls had been affected by that melt process, in part visible in the cut-back lipping of the pit (Figure 4-4).

Level 5 consisted of a thin band of dark brown soil filled with a heavy deposit of large plaster fragments. It was quite distinct and did contain some artifacts, although in very low density.

The question of pit use naturally arises. It is one for which no suitable solution has yet been found. Possibilities which have been expressed are a root cellar, a storm cellar, and a treasure hunter's hole. The regularity of its form as well as the stone alignment, Feature 5, do not make this appear to be random or hastily dug as would be the case with the latter. The heavy concentration of large plaster chunks in level 5 make it appear to have existed prior to the demise of the building and to have been filled when the building was

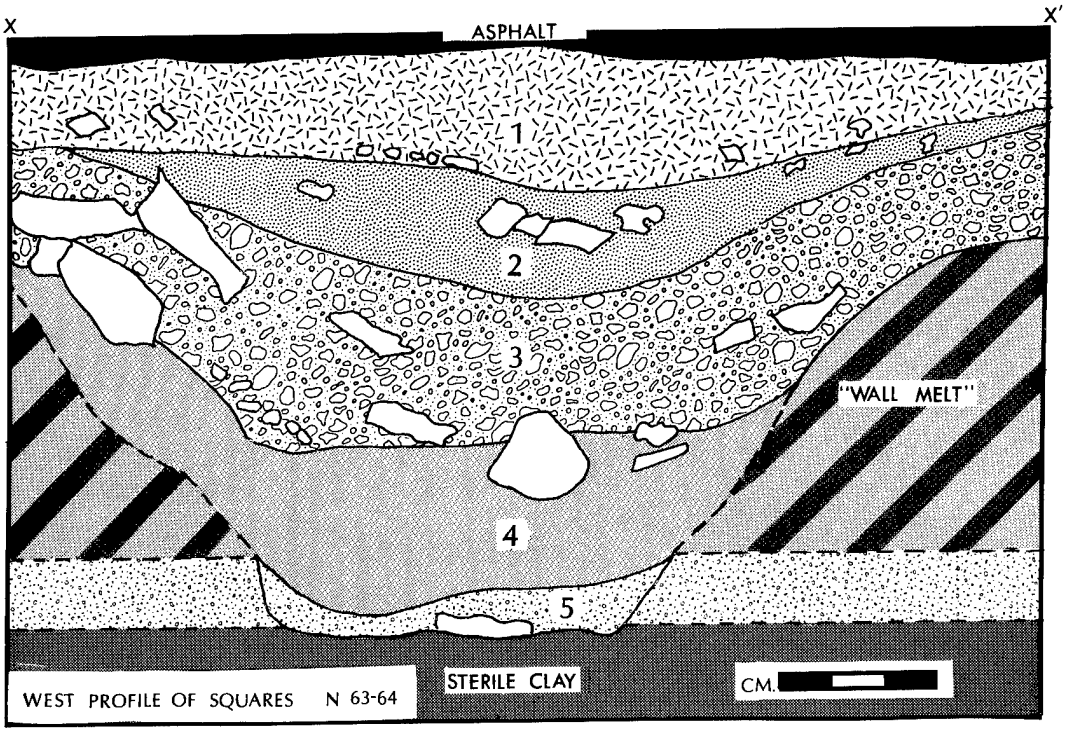


Figure 4-5. Feature 8 Cross-section. Level 1: Chat fill; Level 2: Mixed occupational debris; Level 3: Heavy rock fall; Level 4: Orange and brown "wall melt"; Level 5: Plaster and mortar fall.

Figure 4-6. Photograph of Feature 8 Cross-section.

being torn down. After being carpeted with plaster, something which could not be salvaged, it was left thereafter exposed. This led to sloughing of the walls over the plaster, eventual use as a trash receptacle, and later deliberate filling as a nuisance when the area was desired for use with artillery or as a parking lot.

Nothing was found to indicate method of ingress and egress although this may have been missed, particularly if unsubstantial. As indicated in the historic documentation, a pantry with an implied location in the building itself was also present. The reference is unclear, however, and would still not entirely rule out the possibility of an additional root cellar. Likewise, use as a storm cellar cannot be adequately addressed at present. While multiple use is a distinct possibility, the construction of tornado cellars as such (which are known to have often been used coincidentally as root cellars), does not appear to be a typical trait among the earlier historic populations of the area. Rather, it is a characteristic more in keeping with post-1901 occupations. In addition, these were generally placed outside of the structures, even though not very far away.

An additional possibility is that mentioned by Nye (1969:118) and discussed elsewhere, that this is the basement excavated in 1870 under one of the buildings so that soldiers might hide in it at issues, thus being available if needed but not presenting a distrustful face to the Indians. Nye (1969:118) is quite specific that this lay at a north end, giving good reason to doubt such a conclusion. However, not only is his statement unreferenced and as yet otherwise unsupported, but no such cellar could be found associated with the north end of the west building. (He may, of course, have meant the east building.) In addition, the nearness of the chimneys would have provided a convenient outlet for the smoke from the stove around which the soldiers are said to have huddled. Such suggestions must, however, presently remain inconclusive.

In summary, the pit was excavated prior to the building's demise. It was deliberate and in accordance with the positioning of the Commissary building. The stone edging in addition implies it to be an architectural feature. Actual use, however, is at present tentative.

Feature 9

This plaster flooring, originally rectangular in outline, is 5.2 by 13.1 feet (1.6 by 4.0 meters) in size (Figure 4-2). The mortar itself is quite compact with no use of aggregate. It appears to have

been laid down without the use of an underlying bed of stone. The surface was smoothed with the long axis and its west edge lay immediately outside the east wall of the Commissary. Because of this placement, it is thought that this may represent a porch at the location of a former door.

Feature 10

The Commissary well was found centered in square CC67 (Map 1; Figure 4-7a). It held the greatest unrealized potential of any feature on the site. It appears to have been a dug well with a tabular limestone lining. A pulley assembly (Figure 4-8) was used both to remove debris from the well and to lower workmen into the well. A climbing safety harness was fixed to the wall of the well while an air blower with integral generator provided both ventilation and power for a light source. This latter was supplied through the Fort Sill Directorate of Facilities Engineering and it was with their help that the pulley assembly was prepared.

From the outset it appeared that the well had been deliberately filled in a very short time and probably quite recently. For example, large pieces of wood with round nails in them were found through much of the well depth. Additional artifacts included 2 1/2-inch pipe nipples, cloth covered communications wire, and window screen frames of galvanized tin in different shapes and with screen clamped in place. No significant stratigraphy was evident.

From the beginning, "excavation" entailed primarily hoisting out large rock or entanglement of concertina wire or heavy cable followed by numerous buckets of crumbled limestone (Figure 4-7b). The wood previously mentioned proved difficult to deal with because of the noxious gases given off by it in decay. Work had at times to be halted while these fumes cleared.

As excavation continued it became apparent that only the upper 4.6 feet (1.4 meters) of the wall were mortared in place. Below that the stone had been simply dry stacked. Well diameter varies somewhat as it was not perfectly circular through its entire depth. However, diameter at ground level was 1.10 meters. At just under 30 feet (about 9 meters) depth, the false floor collapsed out from under the excavator, who fortunately had his safety harness in place. It disappeared into somewhat murky waters below. Present water level is at 32.3 feet (9.85 m.) depth.

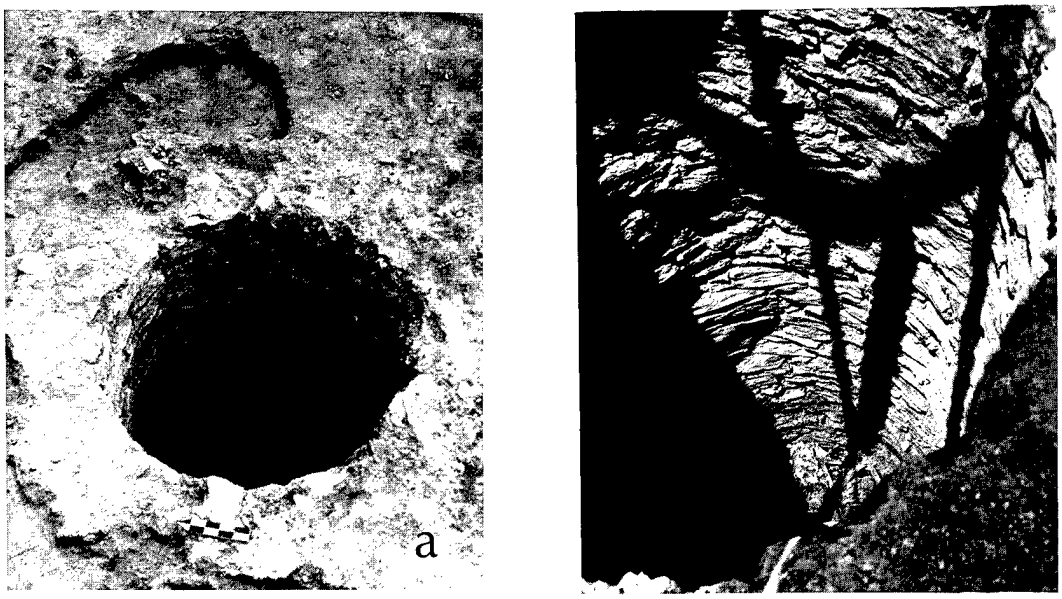


Figure 4-7. Feature 10. a. the well as it appeared at ground surface, b. view down well during excavation.

Figure 4-8. Pulley Assembly Used for Well Excavation.

Efforts to use a submersible pump to determine the water flow into the well and to expose the bottom so that excavations might continue proved unsuccessful. The well remains a feature of great unassessed potential.

As a final note, this well was mentioned by Tatum in a letter dated 24 June 1871.

> We have an iron pumpin the well here and one at the Doctors. The water in both wells is pretty good, but not equal to the farm well (Tatum, 1968:187).

Although almost certainly covered during its use, the exact nature of this well's covering is not apparent in the archaeological record. Because of the depth of the well, a dipper rather than a suction type of pump might have been preferred. However, it is of possible significance in this regard that the request was made of A. H. Pickering that the latter's brother John might purchase for Tatum a list of items including the following:

1 Doz well buckets
1 Package of 3/4 in rope for wells

(Kiowa Indian Agency Records, Indian Archives Division, Oklahoma Historical Society, Oklahoma City). While this list was in an unsigned copy of an original letter dated 9-15-1869, it appears to be in Tatum's handwriting. Thus while it may have been that such items were intended for the use of the wells being set in at locations other than the Commissaries (which at the time were still in the hands of the Military), it is also possible that for a time prior to the above mentioned 1871 letter, a simple bucket and pulley arrangement was in use at the Commissaries. Discovery of documents relating specifically to the purchase or installation of the "iron pump" might clarify this situation.

CHAPTER V
KITCHEN GROUP ARTIFACTS

1. Ceramics

These discussions use the terminology and approach utilized in Spivey, et al, 1977. That approach is basically as expressed in South (1974) with some modifications to better accommodate its application to late nineteenth century assemblages.

The ceramic artifacts from Cm-232 are relatively straightforward and uncomplicated. Virtually all of these are either definitely or probably applicable to the Kitchen Group. An exception is the brown-glazed stoneware ink bottle (which is also taken up in the discussions of the Writing category of Activities Group artifacts).

The assemblage is characterized on the basis of paste with subdivisions based on surface treatment. Although the total collection is small, a wide variety of vessels and a corresponding wide variety of ceramic treatments are present. This classification is summarized in Table 5-1.

One noteable feature of the ceramics assemblage is the appearance of a relatively high percentage of decorated ware in the Feature 8 pit. It is also of interest that it is some of these for which the most precise dating of manufacture can be derived. All are found in the upper levels of the Feature, no lower than level 3. The dating of some of these, based on manufacturer's markings, is as follows:

"J. Bourne & Son"(ink bottle)	1850-1891
"Laughlin"	1874- ?
"Henry Alcock & Co."	1891-1900 (1910?)
"QMD"	1893-1916

From these then, it would appear that their deposition can be tentatively dated to the mid- or late 1890's. The dating of specific items will be taken up in more detail in the following discussions.

a. Stoneware

All of the sherds included in this category are from heavy, thick-walled utilitarian vessels. They comprise a minimum of six

Table 5-1. Ceramic Classification

	No. of Sherds	Minimum No. of Vessels
PORCELAIN		
Plain	7	2
Underglaze blue painted	1	1
Brown decalomania	1	1
Polychrome decalomania	1	1
Underglaze blue (oriental?)	1	1
SEMI-PORCELAIN		
Plain	6	1
STONEWARE		
Brown stoneware (ink bottle)	7	2
Tan/buff stoneware (Ginger beer bottle)	3	1
Brown Albany glaze	1	1
Grey/brown glaze	1	1
Black basaltes	1	1
Buff glaze	36	1
EARTHENWARE		
Ironstone/Whiteware		
Plain	134	19
Embossed	7	2
Polychrome painted	6	3
Transfer printed (red)	1	1
Decalomania/Gilt/Embossed	1	1
Decalomania/Gilt/Overglaze painted	1	1
Yellowware		
Yellow glaze	10	1
TOTAL	226	42

vessels based on a total of 49 sherds. The most numerous of these consisted of portions of a buff glazed crock which has a reconstructed interior diameter of about 5 1/4 inches. No impressed markings or unusual surface treatment is in evidence.

The previously mentioned ink bottle sherds comprise the second largest type of stoneware. These are identical to those described in Spivey, et al (1977). These seven brown glazed sherds represent one or possibly two vessels. It was not possible to articulate the large impressed ink bottle base with any of the other six sherds. The bottle base (Figure 12-6e) bears the following impressed mark:

VITREOUS STONE BOTTLES
J. BOURNE & SON
PATENTEES
DENBY POTTERY
NEAR DENBY

J. ARNOLD
LONDON

"J. Arnold" likely represents the product manufacturer while J. Bourne and Son are shown by Godden (1964:89-90) to have been established around 1809. However, Joseph Bourne became established with the firm from 1833 through 1860 while the words "& SON" were added after about 1850. Absence of the word "England" in the mark indicates a pre-1891 date of manufacture.

These fragments are a good example of the scatter sometimes apparent in sherds likely from the same vessel. These seven were found in the following squares: N63, P60, Q51, Q52, and R91.

Three sherds of tan and buff glazed "ginger beer bottle" (Figure 5-1e) were found in square R86. These likely represent remnants of the same vessel.

The remaining four sherds of stoneware exhibit interior corrugations with smoothed exteriors. All are too small upon which to base suggestions of vessel shape. One without provenience has a brown Albany glaze. One is a black basalt with a gray paste. The last has a brown interior glaze and a gray exterior treatment. This may represent some exposure of the gray surface to unusual environmental conditions, perhaps burning.

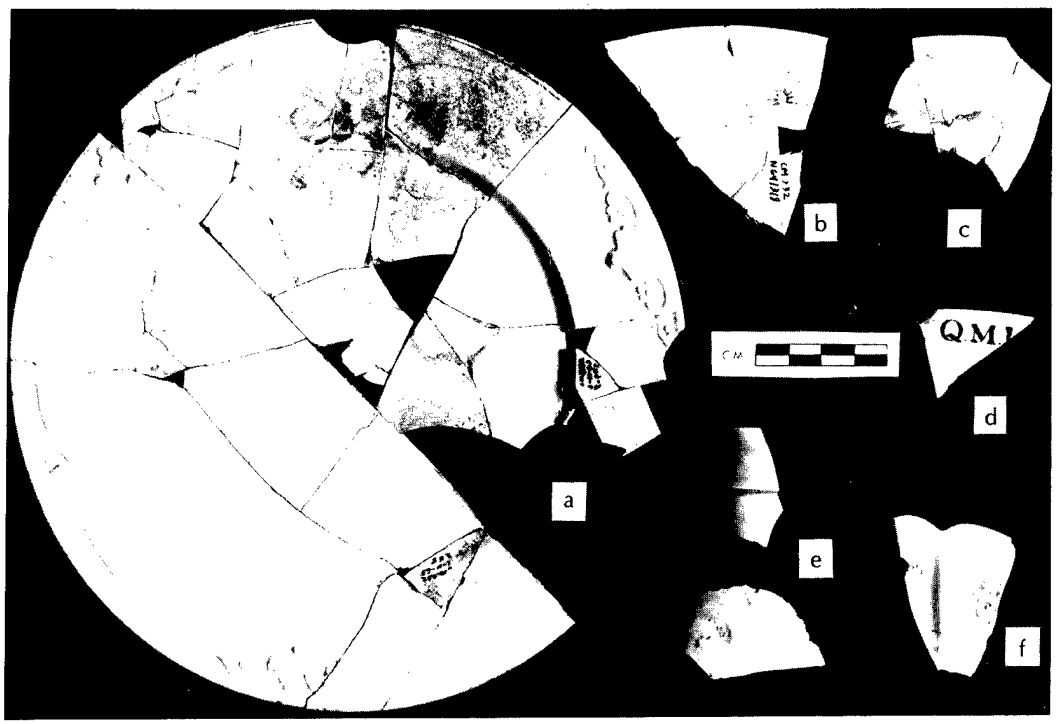


Figure 5-1. Selected Ceramics. a. ironstone/whiteware plate by Henry Alcock & Co., b. ironstone/whiteware with red butterfly transfer, c. hand-painted ironstone/whiteware, d. Quartermaster "semi-porcelain," e. "ginger beer" stoneware, f. porcelain with floral decalomania.

b. "Semi-porcelain"

This category is one not commonly recognized from assemblages dating prior to the late nineteenth century. Commonly called "hotel ware" it consists of a well vitrified, heavy, utilitarian whiteware. The small and scattered sherds of "semi-porcelain" may represent a single vessel. The largest, apparently from a saucer, is a rim sherd and bears the letters "Q.M.(D)" (Figure 5-1d), indicating manufacture for issue by the Army Quartermaster Department between the years 1893 and 1916. All are plain white in treatment and, with that one possible exception, generally too small to determine vessel shape.

c. Porcelain

The largest group of porcelain has a plain white exterior treatment. This includes a total of seven sherds representing a minimum of two vessels, probably both cups. The largest portion of a tea cup

was present in the area of square L55. It has a single handle at one side and a mouth diameter on the order of three inches. Another sherd from square T70 is a small rim portion of what may be a cup or perhaps a saucer. The three remaining sherds of this type are too small to deal with individually but may represent portions of cups or saucers also.

In this category of plain white porcelain are two unusual sherds which are glazed only on one side. These may represent parts of figurines or dolls.

One large sherd from square Q70 represents a portion of lip from a large and ornate molded dish with floral polychrome decalomania interior and exterior treatment (Figure 5-1f). This one sherd is unique at the site.

The final three porcelain classes are represented also by one small sherd each. The largest is a rimsherd from a cup with a light blue underglaze color but without any further decoration. The other two are too small upon which to base suggestions of vessel shape. One is white with an underglaze blue paint which appears to have been part of a larger scene. The last had a brown floral decalomania motif. It may be that this brown color was at one time gold.

d. Earthenware

Earthenware constituted by far the largest portion of the ceramics recovered from Cm-232. This group includes both yellow wares and ironstone/whitewares.

The ironstone/whitewares are divided into plain and decorated groups. The latter contains five different types of decorative combinations.

The simplest of these five decorative combinations at the site consist of two bowls which bear repousse moldings. None are large enough to determine much of the overall pattern. However, one bears this molding on the inside lip white the other is on the outside of the bowl beginning just below the lip. Seven sherds comprise the remains of these two bowls.

A portion of soupbowl was found in level 2 of square N63. It bears a large butterfly in red transfer (Figure 5-1b). This pattern is also unique to this single sherd.

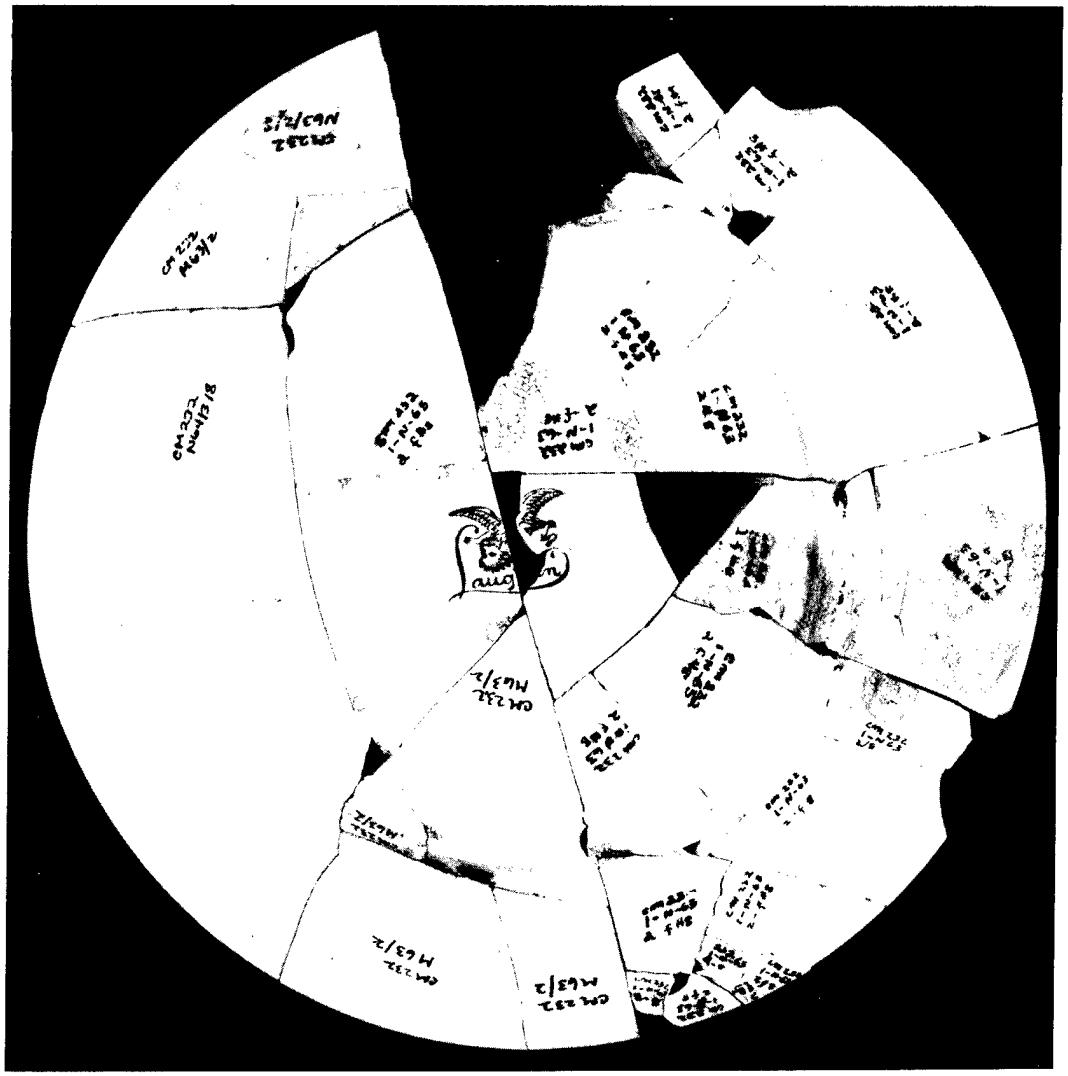


Figure 5-2. Earthenware Plate by Homer Laughlin China Co.

The most elaborately decorated ceramics consisted of two individual plates, both of which were recovered from Feature 8 almost in their entirety. The first has an embossed inner rim. In addition to this it bears a single gilt line around the rim and a floral decalomania design utilizing yellow and pink on a brown outline (Figure 5-1a). On its base appears a fighting eagle and lion emblem above the word "Laughlin" (Figure 5-2). This is shown by Thorn (1947:133) to be one of the symbols used by the Homer Laughlin China Co. of East Liverpool, Ohio. Thorn further gives 1874 as the year of this firm's establishment. In addition to this manufacturer's mark the following pattern mark appears in gilt on the base:

LOUIS XVI
DECOR
720

The second virtually complete plate (Figure 5-3d) with an elaborate decorative scheme on ironstone/whiteware also bears polychrome floral decalomania and a single gilt line near the plate rim. However, the repousse work is lacking. Its base bears the mark of the firm of Henry Alcock & Co., Cobridge, England. This mark provides dating of not earlier than 1891 because of the appearance of the word "England" in the mark. Although a portion of the mark on the right side is not present, this mark does not appear to contain the word "Ltd." in the manufacturer's name, tentatively dating production to no later than 1900 (see #65 in Godden, 1964:27). In any event, it definitely predates 1910 when the firm became Henry Alcock Pottery.

The final decorated group consists of a minimum of six sherds comprising a minimum of two cups. These have been hand-painted with black, red, green, and yellow colors in a tea leaf design (Figure 5-1c).

A total of 134 sherds of plain ironstone/whiteware was recovered. Together these constituted a minimum of nineteen individual pieces including the following:

cups	4
saucers/vegetable dishes	5
bowls	4
plates	4
tureens	1
potlid	1

Profiles for some of these are shown in Figure 5-3. Other than differences in manufacturer's markings, the only unusual group within the ironstone/whiteware is a small group of sherds from the southeastern edge of the site. These exhibit an atypically thin cross section with a very light blue cast to the glaze. Unfortunately, these include no rims.

Very few makers marks are in evidence among ironstone/whiteware sherds. A number of these are impressed and either illegible or incomplete making their interpretation impossible. One of these impressed marks appears on a single sherd from square O64, level 2. It shows the letters "MEA(K)" above "CO." This may well

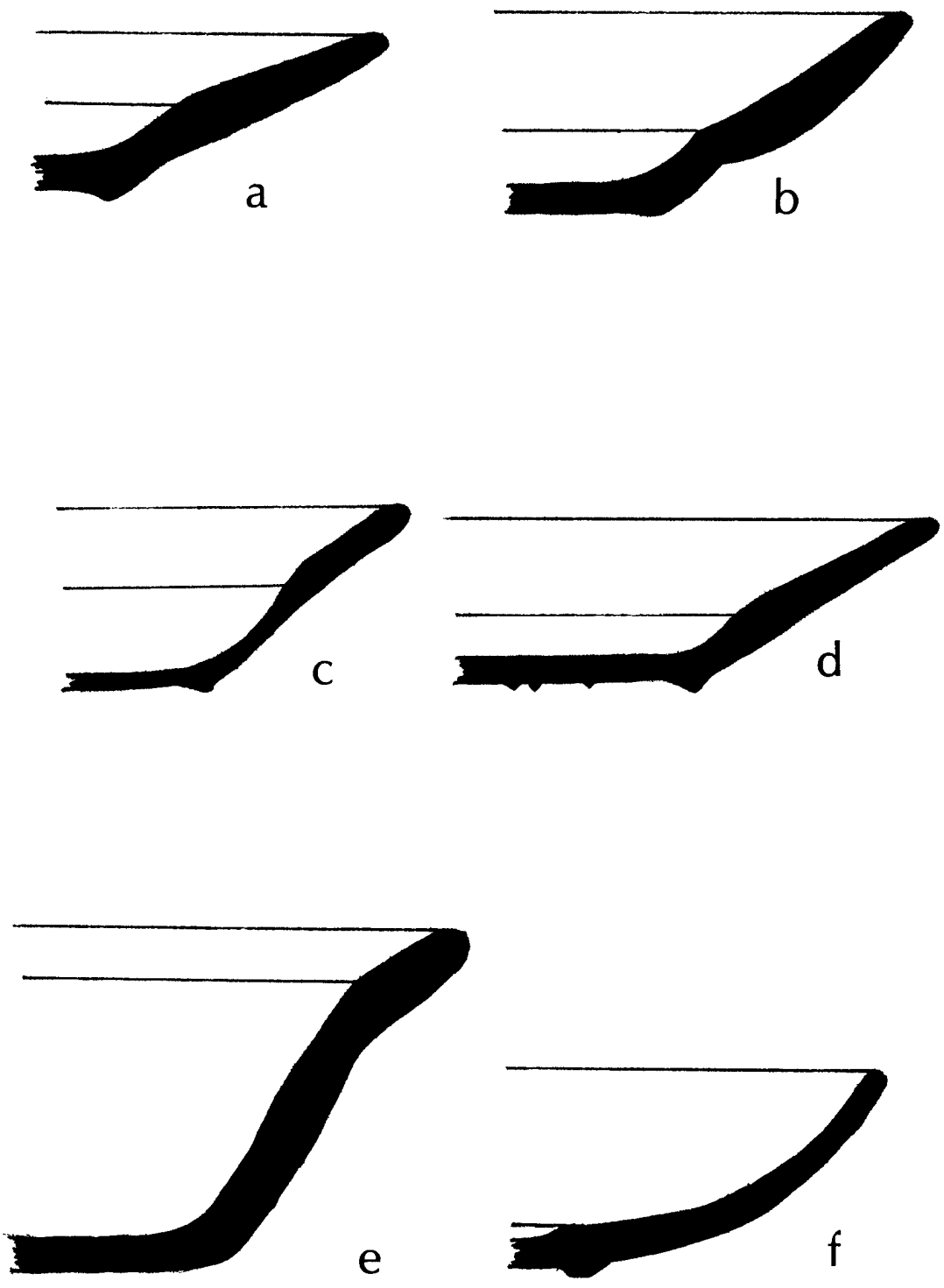


Figure 5-3. Ironstone/Whiteware Ceramic Profiles. a. plate, b. "George Jones" plate, c. small bowl, d. "Henry Alcock" plate, e. large bowl, f. saucer/vegetable dish.

indicate the firm of Henry Meakin of Cobridge suggesting a possible dating to the 1870's period (Godden, 1964:426). Another sherd from square Q70 bears the Royal Arms seal printed in black under an impressed oval and the word "CHINA." This may also represent Meakin manufacture. However, the incompleteness of the mark and the use of the Royal Arms seal by many other firms make this more uncertain.

One of the more intriguing marks is that shown in Figure 5-4. The firm is probably that of George Jones (Godden, 1964:359), founded around 1864 and continuing up to present times. However, while many marks are known for the firm through its long life, none appear to closely resemble this. Although the company name is incomplete, the proportioning may suggest that this predated the addition of "& SONS," said to have occurred in late 1873.

In the group of earthenwares was a small collection of ten sherds of yellowware. These differ from the earthenwares discussed above only in that they bear a yellow glaze and have a molded although otherwise unelaborated surface. These ten sherds were found in the following squares: Q72, Q75, R72, S73, S78, T71, U75, and W81.

2. Bottles

Introduction

A total of 2,608 glass vessel sherds were found at Cm-232. These were divided into the following color groups:

Aqua	1107
Clear	895
Olive green	155
Brown	424
Purpled	27

Distribution maps were made of these in order to try to determine something of the possible conditions under which they were deposited. The extent of the scatter itself is of interest in that the very southern end of the structure was devoid of debris while that area to the north, beginning at Feature 8 and continuing up to the area of Row 80, had a relatively high density which quickly dropped off with increasing distance to the north. All of the color groups showed a concentration in the Feature 8 pit, as would be expected. Other individual concentrations

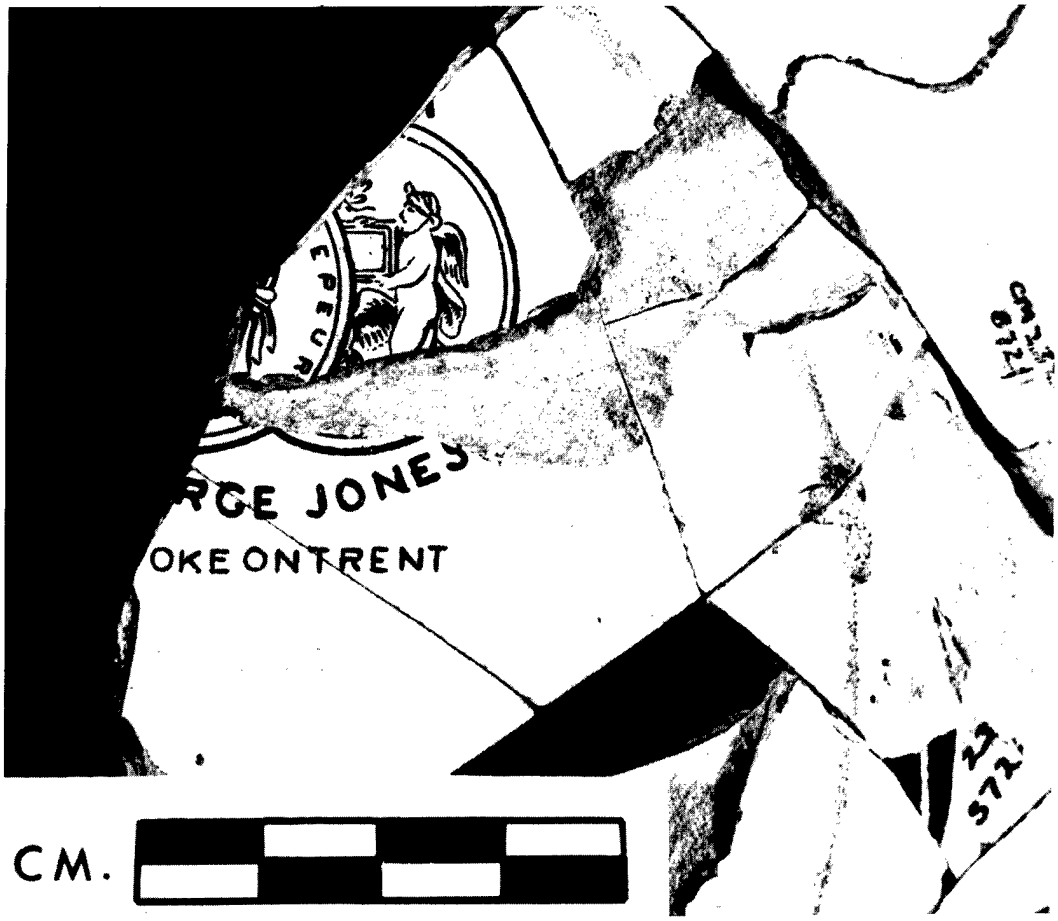


Figure 5-4. Earthenware Plate by George Jones.

were also apparent. These fell in a band across the Row 70 to 77 portion of the site. This would correspond roughly to the south central portion of the structure.

While much of the structure area was not excavated, particularly to the north, these areas were exposed by the Gradall and impressions gained in the field by the excavators tend to confirm these distributions. Indeed, this area of high artifact density was one of the considerations in determining areas to be excavated.

These glass distributions are considered to be of little value to the interpretation of activities as relating to the original Agency for reasons which will become apparent, and so are not considered further. However, this distribution pattern is repeated in other artifact groups and is mentioned in discussions of later site utilizations.

The attempt was made to derive a minimum number of bottles and to characterize bottles on the site by categorizing primarily on the basis of mouth finishes. This characteristic was selected because there is only one per bottle, they show great variability, and they are important diagnostic features for the interpretation of use. Ten basic finishes were defined for the site.

Use categorizations and their subdivisions necessarily include more than just mouth finish. Glass thickness, general size, body proportioning, and color are some of the other qualities considered. Even so, these categories must be broad because of the fragmentary nature of the evidence and because of the quite varying uses to which similar bottles were put.

The use distinctions contained herein are by no means a final solution, but rather were found useful for the purpose of describing and to a more limited extent, for analyzing the bottles in the Cm-232 collection. This overall simplistic approach may not pertain to collections from other sites. Breakdown within these broad categories are by body styles as represented in Putnam (1965) or by other use bottle traits. More specific suggestions of use are also occasionally possible.

"Finish" as used here means the manner of lip treatment, not always entailing the application of additional glass to the orifice. The "home-canning" (Figure 5-5h) is an example of lip treatment rather than an applied finish. (Its use is represented by only one sherd which came from the edge of a household canning jar.) Ten finishes defined for the site are illustrated schematically in Figure 5-5.

Use groupings based on mouth finishes include the following minimum number of vessels:

Pharmaceutical	20
Beverage	23
Culinary	13

Only one of these, a beverage bottle, is not glass. That one is ceramic Including vessels which could not be so placed into one of these use categories, a total of 64 vessels have been defined for the bottle portion of the Kitchen group.

Deviations from the usual method of classification did occur. For example, in addition to finishes, bases were discussed in "Specialty" vessels which were unusually fragmentary. Were larger

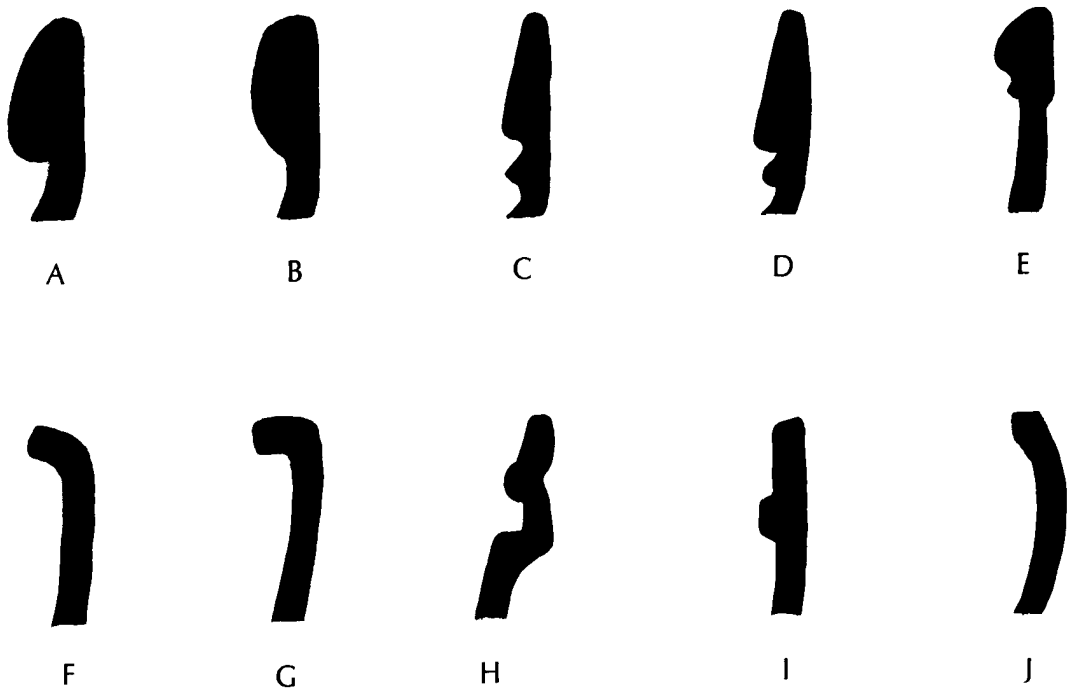


Figure 5-5. Generalized Bottle Mouth Finishes. a. tulip, b. beaded, c. "under ridge," d. "under ring," e. double ring, f. bevel collared, g. flat collared, h. screw, i. banded, j. simple rimmed.

portions present and use interpretations more conclusive, at least two of these three might have been included with the Personal rather than here with the Kitchen group.

All bottles which are green have been classed "olive green" (even though, for example, one from S63, level 3 is more an "emerald"). No attempt was made to distinguish between "amber" and "brown." All yellow browns are termed the latter. It was not found possible to arrive at a satisfactory subdivision of aqua. It therefore includes all ranges of blue green or green blue. The other colors were clear, purpled (no glass was found which could be recognized as having been deliberately colored purple), cobalt blue, and certain minority colors generally represented by individual specimens.

In the descriptions, a body "panel" is considered to be a flat body side. A panel inset into a bottle is here called a "recessed panel." Edges between panels can be either rounded or faceted but even though flat and often relatively wide, these are not considered to represent "panels" until they equal in width the narrowest obvious panel.

"Finishes," as already stated, are not always applied. With very few exceptions, all bottles found at the site showed evidence of having had an applied finish. (Certain exceptions, such as the modern machine-made Royal Crown bottle, were not represented by orifice fragments.) In the case of the single double ring finish, it appears that two applications were made. In no case was it possible to find a machine-made bottle mouth. Almost without exception, where present, mold seams terminated below the orifice. In at least four cases, mold seams had been eradicated by the bottle having been turned in the mold.

Following the discussions of the individual bottle categories as based on mouth finish or lips, are discussions of the manufacturer's markings present on bottle bases as found at the site and a description of body inscriptions. Logotypes, etc. in quotes are as present on the sherds. Those further enclosed in parentheses are only suspected. The presence of a slash ("/") indicates the start of a new line.

a. Pharmaceutical Bottles

As mentioned previously, mouths and lips provide here the bases for individual bottle counts and categorization. Where body sherds or bases are present in the same square and appear to have originated from the same bottle, these also are considered even though reconstruction has not been accomplished.

This general category of bottles is characterized by an unelaborated body with volume of from 1/2 to perhaps 32 ounces, and evenly to modestly high proportioning. Glass color is aqua or more generally clear. Most finishes are either a single collar (Figure 5-5g) or the collar with a slight inward taper ("beveled collar," Figure 5-5f). While no documentation to this effect has been found, intuitively the beveled collar should be associated with the use of liquids as such a lip would help to prevent drippage. Liquid contents were used in the flat collared bottle also, however.

"Pharmaceutical" bottles with the general set of characteristics just given may have contained not only medicines, but also extracts or syrups which might be used for some food or beverage preparation, certain tioletries such as scents or creams, glues, and shoe polishes. Medicines would include both prescription and patent medicine in both liquid, powder, and tablet form, and would include liniments. Four ink bottles of general pharmaceutical style are discussed in the Activities Group-Writing and are excluded from all of the following discussions with the exception of considerations of manufacturer's marks and their significance.

These "pharmaceutical" bottles reflect the wide range of products which they contained in the wide variety of bottle styles which were found at the site. Twenty bottles (or mouths) were found appropriate for this category. Of these, ten are so small or contain so little of the body that their inclusion here must be tentative. These last will be described in tabular form (see Table 5-2). The former are of several types, reflecting primarily their bottle style as given in Putnam (1965).

Most of the pharmaceutical bottles are of the panelled or recessed panel type. However, five are either round or oval. Two of these carried the same product. These are round in cross section with the flat-collar finish. The body itself is disproportionately tall for its other dimensions. An inscription vertically down the bottle side reads "C. A. MURDOCK & Co./KANSAS CITY." In addition, a vertical line extends from the base to the shoulder and is graduated, probably into ounces, with additional quarter unit graduations. That pictured in Figure 5-5d is from Feature 8, squares O64 and N64, level 3. Most of the body of another was found in square U76 and although actual articulation was not possible, the complete neck from square M63, level 1 appears to have once been part of the same bottle. Portions of a third "Murdock" bottle were found in square N63, level 2. However, because its mouth was either absent or not recognized, it was excluded from the total count. None of these have any other markings. The graduations on these seem to indicate that the contents were liquid. Correspondence with Mr. William Crowley, Curator of History at the Kansas City Museum of History and Science, has brought to light additional information concerning these bottles. According to early Kansas City business directories in that Museum's holdings, "the company first appeared in Kansas City sometime between 1881 and 1885. It continued in existence until 1929 when it was listed as a branch of the Jewett & Sherman Co., flavoring extracts." The actual directory entry for 1886-1887 is as follows:

> Murdock, C.A. & Co., coffees, spices, extracts, baking-powders, etc., main off. 1220 Union av. tel.123; factory 12 and 14 E. 3d. tel 302.

Two round bottles were found in squares U76 and O-P64, level 5. The former is of clear glass with rounded shoulders and a flat collared finish. It bears only the basal marking "GW." The style is that of the "Round Tablet" bottle (Putnam, 1965:34). The second is noteworthy in that it is from the floor of the Feature 8 pit. Unfortunately, it bears no markings whatsoever to aid with dating. The glass is aqua while the finish is also the flat collar. Although the neck height is

somewhat greater than that of the above, it is more in proportion to its larger body size (Figure 5-6e). It conforms to Putnam's "Round Prescription" type (1965:29) although a similar bottle is elsewhere (1965:62) shown to be a "nerve and liniment" bottle. This, however, appears too small for a liniment bottle unless as a sample.

One oval bottle was found in square M62, level 2. It also is of clear glass but has the beveled collar. No base is associated and the body sherds bear no inscriptions. It is of the "Plain Oval Prescription" type (Putnam, 1965:33) and may have been used for a variety of items although, as mentioned earlier, this finish may reflect intended use with liquids.

The two pharmaceutical bottles with recessed panels are from squares L73 and V75. Of clear color, they are of the "Short Ball Neck Panel" type (Putnam, 1965:48). This type has a rectangular cross section with only slightly faceted or rounded corners and a sloping shoulder. The finish is of the applied flat collar type. However, an additional convex beading of glass encircles the neck a short distance above the shoulder. This beading appears to be part of the mold although the mold seam is present above it but not on it. The walls overall are rather thick and what may be an "Owen's ring" (Kendrick, 1966:83) appears on the bottom. Neither bear inscriptions. A portion of another ball neck bottle was found in square L77. It was also of clear glass but consisted only of a neck midsection.

The remainder of the pharmaceutical bottles have plain panels with clear or aqua colored glass. These total five in number. Of the four made of clear glass, only one has the flat collar finish. It is from square N63 and appears to conform to the "Short Blake" (Putnam, 1965:31), that is, with four-sided rectangular cross section, faceted corners, and sloping shoulders. It is too fragmentary to make an estimate as to contents although volume was probably no more than a few ounces.

The remaining four plain-panel pharmaceuticals have the beveled collar. These conform to two of Putnam's styles, the "French Square Prescription" (1965:30) and the "Tall Blake" (1965:31). (It should be noted that there is no discernible difference between the Tall and the Short Blake other than the availability of the Short in both "Narrow" and "Wide Mouth" finishes, apparently equivalent to the "beveled" and "flat collar" as used here. The Tall Blake seems to come only with the Narrow mouth but in all the same sizes and with the same prices as the Narrow mouth Short version.)

One of the French Squares is from square N63, level 2. It is equivalent to the Blake except that has a squared rather than rectangular cross section. This bottle bears what appears to be the single letter "T" on its base. The second bottle of the French Square type has a beveled collar finish and an aqua color. Contents totalled perhaps 15 ounces at most. Because of the glass color, it is more likely that it was used for non-medicinal purposes. Putnam also shows the French Square to be used for Vermifuge Patent Medicine (1965:62).

The two Tall Blake bottles are from squares U77 and M63. The former has an estimated capacity of perhaps 12 to 16 ounces while the latter has an estimated capacity of perhaps 32 ounces.

The remaining ten pharmaceutical bottles are too fragmentary to warrant individual description. These are all finished with either the flat or beveled collar and most bear no body portions at all. These are described in Table 5-2 below. In only four cases is enough remaining of the body to say something of it.

b. Culinary Bottles

The thirteen bottles included herein are thought to have possibly contained certain oils, extracts, etc. used in food or beverage preparation as well as condiments and other edibles. At least one may have held bluing, however. Characteristics include unusually long necks or wide mouths. Mouth finishes from Cm-232 which are associated with these are the one double ring on the site, the simple rimmed, one simple rounded, and a few tulip. (The tulip finish as found here have relatively flat sides as compared to those more bulbar types found with the potables.) In addition, all are either clear or aqua and certain of the aqua bottles have a decidedly blue cast. Seven of the 13 "Culinary" bottles have relatively narrow mouths. These are discussed first.

Although neck length is an important characteristic distinguishing these bottles, several are so fragmentary that ascription to this Culinary category is based primarily on their mouth finish and to their blue cast. The absence of body sherds from all but one of these does little to aid the conclusiveness of their categorization. Four of these seven have simple rimmed finishes (Figure 5-5j). The narrow mouth culinaries have a thickening much more robust than the wide mouth culinaries discussed later. No mold seams are visible anywhere on any of these although, as stated before, they are quite fragmentary. Their provenience is squares I69, K58, S89, and V75.

Table 5-2. Description of Fragmentary Pharmaceutical Bottles From Cm-232.

Provenience	Color	Finish	Orifice in. (mm.)	Comments
S79,N92	Aqua	BC[1]	0.53(13.5)	---
P78	Aqua	FC[2]	--	---
V81	Aqua	FC	--	---
L70	Clear	FC	0.34(9)	rectangular cross-section (?)
N110	Clear	FC	0.37(9.5)	4-side panel with faceted corners (?)
P64/2	Clear	BC	0.45(11.5)	sloping shoulder
Q73	Clear	FC	0.55(14)	sloping shoulder
R74	Clear	BC	0.35(9)	---
W88	Clear	FC	0.33(8.5)	---
CC59	Clear	FC	--	---

[1]Beveled collar
[2]Flat collar

Two of the narrow-mouth foodstuff bottles have tulip finishes (Figure 5-5a). This finish, as well as having a different conformation, is equally as thick as the simple rimmed finish just discussed but is higher in proportion to thickness. That from square T69 is fragmentary and includes no body sherds; that from square N63, level 4 is complete. It is oval in cross section with mold seams ending at the mouth finish. Bottle capacity is about four ounces (Figure 5-6c). Orifice diameter is 0.40 inches (10.3 mm.). Height to shoulder is 4.4 inches (111 mm.) while neck height from the shoulder is 1.7 inches (43 mm.). It bears the basal marking "GW." Putnam (1965: 62) shows this style to have been used for bluing.

The final narrow-mouth foodstuff bottle is that with the double ring finish. It was found in square R72. It has mold seams which

Figure 5-6. Reconstructed Glass Bottles. a. brown beer with "under ridge" finish, b. green wine/champagne with beaded finish, c. aqua "bluing" bottle with tulip finish, d. clear "MURDOCK" bottle with flat collar finish, e. Putnam's "Round Tablet" bottle with flat collar finish.

end just below the finish. Each of the rings appears to have been placed individually. The average inside diameter of the mouth finish is 0.40 inches (10 mm.) while that of the bottle neck is 0.44 inches (about 11 mm.) causing a noticeable restriction in the neck at that point.

The remaining six are commercial bottles and four have simple rimmed finishes, one has a tulip finish, and one has what was probably a smooth rounded edge like a drinking glass (again not a true "finish"). Of the four simple rimmed finishes, those from squares L75, N99, and O75 are too small to show mold seams or body characteristics. Only the first and last of these are aqua colored. The fourth from square S64, level 3, however, has a steep, narrow shoulder with what appears to be a horizontal mold seam just below the shoulder. This may have been made in a 3-part mold. Definite vertical seams elsewhere terminate at the finish. Its cross section

appears to have been round with the body walls descending vertically from the shoulder. Color is clear. The inside neck diameter is 1.3 inches (33 mm.) as compared to a projected body outside diameter of 2.1 inches (about 53 mm.).

In square L75 were found portions of a large bottle. Reconstruction was possible for the base and three of its sides. Two of the latter are recessed panels. Body style appears similar to the "Iowa Panel" (Putnam, 1965:53). Capacity is at least 20 ounces. The bottle is noteworthy on two counts. First, it is of an aqua color, etc. which is very similar to that of the wide-mouth finish of that same provenience just discussed. Unfortunately, nothing else of the upper portion shoulders or neck are present, therefore making it impossible to definitely associate the mouth with the bottle body. Second, the two recessed panels are both inscribed. These read as follows:

"EXTR(A) ---/ SARSAPARI(LLA)" and
"LOUISV(ILL)E KY"

The third side is not recessed; the fourth side is absent. Sarsaparilla is the root of a tropical vine which was commonly used as a base in bitters and other medicinals later becoming popular as a flavoring in beverages. This bottle likely held extract of sarsaparilla perhaps as a powder or a liquid. There are no indications that it was intended for use as a medicine, however. It may be then that this would appropriately be a beverage preparation.

The final bottle of this wide-mouth Culinary category is of clear glass and has a decorative ring encircling it just under the mouth. As mentioned above, this does not appear to have a true finish, the orifice lip being only smoothly rounded like a drinking glass. However, edge damage has occurred over the entire distance of lip recovered (Figure 5-7h). This was found in square V74. In the same square was found a heavy base which probably represents the same bottle. This has a heavy basal ring (Figure 5-8i). The curvature of the side indicates a globular or pear-shaped body becoming restricted toward the top. No mold seams or other markings are evident. Mustard is one product which at one time was available in such bottles. Another not uncommon vessel of somewhat similar character was the celery holder (see Montgomery Ward & Co., 1969:545). However, the approximately 1 1/2-inch (38 mm.) diameter opening is considered restrictive in such use.

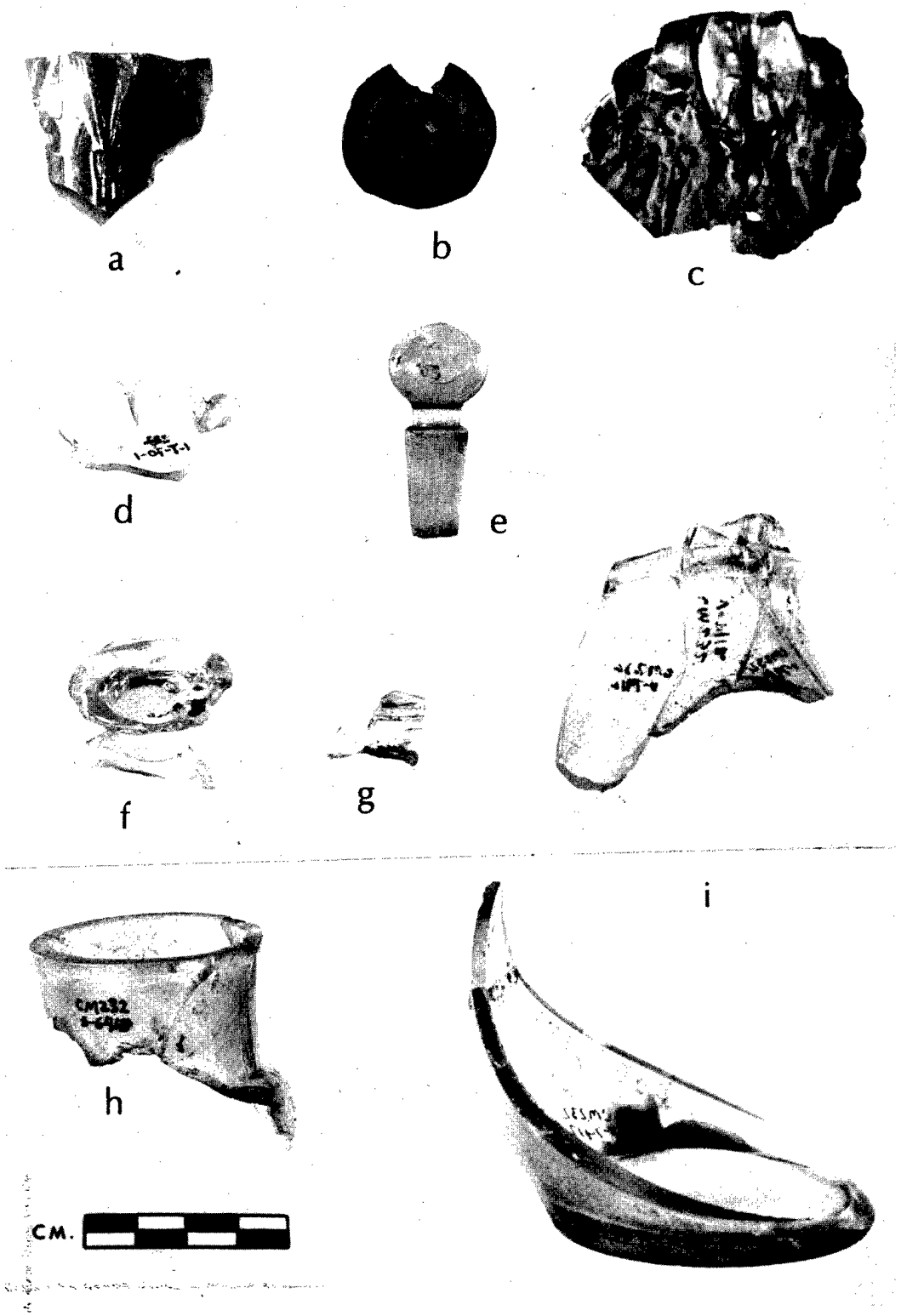


Figure 5-7. Miscellaneous Kitchen Group Artifacts. a. "specialty" vessel, b. brass cap seal, c. lead foil wrap, d. scalloped edge "specialty vessel" (lamp chimney?), e. ground glass stopper, f. clear glass lid handle, g. unidentified clear glass, h. wide mouthed "culinary" vessel with simple rimmed finish, i. neck and base of "culinary" clear glass vessel.

c. Beverage Bottles

Some liquids packaged in a pharmaceutical bottle might have been drunk with the relish equal to that of some of these potables. However, these were intended primarily to be beverages without additional restorative powers however superfluously considered in their preparation or consumption.

Bottles of this type from Cm-232 fit into the generally recognized categories of soda water, beer, and wine/champagne and total twenty-three. Five different neck finishes are present. These serve not only to reinforce the mouth but also play a part in the retention of closure. This is particularly the case where the contents are effervescent and therefore under pressure. These finishes provide rounded surfaces just below the mouth for holding bail type seals or reinforcing for corks. They include the tulip finish, the heavy mouth with under ring, the heavy mouth with under ridge, the simple beaded finish, and the banded finish (Figure 5-5).

Several of these have been spun in the mold eradicating any mold marks which might have existed. Where the mold seam can be adequately distinguished all end just below the finish. Colors include brown, aqua, and olive green.

The thirteen "beer" bottles are of brown or aqua color. All show mold seams. The "mineral waters" are those which have been turned in the mold, obliterating their mold seams. Two of these are aqua while the third is brown. "Wine/champagne" bottles are distinguishable by their olive green color. There are four of these. In addition, three bottle portions exist which although they could be classed with potables, either their finish or their "beverage" could not be definitely ascertained. These categories are not intended to be absolutes but merely aids toward use reconstruction. The fragmentary nature of some bottles makes their classification problematical. No "liquor" bottles are defined. Some particularly where not complete may have held distilled spirits. However, no bottles were found which could be definitely assigned such a use.

The beer bottles comprise by far the largest of these categories (Figure 5-6a). With the advent in the mid-1870's of pasteurization in the beer industry, name brands of beer became capable of supplying more distant markets. This created a blossoming growth of those fortunate manufacturers who managed to capture large portions of this national market. It also brought about a tremendous upswing in beer consumption, particularly where local breweries had not been available

previously. Only following this time was it likely that brand beer became readily available in such a frontier setting as existed at Fort Sill.

Among thirteen beer bottles, three finishes are represented. These are the tulip, the heavy mouth with under ring, and the heavy mouth with under ridge. Only one beer bottle had the tulip finish. It is brown and bears the basal mark "C&CO LIM/ 2." Its provenience is square S64, level 3.

The under ridge finish is the second largest group with 3 brown bottles, from squares L87 and N64, level 4, and V74. The first is fragmentary with no base and little body associated. The second is complete and has the basal marking "A&DHC." The mold seam ends just below the mouth finish. The third consists of some necks as well as the almost complete finish. Mold seam termination is also just below the finish.

Brown and aqua color bottles are represented in those nine beers with the under ring finish. Rather than itemize the characteristics of each individually, this descriptive information has been summarized in Table 5-3. Consistencies in provenience and in manufacturer indicate likely deposit at the same time. Further discussion of the manufacturers involved is presented in the general discussion of manufacturers. It should be noted that body sherds from square N64, level 3 articulating with a base from square N63, level 2 provide the association between the manufacturer's mark and the mouth finish.

Wine/champagne bottles comprise the second largest category of potables. Three neck finishes are present in this group of only four. These are the under ring, the beaded, and the banded. As stated before, these are distinguished by having olive green color. The amount of green bottle glass on the site was found to be minor in comparison to that of other shades. In addition, it was as a group broken into relatively smaller and more scattered pieces. These conditions permitted little reconstruction.

The only wine/champagne bottle with an under ring finish consists only of the finish and portion of the neck. Twisted brass wire remnants were found around the neck. This wire is of 0.02 inches (0.7 mm.) diameter.

Both of the two banded finish bottles consist of little more than the finish. These are from squares S53 and R73. No bases could be definitely associated with them. However, dark olive green bases

Table 5-3. Beer Bottles With Under Ring Finishes.

Provenience	Color	Basal Marking	Mold Seam
O63/1	Brown	---	---
S64/3	Aqua	ABG Co/3	Below finish
S64/3	Aqua	ABG Co/3	Below finish
S64/3	Aqua	ABG Co/19	Above shoulder (min.)
S64/3	Aqua	ABG Co/10	Below finish
S64/3	Aqua	FHGW/43	Below finish
S64/3	Brown	FHGW/16	Below finish
S64/3	Brown	SB&G Co/3	Below finish
N64/3	Aqua	A.B.G.M. Co./L9	Below finish

were found in squares L75 and N64, level 3. Both are round in cross section with pontil marks inside of one or two rings on a kick-up base. However, that from L75 is slightly smaller in diameter and has a matte patina while that from N64, level 3 has a spin mold sheen but a stippled surface and very vesicular glass. This may indicate formation in a contact mold (Lorraine, 1968:41). Neither of these show evidences of exposure to heat although both of the banded mouth finishes have been burned.

The final wine/champagne bottle is almost complete (Figure 5-6b). Its provenience is square S63, level 3. It has been spun in the mold. No pontil mark is evident on the base which is slightly raised.

The final category of beverage bottles is of those three which contained mineral or soda water. All were turned in the mold. Two are aqua color while the third is brown. This latter has a tulip finish and an apparent pontil mark on its base. Both of the aqua bottles are from square M64, level 2, and both have an under ring finish. While one consists of the entire finish, only a portion of the other was found. However, the larger of these shows that it has the relatively wide squat neck which characterizes many mineral water type bottles. No basal or body sherds could be associated with either. While both aqua, they are of slightly different hue.

In summary, twenty bottles can be assigned to one of these three categories. The three which cannot are too fragmentary to suggest both finish and category with assurance. All are of a size sufficiently large to have been used for larger bottle sizes. Descriptive information is given below.

Provenience	Color	Finish	Comments
I70	olive green	probably tulip	possibly wine/ champagne
R88	aqua	---	---
N112	brown	possibly under ring or under ridge	possibly beer

With regards to these beverage bottles two facts are noteworthy. The first is that these carry the widest variety and the greatest number of manufacturer's markings of any bottle grouping. These manufacturer's markings not only indicate something of commercial arrangements, etc. in the area but are an aid in establishing a temporal framework for dealing with the site. More detailed remarks concerning these are present in the discussions of manufacturers. Many of these potables were recovered from Feature 8 and the significance of these will be reviewed in the conclusions.

A second consideration is that the occupants of the Commissary buildings during the eight years during which they were legitimately inhabited, were Quakers. Agents Tatum and Haworth were known to be men deeply religious and against the use of alcohol, which is what most of these bottles likely contained. While the Agents and their families were not the only ones who lived at the site, most of the others either were also Quakers or would have had to carry on their drinking illicitly. The accumulation of these bottles would therefore not be expected to be great. As would be expected, the dating and disposition of these bottles tends to indicate their deposit following the site's abandonment.

d. "Specialty" Vessels

These have been distinguished only because of their coloring. Each of the three are represented by only one sherd, two of which are quite small. Their descriptions follow.

Provenience

N87	two layers (clear pink and a very thin translucent white), thin
Q73	milky blue color, relatively thick, mold seam and raised cable pattern present on the exterior
R65	two layers (milk white inside, thin clear pink outside), thin overall

The first and third may have been used for special commodities such as women's toiletries. Because of their size, these suggestions are quite speculative. The second is heavy enough to have served as a vase or other receptacle (Figure 5-7a).

e. Glassware Miscellaneous

A rim section was found in square R73 which could not be identified. The orifice is about 1.3 inches (33 mm.) in diameter. The lip itself is sharply outcurved from what if continued, was a rounded and globular body. The lip itself has received no special treatment. Glass color is clear and thickness is 0.07 inches (1.7 mm.).

Much of the glass showed damage from exposure to heat. Indeed, some had been completely melted and were identifiable only as glass. One fragment from square U75 has been softened so that it distorted but may represent remnants of a handle.

Two ground glass stoppers were found. Such as these may have seen use on the table with oil and vinegar cruets, in the bedroom with toiletries such as perfume, or in a shop with chemicals. That from square K60 is just over 2 inches (51 mm.) long and has a flat, circular handle. That from the area of squares K-L49-50 is 1.6 inches (41 mm.) long and has a round knob handle (Figure 5-7e).

A circular, flat handle of clear glass was found in square M64, level 2. It is mold-made and is relatively robust and unadorned. Its position was likely in the center of a lid of the larger container such as a mustard pot, sugar bowl, etc.

It was possible in certain instances to recognize bottles which were distinctive but were not included in the foregoing discussions because they had no associated mouth finishes. All of the remaining "specialty" bottles discussed below are of this type. Three others include one possible medicine bottle and one soft drink. The former consists of seven small cobalt blue body sherds found in the following

squares: P89, P90, Q89, Q90, and R87. Their color in conjunction with general body shape give reason to suspect it may have been a Bromo-seltzer bottle.

The other two bottles are distinctive in that they appear to be essentially modern because of the quality of the glass and because of their markings. One is the face of a Royal Crown Cola bottle incorporating a portion of the red paint crown. It was found in square S66. The other includes clear glass fragments, two from square K62 and two from square N66. One from the former bears the lettering "--S--/ (F)LAVO(R)---." Similar but incomplete lettering is present on a sherd from N66.

Two glass sherds were found which are edges decorated with a scalloped decoration (Figure 5-7d). It is clear of color. Contouring of the walls beneath the edging indicates a round vessel narrowing in diameter toward this edge. The object itself may have been utilitarian, such as a lamp chimney, or more decorative, such as a vase. One fragment was found in each of squares S64 (level 3) and T70.

A variety of clear pressed glass was found which was too fragmentary to allow reconstruction of any type. These are thought to represent three or four vessels. Summaries of these are below.

Provenience	No. of Fragments	Comments
1. N/63	1	flat, roughened lip fragments;
N64/3	1	horizontal banding below the lip
2. N64/3	1	possible lid or base; flat base (top?) with uneven walls, round cross section (Figure 5-7g)
3. N63	1	raised ribbing radiating similar to
P-Q53-54	4	sunburst pattern on excurvate
W81	1	side
4. T69	1	similar to #3 above but glass much thicker with wider lines on incurvate side

Discussion: Bottle Manufacturers

The use of orifices or finishes to count and categorize glass vessels ignores the valuable information which similar consideration of the bottle bases may also reveal. In order to overcome this to some degree, manufacturer's logotypes found on vessel bases are reviewed in the following discussion. These are particularly

important in that the period of manufacture is occasionally thereby derivable. It is hoped that at some time in the future a more comprehensive discussion of mold types, etc. as indicated by basal fragments from the site may also be undertaken.

"A 43/ A"

Found on a clear glass panel bottle with faceted corners. Provenience is square N64, level 3. No mouth finish could be associated with it.

This may not be a manufacturer's mark. No reference has been found to definitely indicate an appropriate producer utilizing it.

"ABH Co"

This mark was found on the bases of three aqua colored beer bottles in square S64, level 3. Mouth finish is of the "under ring" type. These initials are in a straight line across the center of the base with a number under each. These latter are "3," "10," and "19."

The use of this mark is unknown. Two large manufacturers, Adolphus Busch and American Bottle, used similar logos and it is tempting to consider this a variant of one of those. However, Toulouse (1971:28) indicates that "AGB Co" markings, another possible variant, have been found on imported British Lea & Perrins bottles in ghost town dumps. While the true company name is not known, he suspects that the "A" may have stood for "Albion." Because of the context in which those bottles have been found, he tentatively dates them to the 1880 to 1900 period, which is as might be expected here at Cm-232. However, not only is the word order different on these bottles from Cm-232, but these are more probably beer bottles.

"A.B.G.M. CO." Adolphus Busch Glass Manufacturing Co. 1886-1928

Four aqua colored beer bottles probably carried this mark. One of these was identified on the basis of only a portion of one base. It and two of the others could not be associated with specific mouth finishes. Suggestion of beer bottles is based on size, shape, manufacturer, and comparison to the more complete single specimen. Details of these four are given below. The manufacturers initials are in a circle with the inscription in the center as shown below.

Provenience	Center Inscription	Mouth Finish
N63/2	"J5"	---
N63/3	"P17"	---
N64/3	"L9"	under ring
P87	--	---

This mark is that of the Adolphus Busch Blass Manufacturing Company. The company began with the takeover by the brewer Adolphus Busch of the bankrupt Belleville Glass Works in Belleville, Illinois. Toulouse (1971:26) dates the use of this mark from 1886 until 1928. It appears that it was in use both at the Belleville plant, closed in 1905 after merger with other companies into the American Bottle Company, and at Busch's St. Louis plant opened in 1900 and continued until 1928.

"A&DHC" A. & D. H. Chambers 1843-1886 at least

Only one bottle from the site exhibited this mark. It was a brown beer bottle with an "under ridge" finish from square N64, level 4.

The company was begun in 1843 by two brothers, Agnew and David H. Chambers in Pittsburgh. They only began making beer bottles probably in the seventies and eighties, being known earlier for the Civil War "Union" flasks and as manufacturers of what is thought to be the first cylinder window glass in the country (Toulouse, 1971:37-38).

"C.B./K"

The "C.B." are above and centered over the "K." Of the two fragments of this base, only one has any unit provenience, that from U74. The bottle is round in cross section and has a basal outside diameter on the order of 3 inches (76 mm.). No neck or finish was associated with it but other characteristics give it the appearance of a beverage bottle.

The manufacturer is unknown.

"C & CO LIM"

Only one example of this marking was found. It was present across the center of a brown beer bottle base in square S64, level 3. The mouth finish was tulip and the numeral "2" was under the manufacturer's initials.

The manufacturer is not known although Toulouse (1971:119-120) identifies the Cunningham & Company firm as using "C & CO." This company specialized in beverage bottles and was active from 1879 until 1907. However, "Limited" is not indicated to have been a part of the company name.

"FG CO" Fairmont Glass Co., Fairmont, Indiana 1889-1898

This marking was found on the shallowly dished base of two clear glass bottles in squares M63 and U76. These bottles are similar to Putnam's "Stoppered Carmine Ink" (1956:60) with no body inscriptions and a flat collared finish. They are discussed with other Activities Group-Writing artifacts.

According to Toulouse (1971:200-201) the company was formed by a banker named Winslow in 1889. His son took over the company in 1894 upon the elder's death and proceeded to expand and develop it until his death in 1927. During those years it went through a series of name changes, the first of which provided the terminal date for the appearance of this mark.

"FHGW" Frederick Hampson Glass Works 1880-1900

These letters occur across the centers of three beer bottle bases. Two of these are aqua in color and one is brown. Both of the former also bear the numeral "43" below the company initials while the latter bears "16." All have the "under ring" finish and are from square S64, level 3.

Toulouse (1971:202-203) identifies this mark as being that of the Frederick Hampson Glass Works in Lancashire, England. The company was formed in 1851 but the tentative dating of the 1880 to 1900 period is suggested on the basis of the appearance of this marking "in western ghost towns."

"GW"

This was found on three bottle bases. These include the following:

Provenience

1. N63/4 oval pharmaceutical bottle; aqua
2. U76 round small pharmaceutical probably tablet; clear
3. T78 panel bottle, use unknown; clear; tentative as only a portion of the base with "W" is present

The user of this logotype is unknown, as is its dating. However, the presence of the complete aqua bottle in level 4 of Feature 8 does imply dating probably in the 1880's.

"SB&GC" Streator Bottle & Glass Co. 1881-1905

This marking is across the center of a brown beer bottle base from square S64, level 3. It has the "under ring" finish and the numeral "3" is present below the company initials.

The company was founded by six citizens of Streator, Illinois in 1881. It later received the backing of Adolphus Busch who eventually took over the company and in 1905 merged it with the Ohio Bottle Company and the Adolphus Busch Glass Manufacturing Company to form the American Bottle Company (Toulouse, 1971:461-463).

"T"

The single bottle with this mark is clear and is a square panel bottle with beveled corners from square N63, level 2. The base is associated with a beveled collared finish and was considered in the pharmaceutical category.

No manufacturer appropriate to the site is known to have used this mark. It may have had a purpose other than to identify the producer.

"W M(CCUL)LY & (Co P)ITTSBURGH PA" 1841-1886

The single base bearing this mark was found in square V75. It is brown in color and is fragmentary with no associated finish. It appears to have been a beverage bottle. It has an unusually deep base with a pronounced pontil mark. The lettering and its background is quite rough. Body fragments indicate it to have been made in a three part mold and the letters "TE" appear near the shoulder.

William McCully and Company was known to have used many different marks throughout its history including no less than seven variations on the company name. "Apparently how much or how little of the company name went onto the bottle or jar depended on the space available" (Toulouse, 1971:353). The history of the company is too long to give here. However, this variation of the McCully mark is dateable to the period beginning in 1841, when the firm was included in a partnership arrangement whereby "& Company" was added to the name. Following the founder's death in 1859, the company continued under his son John McCully and others until its demise around 1886 (Toulouse, 1971:351-353).

A case of amber bottles bearing this same marking was found in the steamboat Bertrand. These were similar in style to bourbon whiskey bottles but had a much lower alcoholic content. These Bertrand bottles are similar to that from Cm-232 in that they also were made in three-piece molds and bore on their shoulders the word "PATENTED." However, they differ in that they bear three dots on their base rather than one large pontil mark and, with a basal diameter of 2 13/16 inches, are smaller than that from Cm-232 which has a diameter of about 3 1/4 inches (82 mm.) (see Switzer, 1974:29).

Discussion: Body Inscriptions

Among the many body sherds found on the site were some which bore legends of some sort. Some of these have been mentioned in the bottle descriptions. Noteable among these were the C. A. Murdock & Co. pharmaceutical bottles and the single Sarsaparilla bottle included in foodstuffs. Most of these body inscriptions are disjointed letters but two warrant some further treatment.

"BAILEY & E(A)---/--- N OIL"

The words "BAILEY & E(A)" are present on two articulating sherds from the area of squares V-W94 in the central portion of the structure. They are on the narrow recessed side panel of an aqua bottle. "N OIL" was found on a front recessed panel of an aqua bottle in square W94. They do not articulate. However, their shading, size, proximity, etc. imply association. No additional information could be found on a company with a similar name. The bottle contents may have been lemon oil.

"(B)URNETT'(S COCO)AINE"

Portions of these were found widely scattered on the site. The first part was found north of Feature 8 toward the middle of the site (squares V75-76) while the latter were present in square S55 near Feature 6, the sidewalk. Other portions were found in squares J55 and O-P45-48 over the sidewalk area. These do not articulate and are associated on the basis of bottle and letter style, size, and of letter positioning on the bottle. The bottle apparently was of aqua color and eight sided.

A similar bottle was found at Fort Richardson in excavations conducted in the fall of 1976 (see Westbury, 1977:Plate 2a). The word "BOSTON" was on one side. Sellari and Sellari (1975:76) list

a total of six Burnett type bottles, only three of which state the contents. These six include variations both in the bottle styles and glass color. Although it is not clear whether present on the bottle or derived elsewhere, the dating 1864 to 1900 is provided.

Bottle Summary

In reviewing generally the glass bottles from Cm-232, it is immediately apparent that not only was there variability in the styles and possible uses to which they were put, but that the time frame of their manufacture, and by implication their use, is correspondingly narrow. As to this latter point, none of the bottles were completely hand-blown. The use of two and three part molds was in evidence and where mold seams were not present, these appeared to be of the spun mold type. Similarly, no bottles as defined by their lips were completely machine-made. Indeed, even crown caps were not in evidence. The first fully automatic bottle-making machine was patented by Michael J. Owen in 1899 and perfected in 1903 while the crown cap was originated in 1892 by William Painter (Kendrick, 1966: 49, 79-80). Particularly the development of the bottle-making machinery revolutionized the industry so that by World War I, hand production had virtually disappeared. Additional temporal control is provided by the few dates obtainable through manufacturer's logos present on bottle bases. These are as follows:

A.B.G.M. CO.	1886-1928
A&DHC	1843-1886 at least
FG CO	1889-1898
FHGW	1880-1900
SB&GC	1881-1905
W M^{C}CULLY & CO	1841-1886

Further but less compelling evidence is provided by the presence of mold seams almost all of which terminate immediately at the mouth finish and by other details of bottle design. In total, the collection appears to date from the mid to late 1880's up to the turn of the century.

As already mentioned, in addition to the temporal significance of this category of artifacts is their variability. In spite of the lumping of these into three very broad groups and the apparent omission of certain bottle types which seem to so commonly appear at other occupations of similar age, this collection is such as to suggest an occupation rather than accidental or haphazard deposit.

The final note to be made of these is the fact of wide dispersion even of individual items, both bottles and glass tableware. Specific

examples, such as the Burnett's Cocoaine bottle, are given in the discussions. This scatter is too wide to have been the result of natural forces or of simple discard. Such scatter is discussed in later remarks concerning the changing pattern of site use and is reflected in other artifact groups, noteably ceramic tableware.

3. Bottle Miscellanea

a. Lead Foil Wraps

These consist of sheets of heavy lead foil wrapped around the flat tip and shank of some roughly cylindrical object (Figure 5-7c). All have been distorted and several show signs of burning. None are deliberately inscribed. As the round centers which covered the tip of the object have with one exception become separated from the outer portion of the wrap which covered the object shank, separate counts were made of each. Although each "cap" must have been associated with one "side" piece, these were counted separately (Table 5-4). Their condition did not permit reconstruction.

Two possible uses present themselves. The first and most likely use of these is as bottle wraps. Foil wrapping was present on beverage bottles taken from the 1860's period steamboat Bertrand (Switzer, 1974) and is still used today on wines and some beers. These round caps are roughly one inch (25.4 mm.) across while the outer wraps are roughly 1.9 inches (48.3 mm.) long. These figures proportion themselves well to the neck of a beer or wine bottle. None are wide enough so as to encircle a full-size bottle neck although their poor condition may account for this. Assuming that these were bottle wraps, it was not possible to determine other details of bottle closure. Wire marks were not apparent but these were not likely associated with crown cap closures as these would have impressed themselves into the lead. Also separation would have occurred lower on the wrap rather than right at the top edge.

An alternate use is also suggested. At least two fuzes are now known to have used such a tin hood. These are the I.A. fuze, Model 1915, invented by General Ste-Claire Deville, and the I.A.L. fuze, Model 1916, invented by Mr. Andre Lefevre. Both fuzes are similar in operation and in exterior appearance with long, projecting noses. Both are suitable for use on the 75 and 155 mm. cannon. Their operation is as described below.

> The Mark III fuze (French I. A. L.) is a super-sensitive type which bursts the shell above ground. This fuze is

Table 5-4. Provenience of Lead Foil Wraps, Cm-232.

Provenience	Caps	Sides
L72	1	
N113	1	
Q92	1	
R91		1
R97		1
S73	1	
W82		1
W97		1
W98		1
No Provenience	2	2
Total	6	7

Note: Similar but small fragments were also found in squares M107, R72, U92, Y111.

> generally used for high-explosive shell fired against personnel, where the effect of shell fragments is desired. It is also generally used in gas and smoke shell where burst is desired before the shell buries itself (U.S. Army Ordnance Department, 1919a:158).

Incorporated into the designs are bore safety mechanisms which requires some additional protection.

> . . .a tape of tarred canvass is wound round the spiral so as to keep it tight, and the head is covered by a thin hood made of tin. The hood and the tape are removed by pulling the free end of the tape (U.S. Field Artillery School of Instruction, Saumur, 1918:51).

Projectiles were not sent into the field armed with this fuze. The tin hood was removed only after the fuze was screwed into place prior to firing.

[This summary was taken primarily from pages 48 through 51, U.S. Field Artillery School of Instruction, Saumur, 1918. Additional reference should also be made to Figures 61 and 62 which show these fuzes with the tin hoods in place.]

b. Brass Cap Seal

This is a thin circular stamping of sheet brass found in the area of squares V-W94. It bears an embossed design (Figure 5-7b). The outer edges are slightly down-turned and diameter is roughly 1.2 inches (30 mm.). Use is unknown although it may have originally been the seal placed over a corked bottle.

c. Lead Bottle Seals

Of the six lead seals found, three are related to bottle closures. Two have embossed markings which appear to read "ANHEUSER BUSCH" and "ST. LOUIS MO." on opposite sides (Figure 5-8a&b). The third is likewise embossed with what appears to be a similar Anheuser Busch seal although format and some wording on both sides appears different (Figure 5-8c).

Anheuser-Busch is presently best known as the manufacturer of Budweiser beer. The company had its start in 1857 with the acquisition of a brewery in St. Louis by Eberhard Anheuser, a soap manufacturer. He and his son-in-law Adolphus Busch built the business into one of the most successful in American history (Baron, 1962:212). Anheuser-Busch is widely credited with being a pioneer in the use of pasteurization of beer in the mid-1870's, allowing its great expansion in the use of bottled beer. This further resulted in being able to supply more widespread markets and subsequent increase in business volume (Baron, 1962:241).

These seals show that someone in the area had been imbibing beer associated with that company. It is unclear, however, which beer this might be. During the nineteenth century government taxing regulations mandated separate brewing and bottling operations.

> Bottling must be done in a building entirely distinct and separate from, and having no communication with, the brewery or warehouse. This means that the location and

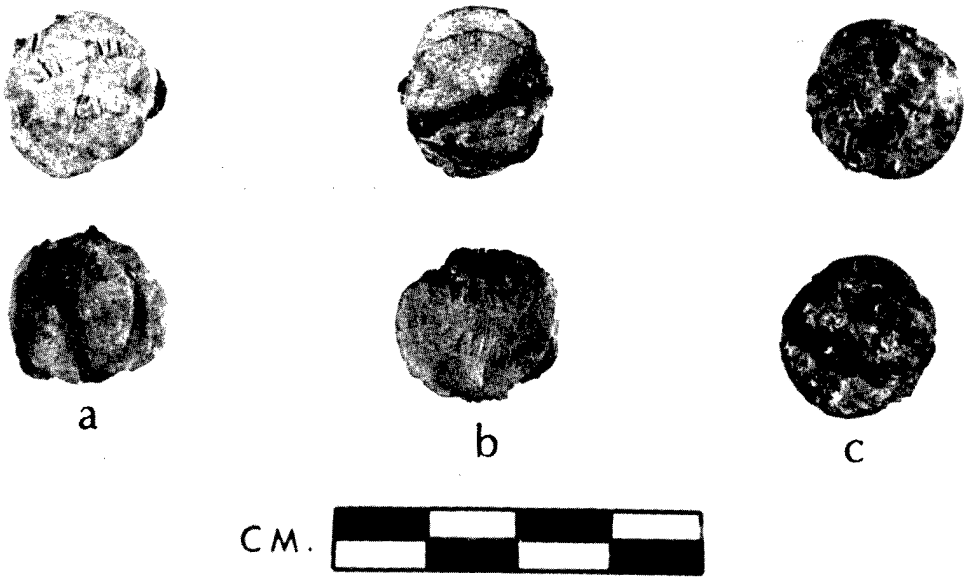


Figure 5-8. Anheuser-Busch Lead Seals. a-b. front and back of primary pattern, c. front and back of secondary pattern.

> arrangement of the brewery or warehouse and the bottlery must be such that it is a physical impossibility to take beer from the former to the latter without carrying the beer over the surface of a street or road which is a public highway and actually and commonly used by the public as a thoroughfare (Baron, 1962:245).

In part because of this legal problem, a division developed in the industry and very few companies engaged in both bottling and brewing. Anheuser-Busch was one of the few which always carried on both in putting out their "St. Louis Lager Beer." However, when Carl Conrad in the mid-1870's returned to St. Louis from Germany with the formula for the now famous Budweiser beer, he obtained Anheuser-Busch to do the brewing and bottling for him while providing the empty bottles from his own factory. This relationship continued until 1883 when Carl Conrad and Company went into bankruptcy. "Budweiser" beer officially became the property of Anheuser-Busch in 1891 (Toulouse, 1971:117-118). The possibility then presents itself that these seals may have been applied to St. Louis Lager, Budweiser, or any other beer which Anheuser-Busch bottled.

Although is seems reasonable to associate these seals with the use of beer, the specific application is not so definite. On the one hand

is a significant amount of negative evidence for their use on bottles. This includes instances in which beer bottles have been found, often with their wire closures in place, but with no evidence of such seals. In addition, old beer bottles show no evidence of such seals when they do occasionally appear in publications (e.g., the 1880 to 1890 period Budweiser bottle in Sellari and Sellari, 1975:35). An alternate possibility is that these were used with other and less common containers of beer, possibly cases or kegs. Although Ft. Sill was some distance from point of manufacture, it is not unreasonable that keg beer might have appeared here prior to the turn of the century. Rickey (1963:205), for example, cites an instance in which kegs of Milwaukee beer played a part in the Fourth of July celebrations of the soldiers on the Mexican border during the 1885 Geronimo campaign.

4. Glassware

A total of four drinking glasses comprise the total artifacts in this category. In only one case has it been possible to reconstruct a portion from lip to base. Of the other three, two have been defined on the basis of their bases while one has been defined on the basis of lips. Their inclusion as drinking glasses must then be qualified.

Two lip fragments were found in squares R78 and T82. Although they do not articulate, their thickness and curvature makes it possible that they represent the same vessel and so they have been counted as one. Both are clear and have smoothly rounded lips. Other glass sherds from the site have been found with these same characteristics and have been included with the lamp chimney glass. The distinction is made on the basis of change in glass wall thickness. "Chimneys" show no increase in thickness with increasing distance from the lip edge. These both showed increasing thickness.

Both of the bases are of purpled glass. This characteristic, a result of inclusion of manganese in the glass formula, would date these to the period roughly between 1880 and World War I (Kendrick, 1966:57). Neither bears any inscription or other marking. That from square Q63, level 3 has a smooth concave base and the walls increase slightly in outside diameter from the base. It is quite heavy and may have been a mug (Figure 5-9a). The other base is of two sherds from squares L86 and L87. It is not complete. A concavity is also present. However, it is impressed with a fluted design not duplicated on the outside base or walls. It may also have been a mug.

The final drinking glass is an almost complete pressed glass tumbler. It was reconstructed from sherds from the following squares:

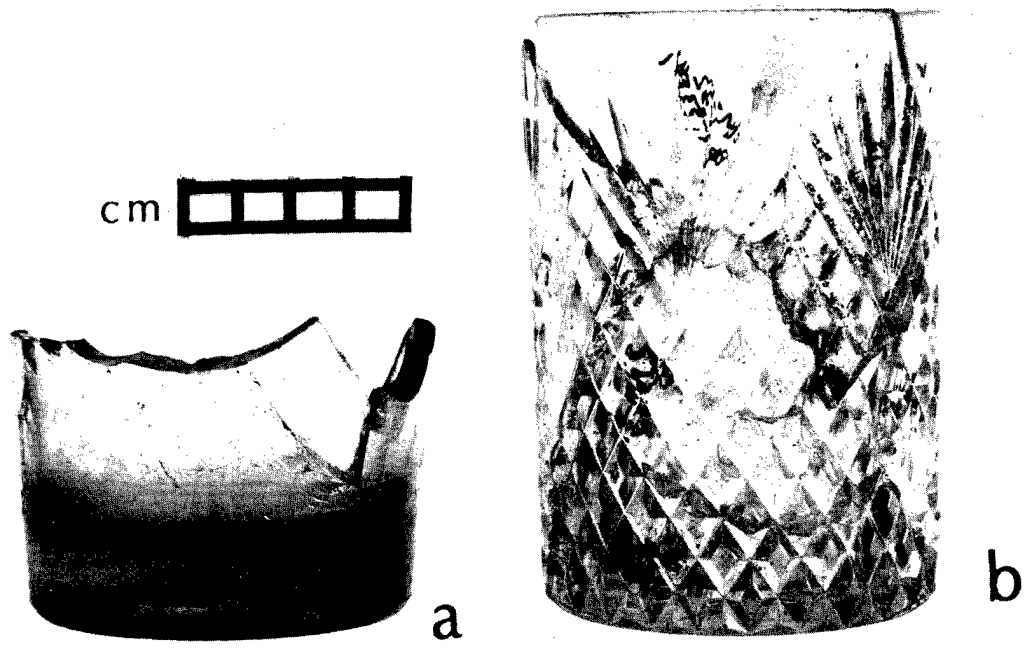


Figure 5-9. Drinking Glasses. a. purpled glass (mug?), b. pressed "Czarina" pattern c. 1895.

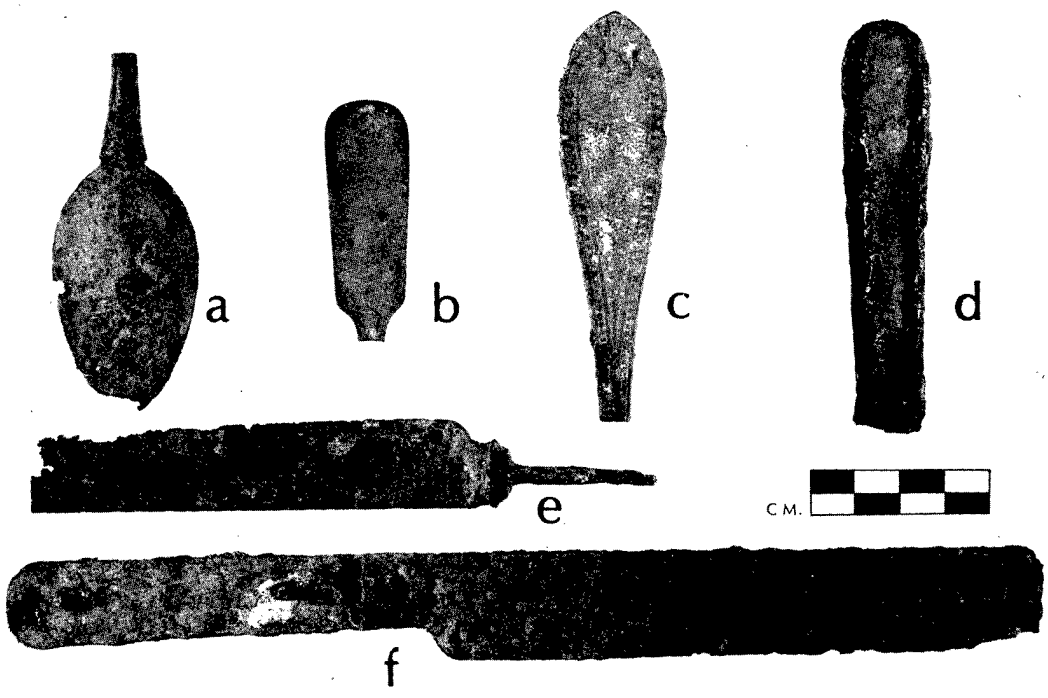


Figure 5-10. Tableware. a. bowl of spoon with two-part applied handle, b. stamped sheet brass handle, c. cast white metal handle, d. mess knife handle (19th century?), e. tanged knife blade, f. one-piece knife blade and handle.

M64, level 2; M64, level 3; N63, level 2; S64, level 3: N63-64, level 3; and P-Q53-54. It stands 3.9 inches (100 mm.) tall with an outside diameter at the lip of 2.85 inches (72 1/2 mm.) and bears the Strawberry Diamond and Fan pattern (Figure 4-10b). Keefe (1974:207) dates other pieces of this pattern c. 1895-1900. In 1895 the Montgomery Ward Company offered this pattern in pressed and cut glass, calling it also the "Czarina" pattern. According to their description, it is "an exact imitation of the celebrated strawberry diamond and fan genuine cut glass pattern, which came into prominence during the World's Fair" (Montgomery Ward Co., 1969:538).

5. Tableware

The only identifiable eating utensils were one spoon and a number of knives. Three handles were also found. For the sake of simplicity, these are presented separately below.

a. Spoon

The bowl of one tablespoon was found in square S71 (Figure 5-10a). It is of iron and has an unusual three-part construction. The bowl is separate from the handle and is held in place by a tang inserted between the two halves of the handle. The upper portion of the handle is decorated in relief and is wrapped to overlap the edges of the plain strip which comprises the lower handle. These are pressed together securing the bowl and forming the handle. No manufacturer's mark is apparent. Nothing is known of the dating of this technique. A handle of similar construction is discussed below under "Miscellaneous."

b. Knives

Of the eight knife fragments found at the site, two are of distinctly military design and will be discussed last. Of the six "civilian" knives, four consist of handle and blade portions while the remaining two are simply blade mid sections. None of the six are serrated and manufacturer's or other markings are not apparent due possibly to their condition. All appear to have been intended as eating utensils although use as a sheath knife, for example, cannot absolutely be ruled out for all. All appear to be without specialized function, as for example, a cheese knife.

Two blade mid sections were found in squares W87 and M68. Neither is serrated. Little can be said of that from square M68. It is too incomplete even to determine whether it was rounded or pointed.

However, it does have a sharp rather than a dulled edge. The knife blade mid section from square W87 also has a sharp cutting edge. However, the curve of the blade implies that the tip was pointed rather than rounded.

Three knives have one-piece blade and handle. A bolster separating the blade from the handle is present on two of these. One is of iron while the other (Figure 5-10f) is of a white metal. In both this has been applied to rather than being integral to the blade. Also on both are the remains of the wooden grips which formed the handle. Three rivets held the grips to the knife with the white metal bolster while that with the iron shows only two rivets. All of these rivets are brass. The provenience of these is N69 and R70 respectively. Around one of the rivets of the knife from R70 is a white pigment which may be traces of paint.

The piece from square N71 is more fragmentary, consisting only of a portion of the iron handle with a single brass rivet through it. Nothing remains of the grips, blade, etc.

The fourth knife section while also of iron is tanged for insertion into a handle (Figure 5-10e). It has, however, a reinforcement between the tang and the blade which served the same purpose as the applied bolster.

Two one-piece knife handles were found in squares R72 and U77 which are distinctly military issue in origin. The former is of iron and appears to have a separate blade, broken off at the handle (Figure 5-10d). No markings can be found on it. It shows similarity to the mess knife used prior to that discussed below and shown in Ordnance Memoranda No. 29 (U.S. Army Ordnance Department, 1891:Plate XIV). The knife and fork are described as being "made of steel; handles japanned" (U.S. Army Ordnance Department, 1891:18). No evidence remains of japanning on this knife although size and shape are virtually identical. Inclusion in this Memoranda would indicate its use at least as early as 1885 and possibly earlier. It is not known if a different style was adopted prior to that of 1910. However, as mentioned earlier, the use of the instrument cannot be assumed to have ceased immediately upon the adoption of a new style. The Ordnance Memoranda No. 19 (U.S. Army Quartermaster Corps, 1875:56; untitled illustration) does show a knife of similar style although no descriptive information is available as in the 1885 memoranda. However, an issue knife dated 1876 in the collection of the Fort Sill Museum was recovered from the old Fort Sill Dump, site 34-Cm-9. While it also has a one-piece iron handle of similar design, its proportions are somewhat different. While this may represent manufacturer's variation, it just as likely may indicate a different specification.

The second has a cast white metal handle with an iron blade. This is the issue knife, Model of 1910. Markings are present on both sides of the handle. One side bears "U.S." (raised) and "C35" (stamped). The other side bears the raised date "1917" under an unintelligible manufacturer's mark.

c. Miscellaneous

This category is comprised of three spoon or fork handles. One is from R70 and is composed of two-piece pressed iron as described for the spoon bowl from S71. They do not articulate.

Although the remaining two handles are one-piece, they are quite different. That from square S69 is flat and stamped from a piece of sheet brass (Figure 5-10b), while that from square Q73 is thicker and is cast from a white metal. The former is unelaborated while the latter bears a decorative border (Figure 5-10c).

6. Kitchenware

a. Kettle Leg

A short shank of iron just over 1 1/4 inches (33 mm.) long, this appears to be the leg from a larger item. Because of the curvature of its upper surface this might have been the curved undersurface of an iron kettle. Provenience is square L87. However, it appears to be of a malleable rather than a cast iron and although it may have been applied to the underside of a cast kettle, its taper also gives it the appearance of the tip of a horse shoe wing.

b. Grating

Two types of grating were recovered from Cm-232. One and possibly both may be associated with stoves or heaters. It is surprising that more was not found at the site to indicate the use of such heating devices. While it is possible that heat for comfort and for food preparation was primarily provided by the fireplace(s), it seems likely that additional facilities were necessary. Although no stove pipes can be seen in any of the photographs of the Commissary buildings, these may have exited on the courtyard side where not visible or they may have emptied into the chimneys.

Both of these gratings are of cast iron. Only four fragments of the most common type were found. These were in squares U73, U74,

U75, and V74. None of these articulate although their poor condition may contribute to this. These are solid and triangular in cross section.

The less common grating type found is represented by only two pieces, found in square M55 and in the area of squares N-Q58-59. This grating is similar to the above type in that it is cast with a triangular cross section. The interior arms, however, are ribbed presenting a wide and flat surface as opposed to its narrow and thick bordering. Possible black paint is still remnant on that from M55. This may represent original japanning. If so, it is unlikely that this would have been a fire grate. These also do not articulate.

The presence of these in the absence of larger fragments representing more substantive evidence of a stove's presence implies one of two things. Either the area was used for dumping of litter from elsewhere, or the larger pieces which were once associated with this grating were removed from the area prior to the laying of the original blacktop. This removal may have been associated with a deliberate attempt to clear the area for renewed use, possibly for the original parking lot. However, the absence of such pieces in Feature 8 which seems to have been a receptacle for much of the debris in the area, tends to imply the former.

7. Storageware

a. Tin Cans

Cm-232 yielded up a confusion of fragile, heavily rusted, thin sheet iron, probably relating to tin cans. Much had been crushed, tangled, chewed up, and scattered. Some was obviously of tin can origin while some related to buckets, pails, or other containers which did not necessarily relate at all to food. One example of this latter might be the "tin boxes" for certain artillery primers discussed in the Military Ordnance group. No labels, etc. were found.

It was necessary to consider only those fragments which could be identified. These consisted primarily of tin can bases and lids. A range of vessel sizes was present as were a variety of closure techniques with a corresponding variability in the dating of the group. It is hard to characterize the collection as a whole. Most appear to be related to food storage and most used the soldered seams or hole-in-top, etc. which indicates early production. However, essentially modern cans with crimped edges were also found. In addition were found a variety of closures not intended for hermetic sealing and

therefore many of which may not have pertained to food at all. While some may have been kitchen products like baking powder, other possibilities would have been rifle caps or primers, tobacco in one of its various forms, or even military equipment.

Tin can fragments were separated into "body" fragments and fragments with lip seams. The latter were distinguished insofar as possible into those with crimped edges and those with one of the two types of soldered tops. According to Fontana and Greenleaf (1962: 72-75), the earlier was the hole-in-top can. It entailed a two part lid, the inner lid of which was placed only following the insertion of the contents. It had a small hole sealed with a drop of solder (Fontana and Greenleaf, 1962:68-69). A later development, introduced by Carnation presumably some time around the turn of the century, is the soldered can with the "matchstick" size filler hole in the lid, adequate for liquids but not for solids (Fontana and Greenleaf, 1962: 74-75). It appears that both of these types were represented on the site. Some cans were distinguishable as containing liquids in that they had mere slit openings for pouring.

A total of 408 body fragments were found. Of the 117 lid and base fragments, 54 appears to have been crimped while 63 were soldered. It was only possible to make estimates of the minimum number of cans which these figures represented. A total of only three crimped cans could be recognized while fourteen of the soldered type were recognizable. Of those soldered, eight appeared to have been hole-in-top while six appeared to have been "matchstick."

A number were of special types or were lids not used on sealed metal cans at all. These latter might include baking powder cans. Six were large and round with press on lids and carrying bales (Figure 5-11e). These are commonly used today for such things as paint but in the past were also used for foodstuffs such as lard. Four lids were found which were of the type appropriate to these "lard" pails. The small "baking powder" lids were oval and were pressed into place. Two of these were found. A larger oval press-on lid type was also found (Figure 5-11d). These had deeply inset lids and numbered six. Their possible use is unknown.

At least one can was found which was opened with a key. It also was hole-in-top but opened around the outer lip like the modern cocktail peanut can. The entire can and key were recovered (see Figure 5-11a&b). The final of the more complete and special cans was similar to a snuff can, i.e., round and shallow (Figure 5-11c). The lid simply lifted off. It is about 1.8 inches (46 mm.) in diameter. Except where features such as hole-in-top lids exist there is presently little by which these specialty types can be dated.

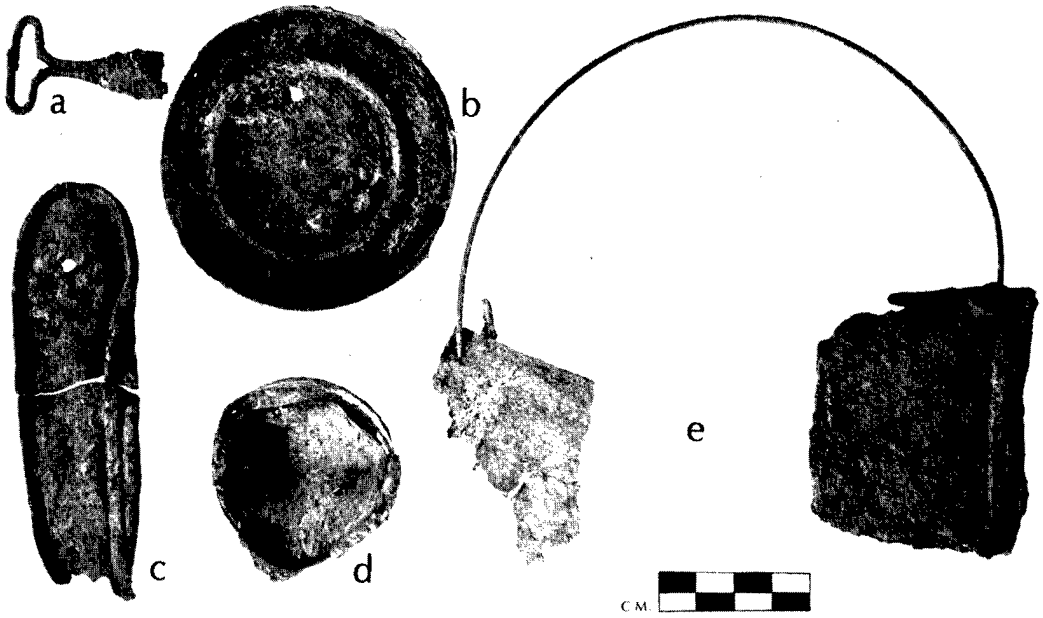


Figure 5-11. Tin Cans. a. opening key, b. hole-in-top can lid (key opened around sides), c. "snuff" can, d. large "baking soda" lid, e. pail type with carrying bale.

Figure 5-12. Homecanning Artifacts and Bone. a. lid liner, b. jar shoulder and mouth, c. round steak bone, d. fowl radius, e. tibial tarsal (probably bovine), f. roast bone.

The dating potential of tin cans has not proven useful at this site. For example, with regard to Feature 8, both crimped and soldered cans were found to coexist in levels 1 through 4. Although body fragments were present in level 5, at the floor of the feature, these were not recognizable as belonging to either of these groups. However, one of the small and one of the large, deep oval "baking soda" lids were found in level 5.

b. Homecanning Miscellaneous

The problem of preserving foods has always been present. One step toward solving this problem was taken by John Landis Mason who in 1858 patented a threaded jar and lid for use by home canners. One drawback in his design was the use of a zinc cap which allowed the metal to come into contact with the contents. However, this was improved upon later by Salmon B. Rowley and Lewis Boyd who used a glass liner under the cap (Klamkin, 1971:194). The fragment of milk glass from square R78 is from such a cap liner (Figure 5-12a). It bears no markings. These were in use for many years and it is not possible at present to determine dating or manufacturer from such a fragment.

In addition to this lid liner was a mouth and shoulder fragment of a glass Mason jar type vessel (Figure 5-12b). This received treatment in the earlier discussions of Culinary Bottles. (See Figure 5-5h for a cross section of this vessel type.)

8. Bone

Excavated animal bone totalled 1,397 fragments weighing 6168.5 grams. Fragment size varied widely; with few possible exceptions all were kitchen scrap. This is based both on the animals from which they were derived and from the appearance of sawed edges and cut marks. At least 60% had been sawed in butchering while at least another 20% appeared to be but were quite fragmentary. Virtually all are post-cranial. Preservation is quite good and little if anything is thought lost by decay.

Distribution maps of the bone found on the site were prepared by both their weight in grams (Figure 5-13) and the number of fragments per excavated square meter. The differences between these are slight. There is no apparent relationship with architectural features which could be related to the Indian Agency. However, the distribution is worthy of note in that it reflects the same general distribution shown

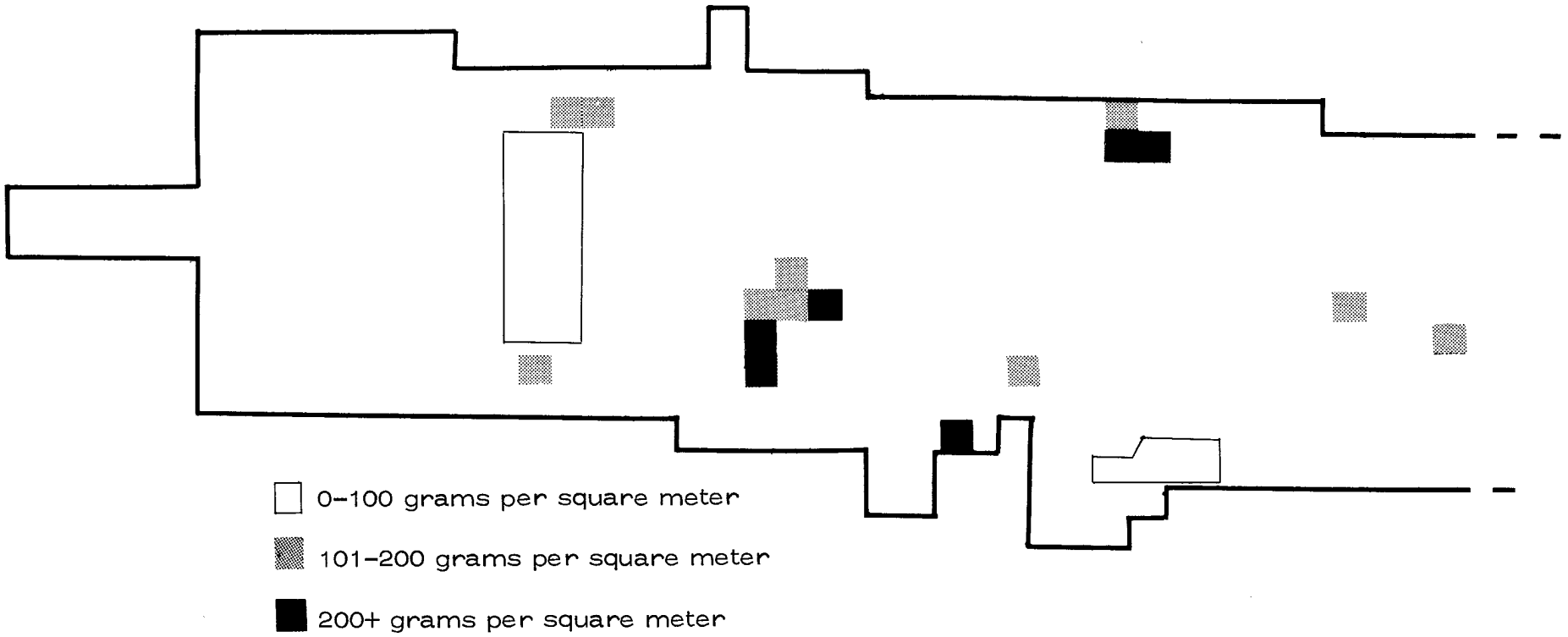


Figure 5-13. Map of Bone Distribution.

by most of the other household debris, a fact which is thought to reflect similarities in initial deposition but may also to some degree result from later, similar disturbances. To the south of the Feature 8 pit is a striking absence of material. The pit itself has a high density while to the immediate north of the pit this density drops off slightly. It picks up again, however, to the north of this and the heaviest scatter is across Rows 70 through 79. Over the remainder of the site it thins with increasing distance to the north. Secondary concentrations occur within this general scheme. Bone, for example, shows a high density in the area of units squares Q-T71-73, on the east central side of the structure (Figure 5-13).

A variety of animal sources produced the bone. Included are fowl (likely chicken), small mammal (possible rabbit), and intermediate sized mammals (likely deer and pig). However, by far the largest contribution was made by modern cattle. Although some may have been bison, portions most readily useful to their distinction were not present. In addition, the early disappearance of bison from the area and the late context with which it is suspected we are dealing here mitigate against that possibility. As mentioned earlier, most are saw cut and many more appear so but are fragmentary. A variety of meat cuts are represented. The beef include round steak, blade cuts, roasts, and ribs. In addition are portions of the extremities which were either used as soup bone or simply discarded. Two long bones of small mammal of deer size and one chop, probably pork, are also present.

It is difficult to say anything precise about the dating of deposition of these. Since their distribution parallels that of other artifacts on the site, it may be that some extrapolation based on the presence of other more dateable materials may be possible. Also it is evident that modern practices were applied to their processing as it would only have been after white presence had made itself felt that such saw cuts should appear. While it is known that beef was for a time issued to the Indians in slaughtered form, it is not thought that these had been reduced to specific cuts (such as the round steaks, for example) but were rather still in bulk form. Indian use is still a possibility, however. Some attempt at dating is also possible in Feature 8. In this regard, the results are quite striking. Bone is present only as deep as level 3 and the amount of deposit decreases sharply between level 2 and level 1 implying that the major period of deposition had already occurred (Table 5-5). Dating of these levels by the presence of other materials (particularly ceramics, glass bottles, and small arms cartridges) in them indicate the main period of bone deposition to be well after the disappearance of the Agency buildings, possibly as early as the 1880's and as late as the pre-World War I twentieth century.

Table 5-5. Distribution of Bone in Feature 8.

Level	Weight (gms.)	Percentage
1	16.0	1.7
2	580.2	61.3
3	350.6	37.0
4	0	0
5	0	0
Total	946.8	100.0

CHAPTER VI
ARCHITECTURAL GROUP ARTIFACTS

1. Window Glass

From Descriptive Statements filed by the local Indian Agent (see Appendix A, #6), it is known that the Commissary buildings are listed as having the following numbers of windows:

25 windows: Store house- Commissary, Council room, and Quarters
19 windows: Store house- Annuities, Office and Quarters

It is not certain how many panes were used per window. The best evidence available is the angled Soule photograph (Figure 2-2). It is possible that these were four pane sashes. This point is of some interest in that the buildings of Fort Sill were built with six pane sashes. This is in accordance with the 1860 Regulations Concerning Barracks and Quarters (U.S. Army, 1861), which consistently specifies that sash. However, a photograph found in the Morris Swett Collection at the Museum of the Great Plains labelled "D. P. Brown Trader Store, Abernathy & Boake. Built by Shirley, on North Side River, Anadarko, 1870" (Figure 6-1) shows the use of a four pane sash. It is known that John Shirley (Nye, 1969:102) was the original contractor for the erection of the Agency Commissaries. Because of the likely use of military derived specifications for the buildings, it would seem therefore more appropriate that the windows for the Commissaries should be of the six pane variety. However, the possibility of license on the part of the contractor in this and other specifics cannot presently be denied.

While some large fragments of window glass were found at Cm-232, it was not possible to reconstruct even one complete pane edge. The largest which was reconstructed measured 4.74 by 2.91 inches (120.4 by 73.9 mm.).

What appears to be an essentially modern glass was also found. It is distinguishable by its increased thickness, decidedly greenish tint (as opposed to the more aqua earlier glass), decreased patina, and lack of bubbles or other imperfections. These were excluded from the map of glass distribution by weight.

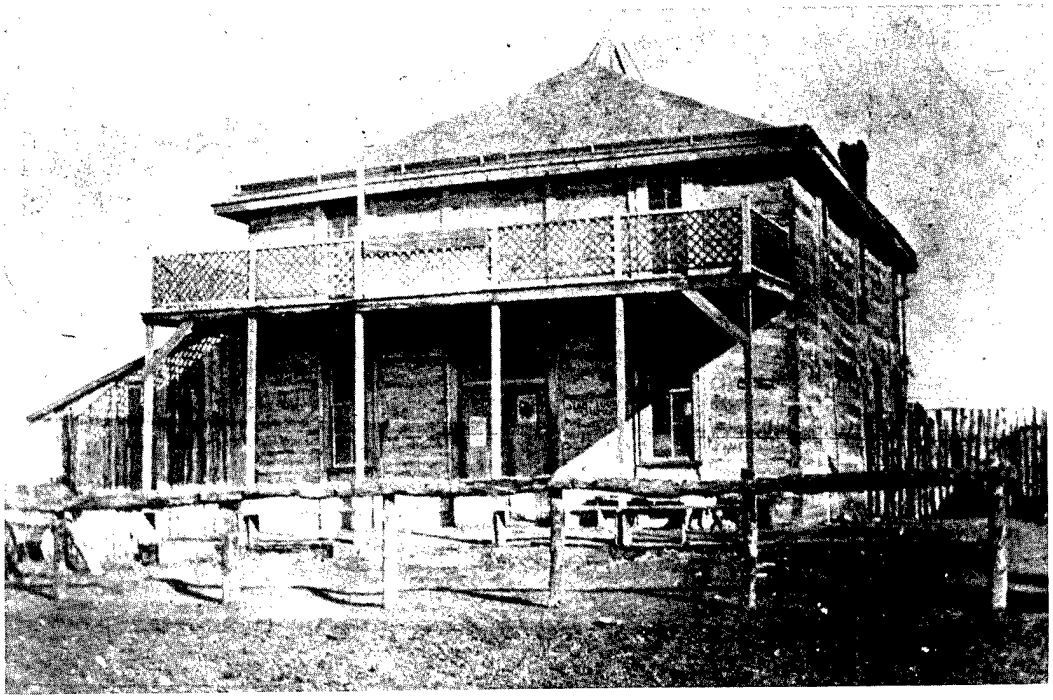


Figure 6-1. "D. P. Brown Trader Store, Abernathy & Boake. Built by Shirley, on North Side River, Anadarko, 1870." (From the Morris Swett Collection, Museum of the Great Plains.)

In order to attempt to understand something more of the construction of the building, a distribution map of window glass by its fragment frequency per square was prepared. It was not possible to distinguish any patterning, probably because of the varying amounts of damage suffered by different parts of the site. Certain units, such as square V83, had large counts of glass which had been crushed into small fragments. Others, however, had relatively large intact fragments. Therefore, the decision was made to examine the glass distribution by weight.

The distribution map of window glass by weight (Figure 6-2) revealed little that was not previously known. It seems evident that windows were present in the east wall of the building, a fact which was assumed but not previously proven. Additional confirmation was also found for the assumed presence of at least one window on the south end of the building, over the porch. To photo right of Mrs. Tatum (seen standing at porch center in Figure 2-2) is a vague darkness which the glass distribution suggests is possibly a window. Other glass concentrations show the presence of a window or windows in the area of Feature 9, discussed elsewhere as a plaster porch

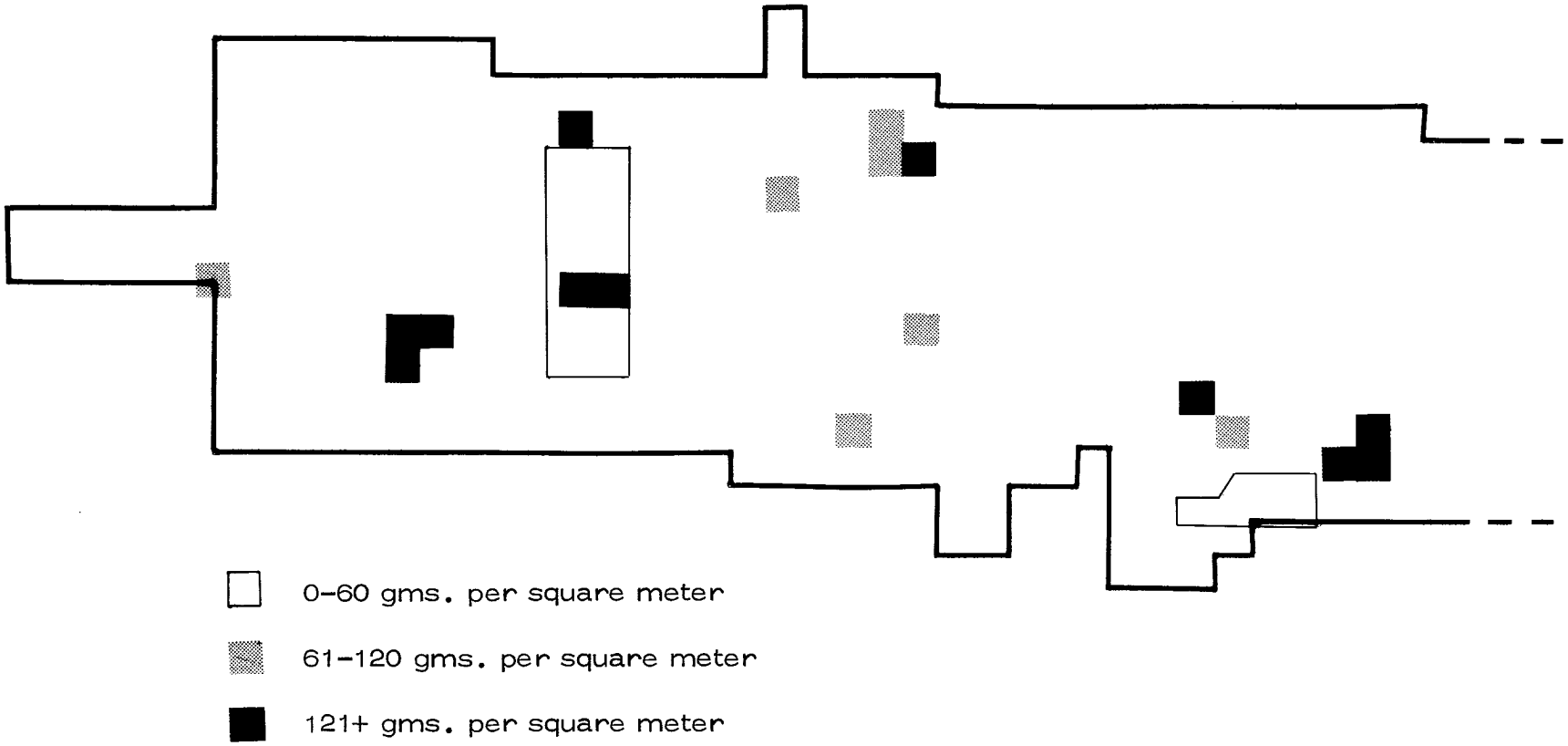


Figure 6-2. Map of Window Glass Distribution by Weight.

probably located outside of the east wall of the building. It would imply the location of a door. The significance of this fact is that two glass concentrations, very close together, occur in this area. One is three to four meters inside the wall from Feature 9. The second concentration is slightly northwest of Feature 9.

Glass thickness has been shown to increase with time (Walker, 1971). Because of this it has proven possible to develop a chronology through the early nineteenth century. It has not, however, been possible as yet to extend this chronology any further into the century. While the dating of the structures on this site is relatively well established, a range of glass thicknesses from 0.033 to 0.118 inches (0.08 to 0.30 cm.) was found. The thickest glass was unusual in that it was in general less patinated, freer of imperfections, and bore a decidedly greenish tint as opposed to the blue-green of the thinner glass. It is assumed that this thicker material represents much later debris. As no later occupations of the site are known (although it is known that others had lived in the general vicinity) it might be assumed that this thicker glass was accidentally spread or deliberately dumped at the site. No unusual concentrations of this glass appeared present on the site.

Individual variability further compounds the problems encountered. One piece from square S59 varies from 0.084 to 0.101 inches (0.213 to 0.257 cm.) while a sliver from square R59 of only 2 inches (51 mm.) length varies between 0.033 and 0.060 inches (0.84 and 1.52 mm.) in thickness.

The window glass from Cm-232 may reflect the problems inherent in trying to apply a chronology to late 19th century glass thicknesses. Excluding the unusually clear, thick glass, the range was from 0.033 to 0.101 inches (0.83 to 2.57 mm.).

Attempts have before been made to translate this weight figure into an estimated surface area of glass (Black, 1974:165-169). Such a procedure was not attempted here. It is worthy of note, however, that at Fort Lancaster when surface area of window glass was compared to weight, "the average weight per square inch was calculated to be 3.7 grams within parameters of approximately 4.20 grams and 3.38 grams" (Black, 1974:102). Although the dating of this site (1855-1875) and of Cm-232 (1869-1882?) are similar, the average weight per square inch of glass at Cm-232 is 2.90 grams while the range is from 2.1 grams to 3.7 grams. This was, however, taken from an admittedly small sample of eight fragments covering a total surface area of 22.1 square inches.

2. Bricks

The use of bricks in the west Commissary building is amply documented by the Soule photograph, Figure 2-2. Two chimneys are shown protruding through the ridgeline at the southern end of the building. In the total absence of evidence for other uses of brick in the structure and the evidence discussed below for an early dating of this brick, it is assumed that all the brick found was associated with these chimneys. While other, more distant photographs do on close examination appear to show chimneys in the east Commissary, no details can be distinguished.

In light of our present knowledge of the construction of the building, little can actually be concluded. However, the northernmost chimney shows brick from roof to cap. The other appears plastered below with exposed brick above. Because of the large quantity of faced stone on the site and because of the apparent use of plastered limestone walls (portions of which were found in Feature 8), it might be suggested that the southern chimney was in part constructed of plastered limestone. Alternately, of course, it may have been that the plaster covered brick as well as limestone.

The brick fragments or brickbats found on the site extended largely to the north of the area where the Soule photograph shows the chimneys to be located. This may reflect a northward direction of collapse, also indicated by the collapsed fireplace found in Feature 8.

No complete bricks were found and much of the evidence for the brick was no more than reddish stains. Considering the quality of the brickbats recovered and the post-depositional disturbance, this is not surprising.

Of the seven brickbats brought back to the lab, all but one were collected without regard to provenience (Table 6-1). That one is from N63, level 4. All were such that a true measurement of length could not be obtained. However, the longest brickbat measured 5.16 inches (131.1 mm.). Excluding the minimum measurements, the average width for these is 3.72 inches (94.5 mm.) while the average thickness is 2.05 inches (52.1 mm.).

Brick are standardized by the American Face Brick Association and the Common Brick Manufacturers' Association at 8" by 2.25" by 3.75". These dimensions vary somewhat "according to the degree to which they were burned, the hard brick being from 1/8 to 3/16 in.

Table 6-1. Dimensions of Brickbats from Cm-232.

Provenience	Length in. (mm.)	Width in. (mm.)	Thickness in. (mm.)
N63/4	3.85*(97.7)	5.55 (128.4)	2.03(51.5)
None	3.28*(83.2)	3.91*(99.2)	2.00(50.8)
None	3.72*(94.4)	3.94 (100.0)	1.99(50.6)
None	5.16*(131.2)	3.79 (96.3)	2.10(53.4)
None	4.62*(117.3)	3.12*(79.3)	2.08(53.2)
None	3.88*(98.8)	3.31 (84.1)	2.17(54.9)
None	2.48*(63.1)	2.53 (63.1)	1.96(49.9)

*broken; measurement is a minimum.

smaller than the salmon brick" (Graham and Emery, 1950:51). There is then a rough comparability between modern and these nineteenth century bricks.

Bricks are commonly made so that there is a top and a bottom side. The top of a brick is distinguished in two ways. First, it is made so that it is slightly wider than the bottom. Graham and Emery (1950:44-45) suggest that this difference can be most easily detected by holding the brick with fingertips from both sides, the top side being distinguished by requiring less effort because of its shape. Only one of these bricks was in such condition as to allow quantification of this difference, on the order of 0.01 inches (about 1/4 mm.). In spite of such slight physical differences, however, for several of these brick some distinction was detectable by the Graham and Emery method described above. Its subjective nature and the condition of these brickbats does, of course, raise questions as to the test's validity.

Another technique for distinguishing top from bottom is by the comparative roughness of the top (Graham and Emery, 1950:44). Three of the brickbats do show striations running the length of the brick and one with the striations running the brick width (although these are so light as not to preclude accidental occurrence). Of the former, only two have enough facing on the side opposite that with the markings to preclude its also having been marked. The origin

of these markings is not certain. Their presence only on the brick tops implies that they might have served some function as in providing a better bonding surface for the mortar. The effect might be similar to that achieved by the depression type brick (Graham and Emery, 1950:47) or the modern 3-hole brick. Indeed, one of these has striations so deep as to suggest their deliberate application. However, it may also be that some of this roughness is the accidental result of wiping excess clay from the top of the mold.

One of these brickbats (Figure 6-3a) is noteworthy in that it bears mortar which reflects the thickness of the joint between it and the brick beneath (according to the striations on the other side). This mortar measures 0.42 inches (10.7 mm.). According to Graham and Emery (1950:155), joint thickness should vary "from 1/8 to 1/2 in. or more to suit the kind of brick used and other conditions." Common brick as these appear to be, "should have at least 3/16 and not more than 3/8 in. thickness of joint." The thickness of this joint then would slightly exceed this modern maximum standard of 3/8 inches (9.7 mm.).

All of these bricks are hand molded. All are of a reddish color and somewhat sandy. They seem to have been baked but are too soft to have been thoroughly fired.

As none of these bricks are marked in any way, their origin is not certain. It is known, however, that at least by 1872 large quantities of brick were being made at Fort Sill (see Appendix A, #3). However, Nye reports, "Early in the spring of 1869 Colonel Grierson sent wagon trains to Fort Arbuckle for lumber, bricks, and tools." Further, "Bricks brought from Fort Arbuckle and Texas were used to build chimneys" (1969:101). Thus it appears that for the military at least, bricks were first made locally later than 1869. The difficulty in determining whether the Commissary bricks were imported or not lies only in part with the uncertainty as to when the Commissary buildings were constructed and when the Army began to produce its own bricks. As discussed earlier in the historical summary, these were built early but on Army contract with a civilian, John Shirley (Nye, 1969:102). This then brings into question whether or not he supplied his own materials or might instead have obtained them as did the Army. Further documentary research may some time clear up this question.

Four basic methods of brick making are outlined by Graham and Emery (1950:11-21): hand, soft mud, dry press, and the stiff mud method. The dry press involves compacting the brick from

dry clay under intense pressure while the stiff mud involves the pressing of wet clay into a continuous bar which is then cut. Neither of these appears to have been used in the production of the Cm-232 brickbats because of the distinctive surfaces which these leave and the compactness which such machine operation applies to the brick. Of hand and soft mud methods, only the latter involves mechanical aids. With the soft mud method, brick clay is pressed into between four and six molds at a time. The mold is 5-sided with a removable base. "The bricks formed by this process are all uniform in size and resemble very much brick made by the hand process" (Graham and Emery, 1950:19). The hand method entails hand pressing the clay into a four-sided mold which rests on a flat table. Excess clay is wiped from the top with the straight edge of a "strike" following which the mold is lifted from around the newly formed brick.

The brickbats found at Cm-232 appear to have been made by the soft mud method. Two factors led to this conclusion. These brickbats are highly vesicular, a factor which does not imply automated clay processing or mechanical pressure in molding. Further, flat surfaces of these brickbats, even where intact, are quite irregular.

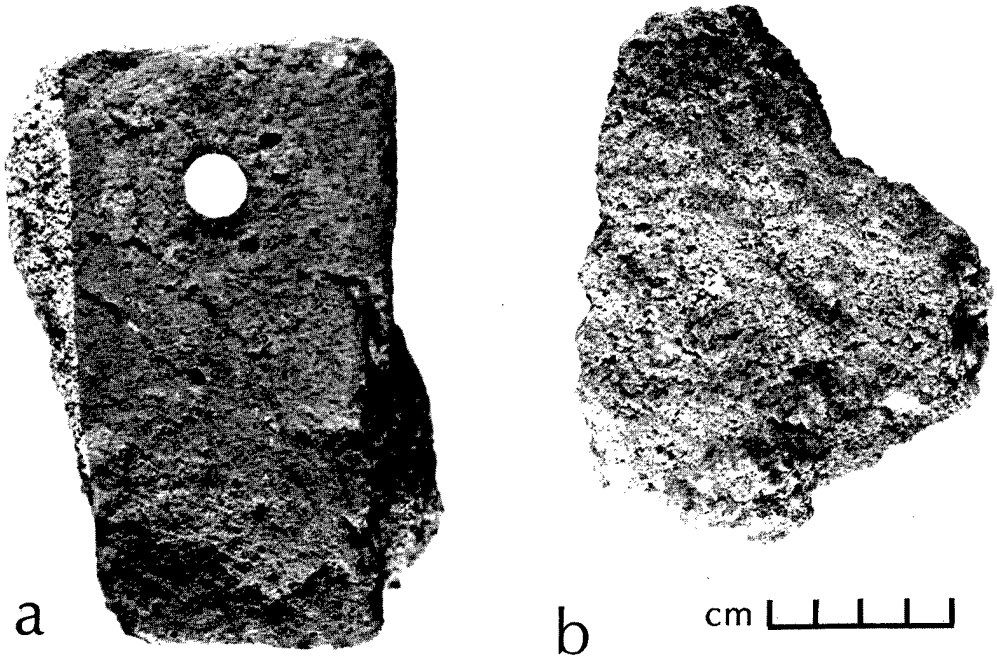


Figure 6-3. Brick and Mortar. a. hand formed brick (white circle is 1 cm. in diameter), b. mortar from between limestone rock.

A final distinction which should be made is the manner in which the clay of the brickbat was prevented from adhering to the mold. Two techniques are used. The first of these entails wetting the mold and sprinkling it with sand. The second entails merely sprinkling the mold with water. By these means are formed the "sand mold" and the "water struck" brick respectively. Assuming that the sand mold brick would have a roughened surface reflecting the roughness of the sand, these brickbats appear to have been so made.

3. Mortar/Plaster

The subject of mortars, plasters, and stuccos is too complicated for a full discussion here. However, something is known via historical accounts of their use at Fort Sill, although nothing is known of it specifically at the Commissaries. According to Nye (1969:105), "crude kilns were made at the southeast side of the quarry to burn lime for cement and plaster. Sand was obtained from the bed of Cache Creek." Much of the work at the Fort was done by skilled civilians who had been brought in from outside. While it not known what part the stone masons had in the actual preparation of the mortar which they would be using, plasterers were also imported (Nye, 1969: 102). These latter would presumably at least supervise the preparation of the plaster as well as participate in its application. It is assumed that although the Commissaries were erected by a civilian under contract, the procedures he would follow would be similar if not identical to those performed by those working directly for the Army.

The binder common to mortar and plaster used at the site was no doubt of the common lime type. Bits of partially burned limestone are evident in the wall plaster. In addition, samples of plaster were submitted to Dr. M. J. Holdaway of the Geology Department of Southern Methodist University for x-ray diffraction analysis. These three samples represented wall plaster, mortar from around the rock fall in Feature 8, and plaster from Feature 9, the flooring. His results are summarized below.

	Quartz	Calcite
wall plaster	40%	60%
wall mortar	25%	75%
flooring	10%	90%

As described below, limestone was burned in one of several possible types of kilns. It is not known what type might have been

in use here. While glassy green clinkers have been found in the plaster, this may have resulted from combination of the burned lime with by-products of the heating fuel. (It also reflects a laxness on the part of those preparing the plaster.) There are two general types of kilns, the intermittent and the continuous. In the former, the kiln is filled and fired; when the burning is completed the fire is allowed to go out and the lime removed. In the latter, the kiln is devised so that the lime may be removed as it is burned. The advantages of the continuous kiln is that it is likely quicker and more economical to operate. However, because of the additional difficulties inherent in operating the continuous kiln, the intermittent type is more likely. Further, with the early abundance of wood in the area as well as the degree of fuel savings (an estimated 60 cubic feet of oak to produce 35 cubic feet of lime in the intermittent versus 47 to 48 cubic feet of oak for the same quantity of lime in the other) the conservative approach need not have been mandatory.

In the intermittent kiln the fuel may be mixed with the limestone or may be kept separate. The latter is more common and may produce the better quality lime. "Those kilns in which the limestone is kept separate from the fuel are known as flare kilns, and the lime obtained from them is called flare-lime" (Dancaster, 1915:37). As mentioned above, sometimes large, green glassy clinkers can be seen in the plaster as can flecks of wood charcoal. Because of the limited occurrence of clinkers and charcoal in the plaster, it is suggested that this might have been accidental and that the binder is flare-lime. What appears to be early lime kilns have recently been found in and near the banks of East Cache Creek. Careful archaeological exploration of these might do much to increase our knowledge of early lime burning as practiced in the area.

It is known that by 1872 bricks were also burned at the Fort (see Appendix A, #3) and it is possible that by that time some more permanent lime kilns had been built. However, at the early date that the Commissaries were first erected, it is less likely that this was the case. However, the issue is still an important one to the full appreciation of the potential variability of the plastering materials used at the site in that it is also known that the plastering was not all done at once. For example, Lawrie Tatum in a letter dated 3 June 1871, stated the following:

> I want to make some improvements here. Have two more rooms here, and have some more plastering done. (Tatum, 1967:61)

Further, replasterings and repaintings were certain to have occurred over the years. The plaster removed from the site was examined for signs of this as discussed below. Suggestions made herein should be regarded as tentative in lieu of more thorough testing of the plaster and more complete historical documentation.

The terminology which will be used in the following discussions is primarily taken from Dancaster (1915). Lime is the binder common to the plasters and mortar used in the construction of Fort Sill and with little doubt of the Commissaries. It is produced by the burning or calcining of limestone in a kiln. Lime provides the basis for many different building materials. Mortar is a mixture of binder and sand, the amount of the latter varying with the job and with the quality of the binder. Cement is obtained by burning limestones with a lower proportion of lime to other constituent minerals. It is possible to obtain the same results by grinding and mixing a fatter lime (i.e., one with too high a proportion of lime) with the requisite amount of foreign materials, usually in the form of a clay, before burning. Portland cement is an example of the latter. Concrete consists of mortar and an aggregate, usually crushed rock.

Stucco is distinguished because of its ability to resist weathering and therefore is preferred for outdoor use. Stucco is a combination of sand, cement, and hydrated (i.e., burned, slaked, and then ground) lime (Graham and Emery, 1951:657). The mixture applied to the exterior of the brick chimney and evident in the Soule photograph, Figure 2-2, would have held up well if a stucco. However, as mentioned above, the production of cement entails proportioning of ingredients prior to burning. With the difficulties entailed in controlled mixing, it seems unlikely that such cement was produced. In the absence of tests not conducted for this report, it cannot be assumed that stucco or even cement was utilized at all on the site.

Plaster and mortar remains were collected primarily from Feature 8. These had been protected from the ravages to which the rest of the site had been subjected and in some cases fairly large pieces remained. These were examined and the discussions which follow as well as the categories of lime use just given, are based on those examinations. "Plaster," of course, is a form of mortar.

Mortars and concretes are used on the interior walls, between brick, around rock, and in the piers. That used in the construction of the rock portions of the chimneys is a concrete composed of a fine aggregate as opposed to larger rock. This fine aggregate

appears to have been collected from natural sources rather than crushed. Particle size ranges up to 0.11 inches (2.8 mm.). In addition, this concrete contains a large amount of sand and is highly vesicular (Figure 6-3b).

Two large objects recovered from as low as level 3 of Feature 8 are of significance not only because they reveal another application of lime binder, but also because of the potential importance which their occurrence has for interpretation of the structural detail. These are two large blocks of apparently mold-formed concrete using extremely large and irregularly placed limestone aggregate. The mortar itself appears to contain some sand along with smaller chunks of partially calcined limestone. Clinkers are either absent or small. While the mortar is very dense, it has large open pockets. The first is the more fragmentary with minimum length and width of 17.2 and 6.2 inches (43.7 and 15.7 cm.), respectively. Thickness is from 8.2 to 8.5 inches (20.8 to 21.6 cm.). The other (Figure 6-4) has been split and although crumbling along the edges, enough remains of the flat surfaces to provide measurements of at least two of its three dimensions. Originally it was rectangular or square. Its length is 13.3 inches (337 mm.) while its minimum width is 4.7 inches (120 mm.). Thickness shows some variability, from 5.8 to 6.5 inches (147 to 164 mm.). Several of its sides show impressions which reflect contact with lumber cut by a circular saw (Figure 6-4). The size and shape of the block suggests that it might have been used as a pier, a step, etc. The saw marks, construction, and placement in Feature 8 imply possible association with the Agency. Although there were indications that the Commissary piers may have been made of stone, these concrete blocks underscored alternate possibilities.

The plaster from Feature 9 is unique at the site. It is more homogeneous (Figure 6-5) with much less sand present. Its increased compactness also seems to make it harder while at the same time giving it something of a brittle quality.

The material between the brick is quite sandy but does not contain aggregate as found in concrete, putting this into a mortar class (Figure 6-3a). While it includes much air, it is not in the large and uneven air pockets found in the concrete. [For further discussions of the brick and its uses, see the earlier Brick discussions.]

The material applied to the interior wall also contains sand but in smaller quantities and more finely grained (Figure 6-6). It is in essence a fine lime mortar used as plaster. Flecks of charred wood are also occasionally visible. It is relatively compact with very little free air space.

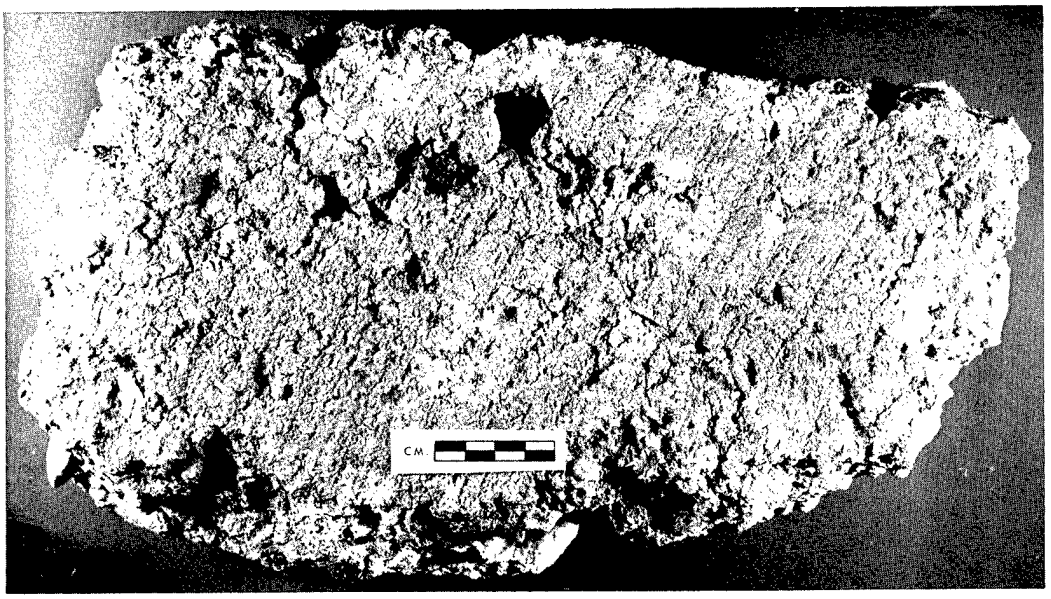


Figure 6-4. Concrete "Footing." (Note presence of radial saw marks on block face.)

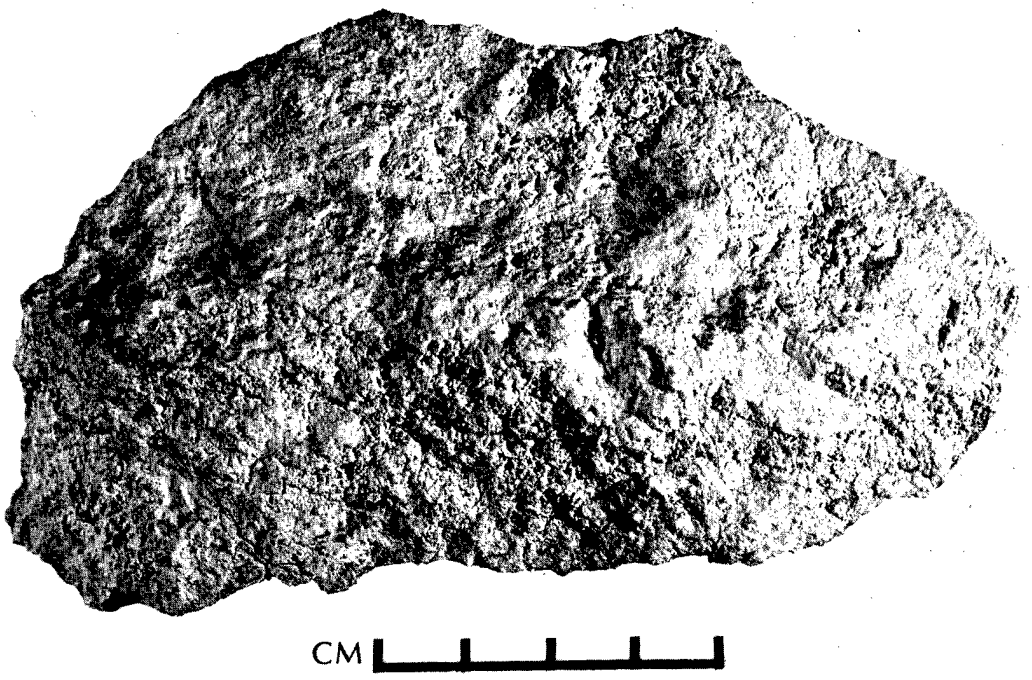


Figure 6-5. Mortar from Feature 9.

Those pieces of plaster which reflect application to lathing show little unusual. The lathing itself was rough cut with sometimes deep circular saw scars. It was placed horizontally across wider vertical furring or framing boards. As presently practiced (Van Den Braden and Hartsell, 1971:163-164) the "standard size of wood lath is 5/16" x 1 1/2" x 4'." They further suggest that lathing ends should have a 1/4-inch wide gap between one another and be not less than 3/8-inch apart along the sides.

Because the plaster was pressed over the lathing of the Agency Commissary, impressions tell something of the lathing now gone. The lathing was placed from 0.39 to 0.57 inches (10.0 to 14.5 mm.) apart although it is quite apparent that these lathing strips were not always placed parallel to one another. This distance with 41 measurements averages 0.41 inches (10.3 mm.). No plaster was large enough to span even one lathing board. However, it is apparent that in at least one instance lathing was a minimum of 1.23 inches (31.4 mm.) wide. Based on only seven measurements, lathing thickness was from 0.34 to 0.52 inches (8.6 to 13.5 mm.) and averaged 0.47 inches (11.9 mm.). Lathing then is slightly thicker but otherwise quite comparable to that used today.

Where the lathing crossed the vertical furring or studs, the mortar was pressed against the furring rather than into the open space beyond. This forms a rectangular rather than downward curving key (Figure 6-6b). Several such pieces were found. None were large enough to clearly show the full width of one of these vertical members. However, here too, the size of the largest piece gives the minimum width of one furring board as 2.32 inches (60.2 mm.). Nothing to indicate the other dimensions or spacing of these verticals or the possible gap between lathing ends was recognized.

Both two and three coat plastering are common. The latter Dancaster (1915:144) calls the rendering, floating, and setting coats. In this country, these are generally known as the scratch, brown, and finish coats (Graham and Emery, 1951:672-676). The initial coat is given the name "scratch" because it is incised with cross-hatchings prior to the application of the brown coat. These markings, provide for better bonding between the coats. The second or brown coat is also scratched although not so heavily as the first. None of the fragments from Cm-232 show more than two coats of plaster.

Two coat work is entirely satisfactory and may have been preferred for two reasons. First, it entails less use of plaster. Second, it saves much time. Graham and Emery (1951:672-676)

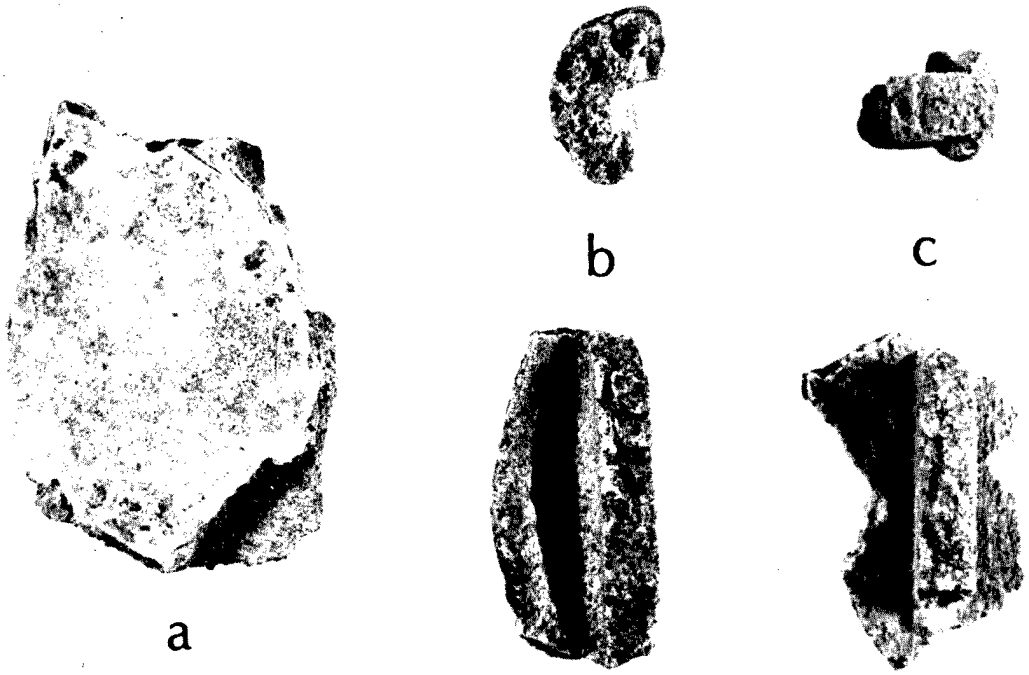


Figure 6-6. Wall Plaster. a. whitewashed outer plaster face (note presence of multiple coats), b. side and front view of broken, curved plaster "key," c. side and back view of straight "key" still attached to outer plaster coat

Figure 6-7. Scored Plaster Coat.

state that the second coat is applied the day following the application of the first. This is preceded only by a light wetting of the first coat. The third coat, however, "should not be applied until at least one week after the application of the second coat." This week includes three days during which the second coat should be kept wet by constant spraying. When only two coats are applied, "the first coat should preferably be doubled - that is, as soon as the first coat is stiff enough it should be followed by a second application of mortar." In addition, a third coat is not necessary. Further,

> The finish coat serves only a decorative purpose and has no structural value. Its sole function is solely to provide an attractive appearance. . . .(Graham and Emery, 1951: 675)

In light of the additional work, time, and materials entailed, it is little wonder that no more than two coats were applied. In fact, in roughly 40% of the pieces from Cm-232 examined, only one coat was apparent. An attempt was made to determine the thickness of these two coats. In 178 pieces the first coat averaged 0.31 inches (8.0 mm.) in thickness with a range of from 0.10 to 0.40 inches (2.6 to 10.1 mm.). The second coat, present on 66 of those 178 pieces, averaged 0.18 inches (4.5 mm.) with a range of from 0.10 to 0.27 inches (2.5 to 6.9 mm.).

One plaster fragment was also found which was quite atypical. Only one coat of 0.33 inches (8.4 mm.) was present. The back is smooth as though placed against brick while a slight rise of about 0.4 inches (10 mm.) thickness implies a brick joint. It is unusual in that the surface has been scored with non parallel lines apparently formed by dragging a 1/2-inch rod across the wet surface (Figure 6-7). This was prepared as a scratch coat, but there is no indication of a second coat ever having been applied. Such wide, deep scoring is evident in several other fragments of plaster although always with a covering coat.

No wall plaster was found which was unpainted. This includes both wall plaster and plaster placed over the brick chimney. This paint is white, probably a simple lime whitewash (Figure 6-6a). Brush strokes are evident on the surface. In every case these were parallel to the lathing (i.e., horizontal). Twenty pieces of painted plaster laid on lathing were examined under the microscope for evidence of repaintings. In every case at least two coats of paint were visible. A range from 2 to 8 coats were found with only one example of the latter. All but one had an even number of coats.

Often animal hair, usually cow, is added to wall plaster prior to its application. This hair is sometimes graded by coarseness, the coarsest used only in the lower coats. This provides a binder and aids better adhesion to the lathing. Hair plaster was commonly used during the period of occupation of the Commissaries. However, there was no evidence of it in any of the materials recovered from Cm-232.

4. Nails

A total of over ten thousand nails were recovered from Cm-232. These include both wire and cut types as well as one railroad spike. Among the cut nails appeared finishing and other specialized types as well as the common. However, the number of these minority types was negligible and the distinction is not maintained in the following analysis.

Nails are of interest for at least several reasons. First, different sizes and configurations tend to be associated with certain construction tasks and thus may indirectly reveal something of now non-existent architecture; second, the distribution of nails across a site may reveal otherwise undetected architectural features or help to determine something of the disturbances which later affected the site. Each of these issues will be addressed in the following discussions.

Square cut nails were first developed in this country sometime around the Revolutionary War when British hand wrought nails were unavailable. Although square cut nails have changed as manufacturing techniques have changed, they have remained basically the same since the mid-nineteenth century. Because of this and the site's time frame, nail morphology reflecting manufacturing practices is not a profitable area of investigation.

Wire nails, invented in France some time around 1830, have since their appearance been ever increasing in popularity. This is due to their ease of manufacture and subsequent low cost. The importation of wire nail construction to this country is credited by different sources to one of two people. The first is to Major Thomas Norton who upon visiting Birmingham, England, where he saw wire nails being made, decided upon his return in 1851 to do the same here. The other is to William Hassall an emigrant from Birmingham who brought the knowledge of nail manufacture with him. However, the dating of these two versions is quite similar; 1851 in the first version

and 1851 or 1852 in the second (Douglas Fisher, 1963:95-96). The wire nail became predominant in the U.S. during the late nineteenth century. The time lag in the market take-over by wire nails is due to many factors including tariffs against foreign made nails, the necessity of using expensive Norway iron, and the lack of automated manufacturing facilities in this country until 1875 (Fontana and Greenleaf, 1962:47). The inferiority of wire nails in certain respects including gripping strength and rust resistance, may have also had an influence. According to Douglas Fisher (1963:96) it was not until 1892 that wire nails accounted for half of all nails sold in this country. Being constructed in 1869, the Commissary buildings were doubtless constructed with square cut nails, as the presence of such large numbers of these nails further attests.

Although no distinctions were made separating different types of cut nails from one another, cut nails were separated from wire nails and separate counts made on each. The total number of each type of nail by pennyweight is given in Table 6-2. The most striking feature of these counts is the preponderance of cut over wire nails, the former comprising some 92.4% of the total. It is interesting to note that something of the proportioning of pennyweights is maintained for both cut and wire types. Also the tendency for even number pennyweights to be preferred over the odd is a phenomenon present here and at many other historic sites. The possibility of task distinction being made on the basis of two pennyweight increments may in turn be related to construction design, to common board thicknesses which tend like pennyweight preferences to run in 1/2-inch increments, or to other factors.

In an attempt to refine what is already known of the Commissary and what can be extrapolated from other archaeologically recovered remains, distribution maps of cut nails by pennyweight were prepared. Nothing of significance was found in these distributions. This may result from the later disturbances of the site. It may also provide additional support for the contention that the building was deliberately razed in order to salvage the lumber. This circumstance would likely result in a nail distribution not reflecting the arrangement of construction members.

Variability in intended nail use is reflected in the nail in at least two ways, morphology and size. No attempt is here made to determine nail use by morphological characteristics other than the simple separation of horseshoe, common cut, and wire nails. The task to which a nail is put is also reflected in nail size, albeit sometimes indirectly. There seems to be general agreement that the larger the

Table 6-2. Percentage of Nails by Pennyweight, Cm-232.

Pennyweight	Cut Nails		Wire Nails	
	No.	%	No.	%
2d	63	.6	5	.6
3d	155	1.5	15	1.8
4d	4074	40.5	156	18.9
5d	285	2.8	47	5.7
6d	1079	10.7	247	30.0
7d	50	.5	26	3.2
8d	1956	19.4	218	26.5
9d	26	.3	3	.4
10d	1925	19.1	26	3.2
12d	333	3.3	7	.8
14d	0	.0	0	.0
16d	70	.7	26	3.2
18d	0	.0	2	.2
20d	31	.3	35	4.2
30d	8	.08	7	.8
40d	7	.07	3	.4
50d	7	.07	0	.0
60d	2	.02	1	.1
Total	10,071	99.9	824	100.0

nail the more strenuous the task to which it would be put. The 1860 Regulations Concerning Barracks and Quarters for the Army of the United States (U.S. Army, 1861) provided a guide for estimating the construction needs of the various structures on a military post. This estimating procedure also includes the nail requirements of the different structures and something of the recommended nail pennyweights for different jobs. While finishing and wrought nails are on occasion prescribed, common cut nails are those used for all major construction. The uses of these recommended common cut nail sizes are as follows:

3d:	lathing walls and ceilings
6d:	shingling
8d:	furring
10d:	flooring
	pillars and roof of veranda
	sheathing
	door and window framing
	weatherboarding
	wainscotting
	stairs
	wash board
20d:	framing joists and roofs
	sheathing
	planking walls in Guardhouse
	flooring of stalls and central passage in stable
	stable posts

Here again a preference is shown for the even pennyweight nails. Also these recommendations comprise a much more limited range of nail sizes than was indicated at Cm-232.

Others have likewise suggested the range of possible or likely uses to which the different pennyweight nails might be put. One of these is Walker (1971:72-73) who presents the following possible uses for nails recovered at the site of Arkansas Post.

2&3d:	metal roofing
4d:	wooden shingles
5d:	"moulding, finishing work, and ornamentation"
6d:	"light framing, clapboarding, bevel siding, and wood grounds"
8d:	"flooring, furring strips, wood grounds, and interior fittings"
9d:	"boarding, flooring, and interior fittings"

10d: "furring strips, flooring, boarding, and interior fittings"
12d: wooden studding, rafters, and heavy framing
20d and above: very heavy framing

Of course such items as "metal roofing" would not apply to Cm-232.

Also found at the site was a single railroad spike found in U74. It is 4.11 inches (104.5 mm.) in length. Two railroad lines serve the area. The first railroad into this area was laid in late 1901 passing closest to the site some 500 to 600 yards to the west. The spike's presence on the site may be accidental or it may be related to some undetected task, but is not likely related to the Commissary buildings.

5. Door Lock Parts

a. Door Jamb Bar

"Door jamb bar" refers to an appurtenance affixed at either side of an inward swinging door across which a heavy wooden board was laid so as to prevent the door from being opened. This one is from square O64, level 4 and is hand made of 1/4-inch strap iron (Figure 6-8a). It is 1.05 inches (22 mm.) wide and almost 8 inches (2.1 cm.) long. It has three large countersunk holes by which it was screwed onto the wall while the top has been curled outward possibly to be decorative but more likely to make barring the door easier. The thickness of the timber bar would not have been more than about 1.6 inches (41 mm.).

Once again the context of this artifact is such that association with the Commissary is not definite. However, its use with what may be double doors, such as the loading dock in the northern, warehouse portion of the building is easy to envision. Because these areas received little of the human traffic to which the southern ends would have been subjected, they would probably have not required knobbed rimlocks as discussed below. These latter would also be somewhat less secure. However, one should note that in the absence of more definitive information on the keeping of horses, carriages, etc., at the Agency, such a locking system might also be applied to the large doors of a surrogate barn.

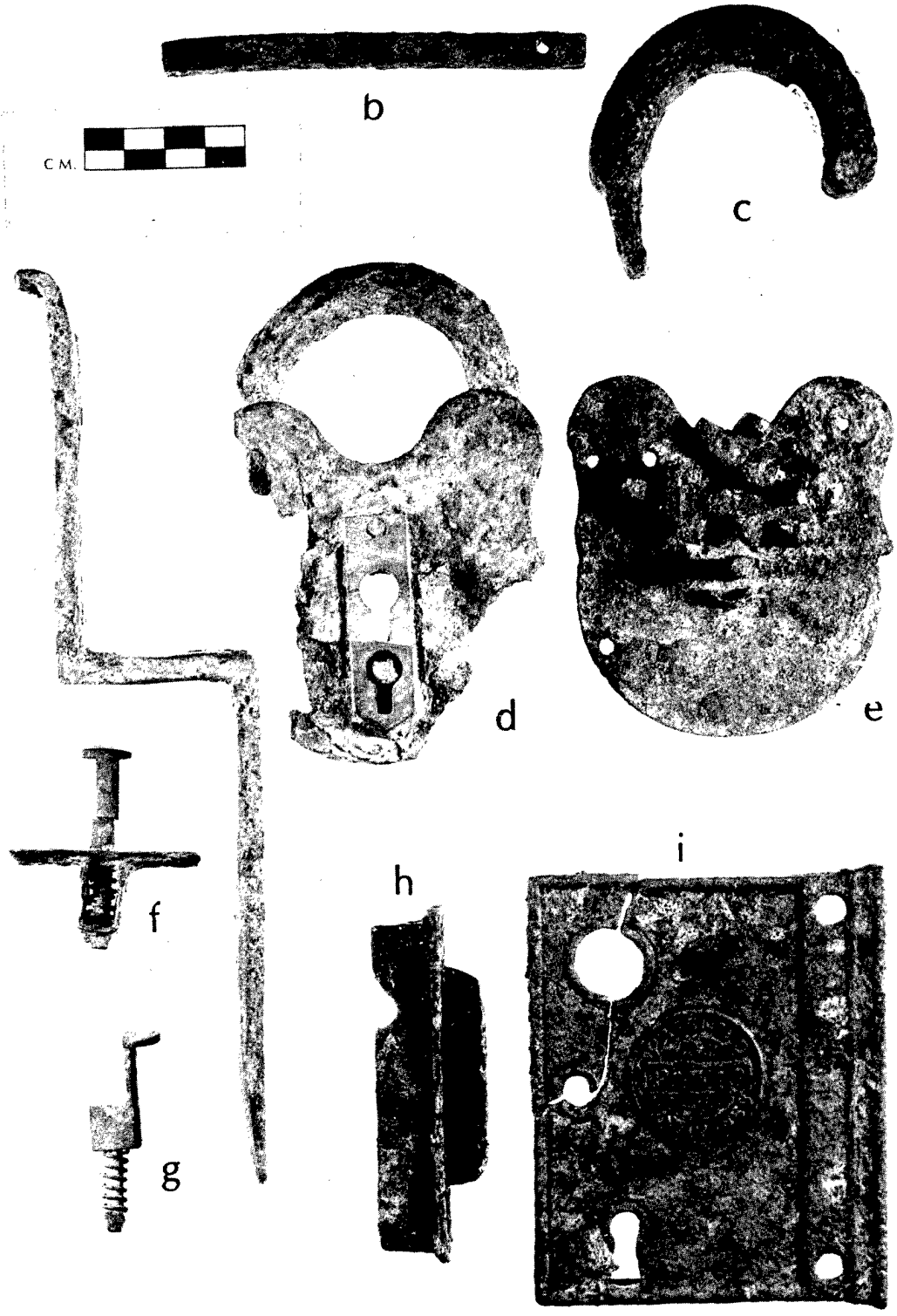


Figure 6-8. Architectural Hardware. a. "door jamb bar," b. knob spindle, c. padlock shackle, d-e. padlock facings, f-g. window springs, h. striker-catch, i. rimlock body

b. Padlocks

Fragments of three different padlocks were found at the site. The largest is from square T83 and is heart shaped (Figure 6-8 d-e). Most of the parts of the lock which were found (including shackle, outer casing, rivets, and some internal working parts) are of iron. It is heavily rusted and markings or remnant paint are not evident. The only part not of iron is a milled brass escutcheon plate around the keyhole on the front face of the lock. It is secured to the lock body by three brass rivets, two on the bottom and one at the top which also secured a swinging keyhole cover, now gone but likely of brass also. It is interesting to note that the brass faceplate has two keyholes, only one of which is functional. The "false keyhole" is the lower of the two and may have been left uncovered. No references have been found to suggest the reason for this.

The key which would actuate the lock was barrelled and the internal mechanism of this lock appears to be of two ward type. A modern view of the warded lock is given by Roper:

> The warded lock is the oldest lock still in use and is found in all corners of the world. It employs a single or multiple warding system. Because of its simple design, its straightforward internal structure, and its easily duplicated key, this lock is an excellent training aid for locksmiths. This same simplicity means that warded locks give very little security (1976:51).

The second lock fragment from the site is from square L83, and is the shackle of a robust lock (Figure 6-8c). It in every respect is the same as the shackle found in place on the padlock discussed above. It is round, measuring 0.58 inches (15 mm.) in diameter with a hinge at one end and a clasp hole at the other. The ends are 1.81 inches (46 mm.) apart.

c. Rimlocks

Parts of four rimlocks were found. These include:

	Provenience
1 - rimlock body	U71
1 - rimlock cover plate	U77
1 - catch	O114
1 - striker-catch	S62

All are of cast iron and show evidence of having originally had a black japanned finish.

The striker-catch and the simple catch differ in that the former has a plate angled to its face which was intended to depress the latch as the door was closed (Figure 6-8h). The simple catch was probably also used with a knobbed rimlock but because it does not have the striker it may also have been used on a deadlatch. On the striker-catch face immediately behind the striker is an illegible inscription, probably a patent date.

The rimlock cover plate bears no inscriptions. It measures approximately 3.5 inches (93 mm.) along one side and could not have been used with the rimlock body described herein.

The one rimlock body which was found was secured to the door by three screws (Figure 6-8i). Its exterior measurements are 3.29 inches (86 mm.) by 3.93 inches (100 mm.). On the face of the lock is an inscription within a circle which reads: "PATENTED MAY 12, 1868 P&W C^{O}." A search of Patent Office records revealed Patent No. 77,909 granted to John E. Parker of Meriden, Connecticut on that date. His Reversible Latch design is described therein as follows:

> This invention related to an improvement in knob-latches, the object being to construct the operative mechanism of the latch-bolt so that the latch-bolt may be reversed for a right or left-hand door, and consists in forming a projection upon the yoke, and combining therewith an arm which projects through the edge of the case, so that the yoke may be raised from the latch-bolt to permit its withdrawal and the latch-case provided with guides to direct and hold the latch-bolt in place.

Patent drawings confirm the identification of this rimlock design (Figure 6-9). Further, although no present day lock manufacturer with the initials "P&W" could be found, it is suggested that "P" might have stood for "Parker."

Finally two very rusted scraps of iron were found in U71. The identification of these is somewhat problematical. However, their conformation suggests that they might have once been part of a rim-lock body similar to that just described. This, however, is stamped rather than cast. According to Roper (1976:51),

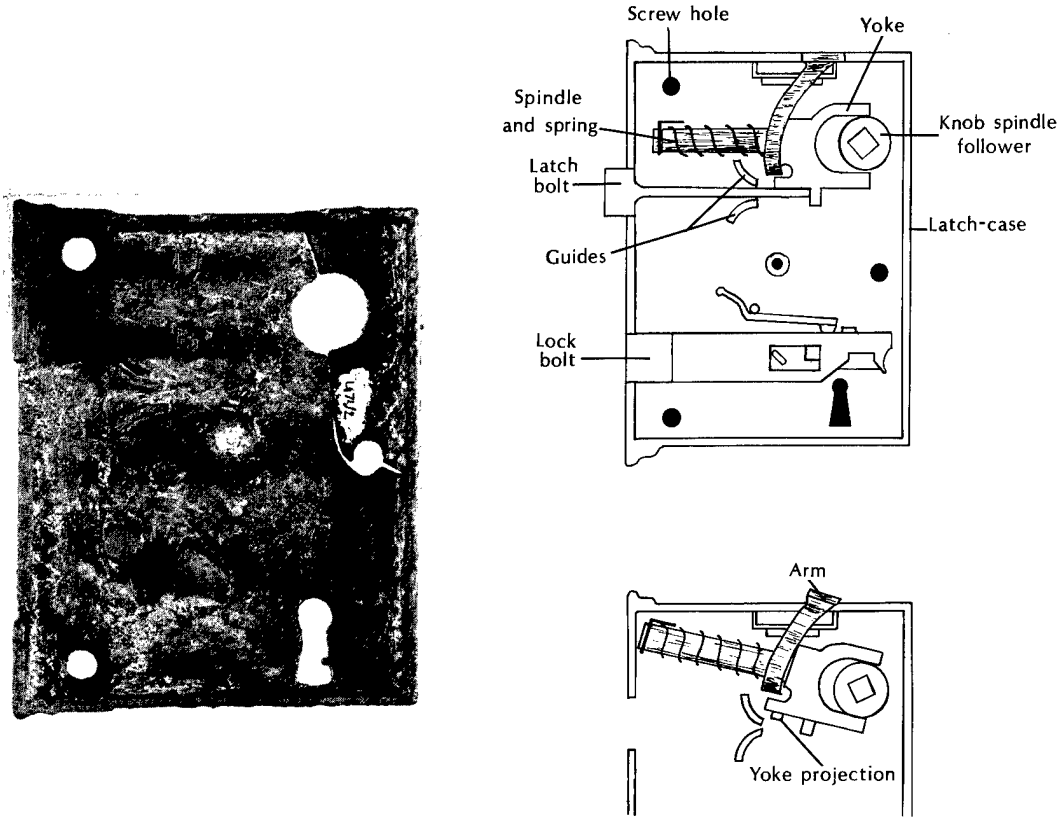


Figure 6-9. Parker Patent Rimlock. left- detail of rimlock body found at Cm-232; right- reproduction of drawing accompanying Patent No. 77,909.

Later types were made of medium gauge sheet metal. The casing consists of two stampings: the cover plate and the backplate. The latter mounts the internal mechanism and forms the sides.

d. Knob Spindle

The sole spindle was found in square S71. It is slightly over four inches (103 mm.) in length and 0.30 inches (7.5 mm.) square (Figure 6-8b). It is iron with two tapped holes through it at one end and one such hole at the other. These holes at opposite ends are also through different faces. Spindles may function either with lever or with knob operated latches. The application of this spindle is not apparent.

e. Door Knob

This is the fragment of a white "porcelain" knob with a white glaze. The metal insert by which the knob was affixed to the spindle has fallen away. It is from square CC62.

6. Miscellaneous Hardware

a. Window Springs

A window spring was once a device commonly used to secure a window. The two found at Cm-232 are of similar design. That window spring from square P69 consists only of the brass spring and latch portions while that from square Q71 is complete. It consists of three basic parts. Central is the brass latch itself with its lower arm. Around this lower arm is a brass spring. The spring is compressed in a housing of sheet iron. The lower arm of the latch is prevented from slipping out of position by the insertion of a small iron pin into the arm where it protrudes outside the housing. The two iron stampings forming the spring housing are riveted together. The inner would have been mortised into the mullion while the outer is drilled for screw attachment and would have been exposed (Figure 6-8 f-g).

The position of these on the site as well as their common early use suggests the possibility of their having been associated with the Commissary.

b. Hinges

Of the three hinges from the site which could be possibly related to building architecture, all are iron strap hinges. The largest is from square N64, level 3 and measures 5.6 inches (142 mm.) from wing tip to hinge center. (The other wing is broken off.)

Both of the smaller hinges are roughly the same size, slightly over 4 inches (110 mm.), although the latter is bent and somewhat difficult to measure. The smaller hinges are from N63, level 2 and N64, level 3. The latter has square cut nails through one wing while the former has square cut nails through both wings. This distinction is important because of the differences shown in the nails in these different wings and because of the fact that although the nails are present in only one wing of the N64 hinge, originally the two were probably similar.

The nails in one wing of each of the smaller hinges have been bent over at a 90 degree angle twice so that the nail tip points in toward the hinge. This could only be reasonably accomplished if the hinges were attached to a board. The technique would have the same effect as clinching. The additional turn of the nail into the hinge further implies that the nail would be exposed since this technique would help to prevent accidents on the exposed point. An attempt was made to determine the thickness of the wood to which the hinge was attached by measuring the distance from the inside of the hinge wing to the inside of the first bend of the nail. In both cases this is approximately 0.4 inches (11 mm.).

The difference between the bent nails just described and those in the wing of the hinge from N63 is that the latter are clinched, that is, the nail tip is curled around on itself. This technique locks the nail in place and prevents it from loosening. According to Fontana and Greenleaf (1962:55) clinching as is present here without nail rupture began circa 1870. Here again, an attempt may be made to estimate the thickness of the material, probably wood, through which the nail was put. In this case the distance from the clinch to the inside of the hinge is 0.7 inches (18 mm.).

It seems more than likely that the two smaller hinges served the same purpose and were attached to the same object(s). Evidence supporting such a contention include similarity in size and provenience as well as similarity in nails and nail treatment. Such strap hinges have been used for many years and are in use today. Their association with the Commissary buildings is therefore open to some question. Here as with other categories of architectural debris, the absence of other known structures in the area mitigates in favor of such an association. However, the possibility also exists that these objects were not architectural at all. Such a contention cannot be adequately answered with the evidence on hand.

It might further be questioned whether these may actually relate to the Commissary period and not to some later use of the site as is so amply indicated by the military paraphernalia discussed elsewhere. After all, while these are all from Feature 8, none were found at a level considered to be unmixed. While such a contention may be made for the largest of the strap hinges, this is not necessarily so for the other two because of the presence of the cut nails just discussed. The replacement of cut with wire nails in this area took place probably between 1890 and 1900. Thus, while it is still not possible to definitely relate these artifacts to the Commissary, circumstantial evidence allows it some probability. It is also of interest that the Soule photograph of the front of the west building shows the yard fence gate supported by two strap hinges (Figure 2-2).

CHAPTER VII
SMALL ARMS GROUP ARTIFACTS

1. Cartridges

The following is arranged according to cartridge types of increasing caliber sizes present on the site. After the round is identified, the number found on the site is given in parentheses followed by a brief discussion. These cartridges are often in corroded, incomplete, or distorted condition and accurate measurements could not always be made. Measurements are given only to the thousandths of an inch. Each non-shot cartridge is numbered as its provenience and vital statistics are given (Table 7-1). Shot shell provenience and headstamping are included in Table 7-2. Of the measurements in Table 7-1, "cartridge length" excludes measurement of the bullet where present. "Head diameter" refers to the outside base diameter of the casing while "shoulder diameter" refers to the casing outside diameter as measured immediately above the base. Individual cartridges of each type are numbered and may be referred to in the text by that number. Abbreviations occasionally used include the following:

IP	internally primed
EP	externally primed
RF	rimfire
BL	blank

In discussing actual weapons, emphasis has been placed on use by the Army. This is seen as justified because of the site's proximity to Fort Sill.

.22 Rimfire (1)

This round appears to be .22 Short but with this slightly longer than normal case, it is in the range of the .22 BB Cap, Government Special (Figure 7-1j). According to Suydam (1960:46), the round was "designed especially for short range practice of troops in World War One." Only U.S. Cartridge Co., Winchester, and one other unnamed company were known to have manufactured it. This round is not in good condition and no headstamping can be distinguished.

Table 7-1. Vital Statistics of Cartridges from Cm-232.

Cartridge	Provenience	Case Length (in.)	Head Diameter (in.)	Shoulder Diameter (in.)
.22 Rimfire	1. K62	0.425	0.265	0.230
.30 Krag Blank, Model 1893	1. N63/2	- - - -	0.535	0.455
	2. O63/1	- - - -	0.540	0.450
	3. S63/3	- - - -	0.540	0.460
	4. S63/4	- - - -	0.540	0.455
	5. do.	3.115	0.540	0.457
	6. do.	- - - -	0.542	0.457
	7. Unknown	3.125	0.540	0.461
.30-06 Springfield	1. N63/1	- - - -	0.469	0.460
	2. S71	- - - -	0.470	0.465
	3. U73	2.485	0.470	0.465
.32 Short RF	1. N68	0.562	0.375	0.320
.32 Long RF	1. P77	0.805	0.379	- - - -
	2. Q51	0.805	0.373	0.314
	3. Q63	0.805	0.361	0.317
.38 Colt Army Blank	1. N63-64/2	1.012	0.430	0.375
.43 Spanish	1. Q63/1	- - - -	0.620	0.514
	2. R73	2.260	0.626	0.514
.44 Henry RF	1. M73	0.839	0.508	0.445
	2. T82	0.820	0.504	0.434
	3. U71	0.836	0.515	0.450
	4. O-P64/5	0.910	0.518	- - - -
	5. R62/1	0.904	0.517	- - - -
	6. Str 1, N end	0.909	0.519	0.440
.44 Colt	1. Q-P64	1.110	0.480	0.459
.45 Colt	1. S57	1.302	0.514	0.470
.45 S & W Schofield	1. N105	- - - -	- - - -	- - - -
	2. T63/3	1.104	0.500	0.475
.45 ACP	1. S63/1	0.890	0.470	0.475
	2. U75	0.890	0.470	0.476
	3. U76	0.889	0.470	0.471
	4. U77	0.886	0.476	0.472
	5. U77	0.886	0.476	0.472
	6. V74	0.890	0.471	0.470
	7. V75	0.900	0.470	0.471
45/70	1. M63/2	2.100	0.602	0.505
	2. N63/2	2.133	0.602	0.503
	3. N63-64/2	2.075	0.604	0.500
	4. I79	- - - -	0.602	0.516
	5. U90	2.085	0.603	0.520
50/70	1. N87	- - - -	0.660	- - - -
	2. P76	1.772	0.652	0.560
	3. Q65	1.790	0.638	0.570
	4. R86	1.777	0.659	0.570
56-50 Spencer	1. P63/1-2	1.179	0.650	0.591
	2. S71	1.181	0.635	0.557
	3. Trench 3	- - - -	- - - -	- - - -

.30 Krag Blank, Model 1893 (7)

Because of the placement of this cartridge in level 4 of the Feature 8 pit with its subsequent important potential for dating and because of the absence of adequate referencing in the readily available literature, this cartridge will receive fuller treatment than is warranted for the others found on the site.

The Krag blanks found at Cm-232 are correctly Rifle and Carbine Blank Cartridges, Whole Case, Caliber .30, Model 1893. The design, originated with the Belgique Militaire, was first seen and adapted from an article in the August, 1893, Revue Militaire de l'Etranger. A revised approach to blank ammunition was necessary because of the adoption of the .30-40 Krag rifle, model of 1892. With its unusual side gate loading system, unless the blank took on the shape and dimensions of the live round, the magazine feed would not function properly. The subsequent 1893 design entailed drawing the "whole case" up to the length of the live round and giving it a taper resembling that of the regular ball ammunition. Three notches were cut in the mouth, the case filled with powder, and the three points folded over so that the tip of the bullet was simulated and a tight closure could be effected. The cartridge tip was then dipped in varnish for waterproofing.

When fired, the folded points forming the head of the blank would open releasing the hot gasses and acting to seal the breech. The casing could be reloaded and was not tinned (Figure 7-1d).

Boxer-type, external .45 caliber rifle primers were used for ignition. The charge consisted of 65 grains of black powder. Although normal .30 Krag ammunition was the first in the U.S. arsenal to use smokeless powder, it was found that the interior volume of the 1893 blank was too great to insure ignition of the necessarily small charge of smokeless powder. Black powder has no such density requirement. It therefore was used in lieu of wadding or other devices which would have effectively diminished the cartridge volume but were regarded as being unacceptably troublesome.

The blank was used in both carbines and rifles until 1896 when a new model blank was adopted. This latter was the Paper-Bullet Blank Cartridge, Model 1896. It utilized 5 grains of E.C. smokeless powder in the casing and 5 grains of smokeless powder pressed into a rolled tube of heavy paper formed into the shape and size of the issue bullet. Use of the Whole Case, Model of 1893 blank was found to sometimes result in premature ignition

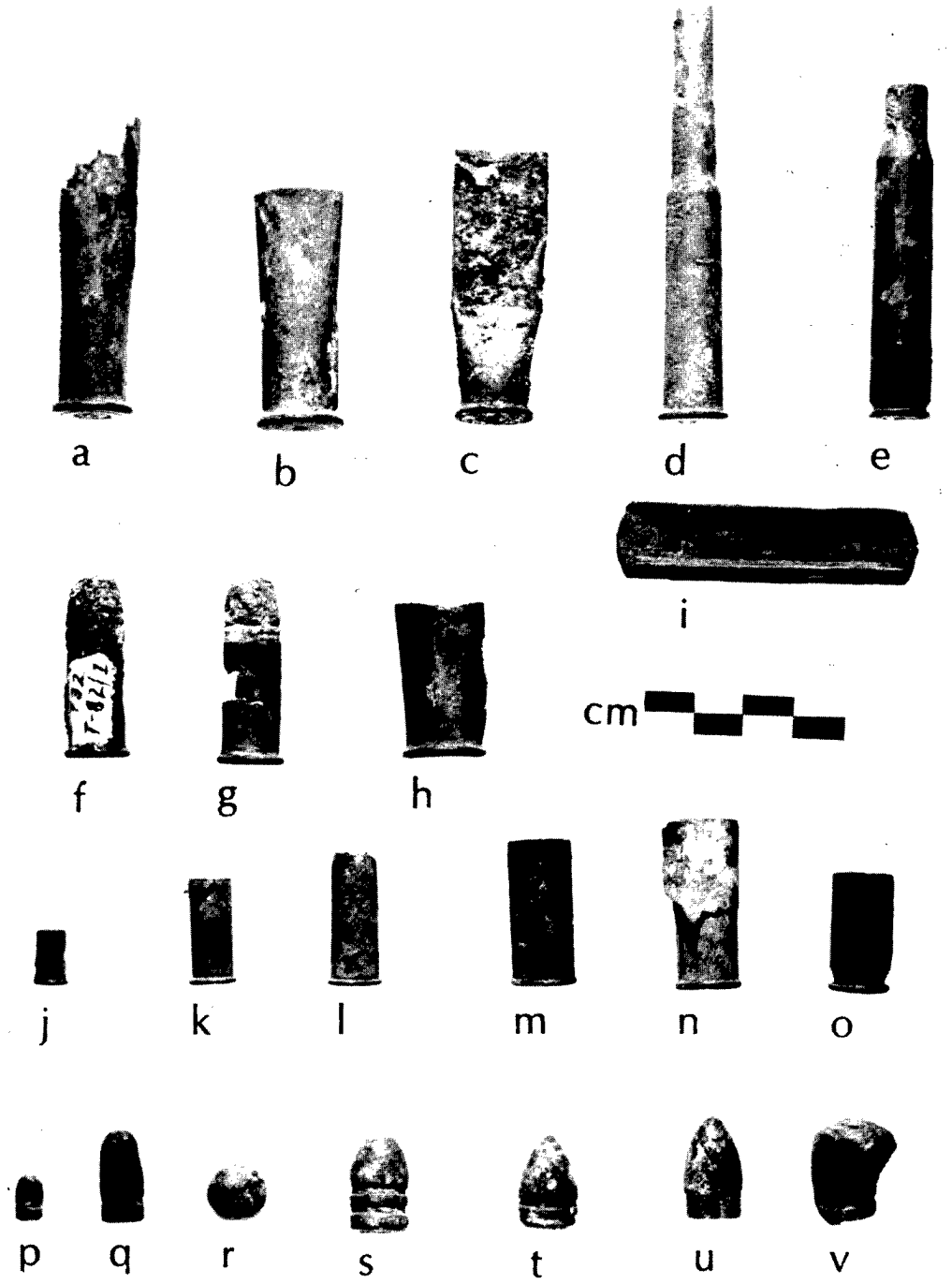


Figure 7-1. Small Arms Group Artifacts. a. .43 Spanish, b. .50/70, c. .45/70 Boxer EP, d. .30 Krag Blank, e. .30-06, f. .44 Henry Short, g. .44 Henry Long, h. 56-50 Spencer, i. stripper clip, j. .22 BB Cap, k. .32 Long, l. .38 Colt Army Blank, m. .45 S&W Schofield, n. .45 Colt, o. .45 ACP, p-v. Bullets #1-#7 [see text].

of rounds still in the magazine when hot gases were accidently released by primer ruptures. This danger apparently could not be overcome but by a radical design change. Although a new blank design was adopted in 1896, it was not until the next year that the Model of 1893 was reported to have been "entirely displaced in service." (These foregoing discussions have been taken from U.S. Army Ordnance Department, 1894, 1897a, and 1897b.)

Although doubtless produced at Frankford Arsenal, none of these seven blanks from Cm-232 are headstamped. All had been fired and some variability in their dimensions was noted. Poor condition is the cause of most of this. Their significance lies in the relatively tight dating which can be assigned to them. Dating used here is from 1893 until 1897. While the latter figure is considered probably accurate, it is possible that it was not in the hands of the troops until 1894, although no official records have been found to confirm this. Subsequently the broader dating is used. Three of these provide the only means of dating level 4 of the Feature 8 pit.

.30-06 Springfield (3)

This round was adopted in 1906 for use in the 1903 and later versions of the military issue .30 caliber bolt-action Springfield rifle (Figure 7-1e). It has external, Boxer priming. Many other military and civilian weapons were also chambered for its use (see Barnes, 1972:38-39). These bear "RA" headstamping indicating manufacture by Remington Arms. In addition, #1 and #2 bear the additional letter "H" preceding the year of manufacture, indicating assembly at Bridgeport where the company was headquartered, but manufacture at a subsidiary plant in Hoboken, New Jersey. This practice was carried on from 1915 until 1919 (see #1515 in White and Munhall, 1963:167). All three of these rounds were manufactured in 1918. At that time the company was known as Remington Arms-Union Metallic Cartridge Company, a fact not reflected by the headstamp.

.32 Short RF (1)

This round bears no special markings or headstamp. It does bear a single rectangular firing pin impression at an angle to the head. It was developed as a later and less powerful version of the .32 Long, discussed below. Its dating is almost as early, however (Suydam, 1960:73). According to Barnes (1972:277) it was made by Remington as late as 1920.

.32 Long RF (3)

This round was first produced in 1861 by Smith & Wesson and was later used in many different pistols and rifles, as was the .32 Short above. It is still in production (Figure 7-1k). Only #2 has any markings, a raised "US" headstamp indicating manufacture by the U.S. Cartridge Company of Lowell, Massachusetts (White and Munhall, 1963:37). Suydam (1960:166) thereby suggests dating to the 1864-1872 period. In addition, #3 above is unfired. The bullet is of lead, with two cannelures, rounded nose and a weight of about 3.2 grams.

.38 Colt Army Blank (1)

That this was a blank is indicated by the slight inturn of the casing at the mouth (Figure 7-1l). Headstamping is not visible. It was adopted for the Model 1892 Colt double action pistol by the military and was in service until replaced with the larger caliber .45 revolver in 1909. Particularly as this was a blank and likely saw little civilian use, its dating can be assumed to extend between those times.

.43 Spanish (2)

Both of these are 3-hole Berdan primed rounds with internal reinforcing. Neither are headstamped. The length measurement of #2 is a minimum. Although crushed, #2 seems to show slight bottle-necking (Figure 7-1a). This most closely resembles the 11.15x58R Spanish Remington round (see Barnes, 1972:205). According to Barnes (1972:198), certain Remington rolling blocks and Peabody pivoting block rifles were chambered for it. Smith (1972:362) indicates that in addition to the Spanish M1871 Remington, the round was also used "by Denmark, Sweden, and Norway." It was used during the Spanish-American War against U.S. troops and may have been brought back as a souvenir (see Logan, 1948:136).

.44 Henry RF (6)

These include both the long and short cased versions of the .44 Henry round, first developed for use in the lever action Henry rifle, Model of 1860. It and the Winchester, Model of 1866 used special firing pins in order to ensure ignition. These firing pins made two linear impressions 180 degrees to one another on the basal edge of the casing, distinguishing rounds fired from these weapons. Both #1 and #3 above were fired from one of these weapons. In addition,

#5 has a shallow indentation, somewhat rectangular and at an angle to the rim edge which may also be a firing pin impression. This round may have been fired in one of the other weapons chambered for this round, notably the .44 Smith & Wesson American and certain Colt handguns. The remaining three do not seem to have been fired. In only two of these, #3 with a short case (Figure 7-1f) and #6 with a long case (Figure 7-1g), are bullets still present. Both of these bullets are flat-nosed.

According to Suydam (1960:101), the raised "H" headstamping was used by the New Haven Arms Co., producer of the Henry, by November of 1861 at which time they were producing it with a round-nosed bullet. About a year later they began to produce the flat-nosed bullet "to lessen the danger of explosion in the magazine." The short case was the earlier version of the two although no precise dating has been found for this (see Suydam, 1960:104-105; Barnes, 1972:280). The round was in production until about 1934 (Barnes, 1972:280) although White and Munhall (1963:27) describe the raised "H" as the "early style" and Suydam (1960:166) implies use only as late as 1872.

.44 Colt (1)

This round was first produced in 1871 for use in the 1860 Colt percussion revolver modified to take this center fire, fixed ammunition. A Boxer primer is used. It did see some use by the military from 1871 to 1873 (Barnes, 1972:169). Of it Suydam (1965a:41) states:

> Apparently the only arms chambered for the 44 Colt cartridge were the 1871-72 open-tops, although it could be used in the 1875 Remington: [sic] why it remained in production so long is hard to say.

He gives 1939 as the terminal date of its production.

This round is of further interest because it bore a bullet very similar to #6, found on the site and discussed later.

.45 Colt (1)

In spite of a slight case lengthening (Figure 7-1n), this appears to most closely resemble the Boxer externally primed .45 Colt which was adopted by the military for use in the Colt 1873 Single Action Army and Colt M1909 revolvers (Barnes, 1972:178). It was

produced in certain special loads one of which might have had such a case length (see Suydam, 1965b:35-36). This round bears no headstamping or other markings.

.45 S & W Schofield (2)

These center-fire Boxer primed cartridges were made for use in the Smith and Wesson Schofield single action revolver manufactured from 1875 to 1877 (Smith, 1968:481) and adopted by the Army. The round saw long military service in that it also chambered in the .45 Colt (also utilized by the Army) until 1892 when a reduction in caliber to .38 was mandated and both revolvers were replaced (see Barnes, 1972:172). These rounds were manufactured for military use and both are headstamped. #1 is headstamped "RF 10 83"; #2 (Figure 7-1m) is headstamped "F 11 89." Both headstamps indicate manufacture at Frankford Arsenal (see #1536 and #810 respectively in White and Munhall, 1963:170,97). The dates of their manufacture are October of 1883 and November of 1889.

.45 ACP (7)

This round (Figure 7-1o) was developed in response to the military's need for a more powerful handgun cartridge than the .38 then in use. The Colt Automatic M1911 was designed so as to fire it. Other weapons have since been chambered for it and it is in wide use today.

All of these have headstamping indicating manufacturer and date. These are as follows:

#1	"FA 1 12"
#2	"REM-UMC 17"
#3	"P.C. Co. 17"
#4	"FA 8 14"
#5	"FA 11 13"
#6	"FA 1 12"
#7	"U.S.C. CO. 5-17"

These indicate manufacturers including the Frankford Arsenal, Remington Arms-Union Metallic Cartridge Co., Peters Cartridge Co., and the United States Cartridge Co. The numbers represent year of production, or where an initial number is also present, the month of production (see White and Munhall, 1963). It is surprising not that these would appear on the site but rather that with such

varied headstamps these cluster as they do. Such a cluster would normally imply that they had all been fired at the same time. However, with such variation, that conclusion must remain tentative.

45/70 (5)

These five rounds represent three quite different priming systems and have correspondingly different headstamps and dating. All, however, were manufactured for use on the Allin trapdoor Springfield which was adopted in caliber reduced from .50 in 1873. It was the Army issue shoulder weapon until the adoption of the bolt-action Krag in 1894 (see Hammer, 1970). It also saw great civilian use as other weapons were chambered for the round and as the trapdoor Springfields fell into civilian hands. The headstamping and dating of these rounds are:

	Primer	Headstamping
1.	EP: BOXER	"F - - -"
2.	EP: BOXER	"F 4 88"
3.	EP: BOXER	"F 2 8-"
4.	EP: BERDAN	"RB 10 78"
5.	IP: BENET CUP	NONE

The single internally primed round can be dated to between September 1873, when the government began to manufacture the 45/70 round, and March of 1877 when the arsenal began headstamping all of their products (Hammer, 1970; Lewis, 1972). Because it is not marked for the carbine, this former date may be January of 1874 (Lewis, 1972:38).

All but #4 were produced by the government at Frankford Arsenal (Figure 7-1c). That one was made by the Union Metallic Cartridge Company on contract at their plant in Bridgeport, Connecticut (#1520 in White and Munhall, 1963:168). Although crushed, it appeared to have Berdan external priming and an internal reinforcement (see also #104 in Lewis, 1972:19).

50/70 (4)

All of these rounds have Martin bar anvil priming, an internal, center-fire type in production at Frankford Arsenal from October 1866 until March of 1868 (Figure 7-1b) (see #315 in Lewis, 1972: 29). It was used in the .50 caliber Allin trapdoor Springfields beginning with the Model of 1866. This rifle ceased to be the standard arm in 1873 when the caliber of the issue rifle was downgraded to .45.

56-50 Spencer (3)

All of these.50 caliber, rimfire Spencer rounds (Figure 7-1h) have "J.G." headstampings indicating production by the company of Jacob Goldmark of New York (Suydam, 1960:167; White and Munhall, 1963:29). This company was in operation during the Civil War period. These chambered in other weapons but #1 and #3 have been struck by firing pins as used in the lever-action Spencer. The round itself was designed in 1864 at Springfield Armory and first used in the 1865 model. It was in production up until about 1920 (Barnes, 1972:281). Cartridge #2 is unfired. Bullet weight is on the order of 18.1 grams.

Table 7-2. Shotshells from Cm-232.

Gauge	Provenience	Headstamp
16	1. Q63/2	REM-UMC SHURSHOT No 16
	2. S73	REM-UMC SHURSHOT No 16
12	1. M83	WINCHESTER REPEATER N$^{O}_{-}$ 12
	2. P-Q53-54	U.M.C. CO. NEW CLUB N$^{O}_{-}$ 12
	3. R80	U.M.C. CO. NEW CLUB N$^{O}_{-}$ 12

16 Ga. shot (2)

These are two of five shot shells from Cm-232. They may represent refuse but are just as likely to have been shot on the site itself. Both are paper cased. They can be dated by their headstamping (Table 7-2), to the period of Remington Arms and Union Metallic Cartridge Company amalgamation. This joint name was in use from 1911 until 1920 and possibly later (see #1527 in White and Munhall, 1963:69).

12 Ga. shot (3)

All of these are paper cased shells. These also might have been used in hunting the area of the site. Shell #1 has a primer stamping as follows: "WRA CO NEW No4." The only dating which was found on these is through the U.M.C. headstamping on #2 (Table 7-2). That company was organized in 1867 and was joined with the Remington Arms Company in 1911 when the name was changed so that headstamping was "REM-UMC" (see #1805 in White and Munhall, 1963:199).

Cartridge Summary

A distribution map of cartridges was prepared and showed little of note. It is clear, however, that a large number of these cartridges were found in Feature 8. The only other feature of consequence, already noted in the discussions preceding, is the tight clustering of .45 ACP rounds to the north of Feature 8. While this might normally indicate that all were fired at the same time, the variability in manufacturer and date of production of these six rounds, casts some doubt on such a conclusion.

Cartridges are of particular value at Cm-232 because of the potential dating value they hold. Because of the disturbed nature of the site outside of the Feature 8 pit, this latter provides great potential for discovering the sequence of site utilization periods. Those cartridges which might provide adequate terminus pro quem for the different levels of Feature 8 are given below.

Level 5:	.44 Henry	1861-1872 (?)
Level 4:	.30 Krag Blank	1893-1897
Level 3:	.30 Krag Blank	1893-1897
Level 2:	16 Ga. shot	
	(REM-UMC headstamp	1911-1920 at least)
Level 1:	30-06	1918

In addition to their dating, these cartridges also suggest something of the types of use to which the site had been put. The use of the site as a trash dump as discussed elsewhere in this report make it difficult to draw inferences of use from most of the artifact categories represented on it. While not entirely relieved from this problem, it can reasonably be suggested that cartridges are not normally an item of intentional disposal. Their discard is usually a terminal operation in their use and near if not at the point of discharge. Based on this assumption, it might be suggested, for example, that the presence of shotshells implies possible hunting in the area, including the vegetation growth and distance from nearby occupations which that activity usually entails.

Evident is the fact that throughout time, the site shows an increasing tendency to military utilization. Military use is implied even among some of their earliest cartridges by the fact that many were manufactured by the government in types suitable for use in military arms of the day. It is known, however, that these were sometimes made available to the civilian community for self-protection and hunting purposes. In later times, as the need for

self-protection became (presumably) diminished and as ammunition became more specialized, such cross-over should have occurred less frequently. For example, such as the .30 Krag blank would have very little practical civilian use. So also would the .45 ACP, standard ammunition but still with a diminished civilian application during those later and more settled times. In the same way the shotshells might have a diminished military application. While such views of individual cartridges set alone are subject to question, in combination they begin to establish a pattern. This pattern of site utilization of an increasingly military nature with time is supported by other evidences and will be considered further in the conclusions.

2. Bullets

The bullets have been divided into two parts. The first comprises projectiles intended to be fired probably from rifles or pistols and second, those intended to be fired from shotguns. Little can be done to discover the specific weapon which fired the latter. Although it may be possible to discover something more of weapons firing the former, little effort has been made in that direction because of the difficulties and time entailed. However, it might in the future provide a fruitful endeavor.

Eight different bullets of quite varying calibers were found. These are arranged in order of increasing caliber and information on them is summarized in Table 7-3. None of these are jacketed and all appear to be of a lead composition although #2 may be of a somewhat harder alloy. The last of the group has mushroomed beyond recognition and was excluded from Figure 7-1. Nothing of its original form remains. Others do show some impact damage (Figure 7-1 p-v).

#3 was made in a two-part mold and the sprue cut off flush with the side of the ball (Figure 7-1r). #4 has a deep conical indentation in its base. There is little doubt that #7 (Figure 7-1v) represents a 50/70 military bullet as used in the trapdoor Springfield carbine (with a 430 grain weight) or rifle (with a 450 grain weight) in service until 1873. The round may well have been fired following that date, however.

Bullet #6 is "heeled" with a small conical indentation in its base (Figure 7-1u). It is of additional interest because of its similarity to the bullet used with the .44 Colt round, a shell casing of which was also found at the site. Suydam describes this as follows:

Table 7-3. Bullets from Cm-232.

Provenience	Caliber (in.)	Weight (gms.)	No. of Lands	Twist
1. N-Q58-59	0.216	1.9	-	right
2. T82	0.340	9.4	-	- - -
3. R86	0.450	9.2	unfired	unfired
4. S70	0.455	15.8	6	left
5. Q72	0.466	14.1	unfired	unfired
6. U58	0.460	15.9	unfired	unfired
7. L72	0.509	28.5	-	- - -
8. V58	- - -	9.3	-	- - -

> The original loads appear to have had a bullet very similar to the conical ball for the percussion revolver: smooth, heeled, with no provision for lubrication (1965a:41).

Shot constitutes the second major category of bullet found at Cm-232. This shot came in the form of buckshot and solid ball. According to Barnes (1972:286) the latter was loaded in this country only through World War II after which only the rifled slug was produced. One reason for this was that the solid ball had to be small enough to go down the most restrictive choke of the gun firing it in order for it not to cause damage. Therefore, the solid shot of ball form was always loaded slightly smaller than its appropriate gauge. This would help to explain the reason for the variation below from true gauge diameter. Those listed as 32 gauge (truly 0.501 caliber) measure on the order of 0.462 inches (11.8 mm.) in diameter while that of 28 gauge (an actual 0.550 caliber) measures around 0.522 inches (13.3 mm.) in diameter. Essential information on these is given below.

Shot Size	Provenience	No.
#2 Buck	P79	2
#2 Buck	R93	1
00 Buck	L72	4
00 Buck	L96	1
00 Buck	V68	1
32 Ga. solid	Q71	1
32 Ga. solid	N98	1
28 Ga. solid	V82	1

The 28 gauge shotgun is still very much in use and has even increased in popularity since the Second World War. The 32 gauge, on the other hand, is obsolete (Barnes, 1972:290).

3. Stripper Clip

A single stripper clip (Figure 7-1i) was found in square V83. It was designed to accept the bases of five rounds of 30-06 ammunition to permit quick and easy loading of the 1903 Springfield bolt-action rifle. This weapon in one of its forms was used at least through World War II as an issue service arm. The clip is made of several sheet brass stampings. Spring pressure holds the rimless rounds in place on cannelures along its sides. Loading was as follows:

> A rifle is loaded by placing a clip of five cartridges above the magazine and receiver, when the bolt is open, and pressing down on the top cartridge. A slight pressure only is required to force the cartridges from the clip into the magazine or container of the rifle (U.S. Army Ordnance Department, 1919a:344).

CHAPTER VIII
MILITARY ORDNANCE GROUP ARTIFACTS

1. Concertina Barbed Wire

Long lengths of barbed wire (Figure 8-1) were recovered from the excavations of the well. It consisted of strands of a civilian barbed wire which had been modified into concertina wire by being inter connected with twisted lengths of 0.08 inch (2.0 mm.) diameter wire. This latter is twice wrapped around double lines of barbed wire and secured with a couple of Z-twists. The barbed wire itself appears to be the Perfect Variation of the Bakers Barb (#260 in Clifton, 1970:260). This is a variation of patent #273219, granted to George C. Baker of Des Moines, Iowa on 27 February 1883.

It is not known precisely when the Army first encountered or utilized barbed wire as an antipersonnel device, although it did occur at least by the First World War. The wire recovered from the well was in good condition and may have been galvanized. One possibility for its occurrence here is that it was used to secure the vehicle parking areas of the site prior to blacktopping.

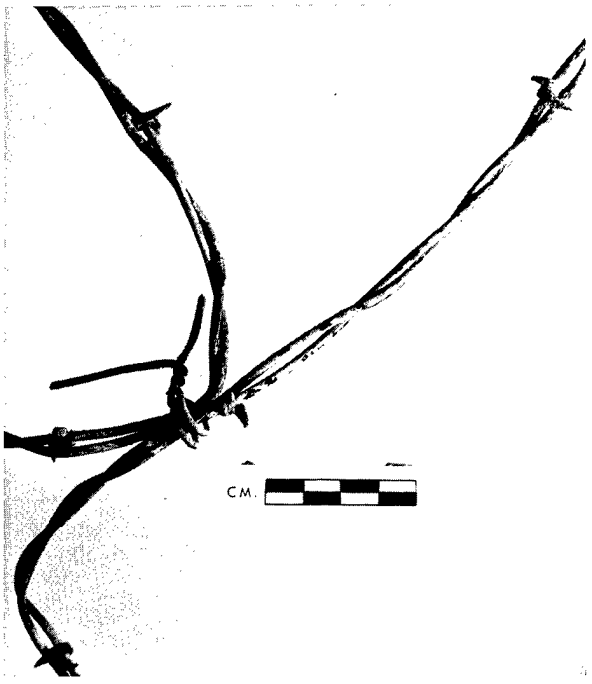


Figure 8-1. Concertina Barbed Wire from Cm-232.

2. Cannon Barrel

Particularly during and immediately after the First World War, accidental early burst of faulty ammunition caused the destruction of firing artillery (Figure 8-2). It was for this reason that the concrete, U-shaped emplacements which presently dot Fort Sill were constructed (Figure 8-3). The gun crew would retire to a safe position behind one prior to the discharge of their piece.

A section of burst cannon barrel was found in square M64, level 3 of the site. It is roughly 4 by 6 inches (105 by 150 mm.) in size and 2 inches (52 mm.) thick. Its ragged edges resemble those of ruptured artillery shell fragments. It has a slight curvature indicating an original inside diameter on the order of 40 cm. It bears no internal grooving and has a slight (0.02 inches or 5 mm.) stepped interior decrease in diameter at one end. Two possibilities have been suggested. This may be an outer casing of a so-called "built-up" tube or it may represent a portion of a breech.

3. Cannon Primers

Among the many items which have been interpreted as being of military origin, were two types of cannon primer. These serve to ignite the larger charge in the cannon breech by which the round is projected. While both of these devices performed this similar task, their designs are quite different, one being of the friction and the other of the percussion type. The latter will be discussed first.

a. 21-Grain Percussion Primer

The 21-grain percussion primer in actuation and appearance resembles a small arms cartridge (Figure 8-4a). It is used with certain larger caliber weapons which accept separate loading ammunition. It was initially used with cannon adopted into the U.S. arsenal during World War I. These include the 155-mm. howitzer and 155-mm. gun, the 8-inch howitzer, and the 240-mm. howitzer (U.S. Army Ordnance Department, 1918:Table 15, p. 138). Certain of the 8-inch and 9.2-inch howitzers may also have been fired with the T-tube friction primer discussed later.

The 21-grain percussion primer was made in this country (U.S. Army Ordnance Department, 1918:176). It is described as follows:

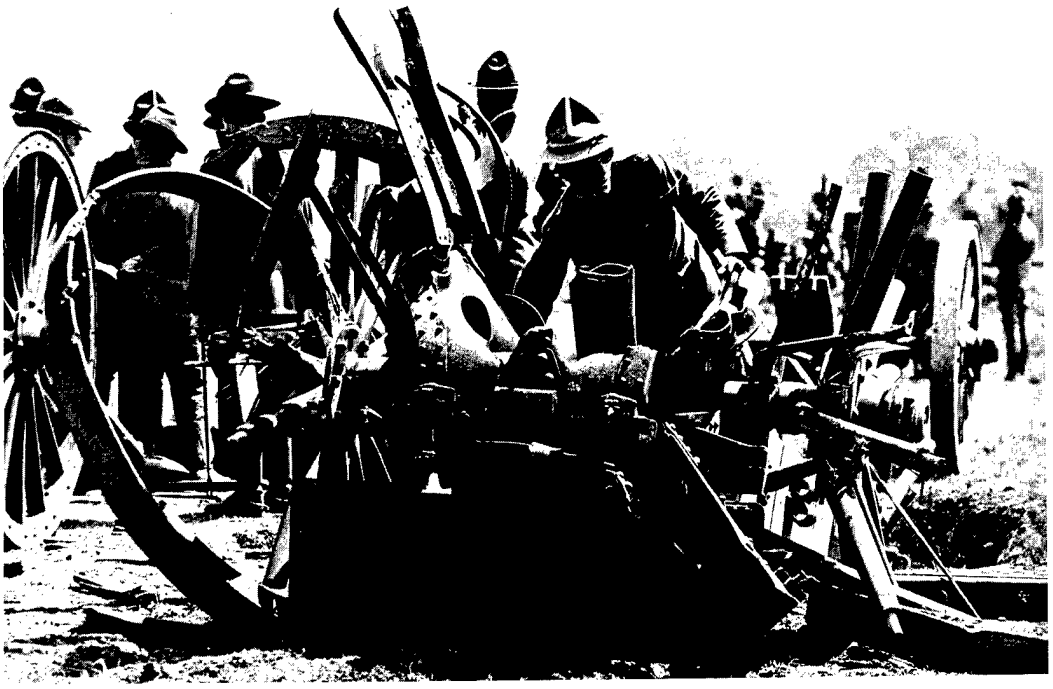


Figure 8-2. "Results of an Accident, Fort Sill." (Probably the 6-inch howitzer, Model of 1908, M1. Photo courtesy of Fort Sill Museum.)

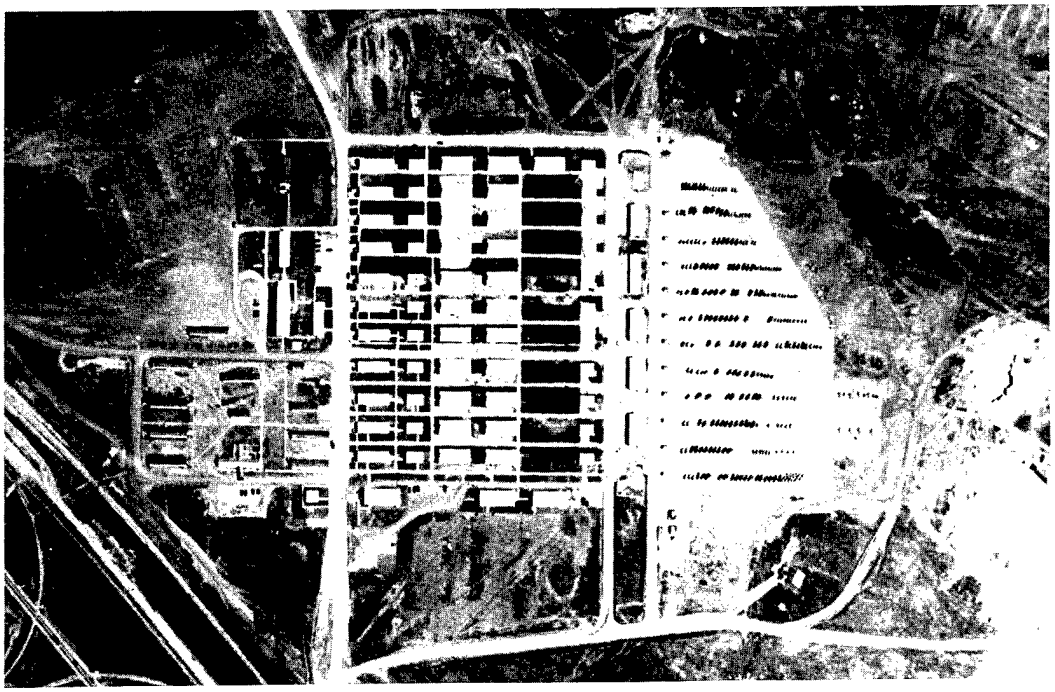


Figure 8-3. Aerial View of Site, 22 March 1942. (Note U-emplacements between parking lot and Quarry Hill. Photo CZQ-4C-17 from the Soil Conservation Service collections, Museum of the Great Plains.)

> The 21-grain percussion primer. . . consists of a brass case resembling in shape a small-arms cartridge case. The head, or rear end of the primer, is countersunk, forming a cup-shaped recess in which the percussion primer proper is fitted. The latter consists of a cap, anvil, and percussion composition. . .
>
> The percussion-cap recess is connected with the interior of the primer case by a small vent. The body of the case contains 21 grains of black powder, constituting the rear igniting charge for the igniting charge in the cartridge. This black powder is inserted under sufficient pressure to retain it in the primer, and a layer of composition wax is used to close the end. The outside surface of the wax is covered with a layer of shellac to insure water-tightness. (U.S. Army Ordnance Department, 1918:30-31).

Twelve 21-grain primers were found on the site. The little variation among them is primarily in the headstamping. No model variations of this primer are known during the World War I period although variations did later occur. As discussed below, it is thought that these may be an early design of 21-grain primer. As only one variation is known to have existed at that time, all differences in sizing are thought to result from manufacturing tolerances or other causes. Descriptive information about these primers is summarized in Table 8-1.

All but two of these primers have legible headstamps. These are of interest in that they reflect manufacturer and possibly something further of dating. The letter "F" may indicate the Frankford Arsenal as manufacturer. The interpretation of "WISE" is not known. The earliest headstamping which could be found (1918) for the 21-grain primer resembles these with a manufacturer's mark above a lot number (U.S. Army Ordnance Department, 1919b: Plate V). The headstamping format in present use includes not only manufacturer's mark and lot number, but also the year of loading and the model number (U.S. Army Ordnance Department, 1941: Figure 68). This was used as early as 1925.

> Before World War I the number of models of any ordnance item was so small that a standardized model was identified by the year, with or without the letter "M" as a prefix, different models sometimes being denoted by a suffix. . .

Table 8-1. Dimensions of 21-grain Percussion Primers from Cm-232.

Provenience	Headstamp	Length in. (mm.)	Head Dia. in. (mm.)	Outside Mouth Dia. in. (mm.)	Head Thick. in. (mm.)
N96	WISE/1718-2	1.585(40.26)	0.506(12.85)	----	0.121(3.07)
N103	-----	1.588(40.34)	0.507(12.88)	0.300(7.62)	0.120(3.05)
075	WISE/1718-70	1.591(40.41)	0.506(12.85)	----	0.128(3.25)
S114	WISE/1718-2	1.584(40.23)	0.510(12.95)	----	0.114(2.90)
V91	WISE/1718-2	1.571(39.90)	0.507(12.88)	0.307(7.80)	0.116(2.95)
W96	WISE/1718-9	1.585(40.26)	0.507(12.88)	0.285(7.24)	0.120(3.05)
CC62	----	1.581(40.16)	0.507(12.88)	0.295(7.49)	0.118(3.00)
Trench 1	F/1117-41	1.585(40.26)	0.510(12.95)	0.285(7.24)	0.116(2.95)
Trench 1	F/1117-4	1.575(40.00)	0.507(12.88)	0.280(7.11)	0.117(2.97)
Trench 1	WISE/1718-70	1.589(40.36)	0.506(12.85)	0.303(7.70)	0.118(3.00)
Trench 1	WISE/1718-70	1.591(40.41)	0.503(12.78)	0.290(7.37)	0.122(3.10)
Unknown	WISE/1718-70	1.587(40.30)	0.507(12.88)	0.300(7.62)	0.125(3.18)

> During World War I and up to 1925, this system was supplemented by the "Mark" system, particularly as applied to ammunition, suffixes being added to denote model variations. . .
>
> Since 1925 all newly developed ordnance items, including ammunition, have been assigned "T" numbers during their development and "M" numbers after standardization by action of the Ordnance Committee, with appropriate suffixes (Ohart, 1946:11).

As the 21-grain percussion primer is used with separate-loading ammunition, it would have been held in place by the breech mechanism. The fact that these would be loose and are small would help to explain why they might have been lost. The most probable reason for their presence on the site is that the site was once used for a firing gun position and that these were lost during the process of firing and reloading. Other evidences result in the same conclusion.

b. T-tube Friction Primer

This all-brass primer is of British origin and quite unusual in its many parts and complicated design (Figure 8-4b). Two were found at the site, one from square U75 and the other with unknown provenience. It was only used on certain large caliber British weapons utilizing separate loading ammunition. Two of these were also adopted by the United States during World War I. These are the 8-inch and the 9.2-inch howitzers.

Both of these primers bear the marking "MMIV" below the flaming grenade symbol for the Ordnance Department. This identifies them as of the Mark IV type. There were at least four different models (Marks) of the T-tube primer, all presumably interchangeable in use. The Mark IV primer operated in the following manner:

> On the withdrawal of the friction bar the detonating composition is ignited and the flash, passing down the perforation in the head and through the plug, fires the powder charge. The ball is driven back by the explosion and seals the tube. This, together with the mode in which the tube is held in the vent, prevents the escape of gas (Great Britain. War Office, 1920a:81).

The differences between the Mark IV and earlier Marks except for the Mark I are minor. The Mark IV* is merely a Mark IV primer

which has been fired and then reloded by having a new body and friction wire fitted (Great Britain. War Office, 1917:43). (The Mark I is different from the Mark IV in that it utilized a firing pin to ignite the detonating composition. It is then more appropriately a "T-tube percussion primer.") These primers were packed in "square tin boxes, ten in a box. Both the top and the bottom of the box are removable, being secured by soldered bands, and the tubes so arranged that five may be withdrawn from the top and five from the bottom" (Great Britain. War Office, 1920a:81).

Of the 9.2-inch howitzer models, at least the Marks I and II were used by the U.S. forces. The former "is 13 calibers long, while the Mark II type is 17.3 calibers, the principal difference being that the latter model is a more powerful weapon" (U.S. Army Ordnance Department, 1923:1). Further,

> Only the 9.2-inch howitzer materiel, Model of 1917 (Vickers Mark I) was manufactured in the United States. The 9.2-inch howitzer materiel, Model of 1917 (Vickers Mark I) and the 9.2-inch howitzer materiel, Model of 1918 (Vickers Mark II) was manufactured in England and procured for the United States Army (U.S. Army Ordnance Department, 1923:4).

Certain differences exist between similar Marks manufactured in this country versus those manufactured in Britain. These, however, had no bearing on the priming systems. Both the French percussion and the T-tube primer systems were used with both Marks of the 9.2-inch howitzer (U.S. Army Ordnance Department, 1923:27). However, later models of the weapon appear to have been altered to accept only a percussion primer.

The 8-inch howitzers are different from the 9.2-inch series in that these have wheeled carriages rather than the immobile platform. Different models of the 8-inch were also produced. At least two, the Mark VI and Mark VIII 1/2, were manufactured in the United States. The former was also manufactured in Britain. Although the basic design throughout is British, the Mark VIII 1/2 is an American modified version of the Mark VIII. "Due to the combination of British and American manufacture, there are several types of breech mechanism in service; the two main types are the T and the French percussion type" (U.S. Army Ordnance Department, 1921:283).

The use of the 8-inch and the 9.2-inch howitzers at Fort Sill is documented both by informants and by photographs. As this was the location of the U. S. Army Field Artillery School of Fire, it is assumed that virtually every model variation which was adopted into

service in this country was present. The 9.2-inch and 8-inch are thought to have been dropped from service by the U.S. in the 1920's. It may have been that the T-tube firing mechanism was discarded earlier. Indeed, the absence of mention of the T-tube primer in the 1920 British manual on the 8-inch implies that at that early date they had already moved away from it (Great Britain. War Office, 1920b: see p. 9-10).

4. Artillery Ammunition Box Hardware

a. Hasp Catches

These six catches are of iron and 1.74 inches (44.4 mm.) square (Figure 8-4h). Countersunk holes are present at each of the four corners. Screws held them onto the front of a wooden ammunition box. The central swivel engaged a hasp secured to the box lid. Wire was placed through the hole in the swivel and this bound with a lead seal. Some of these parts are also discussed in this report. Six catches with provenience as follows were found: M64 (Level 2), N77, N84, P77, V73, and one unknown. It is not known with which specific ammunition these were used or the time frame of their use. (This applies likewise to the hasp and hinges discussed below.) It has been suggested (W. H. Jones, Fort Sill Museum, personal communication) that they resemble parts used on boxes for 75 mm. cannon ammunition.

b. Hasp

This single hasp was found in square 063 (Figure 8-4f). It was used in a manner similar to that described above. It was secured to the lid of a wooden ammunition box with five countersunk screws. The tip of the hasp wing is turned up. It is 1.79 inches (45.4 mm.) wide. From the center of the hinge its length is 3.0 inches (76 mm.) across the screw plate wing and 4.7 inches (119.3 mm.) across the hasp wing. This may have been used on a box with the hinges discussed below or with one of the catches above. However, because of differences in provenience, these have been discussed separately.

c. Hinges

Both of the hinges from Cm-232 were found in square N64, level 3. These were screwed to the back of the lid of a wooden ammunition box which also operated as described under "Ammunition Box Hasp Catch". Indeed, it may have been that one of the catches and the hasp came from the same box as these hinges. However, because of the

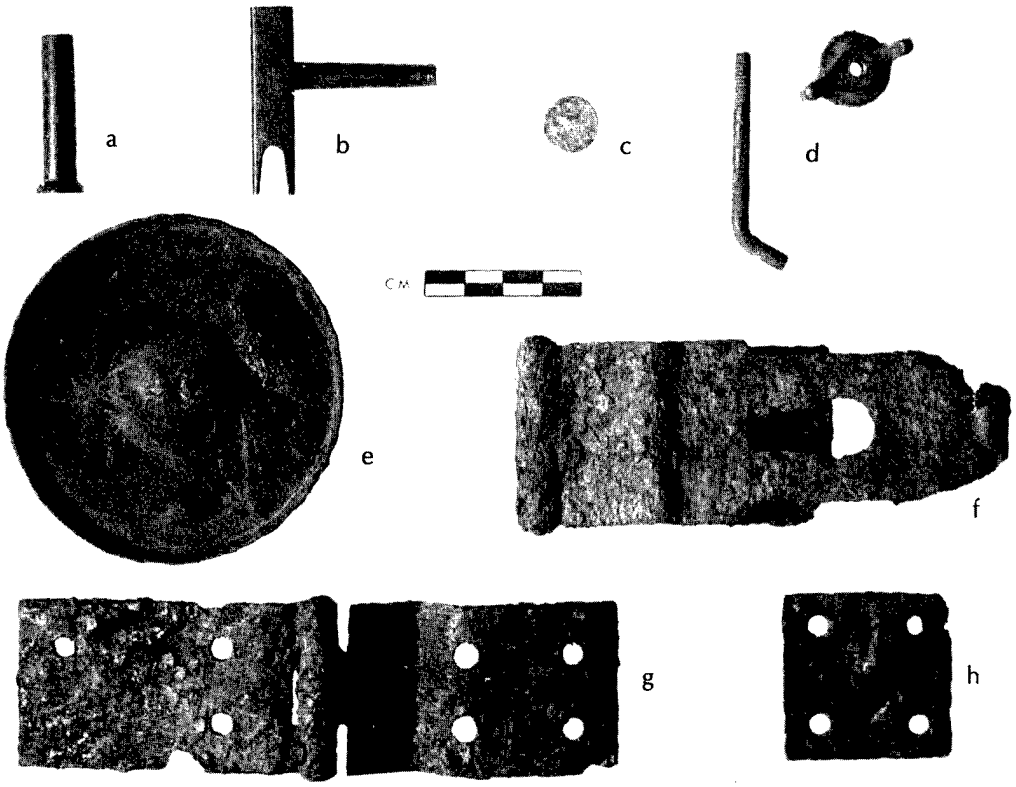


Figure 8-4. Military Ordnance Group Artifacts. a. 21-grain percussion primer, b. Mark IV T-tube friction primer, c. ammo box seal, d. box lid clamp post and wing nut, e. packing tube cap, f. hinge hasp, g. hinge, h. hasp catch

different proveniences of these items, they are presented separately. These are strap hinges with four countersunk holes per wing (Figure 8-4g). They are 1.75 inches (44.4 mm.) wide and 3.2 inches (81 mm.) from the center of the hinge to the end of the wing. Both are bent across one wing in such a manner as to suggest that a narrow board covered the back of the box mouth so that only the front portion of the box lid hinges upward. Also the provenience and similarity of these hinges implies that they came from the same box and that these ammunition boxes had only two hinges.

d. Lid Clamps

These consist of two brass parts, a heavy, one-piece cast wing nut and a threaded shaft (Figure 8-4d). Both were found, together and separately (Table 8-2). According to General J. F. Brittingham

Table 8-2. Provenience of Ammunition Box Clamps, Cm-232.

Square	Shaft	Wing Nut	Both Together
M103	1	-	-
O75	5	-	-
O78	-	2	-
O89	-	1	-
P60	-	1	-
P75	-	1	-
P77	-	1	-
P79	-	2	-
Q75	1	-	-
S78	-	-	1
S88	-	1	-
T73	-	-	1
U72	-	1	-
V70	-	1	-
V83	-	1	-
V88	-	-	1
X62	-	1	-
Unknown	-	1	-
Total	7	14	3

(Ret.) of Lawton, Oklahoma, their purpose was to secure the lid on a wooden ammunition box. The lower tang of the threaded post was embedded into the inside edge of a wooden artillery ammunition box while the threaded end protruded through a hole in the box lid. The wing nut acted to hold the lid in place.

The threaded shaft is 2 1/2 inches (63 1/2 mm.) long. The upper 0.58 inches (14.7 mm.) is threaded; diameter is 0.18 inches (4.7 mm.). Wing nut diameter is about 3/4 inch (19 mm.) with a 1 1/4 inch (32 mm.) wing spread.

e. Packing Tube Caps

It has been suggested by Mr. W. H. Jones of the Fort Sill Museum that these represent the metal ends of cardboard tubes in which were packed fixed ammunition. Such cardboard tubes are still in use and their earlier use is indicated in ordnance documents. These tubes were packed in wooden boxes for shipment. Seven (Figure 8-4e) were found; all are of iron, circular with dimpled center, upturned lips, and an inside diameter of about 3.3 inches (84 mm.). There seem to be differences in the thickness and lip size of these although because of their generally poor condition and variability, neither does this show any consistency nor is any reason apparent. Their provenience and number is as follows:

N64, level 3	1
P63, level 1	1
Q64, level 2	1
U75	1
V70	1
Feature 10, top	1
unknown	1

f. Seals

Three lead seals were found in squares M89, N62, and N64, level 1. These are distinguished from the bottle seals discussed under the domestic debris in that these are more perfectly round, of consistent thickness, and of similar size (Figure 8-4c). The best preserved is 0.57 inches (14.6 mm.) in diameter and 0.17 inches (4.4 mm.) in thickness. Two parallel holes pass through it. While this seal is unstamped, others, including that from N62 are. While usually illegible, this stamp sometimes leaves the raised letters "US" on a lined background. These seals are thought to originate on boxes of artillery ammunition secured with twisted strand iron wire around which the seal is clamped.

5. Artillery Ammunition Hardware

a. Fuze Safety Pins

These are simple pieces of 0.08 inch (2 mm.) diameter wire bent into a half circle (Figure 8-5e). The three were found in squares M76, Q90, and S89. While use is somewhat problematical, devices such as this were commonly used as safety pins on artillery shell fuzes. Very similar pins can be seen in illustrations of 31 and 45 second combination time and percussion fuzes 1907M. Other, internal safety mechanisms were also used in conjunction with the pin. These sometimes would arm the projectile only after firing. Safety pins, however, were removed from the fuze immediately prior to firing.

b. Fuze Caps

All but one of these twenty-nine cones of stamped sheet brass are of the same type and are discussed first. The common type were found scattered across the site according to the provenience given in Table 8-3 and relate roughly to the World War I period as will be shown. These have straight sides which rise roughly 0.5 inches (13 mm.) from the base before sloping inward over the remaining 1.9 inches (49 1/2 mm.) of its height to a rounded point (Figure 8-5f). Diameter at the base is almost 2.5 inches (63 mm.). A 0.35 inch (9.1 mm.) wide brass strip holds the cap in place. This strip and a portion of the cap is covered with a black paint for the full extent of its circumference.

Artillery ammunition is made not only by caliber but also according to intended purpose. Examples are high explosive, smoke, shrapnel, etc. Detonation at the proper time is by fuzes set into the projectile. These fuzes also come in many different types according to intended use. Examples of this are the mechanical time fuze (for anti-aircraft), combination fuze, etc. Certain types of artillery ammunition would often be associated with certain types of fuze because of their complimentary capabilities. For example, a smoke round would usually be fired armed with a fuze which detonated the round before the body of the shell impacted so that the value of the smoke would not be lost by the round being buried in the ground.

One fuze was particularly useful. It was the combination fuze (time and percussion) so called because it could be activated either by impact or by the timed burning of an internal powder train. It was developed in the United States in 1907 and became the model 1907M.

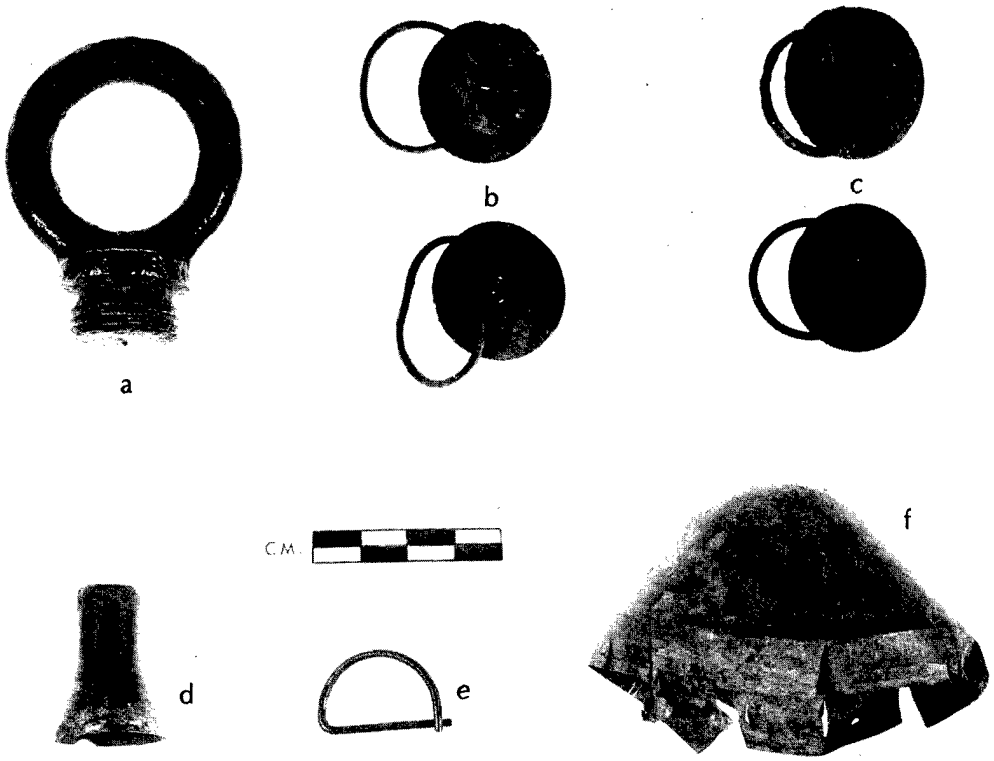


Figure 8-5. Artillery Ammunition Hardware. a. eyebolt adapter plug, b-c. washer type adapter plugs, d. unknown fuze cap, e. fuze safety pin, f. cap for combination fuze model 1907M.

This was used with many different rounds but was always used with the shrapnel round.

The First World War was a time of great advance in artillery materiel and one of the rounds which was highly thought of was shrapnel. It consisted of a hollow casing filled with a powder charge under a packing of grape-sized lead balls. This was capped by the combination fuze. At the appropriate moment in flight, the fuze ignited the powder charge which blew the fuze off of the shell and projected the lead balls like a shotgun.

While the combination fuze was very useful, it was also somewhat delicate as its internal powder train was subject to deterioration upon exposure to moisture, producing uncertain results. This was less of a problem when the fuzes came packed in sealed boxes opened only in the field and prior to firing. However, because of the

difficulty and time involved in fuzing each round and because of the expected great need for antipersonnel capabilities, shrapnel rounds were sent into the field fuzed. These brass cones were an attempt to protect the exposed combination fuzes. They were held in place by a brass strip soldered to the shell. This strip was merely peeled away and the cap removed prior to loading the round. While other types of ammunition may also have been pre-armed and have used these, it is assumed that shrapnel was the most common if not the only ammunition so treated.

Apparently some shrapnel rounds were sent into the field without these brass caps. Some of these had their fuzes dipped in hot wax in an attempt to provide the same protection (Dickinson, 1920:140).

Very lightly stamped onto these cones was information as to the ammunition lot, the model of fuze, the production lot number (of the fuze?), the date of production, and the name of the manufacturer. Because of the condition of these it was often not possible to read or to locate these markings. In other cases, these do not seem to have been marked with all this information or with any information at all.

Three manufacturer's marks are present on these brass fuze caps. These include "SCOVILL", "SCOVILL A.C. CO", and "I.A. & F. CO." It is not known if the first two represent the same or different companies. However, the first undoubtedly is the Scovill which for so many years has made military uniform buttons, some of which were also recovered from Cm-232. "I.A. & F." probably stands for International Arms and Fuse of Bloomfield, New Jersey. This company produced 155-mm. gun high-explosive shells, Mark III, type B (U.S. War Department, 1919:131). However, that is the only shell manufactured by the company during World War I while there were no artillery shells produced by Scovill at either the forging or machining stage.

The Mark III high explosive shell for the 155-mm. gun was unfuzed when sent into the field and was adapted for certain point detonating fuzes, not the 1907M combination fuze (U.S. Army Ordnance Department, 1941:180). It is not then immediately obvious how these companies came to be manufacturing fuze protectors unless they were manufacturing components which were to be assembled elsewhere. Nothing could be found concerning the Scovill A.C. Co.

Where date of manufacture is present, all show 1917 or 1918. It should be made clear that these are not necessarily the dates of usage. Time lag between production and use is not just a function of logistics.

Table 8-3. Brass Fuze Caps from Cm-232.

Provenience	"AM Lot"	Model	"Lot #"	Date	Manufacturer
L67	7872	-	-	-	-
M106	-	-	5192	-	I.A. & F. Co.
N97	-	1907M	4426-13	-	-
N112	7924	-	-	-	-
O71	-	1907M	72-17	-	-
P62	7872	-	-	-	-
R92	7872	-	-	-	-
S91	-	1907M	1391-31	1918	SCOVILL
V83	7924	1907M	284	1917	SCOVILL
V83	7924	1907M	287	1917	SCOVILL
V83	7924	-	-	-	-
V83	7989	-	294	1917	SCOVILL
V83	7899	1907M	320	1917	SCOVILL
V83	7882	-	190	1917	SCOVILL
V83	4978-19	"Mod 1914-15"	-	-	-
W97	-	1907M	-	-	-
W98	7889	1907M	301	1917	SCOVILL
Unknown	7872	-	-	-	-
Unknown	7924	1907M	284	1917	SCOVILL
Unknown	(?) 913	-	-	1917	SCOVILL
Unknown	(?) 913	-	-	1917	SCOVILL
Unknown	7915	1907M	301	1917	SCOVILL

Unmarked Brass Fuze Cap Provenience (7): N62; N106; 064, level 2; Q92; V83 (3)

In the case of shrapnel ammunition in particular, it was found that as compared to war needs, the ammunition was greatly overproduced. This may have been in part because of the difficulty in training gun crews in the proper use of shrapnel and in its subsequent diminished popularity in Europe (W. H. Jones, Fort Sill Museum, personal communication). Large stockpiles of ammunition were in existence at various points around the Fort Sill Military Reservation for many years after the World War. The ammunition not only had the many imperfections inherent in items rushed in production, but deteriorated with long storage. It was used for many years for training purposes and the increasing number of accidents accompanying its use was such that concrete emplacements had to be built at each firing point so that the gun crew would be shielded should a premature detonation occur. Some of these U-shaped emplacements can be seen in aerial photographs (Figure 8-2) to have stood between the site and Quarry Hill. During the 1930's, the ammunition was exploded in place in order to salvage the lead from the shrapnel (General J. F. Brittingham [Ret.], Lawton, Oklahoma, personal communication).

One fuze protector with no provenience was found which was quite different from those discussed above which covered the 1907M combination fuze. This also was of a single piece of stamped sheet brass although it lacked identifying inscriptions. There are indications that black paint may have been applied at least to the basal portion of the cone. It has a cylindrical tip which flares out into a cone slightly less than midway down its base (Figure 8-5d). Basal inside diameter is 0.90 inches (22.8 mm.) while the outside diameter of the upper portion is 9.54 inches (13.7 mm.). There is no evidence for a method of attachment.

The association of this with any particular shell or fuze is difficult to assess since this lacks the markings which would provide dating, etc. However, it is assumed that this would have been used sometime during or following the First World War when the other fuze protectors were in use.

c. Adapter Plugs

As discussed above, certain artillery rounds were shipped with their fuzes already in place and covered with brass caps so as to protect the powder fuze train from the moisture. However, a great number of shells (particularly those other than shrapnel) were shipped without such a fuze and cap closure. In such cases, something had to be done so as to prevent dirt from entering the shell itself. Holes in the nose of the artillery shell which were to receive the fuzes in the

field just prior to their firing were sealed with adapter plugs.

> All loaded adapter and booster casings, whether assembled with the projectile or shipped separately, are required to have the fuze holes closed with adapter plugs to protect the threads and keep out dirt (U.S. Army Ordnance Department, 1919a:187).

"Adapter casings" are referred to because during the First World War, artillery ammunition had to be threaded to accept French fuzes. Because French threading was metric and different from that used in the United States, a special adapter was designed which was threaded into the shell casing and into which the fuze was threaded.

These plugs are of two types, ring bolts and adapter plugs. The larger caliber ammunition is shipped "fitted with a ring bolt to facilitate handling. A fiber or rope grommet is placed on the projectile to protect the copper rotating band" (U.S. Army Ordnance Department, 1918:39).

Twelve of these ring or eye bolts were found (Figure 8-5a). Their provenience is as follows:

Square	Number
M86	2
M97	1
N94	1
N103	2
N106	1
Q74	1
Q75	1
S80	1
S89	1
U75	1

The eye itself is 1 1/4 inches (32 mm.) in inside diameter and 2.6 inches (67 mm.) high. The outside thread diameter is 0.92 inches (23.4 mm.). It is thought that such as these were used on artillery shells of 4.7-inch and above diameter.

Artillery rounds smaller than 4.7-inches did not use the ring plug in part because of their lighter weight. In addition, however, those smaller calibers had fixed ammunition, which would not have been lifted by a ring in the nose of the shell. These were covered with smaller plugs, the metal portion of 49 of which were found scattered

over the site. These are described below.

> As the fuzes are never assembled to the shell until the round is about to be used, an adapter plug is supplied which acts as a protection against the entrance of foreign substance or moisture into the socket. It consists of a compressed felt washer held between an upper washer of tin and a lower washer of tin or copper, both held together by a twisted wire link. The link is first passed over the circumference of a ring which acts as a means of unscrewing the plug (U.S. Army Ordnance Department, 1919a:173).

In 47 of these (Figure 8-5c), the upper washer is iron and 1 1/4 inches (c.32 mm.) in diameter; the lower washer is of a tinned iron and 0.88 inches (22.4 mm.) in diameter. Remains of the felt washers between these are present on only a few. Only two were found which consisted of a lower copper washer (Figure 8-5b). These are slightly smaller (upper washer diameter = 1.18 inches or 30.0 mm.; lower washer diameter = .81 inches or 20.5 mm.) as well as being morphologically dissimilar and having copper or brass rather than iron wire link. This minority type is particularly similar to the Model 1910 plug shown in U.S. Army Field Artillery School of Instruction, Saumur; 1918: Figure 13.

The presence of these on the site fills the gap left by the brass fuze caps (which indicated that shrapnel rounds were being fired from the site) by showing that high explosive and other types of ammunition were also being fired.

Both types of adapter plug, eyebolt and washer, were found scattered over the site with no more than two and usually only one per square meter.

CHAPTER IX
CLOTHING GROUP ARTIFACTS

1. Buttons

a. Sewn Buttons

A total of 52 buttons were recovered from Cm-232. For purposes of discussion these have been divided according to composition and within each of those divisions according to size, method of attachment, color, and any decorative elements which might be present. Other salient characteristics are method of construction, manufacturer, and intended use. Table 9-4 summarizes information on the buttons constructed of brass while Tables 9-1 through 9-3 summarize provenience and size the rest. Button composition and frequencies are plastic (1), composition (1), iron (1), white metal (1), glass (18), shell (12), bone (1), and brass (17).

Miscellaneous Sewn Buttons

The single plastic button is a one-piece, molded 4-holer. It is dark green in color with a beveled face and shallow, dished concavity around the four attachment holes (Figure 9-1c).

The composition button is brown and flat on both sides. Its four attachment holes are rather small. It is molded and the holes show wear on one side but appear to have been tapered inward on the other. One face is marked with a fine black flecking (Figure 9-1b).

The white metal button is stamped from a thin piece of sheet metal. The face is decorated with cross-hatchings and has a raised outer rim while the dished concavity holds the four large fastening holes. The back is undecorated (Figure 9-1a).

It is of interest that in the 1885 Report of the Quartermaster-General (U.S. Army Quartermaster Corps, 1885:603) is stated the adoption of new fly and suspender buttons on military clothing. Further, "similar buttons of white metal will be used on the drawers, stable frocks, and overalls." White metal buttons very similar to this have been found at the old Fort Sill Dump, Cm-9 (Spivey, et al, 1977: Figure 17h).

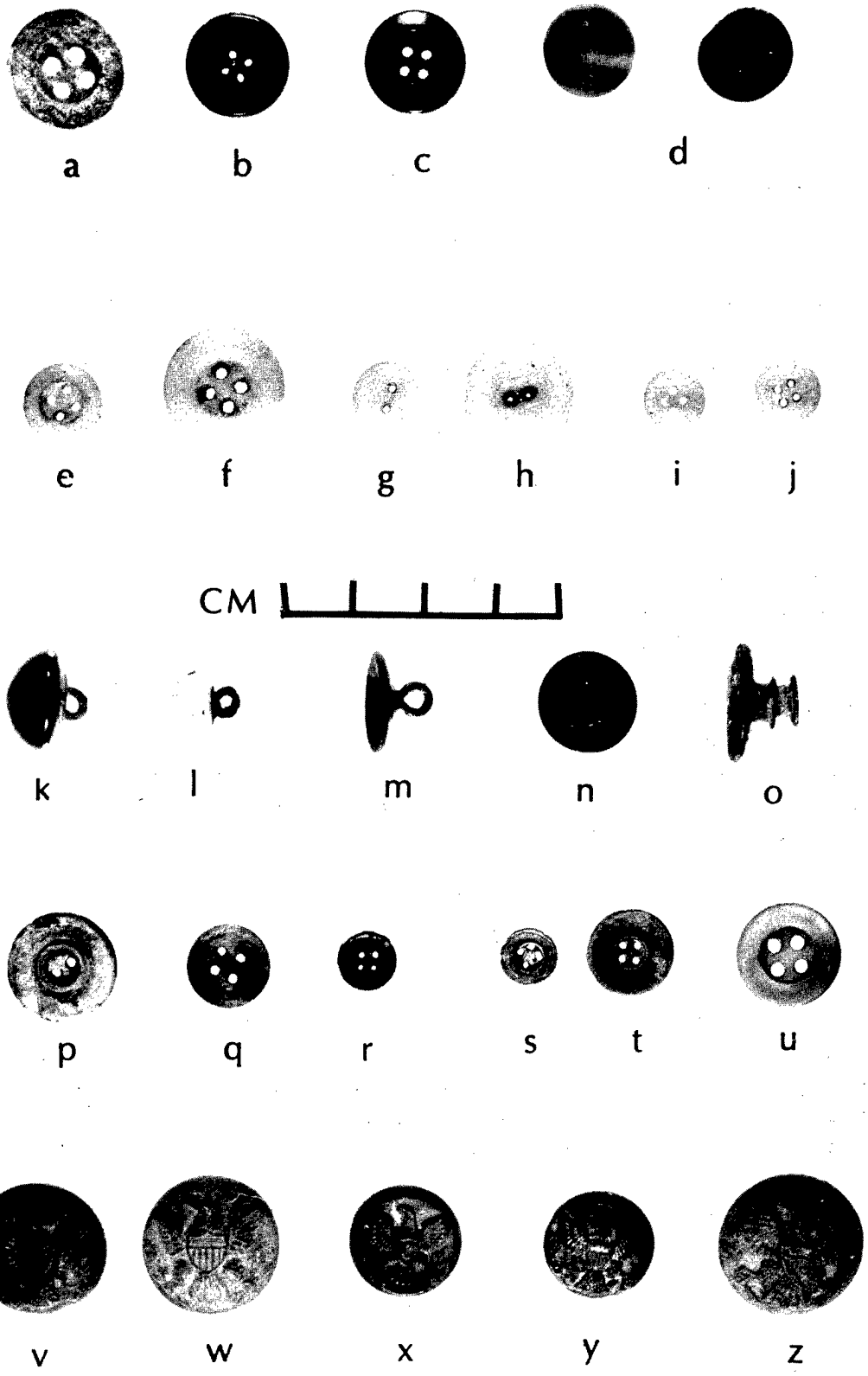


Figure 9-1. Selected Buttons from Cm-232. a. white metal, b. composition, c. green plastic, d. domed sheet brass [front and reverse sides], e-j. white glass, k-l. domed glass, m-n. two-piece sheet brass [side and back views], o. "bachelor's button," p-u. shell, v-w. flat shield General Service military, x. Cavalry officers, y-z. raised shield General Service.

Table 9-1. Miscellaneous Buttons from Cm-232.

Composition	Provenience	Size in. (mm.)
Plastic	P73	0.56(14.3)
Composition	U58	0.57(14.5)
White Metal	M68	0.66(16.8)
Bone	P-Q53-54	0.57(14.6)
Iron	R87	0.54(13.7)

"White metal" as used here is a catchall for any metal alloy button which is white in color. Many "white metals" have in the past been used in the manufacture of buttons. Some of these include Britannia metal, an alloy of tin and antimony which Luscomb (1967:27) says is "very much like hard pewter"; biddery metal, an alloy of copper, zinc, and lead with occasional small quantities of tin (Luscomb, 1967:23); and, of course, pewter, an alloy of primarily tin with several other metals. It is not known what the constituent elements of this button are.

The single iron button from the site is too rusted to distinguish any unusual markings. It does, however, appear to be of two-piece construction and have four holes in a shallow concave face.

The "bone" button appears to be a fragment of a button backing. Composition is not obvious. Color is similar to that of old wood although laminar construction and a somewhat rough face give it the appearance of bone. It appears, at any rate, to have been a simple round button with four thread holes.

Additional information concerning these button types is summarized in Table 9-1.

Glass Sewn Buttons

All but one of the 18 glass buttons (Table 9-2) are white and all but four have holes for attachment. These four have loop shanks and are discussed first.

Table 9-2. Glass Buttons from Cm-232.

Provenience	Size in.(mm.)	Comments
N69	0.42(10.6)	2-hole
S71	0.61(15.5)	2-hole
R72	0.39(10.0)	loop shank
R72	--- (---)	loop shank
Q72	0.38(9.7)	loop shank
Q91	0.57(14.4)	loop shank, black glass
L75	0.34(8.8)	decorated
L75	0.34(8.8)	decorated
P65	0.34(8.8)	decorated, burned
N63/2	0.57(14.4)	opaque white
K62	0.42(10.6)	----------
L75	0.44(11.1)	----------
S72	0.67(17.0)	----------
S72	0.37(9.4)	----------
U72	0.52(12.8)	----------
Q66	0.44(11.2)	----------
O-P64/5	0.41(10.3)	----------
M67	0.36(9.0)	----------

The largest of the shanked glass buttons is of opaque black glass. It has a brass shank soldered into place. Its face is undecorated and domed (Figure 9-1k).

One of the three white glass buttons with shanks is broken. However, a deep and roughened cup in its back shows that it was once shanked. The other two have iron loop shanks. Although all have undecorated, domed heads, two styles are represented. Two of the three are thicker in cross section and opaque (Figure 9-1l). That from square Q72 is the third.

Of the 14 with holes for attachment, all but one are translucent. These fourteen include two distinctive variations: those with two rather than four attachment holes and those with decorations.

All of the three decorated buttons are of the same style (Figure 9-1i). These have four holes in a deeply dished face. The decoration consists of lines in relief radiating out from the center of the button.

The two-hole buttons do not have the dished face that is so common with the four-hole. This dishing served to prevent abrasion of the threads which hold the button in place. This same purpose is served in the two-hole button by a linear depression connecting the two holes. Both of these have such a depression (Figure 9-1 g-h). Both are undecorated and translucent. The larger of the two, however, has a slightly convex face surrounded by a flat margin which gives additional depth to the central depression and serves in some sense as a decorative device.

The remaining nine white glass buttons are similar in that they are all pierced with four holes, have an unelaborated face, and a central concavity (Figure 9-1 e-f). With one, this concavity takes the form of a flatter face with a raised rounded edging rather than a dishing, however (Figure 9-1j). Only one of the group appears to be opaque.

Shell Sewn Buttons

The twelve shell buttons fit into four general morphological categories. The largest includes seven buttons. All seven have four holes in a shallow dished concavity in the face (Figure 9-1 q-r). However, they differ slightly in size, proportion, etc., so that only two (Figure 9-1r; identified with asterisks in Table 9-3) are alike in all respects.

Table 9-3. Shell Buttons from Cm-232.

Provenience	Diameter in. (mm.)	Comments
N64/3	0.58(14.8)	inset center
M63/2	0.59(15.1)	inset center
L76	0.61(15.5)	2-hole
Q73	--- (---)	small inset center
O78	0.32(8.1)	small inset center
L77	0.44(11.2)	----------
S69	0.33(8.3)	*see text
T67	0.38(9.3)	----------
V70	0.33(8.3)	----------
N64/3	0.47(11.8)	----------
R72	0.33(8.3)	*see text
L72	0.55(14.1)	----------

Two shell buttons also similar enough to have come from the same set of clothing have a central depression which, while circular, is not dished but inset with roughly perpendicular walls (Figure 9-1u). These depressions are cut so that the four holes are placed just inside the cavity walls. The area of the face bordering this concavity has a rounded quality.

Two other buttons with an inset center are distinguished from those two above in that they have flat faces and depressions deliberately made small with four very fine thread holes closely placed together (Figure 9-1 s-t).

Of all the shell buttons, only one has two attachment holes. Rather than having a linear depression between the two holes, as was the case with certain glass buttons already discussed, it has on its face an inset cavity as described above. This circular cavity is

rimmed in low relief (Figure 9-1p). This rim might most appropriately be considered as a decorative element on the face of the button and is the only example of this sort on the site.

Brass Sewn Buttons

The brass buttons contain both military uniform and civilian types. All but three are compound and all are shanked. Those which are compound have a Sanders-type loop shank (Luscomb, 1967:17) while the remainder have a shank most similar to the Alpha-type (Luscomb, 1967:141). This latter is a simple loop of metal the ends of which have been connected with solder to the back of the button. A very similar type to this exists as the Omega shank. This also consists of a loop of metal attached to the back of the button. However, here the ends of the loop are folded outward providing better adherence to the button. In cross section it takes the form of the Greek letter from which its name is derived. As used here these are simply shank shapes and do not have the temporal significance which Luscomb applies to them.

The military buttons are the only ones found at the site which bear backmarks. For this and other reasons these are the only buttons for which a reasonable dating might be derived. Information including dating of brass buttons is summarized in Table 9-4. Because of the distinctive division among these brass buttons, the civilian buttons will be discussed first.

Six brass buttons were found which could not be related to the military. All but one are shanked. That one has four holes and is wafer thin. Because of this, it is suspected that it was originally part of a compound button. It does have a dished depression to the thread holes and no apparent decorations of any sort.

Two civilian compound buttons were found. These are shanked and have plain faces with no back marks. Their construction is similar to that of the military uniform buttons in that both are of the Sanders type. The back plate on these, however, is coned back to the shank. The fronts were originally rounded outward but have been crushed in (Figure 9-1 m-n).

Three buttons have a hollow domed shape with Alpha-type loop shanks. They are made from a single stamped piece of brass (Figure 9-1d). Because of the inset of the shank in the domed face of the button, tight stitching of the button to cloth would necessarily have pulled the cloth slightly into the hollow button back. Although not

Table 9-4. Brass Buttons From Cm-232.

Provenience	Size in. (mm.)	Backmark	Dating	Shank Wire Diameter in. (mm.)	Comments
N64/3	0.528(13.4)	----	---	---	4-hole fastening
Q74	0.562(14.2)	----	---	0.061(1.5)	2-piece body; plain face
TRENCH 1	0.558(14.1)	----	---	0.053(1.3)	2-piece body; plain face
P72	0.523(13.3)	----	---	0.034(0.8)	hollow dome
P72	0.523(13.3)	----	---	0.034(0.8)	hollow dome
S73	0.523(13.3)	----	---	0.034(0.8)	hollow dome
PQ53-54	0.633(16.0)	HORSTMANN/ PHIL$^{A}_{\cdot\cdot}$ & NEW YORK	1885-1902	0.036(0.9)	"C" on shield
O63/profile	0.62 (15.8)	HORSTMANN BROS & Co.·/ PHIL$^{A}_{\cdot\cdot}$	1885-1893	0.054(1.3)	late G.S.[1]
N64/3	0.823(20.8)	HORSTMANN BROS & Co.·/ PHIL$^{A}_{\cdot\cdot}$	1885-1893	0.079(2.0)	late G.S.
N64/3	0.810(20.5)	HORSTMANN BROS & Co.·/ PHIL$^{A}_{\cdot\cdot}$	1885-1893	0.059(1.4)	late G.S.
N64/3	0.812(20.6)	HORSTMANN BROS. & Co.·/ PHIL$^{A}_{\cdot\cdot}$	1885-1893	0.063(1.5)	late G.S.
N64/3	0.812(20.6)	WATERBURY MANUFACTURING Co	1885-1902	0.064(1.6)	late G.S.
Q59	0.584(14.8)	SCOVILLS & C$^{O}_{\underline{}}$ EXTRA	1854-1885	---	early G.S.[2]
TRENCH 2	0.809(20.5)	EXTRA QUALITY	1854-1885	0.054(1.3)	early G.S.
TRENCH 3	0.771(19.5)	·SCOVILL MFG CO/ WATERBURY·	1850-1902	0.044(1.1)	early G.S.
Y79	0.774(19.6)	·SCOVILL MFG CO/ WATERBURY·	1850-1902	0.051(1.2)	early G.S.
PQ53-54	0.764(19.3)	WATERBURY BUTTON CO.	1854-1885	0.054(1.3)	early G.S.

[1] General Service with raised shield
[2] General Service with flat shield

excessive, this would have been further aggravated when another layer of cloth was forced over the button for the purpose of closure. A loose stitching providing these with essentially thread shanks in addition to their metal ones is quite possible also. It is reasonable to suggest that they served in a decorative rather than a functional way.

The military buttons are significant in that changing manufacturer's back marks and military fashion provide a potentially useful temporal framework. All but one of these back marks also identify the manufacturer. It should be remembered in viewing these dates that the military for many years after the Civil War continued to issue stockpiled clothing. Chappell (1972), however, indicates that dissatisfaction on the part of soldiers on the frontier with the styles and particularly with the quality of the Civil War stores, led to purchases from outside the Quartermaster. (Eventually this dissatisfaction brought on many uniform changes starting in the early to mid-1870's.) These outside purchases doubtless would affect the range of characteristics of uniform buttons found at a site as would the later uniform changes. Also while changes might be mandated in specifications for buttons purchased through the Quartermaster General, there were invariably time lags in issue. There was a further lag between the time that an item was last issued and the time it was finally discarded. Many was the civilian or Indian who benefitted from the nearby presence of an Army Post by wearing either discarded current issue or out-of-fashion military gear. Therefore, ability of buttons alone to provide an adequate temporal framework for a site is qualified. They may provide the basis for suggesting initial dates of appearance but only more questionably so for closing dates.

Certain changes in Army specifications for issue buttons are known and are of significance to the following discussions. As stated in the "Report of the Quartermaster-General" for 1885:

> To give the uniform dress coats as handsome an appearance as practicable, with a due regard to economy and serviceability, provisions have been made to have the buttons gilded by a fire process, treating the shell of the button in such manner that the gold will appear only on the outside surface. The increase in the cost of the buttons is very small, while considerable labor required to keep the buttons bright and clean will be saved to the enlisted men (U.S. Army Quartermaster Corps, 1885:603).

The specification, adopted 27 March 1885, further distinguished two button sizes. The larger was to be 32 1/2 lignes with a 26 gauge

copper shank (Figure 9-1z); the smaller was to be 25 lignes with a 28 gauge copper shank (Figure 9-1y). Assuming 40 lignes per inch, these sizes should be as follows:

	button size		shank size	
	in.	(mm.)	in.	(mm.)
Large	0.81	21.6	0.07	1.8
Small	0.63	16.0	0.06	1.5

All but one of the buttons found are of the General Service type. The heraldic device common to all General Service buttons consists of a spread eagle holding an olive branch in one talon and arrows in the other and with a lined shield over its chest. It was adopted for use by enlisted men 20 January 1854, and continued in use until 1902 when the Great Seal button was adopted by all ranks of every corps except the Engineers (Albert, 1976:40-41). A similar button which was used by officers and enlisted men alike prior to 1854, was adopted first for the Infantry on 27 March 1821. It consisted of the spread eagle and shield device but with a raised letter within the shield to indicate the corps of the wearer (Albert, 1976:35).

Another significant change took place in 1885 in General Service buttons. According to Brinckerhoff (1972:5), prior to that time the eagle had long, narrow wings and the shield was flat and wide (Figure 9-1 v-w). After that date the eagle's neck was extended and the wings made wider and shorter (Figure 9-1 y-z). In addition to these changes, an elevation and size decrease of the shield was accomplished. This is the most obvious difference and is the one referred to in distinguishing "early" from "late" General Service in Table 9-4. The gilting does not always occur on archaeologically recovered buttons and is, therefore, used cautiously for dating purposes here.

The only military uniform button not of the General Service type is from the area of squares P-Q53-54. It is of small size and bears the letter "C" (standing for "Cavalry") in the shield (Figure 9-1x). The Cavalry was officially organized in 1855, the year following the change to the General Service button for enlisted men. Therefore, this and all other buttons bearing Cavalry designation were to have been worn by officers only (Johnson, 1948:62). The shield is raised and appears to be stippled. Dating for this button then would be between 1885 and 1902.

Of the ten General Service buttons, five have raised shields, indicating manufacture after 1885, and five have the flat shield,

indicating manufacture prior to that date. Of the former, remnant gilting is visible on all but that from N64, level 3. Both large and small sizes are represented in both groups.

The single small button from the later, raised shield group (Figure 9-1y) is from square O63. The back markings on both this and three large size buttons from N64, level 3 are "HORSTMANN BROS & CO/PHILA" (Table 9-4). This was used by the Company from 1859 to 1863 and from 1867 to 1893 (Johnson, 1948:217). Because of the style, their manufacture may then be dated between 1885 and 1893.

The one unusual back mark from this group was found on a large size button from N64, level 3. It is "WATERBURY MANUFACTURING Co" (Table 9-4). According to Luscomb (1967:220), three different companies operated under this name. The earliest was established in 1814 and was probably the producer of the marked buttons as the other two companies, established in 1849 and 1873 respectively, are not known to have ever produced buttons. The dating for this Waterbury button is given by both Luscomb (1967:220) and Johnson (1948:218) as the 1840's. They are also said to be "extremely rare." The Waterbury button found at Cm-232, however, is not so easily dealt with for two reasons. First, the design is of the post-1885 type. Further, Johnson (1948:218) indicates the back mark of the 1840's Waterbury buttons to include the word "manufacturing" in its abbreviated form only. On this example the word is entire. The manufacture of this button is, therefore, tentatively dated to the period of its style, 1885 to 1902.

The large Horstmann and Waterbury buttons discussed above are of interest in that all are from N64, level 3 and all show some evidences of burning, particularly the Horstmanns. It is quite possible that the Horstmann buttons were from the same item of clothing.

As with the raised shield type General Service buttons just discussed, those with the earlier flat shields include four of the large size and one of the small. While these are also separable into two sizes, the earlier specifications are not known. However, it is apparent from these that variation exists, not only between the early groups and the late, but also among those of the early group.

The smallest of the early, flat shield buttons has a "SCOVILLS & Co/EXTRA" back mark (Table 9-4). This marking minus the "EXTRA" is associated with the period 1840-1850 (Johnson, 1948:218; Albert, 1976:464; Luscomb, 1967:174). The obvious conflict is that the General Service button was not adopted until 1854. Further, Fort

Sill was not occupied until the late 1860's. One might then assume that it was manufactured between the mid-1860's and 1885. It is of interest that Brinckerhoff (1972:5) seems to associate quality markings generally with the Civil War period. Because of the problems in dating this back mark, the 1854 to 1885 time frame must be used.

Two buttons bear the mark "SCOVILL MFG CO/WATERBURY" (Figure 9-1w). These are from square Y79 and "Trench 3." Scovill has been making buttons since 1802 (Luscomb, 1967:174). However, it changed names many times in those early years. Those early name changes included the following:

1802	Able Porter and Company
1821	Leavenworth, Hayden and Scovill
1827	J.M.L. & W.H. Scovill
1840	Scovills and Company
1850	Scovill Manufacturing Company

It is still operating under the name present on the back of these two buttons. These buttons were then made some time between 1850 and 1884. It is interesting, however, that Albert (1976:464) lists all of its Scovill back marks which utilize the abbreviated form of "manufacturing" as "Characteristic Scovill Backmarks, 1850-65." It is further of interest that neither of these buttons utilizes the apostrophe following the "f" in the "Manufacturing" abbreviation. This in conjunction with the absence of periods after "SCOVILL" and probably after "MFG" on both buttons, make this back mark slightly different from all of the others illustrated by Albert. However, while the suggestion of Civil War period dating is in line with the dating of the site, the more conservative dating is utilized (Table 9-4). These are the only buttons from the site with back marks of raised lettering. They stand out from a "depressed channel" (Albert, 1976:8) circling the shank.

The Waterbury Button Company went through many name changes, just as did Scovill. Its chronology of name changes is presented below, taken from Luscomb (1967:220):

1812	established under Aaron Benedict
1823	A. Benedict and Co.
1829	Benedict & Co.
1834	Benedict and Burnham (B & B. Co.)
1849	Waterbury Button Company
1949	Waterbury Companies, Inc.

Only a single button with the "WATERBURY BUTTON CO." marking (Figure 9-1v; Table 9-4) was found. Here again button style provides

a tighter temporal framework than does the back mark. The back mark is pressed with distinctive, thick blurred letters.

The final General Service button with the flat shield design has been crushed but is still measureable with reasonable accuracy. It is somewhat larger than the other buttons of similar style and is more comparable to the large size buttons with the later, raised shield design. Its headstamp is "EXTRA QUALITY." With the present information, it is not possible to specify the manufacturer of this button nor is this button readily dateable, except by style. However, as mentioned earlier, Brinckerhoff (1972:5) seems to associate quality markings on buttons with the Civil War period.

b. Bachelor's Buttons

This is a button type clamped into place rather than sewed on, hence its name. The body is of two-part iron while the fastening is performed by two brass cups (Figure 9-1o), the first attached to the back of the button and the second pressed from the other side of the cloth into the first. The face of the button is edged with a deep central concavity. Around that concavity on a cross-hatched field are the words "NICOLL THE TAILOR." The provenience of this button is square S53.

While it may have been applied to clothing, it was probably heavy material, such as work clothes. It is not unreasonable to suggest its use with tentage as well. Some slight plain cloth remnants still cling to the fastening. It is tan in color and appears to be of cotton spun in a Z-twist with a basket weave. This is similar to that cloth found on the wire clip discussed earlier.

2. Safety Pin

The only safety pin recovered is from square N63 and made of a single piece of 0.04 inch (1.2 mm.) thick brass wire. The wire is bent to form the spring and safety catch (Figure 9-2b). Its total length is about 1 3/4 inches (about 44 1/2 mm.).

3. Straight Pins

Of the thirteen straight pins from Cm-232, all are of brass. There is little to differentiate these other than by their lengths of which there are three. The longest varies from 1.29 inches (32.8 mm.)

to 1.33 inches (33.9 mm.). The single intermediate length measured 1.18 inches (29.8 mm.). The shortest, of which only one could be accurately measured, was 1.01 inches (25.7 mm.) in length. In addition one pin was broken and could not be so classified. The provenience of these straight pins is as follows:

long:	Q72 (3), P72, P75, S71, "Trench 3," no provenience
intermediate:	no provenience
short:	L63, M69, S73
broken:	T83

4. Scissors

One handle from a pair of scissors was found in square T83. It is intended for right-handed use. Because of its robustness and its multiple finger eye, it would most appropriately be considered shears or trimmers. It was likely of the straight handle design, the finger holes not being offset from the blades. Remnants of black paint on the handle indicate original japanning (Figure 9-2a).

5. Footwear

a. Shoes

Two leather fragments of shoes with no provenience are present. While it is possible that they initially represented the same shoe, it has not been possible to find adequate articulation to imply this. Therefore, they are described as separate items.

One leather heel was found. It is composed of at least four layers joined by square cut iron nails. These may have been originally headed although they are worn down. These follow the edge of the heel and two have been driven through the heel center. Its present thickness (with at least one layer missing) is about 0.8 inches (20 mm.) at maximum. Width is about 2 1.4 inches (57 mm.).

The second shoe fragment consists of two thinner leather layers than were present in the heel. Two fastening techniques present both suggest that at least one layer is missing. The fastenings present are

iron clinched nails and thin brass wire with a rectangular cross section. These are driven through the central portion of the piece.

It is difficult to form any conclusions about these. The absence of cement and stitching is noteworthy although this and other evidence is difficult to assess with the fragmentary remains present and with the little that is known of late nineteenth century shoe manufacture, dating, etc. Anderson (1968:59) states that the use of wire nailing began in 1862. The machinery was perfected around 1880 and the technique remained popular until the early 20th century. The presence of wire screw nailing here provides the only sure dating. The presence of the iron nails is significant, but because of the possibility of shoe refurbishment and of the fragmentary nature of the evidence, their use and its interpretation cannot be fully assessed. As to style and use, it is possible only to say that it is not from a woman's high heel shoe. Because of its width it may have been worn by a man, woman, or a large child.

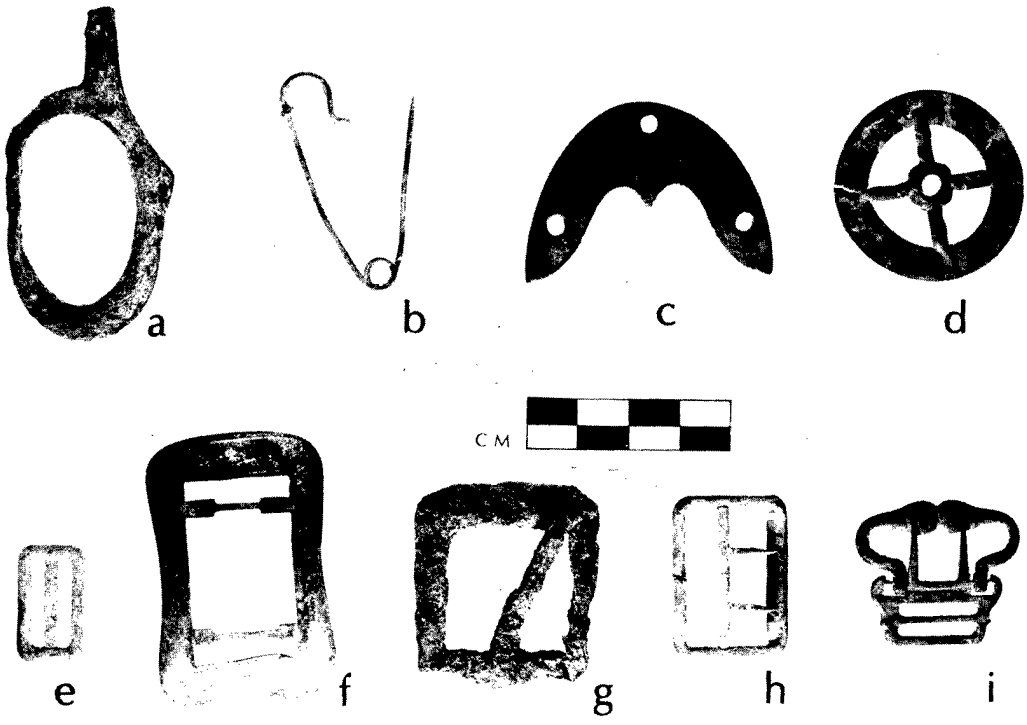


Figure 9-2. Clothing Group Artifacts. a. scissors handle, b. safety pin, c. heel plate, d. helmet reinforcement, e. chin strap buckle, f. sheet brass buckle (?), g. iron buckle, h. trouser buckle, i. suspender buckle.

b. Heel Plate

Made of brass, it has three holes for attachment (Figure 9-2c). Provenience is square V77. While narrow, it need not necessarily have been applied to a narrow heel. However, if the assumption is made that it was applied to the shoe of an individual with normal gait, wear indicated that it was on the right shoe. Such plates are still used today to extend heel life. There is no evidence that this heel plate is associated with the leather heel just discussed.

6. Headgear

a. Helmet Reinforcement

This is an item commonly found at military sites of the period (Figure 9-2d). It consists of a circular sheet of brass 1.47 inches (37.3 mm.) in diameter which has been cut so as to act as reinforcement for the plume holder or spike adopted with the dress helmet, Model of 1881. It was affixed to the top of the helmet and had inserted through it the threaded brass shaft which secured the ornament in place. The basic helmet design was adopted following the crushing defeat of the French in the Franco-Prussian War with the helmet, Model of 1872. This particular device, however, was used only on the later pattern of this helmet and continued as regular issue until a change was mandated in 1902 (Chappel, 1966).

7. Buckles

Six items could be identified as some possible form of personal buckle. Two of these are iron while the rest are of brass. Some can be associated with specific items of clothing (Figure 9-2 e-i).

The iron buckles are probably of civilian origin. One is incomplete and rather thin. This and the presence of fine grooving on the forebar of the buckle body imply use with some sort of cloth rather than the heavier tasks associated with use of leather. The larger, complete buckle appears to be of a shape still common to belt buckles (Figure 9-2g). Its iron prong is of a heavy wire gauge which is simply wrapped around the back crossbar of the buckle body. Use with harness is also possible.

Of the three brass buckles one is distinctly military. From M63, level 4, it has two prongs extending from a rotating central crossbar

(Figure 9-2h). It is broken at the back, possibly the reason for its discard. Its construction is in four parts including the two prongs the crossbar, and the buckle body proper. It is similar to the "gilt buckle" shown in Plate 1 of the "Report of the Quartermaster-General" for 1885 (U.S. Quartermaster Corps, 1885).

One brass suspender buckle was found in Q73 (Figure 9-2i). It was assembled from two stampings. It is probably civilian, not conforming to the specifications which could be found for nineteenth century military suspender buckles.

Found in square O63/1, the single slip buckle (Figure 9-2e) is of a single piece of stamped brass sheeting 0.89 inches (22.7 mm.) long by 0.52 inches wide (13.3 mm.) wide and made to receive straps of up to 0.66 inches (16.8 mm.) in width. It is of a type used on the chin strap of many different military hats from at least as early as the 1858 Forage cap and into the early part of this century (Howell, 1975). It is not known to which specific hat model this belonged.

Finally, from the area of squares P-Q53-54 was found a piece of stamped thin sheet brass which, while it appears to be part of a buckle, may have had some other application (Figure 9-2f). Still present in places on it is a silver plating. Length is approximately 2 inches (51 mm.) while the inside width is 0.8 inches (20 mm.).

8. Miscellaneous Fasteners

a. Wire Catch

This is merely a piece of 0.07 inches (1.8 mm.) diameter brass wire which has been bent into a "C" shape (Figure 10-1b). Its provenience is square N64, level 3. Clips of this sort have had many uses. The clip may have been distorted, making more difficult determination of this use. It is similar, however, to the clip presently used for suspension of equipment from the military web belt equipped with small eyelets through which the ends of the clip are passed. It has also been suggested that it may be a variation of the clasp present on the high collar military uniform used well into this century. Other uses with clothing are also possible.

On one tang of the clip clings a small patch of cloth. It is partially wrapped around the tang. It appears to be of cotton spun with a Z-twist, plain cloth with a basket weave. While its color is a tan, fading may be the cause.

b. Miscellaneous

The use of this item from Trench 1 is unknown. It is obviously broken from a larger item which was probably part of some form of clothing fastener, judging from its light construction. It is stamped from thin sheet brass and of oval to teardrop shape (Figure 10-1d).

9. Adornment

a. Lapel Pin

This unusual item was found in square N64, level 3, of Feature 8. It consists of an emblematic device surrounded by eight radiating points (Figure 9-3). It has been stamped from one piece of brass. The outer radiating arms have a raised outer border and are filled with a blue-green enamel. The inner circle is slightly convex. The emblem is similar to that which adorned U.S. Navy buttons from the 1840's until 14 May 1941 (see Johnson, 1948:76 and Albert, 1976: 86 and 103). An eagle facing left perches on an anchor lying flat. In 1941 the eagle was made to face right. Johnson (1948:76) further suggests that the location of the anchor flute from behind to in front of the eagle's wing (as here) was a later modification although he gives no precise dating. This design differs from the standard button in three ways. The first is that it lacks the three cannonballs which lie below the anchor. However, this is shown by Albert (1976:#116) not to be a unique variation. In addition, this lacks the rope which normally encircles the button and third, it bears the inscription "R.A. & N.U." above the eagle and "U.S." below. The meaning of this former abbreviation has not been determined.

This pin has been badly burned causing the enamel glaze to crack and fall off. Melted lead on the center reverse side indicated location of the attaching device. Because of the design's similarity to that of the naval button, it is thought that this was the pin of an organization of military or military-related personnel, possibly veterans, dependents, or those on active duty. The appearance of buttons, etc. of non-Army origin on Fort Sill is not unknown (W. H. Jones, personal communication) particularly as some artillery training is provided here for members of other branches of the service. However, this is rare and may imply its association with an organization affiliated with the Army as well as the Navy.

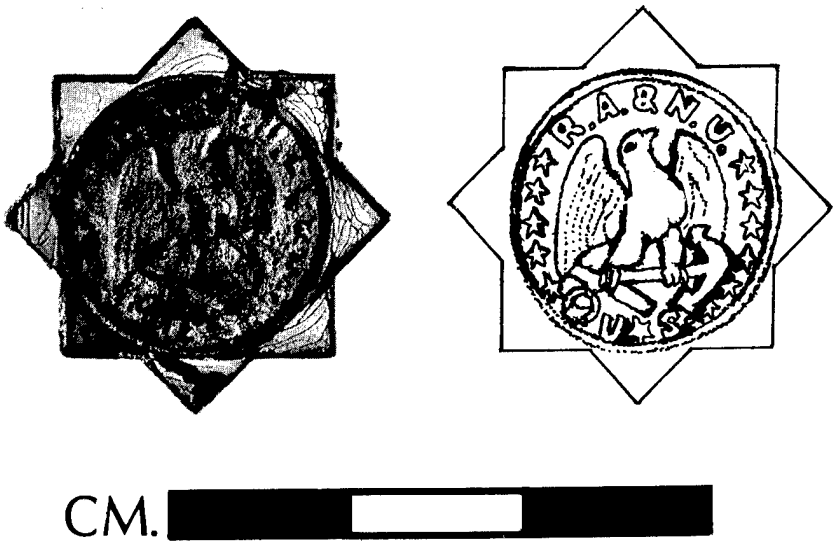


Figure 9-3. Lapel Pin

b. Miscellaneous

This category includes only one item, placed under a miscellaneous heading because its original function is not apparent. It consists of a chain from one end of which is suspended a button.

This is described separately from standard clothing buttons because the delicacy of the button and the chain is such that if it did perform closure it was as a secondary task (Figure 10-1f). More likely it served as feminine adornment either about the person or on clothing or related appurtenances. Use might have been by Indians as well as whites. The button is 0.36 inches (9.2 mm.) in diameter and is constructed in the same manner as the Sanders metal button with Sanders type shank (Luscomb, 1967:17). The chain is of the single jack type, that is with double links turned at an angle to another but shaped from a single piece of twisted wire. This wire is 0.03 inches (0.7 mm.) in diameter.

10. Aboriginal Adornment

a. Bone Hair Pipe

The 2.54 inch (64.6 mm.) fragment of bone hair pipe found in square S71 appears to represent slightly over half its original length

(Figure 10-1a). The neatly drilled hole through its length is of 0.09 inch (2.3 mm.) diameter. Its surface is a smoothly polished white (Figure 10-1a). Its presence on the site is not surprising.

Although termed a "hair pipe" it may have been used as jewelry, suspended from the ears or in a necklace, or part of a larger item such as a breastplate, bandoleer, or on a container. According to Ewers (1957:62-65), bone was first used in hair pipes some time around 1880. The bone corncob pipestems offered by a man named Sherburne licensed to trade with the Poncas in eastern Oklahoma were in such demand for their stems alone that he asked his New York supplier for cylindrical bone beads. The latter, a man named Frost, had them made to order then sold them not only to Sherburne but to other Indian traders as well. They were made from the metacarpals of cattle supplied by Armour & Co. of Chicago and perhaps later by others. Possibly as a result of this new supply of cheaper and more durable bone hair pipes, the manufacture of those from shell ceased in 1889.

b. Glass Beads

Three black glass, wire wound beads were found as follows:

Provenience	Size	
	in.	mm.
R72	0.28	7.2
Q72	0.36	9.2
Trench 4	0.28	7.2

While their point of manufacture is not known, similar beads had for many years been made in Venice. A description of the production of these in Venice is quoted in Orchard (1975:96).

> Spherical and barrel shaped beads are made from a solid rod of glass. The extremity of the rod is melted in a blow flame and a thread of the viscid glass is laid over a revolving iron bar. The motion of the bar draws the glass around it until the bead has assumed the desired dimensions. The size of the perforation conforms to the diameter of the iron bar.

Beads such as these are commonly associated with the Indian trade and indeed were likely carried as a common item in the stores in the

area. While use by whites cannot be denied, Indian presence in the area both while the Indian Agency was active and after, allows ample opportunity for these to have been lost.

11. Miscellaneous Hardware

a. Belt Slips

This consists of a flat sheet of brass from square P63, used for the containment of straps (Figure 10-1e). The two small rivets through it were probably to fasten it to a hard body of some sort as the small diameter heads of the rivets would have easily pulled through pliable material such as leather. The smaller loop of the device was made to accommodate a strap of up to 0.52 inches (13.3 mm.) in width while the larger of up to 1.50 inches (38.0 mm.). The precise use of the item is unknown although its application to military equipage is possible. The significance of the riveting in relation to its use is not presently known.

An object with certain similarities to that above was found in square V75. It also is made of brass and was likely a juncture or fastening of some sort. While distorted, is also is complete. It is decorated (Figure 10-1c) suggesting civilian manufacture and making less likely government issue. Certainly it is not field equipage although certain quartermaster items may have been so adorned. Because of the nature of the piece, it probably is an item of apparel, either male or female.

CHAPTER X
FURNITURE GROUP ARTIFACTS

1. Lock Escutcheon

This escutcheon and lock are from P58 and made to be inletted into a case of some sort, perhaps a box or some small chest. While the locking mechanism itself is of iron, it has a circular escutcheon plate of brass (Figure 10-1g). This measures 1.35 inches (35 mm.) in diameter and has an impressed rope design border. Three brass rivets once held it in place. What remains of the iron lock body extends no more than 0.20 inches (5 mm.) from the back of the escutcheon plate. It throws a dead bolt to the right side. This latch is in extended position and does not reach to the edge of the plate. Originally it accepted a barrel key and therefore is probably a warded-bit key lock (Roper, 1976:45,52). The thinness of the locking mechanism and the short height of the rivet [0.10 inches (2.5 mm.) or less] indicates the lightness of the box or case to which it was affixed.

2. Decorative Boss

Black, faceted, in high relief, and eight sided, this boss appears to be composed of a hard rubber (Figure 10-1h). Two small pins at either end of its long axis penetrated its back, securing it in place. Markings indicate likely vertical positioning when originally in use. It is 1 1/4 inches (32 mm.) in length. Provenience is square R70.

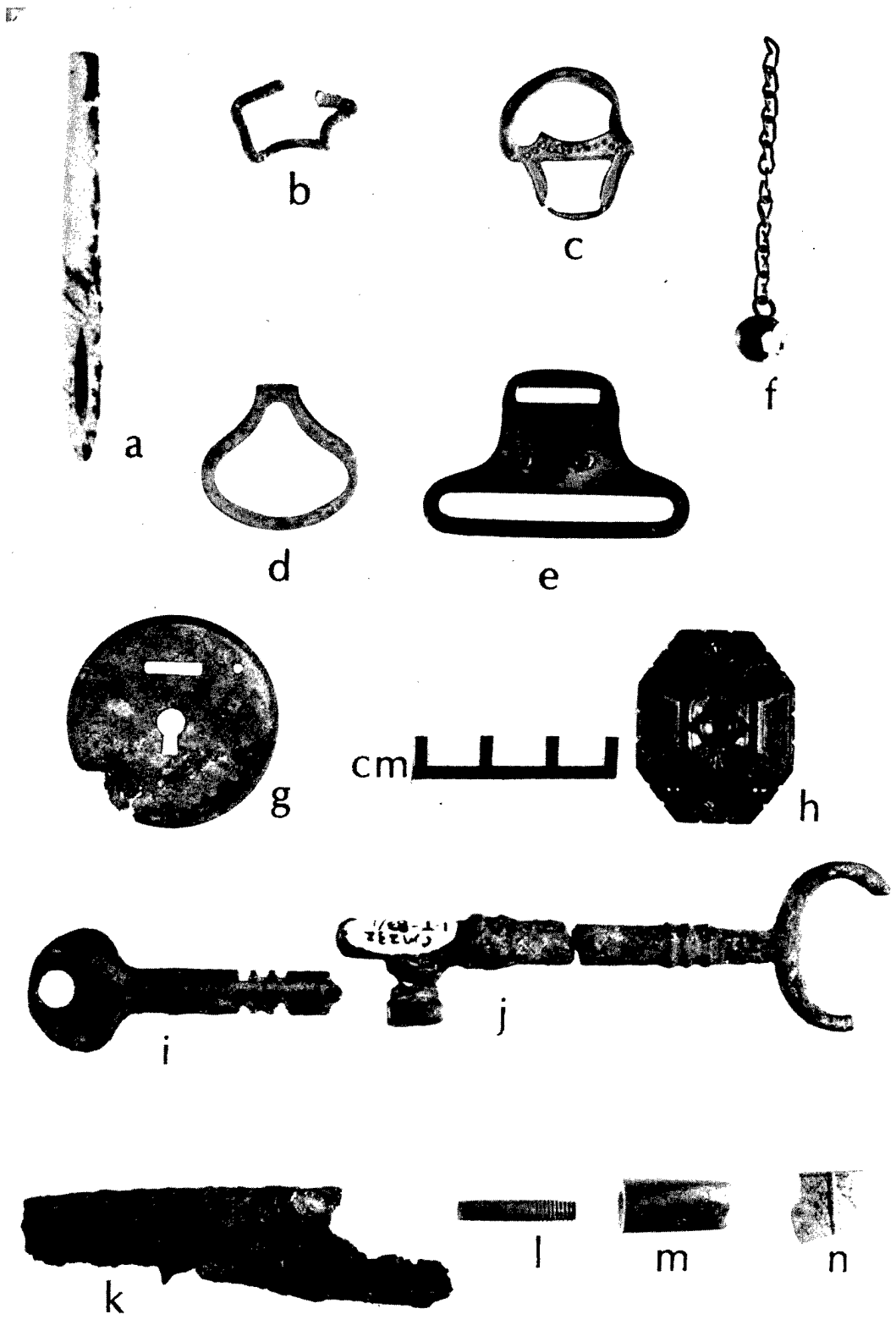


Figure 10-1. Clothing, Furniture, and Personal Group Artifacts. a. bone hairpipe, b. wire catch [note presence of cloth], c-e. miscellaneous clothing artifacts, g. lock escutcheon plate, h. boss, i-j. keys, k. pocket knife, l-n. tobacco pipe artifacts.

CHAPTER XI
PERSONAL GROUP ARTIFACTS

1. Tobacco Pipes

The two fragments of tobacco pipes represent quite different design approaches. In square T83 was found a small lip edge of a clay bowl (Figure 10-1n). The clay is tan in color, well fired, and covered with what must be a very thin clear glaze. Its features are very uniform. The particular piece shows mold manufacture with the mold seam extending downward from the lip of the bowl.

The second pipe fragment, from square R68, consists of a portion of the broken fore end of a separable pipe stem mouthpiece including not only the pipe stem (Figure 10-1m) but also a shaped bone insert (Figure 10-1l). The mouthpiece appears to be composed of a reddish mottled plastic, the fore opening of which is internally threaded. The bone insert is externally threaded and was screwed into the mouthpiece but pressed into the pipe stem. The purpose of the long insert was not only to prevent the stem/mouthpiece joint from leaking, but also to provide the mechanical key for connection. By having one slip joint it also allows quick detachment for cleaning. The mouthpiece does begin to narrow down to form the pipe bit over its 0.73 inch (19.6 mm.) length. However, the round hole which forms the smoke channel shows no evidence of flaring out to the bit. Insert diameter is 0.13 inches (3.4 mm.).

2. Keys

Portions of two warded iron keys were found. Pieces from U60 probably represent the same key (Figure 10-1j). Breakage was apparently a common problem.

> Warded keys are made of iron, steel, brass, and aluminum. Iron and aluminum keys have a tendency to break or bend within a relatively short time; steel and brass keys can outlast the lock (Roper, 1976:61).

The bow on this first specimen is broken. The other, bit end of the key is what Roper (1976:61) calls the antique type, although he also states that such keys are still being made. This particular key does

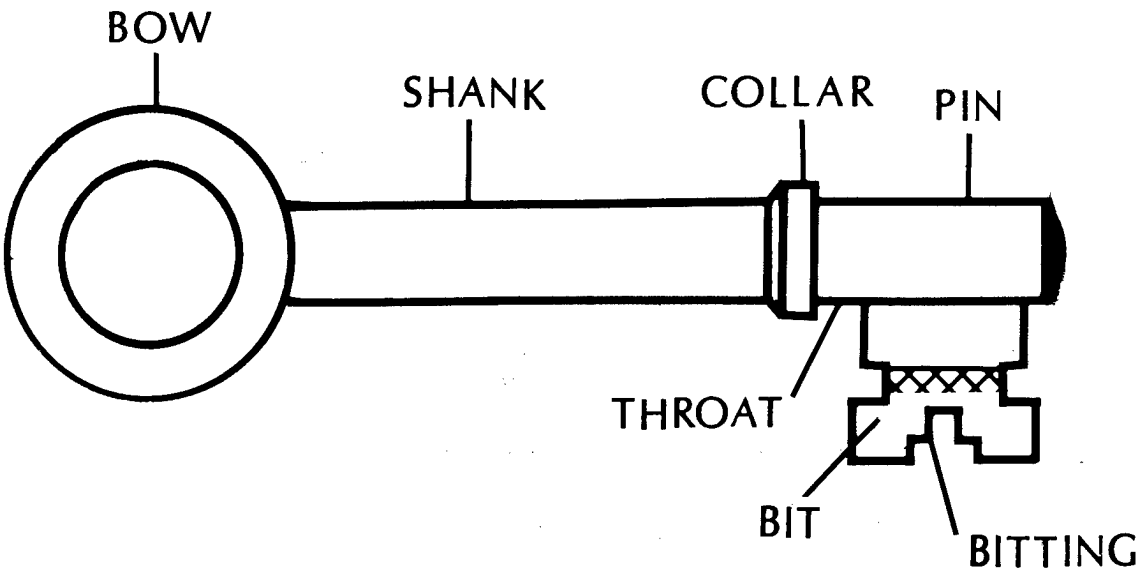


Figure 11-1. The Parts of a Warded Key. [Reprinted from The Complete Handbook of Locks and Locksmithing, copyright 1976 by TAB Books, Blue Ridge Summit, Pa., 17214. Compare this to Figure 10-1j.]

not have the standard ward cuts in the bit (Figure 11-1). Rather, it has two slight end cuts and a side or "bullet" groove cut. The presence of the two end cuts shows that while the key may have been used for other types of locks, the design is appropriate for a rim-lock accessible from both sides of the door.

The final key is from square R68 and is of a type appropriate to a warded padlock (Figure 10-1i). These are inexpensive locks with a limited life expectancy. This particular key has a carrying perforation, is corrugated, and is of three ward design. According to Roper (1976:205), corrugated warded padlock keys are a "mark of the Master Lock Co." This key does appear to have some writing within an oval on one of its faces just below the eye, but the writing is illegible.

3. Coinage

Three coins including one five-cent nickel and two dimes were found. The former is of the "shield type" and was minted in 1866. During only this year and the next the reverse side had rays emanating from the central numeral so as to separate the circling stars from one another. In 1867 and in subsequent years until the entire design was altered in 1883, these rays were omitted although

the remainder of the design was unchanged. The provenience of this nickel was square Q89. Mint marks were not placed on these nickels of which a total of 14,742,500 were produced (Yeoman, Hewitt, and Green, 1948:40).

Both of the dimes are of the "seated Liberty" design. These are of the variety in which the inscription "United States of America" encircles Liberty. Earlier versions either were empty in those areas or had stars. While seated Liberty dimes were in production from 1837 until 1891, this variation occurred from only 1860 on. Most of the information concerning these is summarized in the table below.

The mint marks indicate production at New Orleans ("O") and Carson City, Nevada ("CC") (Yeoman, Hewitt, and Green, 1948:7, 48-49).

Provenience	Date	Mint Mark	Quantity Minted
Trench 3	1876	CC	8,270,000
Trench 4, North end	1891	O	4,540,000

4. Pocket Knife

This is the only knife of clasp type on the site. It was found in square M64, level 2, and consists of heavily rusted portions of its two blades and the front bolster of the handle. Nothing was found of the handle itself. Both blades appear to hinge from the front (Figure 10-1k).

CHAPTER XII
ACTIVITIES GROUP ARTIFACTS

1. Equipment Parts

a. Pipe Fittings

Because of similarities in construction and proximity of provenience, it is thought that these had related functions. Their use is not known in detail and "pipe" may refer to water, gas, etc. although as discussed later, steam is thought most likely.

Figure 12-1a shows a large piece of cast iron found in square N63, level 4. Portions of it are covered with a gray-green caked powder. This may have been applied by chance such as by drip action or deliberately (as a sealer, for example). There is nothing to indicate that any natural causes acting at the site might be responsible for it. The main body consists of a semicircular trough with a bar projecting slightly tangent to and below the trough. That bar has a central opening from which a tapped hole rises vertically through the reinforced center of that bar. Into the latter is screwed an unusual bolt. The bolt head has two oval openings through it at right angles to each other. A large hexagonal nut is used to hold it in place. The bolt closes that tapped hole. However, its functioning is unknown. The only moving parts are the top bolt and nut. It is too elaborate to be simply a pipe support yet not an effective valve or conduit.

The second pipe fitting is a three-way connection from square O63, level 2. Also a single piece of cast iron, it has a single externally threaded nipple (Figure 12-1b). The only allowances for the tightening of a connection other than on the nipple are the holes in the lip of the male fitting. The male fitting has an outside diameter equal to the inside diameter of the female fitting opposite it, about 2.45 inches (62.2 mm.). The opening opposite the nipple is 1.8 inches (46 mm.) in inside diameter. While other uses may also be ascribed to this object, it bears a resemblance to the blowoff valve used with some high-pressure equipment. It would have been encased in outer piping which would serve to make the connections airtight. Its purpose would have been to bring down line pressure when necessary.

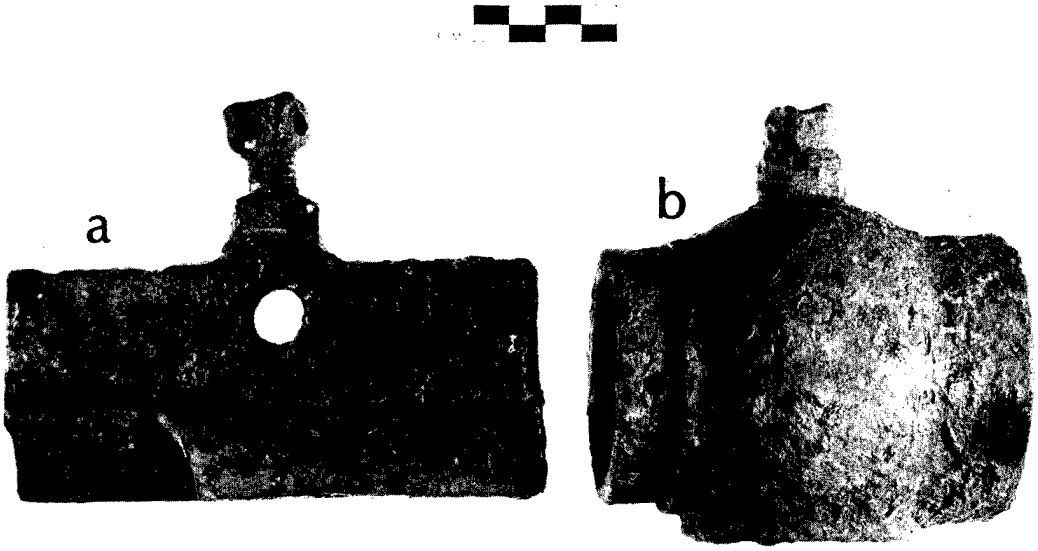


Figure 12-1. Pipe Fittings

With regard to steam equipment, it is of interest to note that one of the items called for in the Medicine Lodge Treaty to be supplied to the Kiowa-Comanche Reservation was a steam-driven saw mill.

> The United States further agrees to cause to be erected on said reservation, near the other buildings, herein authorized, a good steam circular saw mill, with a grist mill and shingle machine attached, the same to cost not exceeding eight thousand dollars (from Article IV in Yost, 1970:211).

Tatum set a high priority on fulfilling this promise possibly in part because of the need for cut lumber to erect the other Agency buildings. He obtained bids and later in 1869 he went to Chicago where he completed purchase of the necessary equipment. It was shipped to the Agency where it was erected near Cache Creek. It served both the Agency and the Post in the years that followed until 1882 when permission was given to sell it at auction and it was presumably sold.

These facts do not demonstrate the correctness of the interpretation of these pipe fittings. They rather show that the early dating of the Agency far from precludes it from association with such equipment. Indeed, one might expect to find such parts as have been wornout or broken and returned to the Agency warehouses.

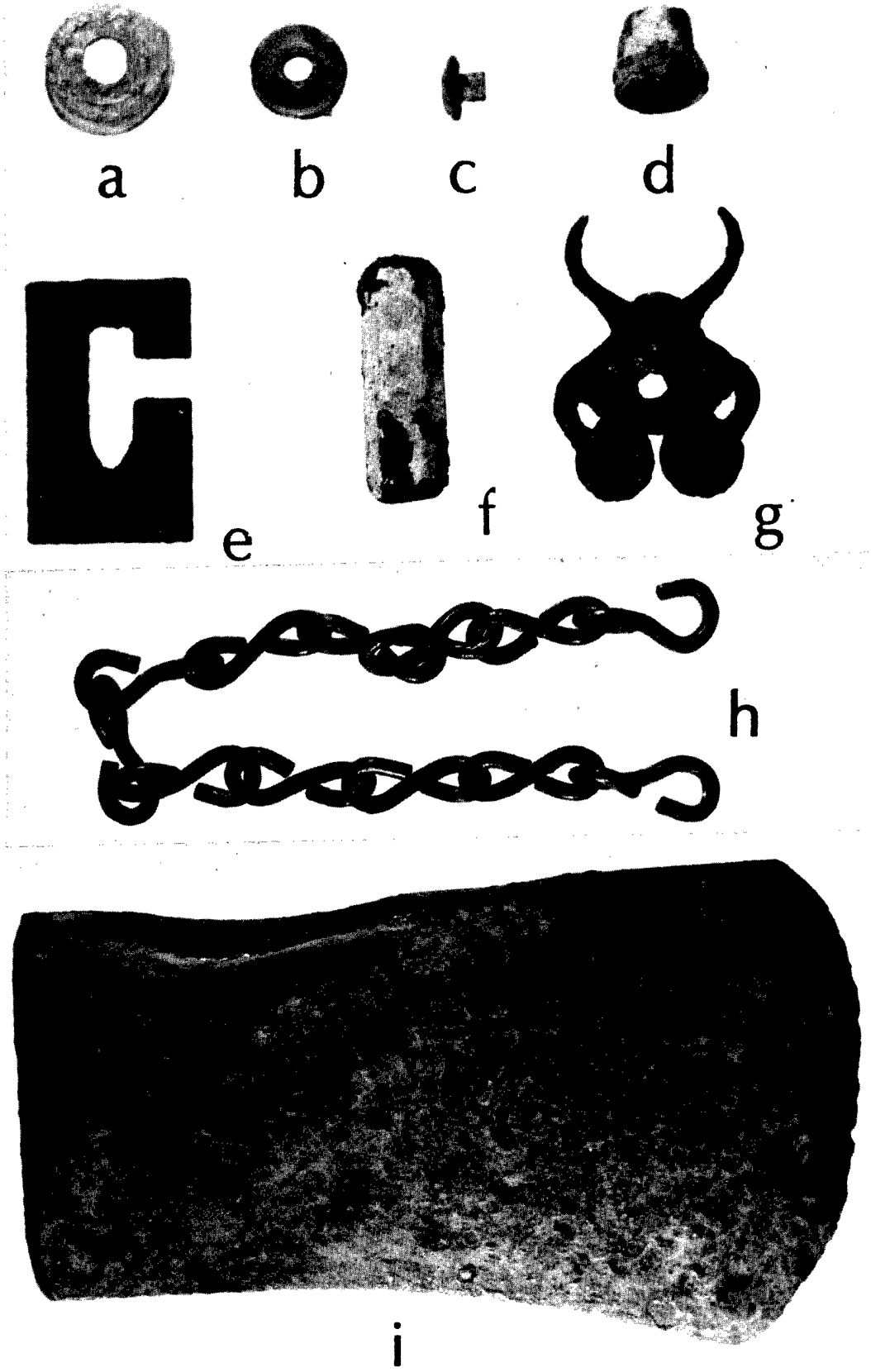


Figure 12-2. Equipment Parts and Hardware. a. nut cup, b. backing plate, c. stud, d. bearing, e. bale tie, f. rod coupling, g. unknown, h. single jack chain, i. axe.

b. Cup Nut and Backing Plate

These two quite different items are discussed together because of the likelihood that they were originally used in the same piece of equipment. Both are of a soft white metal. The cup nut is from square R72 while the back plate is from square R73.

The cup nut (Figure 12-2a) is incomplete. Originally it consisted of a one-piece outer cup and a nut projecting from the cap center inward. The separation of the nut from the rest of the cup left a ragged hole and may have been the reason for its discard. It is knurled both around the upper and the lower edges of the cup. Inside diameter is approximately one inch (25.4 mm.).

The cup back is also one-piece with a large washer-like flange and internally threaded central projection (Figure 12-2b). Its outside diameter is 0.85 inches (21.6 mm.).

There are several reasons why these are thought to have been used in the same piece of equipment. They are similar in composition and construction and were found in proximity of one another. While it is not definitely known how they were used, very similar pieces were used as replacement parts for the Eclipse brand door check (Worthington, 1909:843). This is only a similarity, however, as these are of iron rather than white metal. Nevertheless, the implication of similar application is underscored.

c. Miscellaneous

This category includes two items. They are a bearing and brass spring. The bearing consists of a brass sleeve inside of a heavier iron jacket (Figure 12-2d). The iron is badly rusted and has begun to flake away. It is conically tapered and appears to have been of two parts pressed and crimped together. Over a short 0.704 inch (17.88 mm.) height, its diameter is reduced from 0.640 to 0.517 inches (16.26 to 13.13 mm.). The smaller end is somewhat ragged which seems to result from breaking away of the iron outer jacket rather than from overall breakage.

Such a bearing may have had many uses. While machinery may have been its application, it may have served as nothing more elaborate than as the receiving sleeve for the caster of a bed frame.

The brass spring consists of only four and a half small coils. Its provenience is square V75. There are no indications of use or

mounting. The only unusual feature of it is that one end appears to have been cut while the other is broken. It is therefore likely a discard. The outside coil diameter is 0.42 inches (10.7 mm.) while the wire itself is of 0.05 inches (1.3 mm.) diameter.

The use of such an item is virtually impossible to discern. However, it should be noted that the measurements of this spring are also those of the brass spring which was applied to the primer used by the Army in conjunction with breech-loading cannon. Such artillery was in use into the early part of this century.

2. General Hardware

a. Bale Ties

These were identified with the assistance of Mr. W. H. Jones of the Fort Sill Museum. Many items were earlier shipped in bales such as cotton is presently. These ties were used in conjunction with flat steel wire, probably used only on the larger bales. This form of shipment was used in the 1870's and probably earlier. Little is known of differences in types of bale ties although some small differences were noticed in this group and are discussed later. The use of bales for shipment was continued at least until the 1930's. The 1930 Handbook for Quartermasters (U.S. Army Quartermaster Corps, 1930:48-67) lists issue items, their size, weight, and manner of packing. Bale packing plays a significant part in many items. Some of these baled items and the weight of the bale are given below.

Item	Weight (lbs.)
Clothing	
Aprons, Bakers' and Butchers'	111
Coats, Cotton, olive drab	117
Drawers, Cotton, summer	110
Gloves, Heavy leather	165
Shirts, Cotton, olive drab	96
Trousers, Cotton, olive drab	97
Equipage	
Bandoleers, Cavalry, M-1912	142
Cases, Pillow	98
Covers, Cot	98
Flies, tent, Hospital, tropical	239
Flies, tent, Wall-Large	95
Handkerchiefs, O.D. cotton	110

Item	Weight (lbs.)
Mattresses, single	256
Tents, Shelter half	109
Miscellaneous	
Blankets, saddle O.D.	120
Covers, horse, M-1912, unlined	140
Nets, hay, M-1918	107
Sacks, Supply, Leather	100
Surcingles, M-1912	92

The variety of items makes it difficult to determine site use from the presence of these bale ties even if it were possible to determine when they were used and what items were at that time shipped in bales. However, the intriguing possibility remains that these might have been used on bales shipped to the Kiowa and Comanche Indian Agency, as might have been the case with clothing to be issued to the Indians, for example. However, there is also the possible association of these with, for example, the establishment in the area of a CCC camp in the 1930's.

The 1916 Manual for the Quartermaster Corps, however, indicates that at that time fewer items were shipped in this manner (U.S. Army Quartermaster Corps, 1917: Appendix 5-1). No clothing and only paulins of the "Miscellaneous" category were baled although many items of "Equipage" were. Those items which are included are those of inconvenient conformation, primarily tentage.

Seven bale ties were found. The most common range in length from 2.25 to 2.33 inches (57.2 to 59.2 mm.) and from 1.45 to 1.59 inches in width (36.8 to 40.4 mm.) (Figure 12-2e). These are of one-piece iron with raised borders at two ends. The center is of 0.17 inches (4.3 mm.) thickness while these borders are 0.31 inches (7.9 mm.) thick. These borders extend in only so far as the central cutouts. Provenience of these is as follows: L72, N109, R90, R92, S72, and O111.

The single tie of unusual type is slightly larger in size, 2 by 2.1 inches (about 51 by 53 mm.). In addition, it is keyed to the bottom rather than to the side with a single, more pronounced thickening immediately above the central slot. It was found in square N112.

b. Screws

All but one of the 376 screws recovered from the site were common, iron, gimlet-pointed wood screws with flat, single-slotted,

countersunk heads. These might well have been incorporated into the Commissary buildings or into packing crates, for example, which were being constantly brought into the warehouse. Such screws have, however, been in use through the present and subsequently the association of these with even the period of the Commissaries is also open to question. These may, for example, be remnants of later, perhaps military, use of the site.

It is of interest to note that no significance was recognized in the distribution of these common wood screws. When found they were often heaped into piles in an area of otherwise low screw density. It is unlikely that such a distribution is accidental. However, this pattern may well reflect nothing other than technique of disposal.

Screws are commonly graded first by "shank number" which reflects the thickness. It is then available in a limited range of lengths for that shank number. However, because of the condition of these screws and the time involved, no attempt was made to break the 374 common wood screws down any further than length. These were as follows:

Length (in.)	No. of Screws
0.50	3
0.75	1
1.00	13
1.25	9
1.50	49
1.75	133
2.00	161
2.25	2
2.50	2
2.75	1
Total	374

Two screws different from those discussed above were also found. The first is from N66, level 2. It is of iron with a flat nose as opposed to the gimlet point of the other 374 screws. Its round head is slotted for a phillips screw driver and its shank is threaded up to the head. Length is 1.60 inches (40 mm.).

The second unusual screw is from square N75. Also of iron, it is countersunk and slotted for a single blade screw driver. Threading discontinues a short distance below the head. Most of the shank has been broken off.

c. Bolts

It is unusual that so few bolts were found on the site. With the known civilian and later military use of the site, more should have occurred. Of the two present, one is of iron while the other is of brass. The former is broken. Its head is 0.58 inches (14.7 mm.) square and the threading comes all the way up to the bolt head. The brass bolt appears to be whole although it is only 0.59 inches (15.0 mm.) long with a round head of 0.33 inches (8.3 mm.) diameter. The threading on the bolt shank is quite fine and when the corrosion is completely cleaned, disappears altogether.

d. Staples

Of the seven staples all are iron and all but two are common fencing staples. Those two are somewhat smaller but differ in no other respects and may have been used for a similar purpose. The smaller staples were found in squares M60 and O75 while the common fencing staples were found in squares I79, L69, M97, N89, and P89. Although there is little of note in this category, it is of interest that the distribution of these is restricted to the western portion of the excavated area. While these may have been associated with the Commissaries in spite of the assymmetrical nature of the distribution, it seems just as likely that a fence once crossed the area.

e. Chain

This constitutes only one of the three lengths of chain found at Cm-232. Because the other two appear to have probably been used with harness, they are discussed elsewhere. No such specific use can be assigned to this example however. It consists of two short lengths of single jack chain. Each "link" consists of two eyes shaped from a single piece of 0.15 inch (3.7 mm.) thickness wire. Links are not welded but merely closed one around the other (Figure 12-2h). These links are 1.36 inches (34.5 mm.) in outside length. The longer consists of twelve while the shorter of five links. Provenience is unknown.

Single jack is a relatively light duty chain, flexible and easy to repair. It was used with jobs such as in well pumps or perhaps with tentage.

f. Chain Repair Link

This is a flat link open at one end and used for temporary repair. It may have been used to repair chain in many contexts - trace chain,

logging, etc. and is included here because of this ambiguity. It may or may not ever have been used. If used, it was never welded closed. Its internal length is 1.87 inches (47.5 mm.).

g. Rod Coupling

A rod coupling is similar to a turnbuckle. It is a closed hexagonal rod of iron with a longitudinal hole, threaded at either end (Figure 12-2f). Its threading at either end, however, turns in opposite directions and unlike a turnbuckle, such a device would be used for coupling rather than tension adjustment. It is particularly useful when an odd length of threaded rod is needed and has to be made from two shorter lengths. While it might have had many possible applications, the presence of large and small diameter metal cable elsewhere on the site may be related. Its provenience is square R64, level 1. It measures 0.65 inches (15.4 mm.) across the flats and about 2 inches (51 mm.) in length.

h. Stud

This is a brass one-piece casting, round faced with a flat, squared shank found in square N64, level 3. It is not a clothes button as those discussed elsewhere although it is reminiscent of a key shank button (Luscomb, 1967:113) but lacking a thread hole in the shank (Figure 12-2c). The shank has been broken so the piece is not complete. Possible uses include a tab on military equipage or as a harness or clothing studd. Pertinent measurements are given below:

diameter	0.56 in. (14.2 mm.)
shank width	0.25 in. (6.3 mm.)
shank thickness	0.08 in. (2.1 mm.)

i. Andiron

The one andiron is hand-forged and measures about 17 inches (430 mm.) in height. The design is simple; the feet are nothing more than outturned and flattened portions of the legs (Figure 12-3). It was found at the bottom of Feature 8 in square R63. Rock wall fall in Feature 8 and above this lowest level are discussed elsewhere as having been the likely remnants of one of the building's original chimneys or hearths. In light of its context both within Feature 8 and in conjunction with this hearth stone, it is reasonable to conclude that this was an item of fireplace hardware in the original structure.

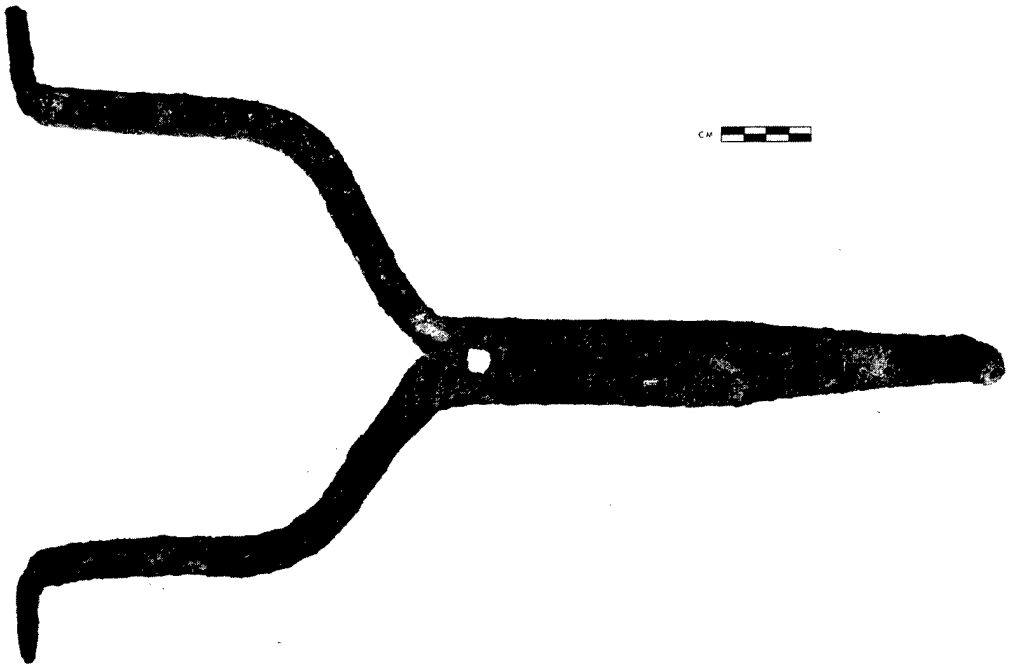


Figure 12-3. Andiron from Bottom of Feature 8.

j. "Tongs"

One complete set of tongs were found in square S71 (Figure 12-2g). It is constructed of seven pieces including two arms, two rollers riveted to the ends of those arms, a back plate, a front cover plate, and a wire spring. All are of cast iron except for the spring which is of brass. It appears to resemble a clamping device held by the spring in an almost closed position and actuated by finger pressure on the outer arms causing the rollers to separate. Release of finger pressure allows the rollers to once more close. The rollers have a single rivet holding them to the arms while a third rivet holds the circular front cover plate, the arms, and the back plate in position. This latter has three features of interest. Two short, rounded legs extend from the back. They may act to prevent lateral movement of the whole if mortised into the surface to which the tongs were secured. It is also perforated, perhaps so that it might be suspended or fastened in place. Lastly, the lower ribbed facing which extends between the tong arms appears to serve two functions. These are first, to cause the rollers to turn when moved resulting not only in their faces always being positioned toward that being grasped, also resulting in movement of the rollers pulling the object inward and against the facing itself. Second, the ribbed facing is wide enough to prevent the rollers from closing completely and perhaps crushing that being grasped.

While the action of the tongs are evident from their construction, their intended application and their dating is not. As to the former, it is known that at certain times somewhat similar devices served domestic household and personal needs. One such is the ember tongs described by Noel-Hume (1976:309). At 2.4 inches (61 mm.) these are shorter than those described by Noel-Hume but appear to have functioned in the same manner. Ember tongs were used by pipe smokers of both the seventeenth and eighteenth centuries to provide a convenient relight.

It has also been suggested that these "tongs" were used as a clasp by which shutters or a door, for example, might be held in place. A third possible use is as a fluting iron, used to put ridges in the ruffles on women's clothing.

k. Miscellaneous

Many items were found which could not be associated with certain specific equipment or tasks but which warranted consideration.

The first is an iron shaft tapered to a rounded point at one end and with an eye at the other. It is slightly over 3 1/2 inches (90 mm.) in length. It may have been used as a linch pin. Provenience is square O71.

The small pickaxe-like device may also be some sort of fastening, although its resemblance to a child's toy is also apparent. It is made of one-piece iron, probably cast, and resembles a pickaxe in miniature. Total length is 2 3/4 in. (70 mm.). Provenience is square P72.

A one-piece iron clamp was found in square T83. It was intended to be held in place by a single countersunk screw through one end at a right angle to the body of the clamp. When properly tightened, the body of the clamp could be used to hold other items in place. The other end of the device is rounded as though meant to cover tubing or electrical cable. Traces of what appears to be black japanning are present on it. Width varies from just under to just over 1 inch (c. 25 mm.).

Another fastening device is a single long rivet. It is a single rod of 1/4-inch (6 1/4 mm.) diameter iron which has been scarfed at either end to 0.55 inch (14.1 mm.) diameter iron washers. Distance between the rivets is 4 inches (102 mm.). These washers have been outturned slightly around the flattened head of the rod. Provenience is square T72.

The point of a screw was found in square V79. The shaft has broken and the tip is round and unthreaded suggesting that it was intended to be exposed or to ride up against something else.

The last item of miscellaneous hardware is a fragment of a cast iron object. It bears no special markings and may represent a foot of some sort. Provenience is square O111.

3. Farm Tools

a. Mower Knife

The single mower knife is from square U71. It is of a type used today and most common to agricultural machines although it may have non-agricultural applications such as grass mowing. The technique of using a blade moving in a reciprocating manner in conjunction with stationary guards dates to the early nineteenth century and has continued in use until today. In operation this knife blade was riveted to a moving arm which passed the blade back and forth through the slotted guard. This latter not only plays a part in the slashing but also serves to separate and position the stalks while protecting the knife from damage (Operation, Care, and Repair of Farm Machinery; n.d.).

This knife is 3.5 inches (89 mm.) wide along its base and 4.1 inches (10.5 mm.) long. Little or no wear is visible along its edge suggesting a replacement accidentally lost.

b. Axe

The iron head of a single-bitted axe was found in square L76 (Figure 12-2i). No manufacturer's mark or other inscriptions are visible. It shows moderate wear but still appears more like the Western Crown pattern blade than any other (see Shapleigh Hardware Co., 1923:2). It does show evidence of heavy pounding both on the poll, the general center of which shows flattening, and across the upper eye where damage is confined primarily to a line across the center of its long axis. While it is common for the poll to experience battering, the wear of the eye as is present here is puzzling.

c. Scythes

The iron head of a snath with affixed blade and the broken end of a scythe blade were found. These are from square O64, level 4 and square U53, respectively. Both are made entirely of iron. No remnant paint or manufacturer's marks are present.

The scythe blade is about 31 1/2 inches (80 cm.) long. While some wear is present, it is not excessive. It is roughly centered in the blade's length. Assuming that the cutting action took place near the blade's original mid-length, this implies that the blade broke at or near the snath head. Scythe blades came in different lengths and with reinforcing ribs depending upon the job contemplated. This also has a single reinforcing rib running along the top of the blade. The Worthington Brothers Company of Cleveland, Ohio, in their 1909 catalogue (p. 982-984) offers four scythe blade lengths. These are the grain, grass, weed, and bush with decreasing lengths. Actual length measurements are given only for the first two, 46 to 48 inches and 28 to 40 inches respectively. This blade would then most likely fit into the grass length.

The snath consists of a wooden shaft with handles and a head to which the blade is held. This iron head and the end of the blade are all that remain of the second scythe. Like the blade just discussed, this blade has a single top rib and also shows some wear. Indeed, it may be that these originally came from the same blade. They do not articulate but this may be due to their rusted condition or to a missing intermediary fragment. The blade fragment held by the snath head is just over 6 1/2 inches (about 17 cm.) in length.

At least two methods may be employed to attach the blade to the snath. The oldest and simplest is by wedging a ring around the handle and the blade tang. Another is that used here and is referred to in the George Worthington Company catalogue (Worthington, 1909: 982) as the "Patent Loop Heel." It entails the use of a "loop bolt." The tang of the blade is placed through the "loop bolt" which is tightened by a nut at its other end, drawing the loop and blade tang against the wooden shaft and iron head which encircles that shaft (Figure 12-4). The slotted lower end of this snath head, made to receive the tip of the blade tang, has been broken off.

Figure 12-4. "Loop Bolt" Blade Attachment for Scythe.

4. Military

a. Insignia

Two fragments of the crossed sabers were found in square M64, level 3. These are simply the scabbard tips and because of a slight size variation, probably came from two different pairs. This was the insignia first worn in the late 1850's by the Cavalry. Initially a stamping, it was replaced by a solid brass casting after 1896 (Brinckerhoff, 1972:13). These are of the solid type (Figure 12-5e).

b. Equipage

Two items have been included here. These are a strap end plate and a brass hook. Other military items identifiable as being related more specifically to a category such as clothing or table-ware have been included under such headings.

The provenience of the single strap end plate from the site is square N66. It is of iron painted or japanned black. These are commonly applied to web belts or straps (Figure 12-5d). This is of size sufficient for straps up to 0.88 inches (22.4 mm.) wide and was likely applied to the tip of a strap on the backpack or some similar piece of military equipage. Its purpose was to prevent shredding at the cut end of the strap. Although similar devices have been used since the nineteenth century on military goods, this is similar to the type in use in very recent times.

A small sheet brass hook with no provenience appears to have been used either on one of the helmet designs adopted for military use following that of 1872 or affixed to a leather strap on a piece of equipage. The former is suggested only because of the similarity of this to other hooks shown as present on such headgear (Howell, 1975). These were used for such tasks as holding up the chin chain when not in use but usually were integral with a covering emblem of some sort. More likely, it was affixed to leather by the double, folded over prongs in the back.

c. Spur

The U.S. Army used the same basic spur design throughout the latter part of the nineteenth and into the early twentieth century. Mr. W. H. Jones of the Fort Sill Museum has identified this as the Civil War model spur, replaced by the Model of 1874. It is of solid cast brass and originally had an iron rowel secured by an iron pin.

The spur is otherwise unmarked. According to an 1861 ordnance manual (U.S. Army Ordnance Department, 1861:158), two sizes of spur were available. These measure as follows:

	inside length of heel	inside width of heel
no. 1	3 1/2 inches	3 1/4 inches
no. 2	3 1/4 inches	3 inches

Using these measurements, this is of no. 1 size.

5. Toys

a. Dolls

Dolls with components of fired clay were quite popular in the nineteenth century and continued in production well into this century. These fragments represent an arm from square Q72, and portion of a face from square M64, level 3. According to the terminology used by those who deal with dolls, the former is "porcelain" while the latter is "bisque." This distinction is made only on the presence of a glaze on "porcelain" and does not therefore correspond to terminology used by ceramicists.

The arm is complete and measures 1.68 inches (42.0 mm.) in length (Figure 12-5b). The paste is white, quite vitreous, and covered with a white glaze. A deep ring for attachment encircles the arm just below where the elbow would be. This implies attachment to a cloth or leather body. The glaze does not extend as far as this attaching ring. Mold lines extending down opposite sides of the arm disappear into the sides of the hand and indicate a two-part mold. The attaching ring is quite irregular and appears to have been applied between molding and firing. The fingers of the hand are together and the hand open. Although the glaze has produced a smooth surface over the hand, the fingers appear to have been molded into the clay beneath.

The face fragment includes portions of the back of the head and the right cheek as well as the entire right ear (Figure 12-5a). This was also mold-made. The ear is integral to the head and although unglazed (i.e., "bisque") the clay is white and well fired. A flesh-toned color extends across the cheek and almost to the ear. Although not a part of the clay, it is not reclusive.

b. Sandstone Ball

Sandstone does occur in the area although nowhere near the site. This ball is imperfectly formed and is conceivably a natural occurrence. Seams and tool marks are not apparent. Its color is grey and diameter is roughly 1 1/4 inches (c. 32 mm.). Although its formation may or may not be ascribed to human agencies, its presence on the site almost certainly would be. One possible use of it would be as a large marble.

6. General Domestic

a. Porcelain Figurine

The base of a single figurine was found (Figure 12-5c) in square V75. It consists of an opaque white, vitrified clay covered with a clear glaze. Green color has been applied above the glaze. The subject of the figure is indeterminate. It bears no marking to indicate manufacturer, etc. but may well have come from the Staffordshire district of England which produced thousands of such mold-made figurines in the last century.

b. Knife

One small knife handle was found which probably would not have been associated with table use. It is long (2.9 inches or 73 1/2 mm.) in relation to its size but otherwise rather slight. Thickness is only 0.11 inches (6.9 mm.). It is gently tapered to fit the hand (Figure 12-5f). The knife consists of a single piece of iron to either side of a portion of which has been riveted thin sheet brass. Handles of some other material which may have once been outside this are no longer in evidence. The rivets themselves are of brass and quite small (less than 0.05 inches or 1 mm.) in diameter. It lacks a hand guard reinforcement between the blade and handle. Because of its size and construction it was not intended for hard use. In all probability it was used in conjunction with certain food preparation or other light domestic activities.

c. Jars

This jar lid is of cast iron with a decorative scroll work on the top and vertical hachures along the outside edge (Figure 12-5h). The inside is tapered for a tight fit and is not designed for threaded screw or any other particular type of closure. Centered in the top is a

rounded brass knob handle also with hachures around its base. While quite apparently a lid of some sort, its specific application is not known. The lid measures 1.6 inches (41 mm.) in inside diameter while the handle is 0.41 inches (10.5 mm.) in diameter.

d. Glass Lamp Chimneys

In the analysis of the bottle glass from Cm-232, 339 pieces of clear glass set itself apart in its clarity, thinness, relatively unchanging thickness, and gentle curves. These were distinguished further by the absence of possible associated bases. Examination and reconstruction indicated that these were broken lamp chimneys (Figure 12-6c). Edges were examined in an attempt to derive the number of these, remembering that each chimney would have upper and lower orifices. Comparisons were made on the basis of orifice diameter, edge profile, body contours where applicable, and thickness. In total, a minimum of eight could be delineated. Because of the thickness and lack of confirming body fragments, three of these are possible vessel lip sherds. These are distinguished by asterisks in Table 12-1. They are included here because they did not demonstrate an increase in wall thickness with increasing distance from the lip. Two, in fact, showed decreases of up to one-third over a relatively short distance. Two similar orifices which showed increases in thickness are discussed with drinking glasses.

Two of these orifices could be identified as probable bases because of sharp outward curvature a short distance from their lips. It is noteworthy that while lips in cross-section were generally smoothly rounded, two were pointed ("smooth sharp"), making thickness measurement more difficult. The only definite top which could be identified (Figure 12-6c) was that from square N63, level 4. It alone was reconstructed to a point where it began to curve outward into the bulge which would have surrounded the burning wick(s). That orifice with square N63 provenience and that from square N64, level 3 are also likely tops because they failed to show the sharp outward curvature expected to form the chimney bulge, both being in the vicinity of 1.6 inches (41 mm.) long.

7. Writing

a. Pencils

The two pencils represent quite different levels of pencil technology. The first is the stub of a slate pencil. It is only slightly

Figure 12-5. Military, Children's, and General Domestic Artifacts. a. "bisque" doll face, b. "porcelain" doll arm, c. figurine base, d. strap end plate, e. military insignia, f. knife, g. equipage hook, h. cast iron jar lid (note scrollwork).

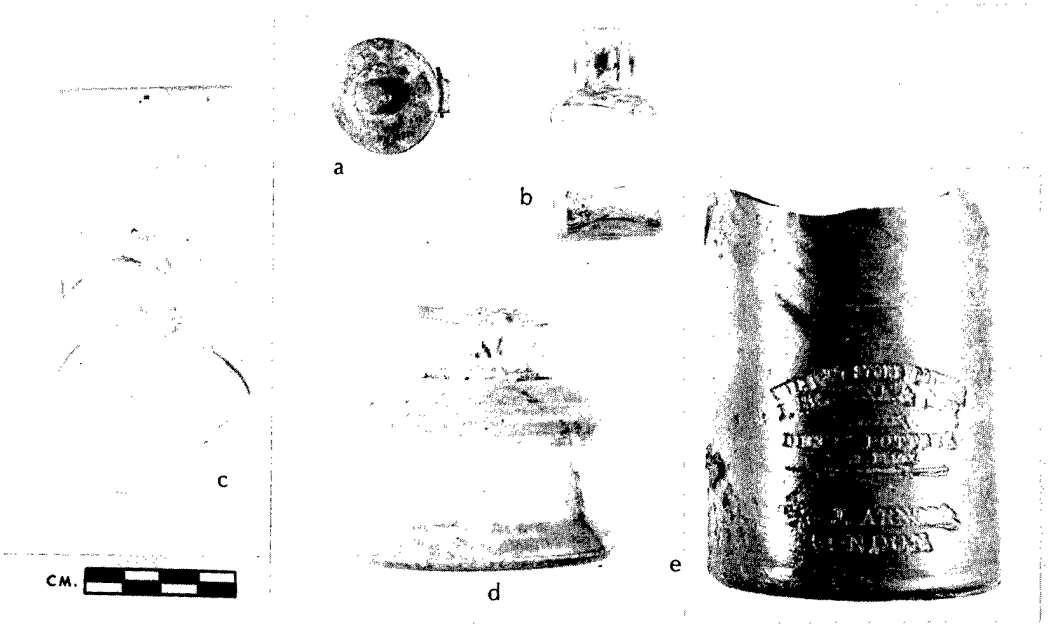


Figure 12-6. General Domestic and Writing Activity Artifacts. a. ink well lid, b. "carmine ink" bottle, c. lamp chimney, d. "CARTER'S" ink bottle, e. ceramic ink bottle.

Table 12-1. Glass Lamp Chimneys from Cm-232.

Provenience	Lip Thickness in.	(mm.)	Top	Base
N63	0.14	(3.5)	-	-
N63/2	0.13	(3.3)	X	-
N64/3	0.04	(1.0)	-	-
N64/3*	0.14	(3.5)	-	-
N64/3*	0.11	(2.8)	-	-
N64/3	0.07	(2.6)	-	X
I70*	0.12	(3.1)	-	-
V74,76,77	0.12	(3.1)	-	X

over an inch in length (about 27 mm.) and 0.16 inches (3.9 mm.) in thickness. It has flat, irregular sides and it shows no evidence of ever having been wood encased.

The other is of the modern wood encased type. Recovered were the ferrule which held the eraser in place and portions of the wood beneath. Yellow pigment is present on this wood. The pencil lead is round.

The history of pencils goes back at least to the early nineteenth century when a cabinetmaker from Concord, Massachusetts became this country's first commercial producer of pencils with some he had made by hand and sold door to door (MacMillan, 1975:82). Dating of these is difficult. There seems to be no way to date the slate type pencil. Of the second, it is known that until 1877, pencil leads were square, giving the wood-encased pencil at least that terminus post quem. In addition, although the use of yellow paint on pencils is not precisely dateable, prior to the 1893 Chicago World's Columbian Exposition, pencils were generally either unpainted or black, dark red, or maroon. At that time, Koh-I-Noor displayed yellow pencils which attracted some attention. The color became popular thereafter as a sign of pencil quality (Wharton, 1953). Additional

justification for considering this second pencil as of twentieth century date is given by Mr. Russel H. Williams of Eberhard Faber, Inc. who suggests that a metal ferrule was first used to secure the eraser sometime around the turn of the century (personal communication). The provenience of these is square O63 (slate), and square T92 (wood-encased).

b. Ink Well Lid

The use of this artifact found in square N77 is somewhat problematical. It is of a soft white metal which seems to be too light to be lead. It is one piece with round knob handle and a raised flange ring around its underside (Figure 12-6a). A small hinge is also integral to the cap. The flange is 0.89 inches (25.3 mm.) in outside diameter while the cap itself is 1.22 inches (about 31 mm.) in diameter.

c. Ink Bottles

The four ink bottles included in these discussions include both ceramic and clear glass composition containers of three different body styles. The glass ink bottles include two of these three. The first is round in cross section and has a beveled collar lip finish, similar to others included in the Pharmaceutical section of Glass Bottles, Kitchen Group Artifacts (Figure 12-6d). The mouth and neck are one piece, applied to the body as a unit. The word "CARTER'S" appears on its bottom. It is squat with a single "panel" encircling the body and was found in square M64, level 2.

The two ink bottles of the second glass body style are small and square (Figure 12-6b). These have faceted edges and shoulders with a flat collared finish. Volume is possibly between one and two ounces. They conform to Putnam's "Stoppered Carmine Ink" (1965: 60) and bear what appears to be the basal marking "FG CO" in a circular concavity. The interpretation and significance of this logotype are taken up in the discussions of manufacturer's marks following the description of glass bottles in the Kitchem Group Artifacts. Of these two, one was from square U76 while of the other, the mouth was from square M63, level 1 and the base from square M64, level 2.

The final ink bottle is brown glazed earthenware (Figure 12-6e). It receives further treatment in the Chapter V discussions of ceramics.

8. Stable and Barn

a. Horseshoe Nails

It is surprising that on a site of this age and association that only three horseshoe nails were found. These are from square L78, square N64, level 3 and the area of squares N63-64, level 3. These are broken, #6 and #7 sizes respectively.

b. Horse/Muleshoes

The two muleshoes and the three horseshoes were found in a context which did not permit suggestion of an association with the Commissary. There is little noteworthy about these and descriptive information about them is presented in Tables 12-2 and 12-3. The similarity between the horseshoe from the trench and that of square K66 is such that it might be suggested that they were once paired. While all showed signs of wear, these two do so to differing degrees. The heel calks from the muleshoe of square S92 and the horseshoe of square M106 appear to have been applied. An alternate technique is to bend down the web tips of the blank. All but that shoe from M106 had four nail holes per web. That one exception appeared to have but three nail holes per web.

c. Curb Bit Cheek Piece

In 1863 the Army instituted a curb bit design calling for the placement of a single cast brass medallion on the cheek. Although the original specifications called for these to bear unit designations,

Table 12-2. Horse and Muleshoes from Cm-232.

Provenience	Horse	Mule	Toe Calk	Heel Calk	Toe Clip	Fuller
N62		X	X		?	X
S92		X		X		X
K66	X					X
M106	X			X		X
Trench west of bldg.	X					X

Table 12-3. Horse and Muleshoe Dimensions from Cm-232.

Provenience	Maximum outside width in.	(mm.)	Length in.	(mm.)
N62	3.6	(92)		(119)
S92	4.2	(106)		(150)
K66	5.1	(129)		(137)
M106	4.4	(112)		(112)
Trench west of bldg.	5.3	(133)		(137)

all which have thus far been found bear the legend "US" (Figure 12-7d; W. H. Jones, personal communication). Two rivets originally held these in place on the iron bit. This, found in square R73, is typical of that 1863 design with circular seal and two projecting lobes. The design was replaced by that of 1874, although those which had been issued continued to be used for many years. Length is 2.15 inches (54.7 mm.) and diameter of the central medallion is 1.24 inches (31.4 mm.).

d. Harness Clip

This small clip was found in square M74. It is a flat piece of sheet brass which has been riveted to what appears to have been a leather strap (Figure 12-7e). It is only 0.55 inches (18.0 mm.) in width and bears the inscription "PAT. APR 6 1869" in a circle about the rivet. According to Leslie R. Welsh, Patent Search Advisor of the Patent and Trademark Office, U.S. patent no. 88,676 was issued to Z. T. Sweet of Eugene City, Oregon on that date. It was for an improved clip for neck yoke and whiffle-tree, the clip being attached to the martingale and breast-strap of the harness. Some relationship may exist.

e. Harness Chain

Two lengths of chain were found at Cm-232 which appeared to relate to harness. These are trace chain from square P63, level 1 and curb chain from square W87.

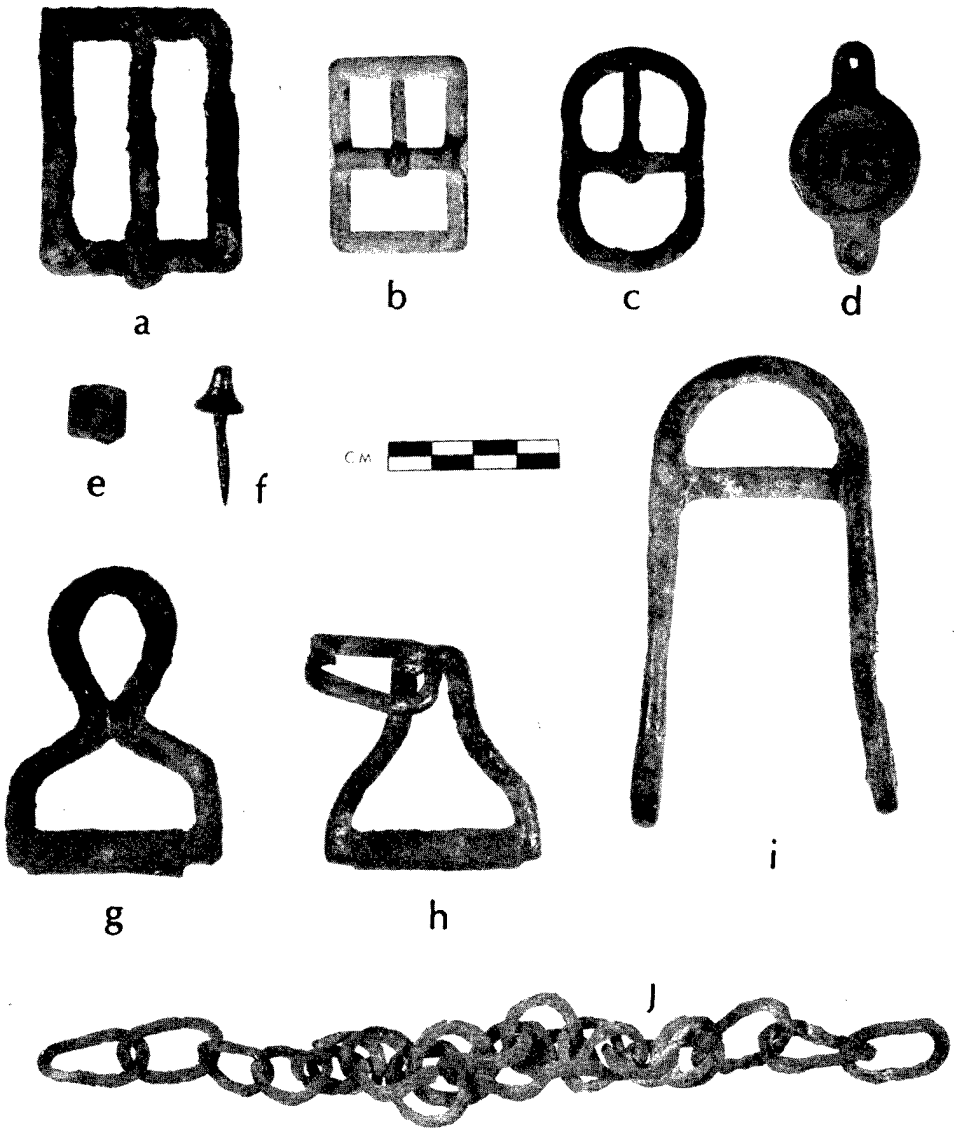


Figure 12-7. Horse and Barn Artifacts. a-c. harness buckles, d. 1863 curb bit medallion, e. harness clip, f. carriage knob, g. cock eye, h. triangular dee, i. unknown wagon clip, j. curb bit chain.

The chain from square P63 is a composite of chain elements which in combination with general robustness tends to imply use as trace chain (Figure 12-8b). These elements include one cock eye, one swivel, one stretched harness ring or possibly flat link, and twisted link chain. All are of iron. The cock eye has no roller and

has been distorted. Its inside width is 1.9 inches (48 mm.). Length is almost 3 inches (76 mm.) while its thickness is 1/4 inch (6 1/2 mm.). Below this are four common twisted chain links with a thickness of almost 1/4 inch (about 6 mm.) and an inside length of 0.8 inches (20.3 mm.). A light chain swivel with an eye of 1/3 inch inside diameter separates these from another twelve twisted chain links. Below this is the flat link of 1.7 by 1.2 inch (43 by 30 mm.) inside diameter and another eighteen twisted links. This combination resembles chain used for stagecoaches (Worthington, 1909: 1904).

Curb chains are attached to the bit and pass under the horse's lower jaw. A leather strap may also be used to perform the same task. This curb chain is constructed of iron links of a low profile twist (Figure 12-7j). Three or four individual links extend from either end of it while the central portion has multiple links, in this case with each link having pass through it portions of four other links. Individual link length is 1 inch (25.4 mm.). These are heavily rusted but link thickness is on the order of 0.14 inches (3.5 mm.).

f. Harness Buckles

Of the five harness buckles, four are of iron and one is of brass (Figure 12-7 a-c). The former include three bar buckles and one of common type. These are described in Table 12-4. Measurements particularly on those of iron must be considered with less assurance than that of the brass buckle because of rust. That bar buckle from square U71 is quite fragmentary but appears to be of the same type and size as that from square Q63 (Figure 12-7c). That latter is rounded at the back of the frame but flattened at the front so that its external width changes. The measurement given is taken at the front and therefore must be considered as a maximum. In addition, the two of this type have a slight S-curve in their frame, further distinguishing them from the other bar buckles which have flat frames.

The buckle from U71 may have been civilian or military in its application. While it is not now present, it may also have had a roller on it at one time, although a roller was not always in use on such a buckle.

The single brass buckle (Figure 12-7b) has been identified by Mr. W. H. Jones of the Fort Sill Museum (personal communication) as being military in origin and being used on the cheek piece. It is similar to that issued in 1874 and in 1904.

Table 12-4. Harness Buckles from Cm-232.

Provenience	Type	Internal Width in. (mm.)	Internal Length in. (mm.)	External Width in. (mm.)	External Length in. (mm.)	Bar Dia. in. (mm.)	Composition
L73	Bar	0.99(25.1)	1.63(41.3)	1.36(34.5)	2.07(52.6)	0.18(4.6)	Iron
N64/3	Bar	0.87(22.2)	1.36(34.5)	1.30(33.2)	1.81(46.1)	0.20(5.2)	Brass
Q63/3	Bar	0.74(19.8)	1.10(28.0)	c.0.18(30.1)	1.58(40.0)	c.0.17(4.2)	Iron
U71	Bar	-	-	-	-	-	Iron
U71	Roller(?)	0.97(24.7)	0.74(19.8)	1.36(34.5)	1.10(28.2)	-	Iron

g. Triangular Cock Eyes

These are pieces of harness equipment which would most often be used for chain/strap connections in a number of areas. Both cock eyes from Cm-232 have rollers (Figure 12-7g). These were available in japanned iron in sizes of 1/2-inch increments from 1 1/4 to 2 1/2 inches (31.8 to 63.4 mm.) (Worthington, 1909:1890). The two found at the site are of different sizes as listed below.

	Length	Strap Width
N98	2.8 in. (71.4 mm.)	1.48 in. (37.6 mm.)
O,P45-48	3.0 in. (77 mm.)	1.26 in. (32.0 mm.)

The length measurement excludes the roller. No remnant japanning is in evidence.

h. Triangular Dees

Triangular roller dees such as found on the site would usually be associated with harness equipment. It is sometimes used as a coupling device or for chain/strap connections. These are of iron and may originally have been japanned although no evidence of it remains. They were available in quarter-inch increments from 1 1/4 to 2 1/2 inches (roughly 32 to 64 mm.) (Worthington, 1909:1890). Both of these two dees are of the 1 1/2-inch size.

These may have had a different application than harness, however. The narrow of both is offset to one side of the main axis of the dee. While that from square Q91 is plain, that from square P72 was found with a large staple around it (Figure 12-7h). The staple had been driven through something of 0.97 inches (24.7 mm.) thickness and the tips hammered back. As mentioned elsewhere, this might be either to secure the staple or to eliminate sharp projections. It may have been that these were applied to the side of a wagon box, for example.

i. Sliding Belt Keeper

These two belt keepers were used to hold lengths of leather or possibly cloth straps flush. This would be particularly useful where a long strap extended too far beyond a buckle. Harness is expected to show the most common use of these. Of the same size, their provenience is squares S87 and S92. They will accept straps of up to 1.12 inches (28.4 mm.) in width and 0.17 inches (4.3 mm.) thickness. Their length is 0.98 inches (24.9 mm.).

j. Harness Rivets

Of the twenty rivets or rivet parts from Cm-232, only two were complete. The rest were either rivet bodies with head and shank, or simply the circular burr. No markings were observed on any of these. Harness rivets such as these were used throughout the period of the site's use and therefore bears no temporal significance. Rivets and burrs are available in a variety of sizes to better suit the job. These reflect this with rivet head diameter varying from 0.24 to 0.49 inches (6.1 to 12.4 mm.) and with burr diameters from 0.25 to 0.56 inches (6.4 to 14.2 mm.).

While harness is the most likely use for these, they may also have been applied to items of clothing such as belts or to items of civilian and military equipment.

Rivets are sold in sizes reflecting the size of the head. These sizes are then available in a range of shaft lengths (W. H. Jones, personal communication). The size of rivet head is inversely related to its size number. These sizes include #8 through #12 and are shown in parenthesis after the count in Table 12-5. The larger #8 would almost certainly have been used with harness while at the other extreme the #12 might have been used with personal equipage.

k. Harness Rings

Harness rings have many uses in harness and saddle. These are of iron and very similar in size. Their dimensions are given below.

	Inside Diameter	Thickness
N69	1.75 in. (44.5 mm.)	0.21 in. (5.2 mm.)
Q55	1.76 in. (44.7 mm.)	0.25 in. (6.4 mm.)

While their specific use cannot be determined, these are too small for cinches and some other uses.

l. Carriage Knob

The carriage knob is affixed on the side of the carriage body and secures the grommeted edge of the fabric top or the curtains. The site's one carriage knob is from O100 and has been broken (Figure 12-7f). These were commonly made to be driven or screwed into place. This is of the former type and has a nail shank beneath the head. This shank is 0.88 inches (22.3 mm.) long. This corresponds to the 7/8 inch shank lengths for all driven carriage knobs offered in the

Table 12-5. Rivets and Burrs from Cm-232.

Provenience	Rivet	Burr	Rivet and Burr
N64/3	2(#10,#11)	3	1(#12)
R62/3			1(#8)
R73	1(#9)		
S66	1(#8)		
T71		2	
T72		1	
T73	1(#8)		
U71	1(#8)		
U72		1	
U75		1	
U76		2	
U78		1	
W94	1(#10)		
Total	7	11	2

1909 George Worthington Co. catalogue (p. 2172). The catalogue also offers these in brass and japanned iron although no evidence of japanning remains here.

m. Wagon Staples

These staples are larger than those commonly used for fencing although they may not always be associated with wagons. While four were found, one was still affixed to a triangular roller dee and will be discussed with that item. All are of iron.

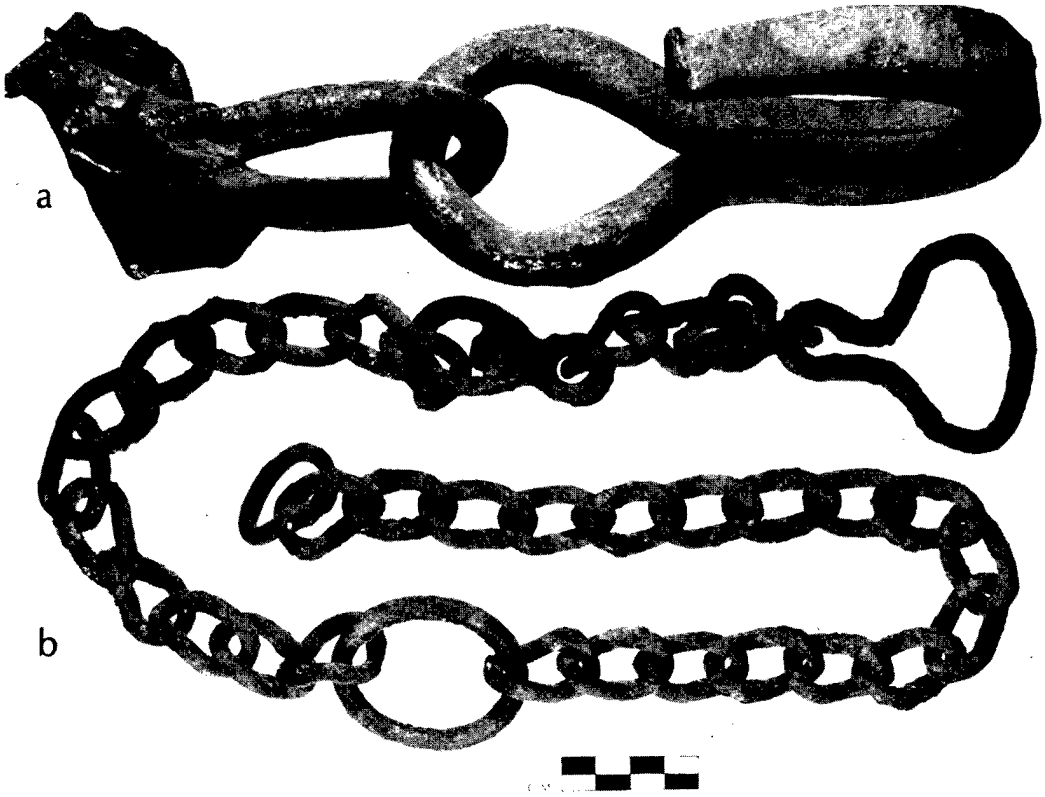


Figure 12-8. Harness and Wagon Artifacts. a. Escort Wagon lead bar clip and hook, b. trace chain.

Two staples had the common fencing staple shape. The larger of these two was found in square T70 and is somewhat over 2.7 inches (68 mm.) in length. The smaller, from Q89, is somewhat over 1.6 inches (41 mm.) in length. After having been driven, its sharp points were bent over. The maximum thickness through which this staple might have been driven is 1.3 inches (33 mm.).

The third wagon staple is quite distinctive in shape from the fencing type. While of wire, it is wide and short but with typical sharp ends (indicating that it was to be driven into place). Its inside measure is just over 2 inches (51 mm.).

n. Wagon Clip

The specific use of this clip is not known. It is unbroken and measures 4 1/4 inches (108 mm.) in length (Figure 12-7i). It is just under 1/4 inch (6 mm.) in thickness. Two cross bars once held it in

place; the back one is now gone. It has a slight upward curve from front to back. Because of its size, it was probably the tongue cap or a singletree strap to some light duty vehicle such as a buggy. It was found in square K59.

o. Lead Bar Hook and Clip

This large center clip and hook were found to the east of the main excavations. The center clip has been crushed and distorted (Figure 12-8a). Originally, the hook point was securely wrapped around an iron ring, now gone. The hook alone measures seven inches in length.

This item is illustrated in certain Quartermaster publications (U.S. Army Quartermaster Corps, 1917:293, #6 and 1930:316, #32) as a part of the escort wagon.

The escort wagon ceased to be a part of the Army's inventory during World War II. The lead bar acted as a doubletree to the harness for the lead team of animals. The hook and ring were attached to a heavy ring on the forepart of the wagon tongue.

CHAPTER XIII
CONCLUSIONS

The information retrieved by this project answers only in part those research questions which were formulated initially. While some of the data relates to the Commissary period of the site's occupation, as much or more relates to later site utilizations. These include trash disposal, military training, and most recently vehicle parking. Such uses, while not originally intended to have been the major thrust of these researches, are nevertheless significant particularly with regard to the effects which they had on the condition of the site.

Many difficulties were encountered in the interpretations relating to 34-Cm-232. These stemmed from both the disturbances of context and to the later trash dumping on the site. The former entailed both compaction and churning. Compaction is the more obvious of the two disturbances of context. As was stated in the discussions on methodology (Chapter III), it very quickly became apparent that the entire historic occupation level of the site had been compressed into a single mixed and homogeneous level of no more than about 25 cm. thickness. Horizontal disturbances were evident in the occasional presence of bulldozer tread markings in the sterile clay beneath the occupational level. Another indication was the spread of individual ceramic and glass containers (Chapter V) over relatively large areas. Because of these disturbances it is not possible to place great reliance on artifact distributions.

The artifacts themselves were damaged by the same forces which so disturbed their context. For example, the window glass present in certain areas along the eastern wall of the structure (Chapter VI) was crushed into small splinters. It was impossible (for the same reason and because of limitations in time and resources) to reconstruct the complete edge of even one window pane. In addition, other items which might have otherwise have been of importance, remained largely unidentifiable.

Another difficulty which hampered interpretation particularly of the Indian Agency period, was the trash dumping which later took place on the site. This practice of trash disposal is in part based on documentary sources which suggest the demise of the Commissary buildings to have taken place sometime during the early 1880's with no evidence

of a follow-up occupation. Much of the not distinctively military artifact inventory (notably ceramic and glass vessels) postdates that time. Other objects (such as the animal bone) appear in horizontal and vertical (in Feature 8) association with these datable items suggesting coterminous deposit.

The inability to date artifacts was for some items (e.g., the andiron and perhaps the "GW" marked pharmaceutical bottle) partially overcome by the presence toward the south end of the structure of the pit, Feature 8. Many factors imply the presence of Feature 8 prior to the razing of the Commissaries. These include its location, orientation, and the absence in its lowest level of artifacts demonstratively postdating building demise.

With further documentary and archaeological study, this assemblage has potential pertinence to areal problems. At present however, it can be said that the material was dense and varied enough to suggest that it was not likely the result of accidental or haphazard deposit. It also likely originated from habitations rather than from some specialized activities which had once been carried on in the area. Further, the relative absence of definitely Commissary period items, particularly furniture and personal possessions, from the inventory of materials recovered is in concert with the historical suggestion of orderly abandonment.

In light of the foregoing considerations of the condition of the artifactual evidence and of the site, it is not surprising that difficulty in determining something more of the Agency Commissary period of the site's utilization was encountered. With the exception of certain specific artifacts, the most pertinent information which was achieved of this period related to the isolated details of the buildings themselves. These interpretations both confirm and supplement what is already known of these structures. Most of these architectural traits are encompassed in designated Features from the site (see Chapter IV). The distribution of plaster and mortar remains helps to delimit the building and serves to confirm its width of roughly 30 feet. The placement of Feature 9 (plaster flooring) and Feature 10 (well) serves to confirm this as the west Commissary building and further to suggest (based on the assumption of the well's placement in the center of the intermediary courtyard) a separation of the buildings on the order of 55 feet. Feature 9, in addition, suggests door placement. Certain clusterings of window glass suggest locations of windows on the south and east wall (Chapter VI), although the disturbed context of the artifacts in general makes such conclusions more tentative. The presence of the front walk, Feature 6, had been previously unsuspected because

of lack of mention in the written descriptions and because of the picket fence around the front yard which hid it from photographic view (Figure 2-2). Its length serves both to suggest a front yard extending on the order of 6 meters out from the porch and to suggest the possibility of the front porch having been erected after the original construction of the building itself. Certain large limestone slabs imply the use of stone piers while the presence of large, cast concrete blocks in Feature 8 suggest their possible use as building piers, steps, etc.

A wide variety of plaster and mortar materials (Chapter VI) are found at the site. Their uses include the setting of the fireplace stone, of portions of the well wall, and of the brick in the chimneys; plastering of walls; pouring of flooring; and casting of the "piers" mentioned above. Some attempt was made in the foregoing discussions to put these many uses in perspective as all appeared to share a common burned lime binder. Such building materials appear to have made significant contribution to early construction in this area with its abundant supply of raw limestone. Many of the buildings at Fort Sill utilized lime binder, for example. It may be that with further historical research, study of both standing and archaeologically documented structures in the area, and excavation of possible lime kiln sites recently discovered in the area of East Cache Creek, a fuller appreciation of this may be possible.

These aforementioned evidences of architecture and the directions for further research are at present the primary dividends of this investigation insofar as the Agency Commissaries are concerned. Additional information retrieved beyond this related primarily to the later uses to which the site was put and although supported by some documentation, are almost entirely evidenced in the artifacts recovered. Following the abandonment and later destruction of the buildings from the site it was used for trash disposal. Already mentioned also is the fact that the artifacts are such as to imply possible habitation. Local informants have suggested that houses were built to the south and east of Quarry Hill for workmen or retired enlisted personnel. In addition, it is known that the house of George Wratten, Interpreter to the Apache prisoners-of-war brought to Fort Sill in the winter of 1894, once stood some 200 yards southwest of the site. To the east of the site on the East Cache Creek floodplain was the area used during this entire period as the Fort Sill dump, site 34-Cm-9. Recently materials recovered from it have been described (Spivey, et al, 1977).

This use of the site continued possibly up to the turn of the century while a more military presence began to assert itself. Some overlap may be present, evident for example in the .30 Krag blank, Model of

1893. The increasing military presence at the site is demonstrated by a decrease in the quantity of non-military debris in conjunction with an increasing variety and frequency of military paraphernalia, at first noticeable in accoutrements and then in small arms cartridges (Chapter VII). This military ascendancy is to the virtual exclusion of civilian uses by the period of the First World War when the abundant military ordnance relates primarily to artillery firing (Chapter VIII). Nearby concrete firing emplacements (Figure 8-3) also bespeak such a use. Manufacturer's markings and ordnance types used during World War I and the years immediately following limits the likely time span of such site use. Thereafter the presence of firing artillery seems to have diminished. Informants suggest that the site may have been utilized for vehicle parking as early as the appearance in the 1930's of a Civilian Conservation Corps encampment in the area. Sometime between then and World War II, the site was gravelled to facilitate this use although the site's margin may have continued to be used for firing. However, in 1942, the site was blacktopped and remained covered until this investigation. Probably during one or both of these parking lot stages the site suffered its greatest disturbance.

REFERENCES CITED

Albert, Alphaeus H.

1976 Record of American Uniform and Historical Buttons, 1775-1976. Boyertown Publishing Co., Boyertown, Penna.

Anderson, Adrienne

1968 "The Archaeology of Mass-Produced Footwear." Historical Archaeology, Annual Publication of the Society for Historical Archaeology, 2:56-65.

Barnes, Frank C.

1972 Cartridges of the World. rev. 3rd ed. DBI Books, Inc., Northfield, Illinois.

Baron, Stanley W.

1962 Brewed in America: A History of Beer & Ale in the United States. Arno Press, New York.

Battey, Thomas C.

1968 The Life and Adventures of a Quaker Among the Indians. new ed. University of Oklahoma Press, Norman.

Black, Art

1974 "Fort Lancaster State Historic Site, Crockett County, Texas." Texas Parks & Wildlife Department Archaeological Report, No. 18. Austin.

Brinckerhoff, Sidney B.

1972 "Metal Uniform Insignia of the Frontier U.S. Army 1846-1902." Arizona Historical Society Museum Monograph No. 3. Tucson.

Butler, Josiah

1928 "Pioneer School Teaching at the Comanche-Kiowa School 1870-3." Chronicles of Oklahoma, 6(4):483-528.

Chappell, Gordon

1966 "Brass Spikes & Horsehair Plumes, a Study of U.S. Army Dress Helmets 1872-1903." Museum Monograph No. 4. Arizona Pioneers' Historical Society, Tucson.

1972 "The Search for the Well-Dressed Soldier, 1865-1890." Museum Monograph No. 5. Arizona Historical Society, Tucson.

Clifton, Robert T.

1970 Barbs, Prongs, Points, Prickers, and Stickers. University of Oklahoma Press, Norman.

Conover, George W.

1927 Sixty Years in Southwest Oklahoma. N. T. Plummer Anadarko, Oklahoma.

Dancaster, Ernest A.

1915 Limes & Cements, Their Nature, Manufacture and Use. D. Appleton & Co., New York.

Dickinson, W. N.

1920 The Story of the 75. Government Printing Office, Washington, D.C.

Ewers, John C.

1957 "Hair Pipes in Plains Indian Adornment, A Study in Indian and White Ingenuity." Anthropological Papers No. 50. Bureau of American Ethnology Bulletin 164. Government Printing Office, Washington, D.C.

Fisher, Barbara E.

1963 Forrestine Cooper Hooker's Notes and Memoirs on Army Life in the West, 1871-1876. M.A. thesis. Department of History, University of Arizona, Tucson.

Fisher, Douglas Alan

1963 The Epic of Steel. Harper & Row, New York.

Fontana, Gernard L. and J. Cameron Greenleaf, et al

1962 "Johnny Ward's Ranch: A Study in Historic Archaeology." The Kiva, 28(1-2):1-115. Tucson.

Gibson, Arrell M.

1965 Oklahoma, A History of Five Centuries. Harlow Publishing Corp., Norman, Oklahoma.

Godden, Geoffrey A.

1964 Encyclopaedia of British Pottery and Porcelain Marks. Bonanza Books, New York.

Graham, Frank D. and Thomas J. Emery

1950 Audels Masons and Builders Guide #1. Theo. Audel & Co., New York.

1951 Audels Masons and Builders Guide #3. Theo. Audel & Co., New York.

Great Britain. War Office

1917 Handbook of the B. L. 8-Inch Howitzer, Mark VI on Travelling Carriage. His Majesty's Stationery Office, London.

1920a Handbook of the B. L. 9.2-Inch Howitzers, Marks I & II. His Majesty's Stationery Office, London.

1920b Handbook of the B. L. 8-Inch Howitzers, Marks VI to VIII, on Travelling Carriages. His Majesty's Stationery Office, London.

Hammer, Kenneth M.

1970 The Springfield Carbine on the Western Frontier. The Old Army Press, Bellevue, Nebraska.

Howell, Edgar M.

1975 "United States Army Headgear 1855-1902, Catalog of United States Army Uniforms in the Collections of the Smithsonian Institution, II." Smithsonian Studies in History and Technology, No. 30. Government Printing Office, Washington, D.C.

Johnson, David F.

1948 Uniform Buttons, American Armed Forces 1784-1948, Volume 1, Descriptions and Values. Century House, Watkins Glen, New York.

Keefe, John W.

1974 "Libby cut and engraved glass." American Glass, Volume 2. edited by Robert E. DiBartolomeo, p. 205-210. Weathervane Books, New York.

Kendrick, Grace

1966 The Antique Bottle Collector. Old Time Bottle Publishing Co., Salem, Oregon.

Klamkin, Marian

1971 The Collector's Book of Bottles. Dodd, Mead & Co., New York.

Lewis, Kenneth E.

1972 "Archaeological Investigations at Fort Towson, Choctaw County, Ok." Studies in Oklahoma's Past, No. 2. Oklahoma Archaeological Survey, University of Oklahoma, Norman.

Logan, Herschel C.

1948 Cartridges-A Pictorial Digest of Small Arms Ammunition. Standard Publications, Huntingdon, Va.

Lorrain, Dessamae

1968 "An Archaeologist's Guide to Nineteenth Century American Glass." Historical Archaeology, Annual Publication of the Society for Historical Archaeology, 2:35-44.

Luscomb, Sally C.

1967 The Collector's Encyclopedia of Buttons. Crown Publishers Inc., New York.

MacMillan, Willian L., III

1975 "The Pencil Still Is a Basic Tool." The Office, 41(8): 82+. (August 1975).

Montgomery Ward & Company

1969 Catalogue and Buyers' Guide No. 57, Spring and Summer, 1895. Dover Publications, Inc., New York.

Noël-Hume, Ivor

1976 A Guide to Artifacts of Colonial America. Alfred A. Knopf, New York.

Nye, W. S.

1969 Carbine & Lance: The Story of Old Fort Sill. University of Oklahoma Press, Norman.

Ohart, Theodore C.

1946 Elements of Ammunition. John Wiley & Sons, Inc., New York.

---

n.d. The Operation, Care, and Repair of Farm Machinery 22nd ed. John Deere, Moline, Ill.

Orchard, William C.

1975 "Beads and Beadwork of the American Indians." Contributions from the Museum of the American Indian, Heye Foundation, Volume XI. LaSalle Litho Corp., New York.

Putnam, H. E.

1965 Bottle Identification. Old Time Bottling Co., Salem, Oregon.

Rickey, Don

1963 Forty Miles a Day on Beans and Hay. University of Oklahoma Press, Norman.

Roper, C. A.

1976 The Complete Handbook of Locks and Locksmithing. TAB Books, Blue Ridge Summit, Penn.

Sellari, Carlo and Dot Sellari

1975 The Illustrated Price Guide of Antique Bottles. Country Beautiful Corporation, Waukesha, Wisconsin.

Shapleigh Hardware Co.

1923 Shapleighs General Hardware Catalog No. 300. St. Louis.

Smith, W. H. B. and Joseph E. Smith

1968 The Book of Pistols and Revolvers. Castle Books, New York.

1972 The Book of Rifles. Castle Books, New York.

South, Stanley

1974 "Palmetto Parapets." Institute of Archaeology and Anthropology, Anthropological Studies, #1. The University of South Carolina, Columbia.

1977 Method and Theory in Historical Archaeology. Academic Press, New York.

Spivey, Towana, C. Reid Ferring, Daniel J. Crouch, and Kathy Franklin

1977 "Archaeological Investigations Along the Waurika Pipeline." Contributions of the Museum of the Great Plains, No. 5., Lawton, Oklahoma.

Suydam, Charles R.

1960 The American Cartridge: An Illustrated Study of the Rimfire Cartridge in the U.S. G. Robert Lawrence, Santa Ana, Ca.

Suydam, Charles R.

1965a "American Pistol and Revolver Cartridges, Part V-B." The Gun Report, 11(6):32-37+. Aledo, Illinois.

1965b "American Pistol and Revolver Cartridges, Part V-C." The Gun Report, 11(7):30-39. Aledo, Illinois.

Switzer, Ronald R.

1974 The Bertrand Bottles, A Study of 19th Century Glass and Ceramic Containers. National Park Service Publications in Archeology, No. 12. Government Printing Office, Washington, D.C.

Tatum, Lawrie

1967 "Laurie Tatum's Letters." Prairie Lore, 4(1):50-61. Southwestern Oklahoma Historical Society, Lawton, Oklahoma.

1968 "Laurie Tatum Letters." Prairie Lore, 4(3):186-189. Southwestern Oklahoma Historical Society, Lawton, Oklahoma.

1970 Our Red Brothers and the Peace Policy of President Ulysses S. Grant. University of Nebraska Press, Lincoln.

Thorn, C. Jordan

1947 Handbook of Old Pottery & Porcelain Marks. Tudor Publishing Company, New York.

Toulouse, Julian Harrison

1971 Bottle Makers and Their Marks. Thomas Nelson, Inc., Camden.

United States. Army

1861 Regulations Concerning Barracks and Quarters for the Army of the United States, 1860. George W. Bowman, Washington, D.C.

United States. Army Field Artillery School of Instruction, Saumur

1918 Ammunition. E. Roland, Saumur, France.

United States. Army Ordnance Department

1861 The Ordnance Manual for the Use of the Officers of the United States Army. 3rd ed. J. B. Lippincott & Co.

1891 "Horse Equipments and Cavalry Accoutrements, as Prescribed by G. O. 73, A.G.O., 1885." Ordnance Memoranda No. 29. Government Printing Office, Washington, D.C.

1894 "Report of the Chief of Ordnance." in Annual Report of the Secretary of War for the Year 1894, Volume III. Government Printing Office, Washington, D.C.

1897a "Report of the Chief of Ordnance." in Annual Report of the Secretary of War for the Year 1896, Volume III. Government Printing Office, Washington, D.C.

1897b "Report of the Chief of Ordnance." in Annual Reports of the War Department for the Fiscal Year Ended June 30, 1897, Volume II. Government Printing Office, Washington, D.C.

1918 "Handbook of the 155-MM. Gun Materiel, Model of 1918 (Filloux)." Form No. 1818. Government Printing Office, Washington, D.C.

1919a "Handbook of Ordnance Data." Form No. 1861. Government Printing Office, Washington, D.C.

1919b "Handbook of the 155-MM Howitzer Materiel, Model of 1918 (Schneider), Motorized, with Instructions for its Care." Form No. 2017. Government Printing Office, Washington, D.C.

1921 "Handbook of Artillery, Including Mobile, Anti-aircraft, Motor Carriage, and Trench Materiel." Ordnance Department Document No. 2033. Government Printing Office, Washington, D.C.

1923 "Service Handbook of the 9.2-Inch Howitzer Materiel, Model of 1917 (Vickers Mark I), and 9.2-Inch Howitzer Materiel, Model of 1918 (Vickers Mark II)." War Department Document No. 1098. Government Printing Office, Washington, D.C.

U.S. Army Ordnance Department

1941 "155-MM Gun Materiel, M1917, M1918, and Modifications." Technical Manual No. 9-345. Washington, D.C.

United States. Army Quartermaster Corps

1875 "Proceedings of the Board of Officers Convened Under Special Orders No. 120, A. B. O., 1874, on Infantry-Equipments, and Materials and Supplies Necessary for Efficient Outfit of Infantry Troops in Field and Garrison; with the Action of the War Department Thereon." Ordnance Memoranda, No. 19. Government Printing Office, Washington, D.C.

1885 "Report of the Quartermaster General." in Annual Report of the Secretary of War for the Year 1885, Volume I. Government Printing Office, Washington, D.C.

1917 Manual for the Quartermaster Corps, 1916, Volume 2, Appendix. (Corrected to December 15, 1917). Government Printing Office, Washington, D.C.

1930 Handbook for Quartermaster, Parts I to V. Government Printing Office, Washington, D.C.

1938 "Component Parts, Spare Parts, Accessories and Contents of Chests, Kits, Sets, Outfits and Items of Quartermaster Corps Property." Office of the Quartermaster General Circular No. 4. Washington, D.C.

United States. War Department

1919 America's Munitions 1917-1918. Report of Benedict Crowell, the Assistant Secretary of War, Director of Munitions. Government Printing Office, Washington, D.C.

Van Den Branden, L. and Thomas L. Hartsell

1971 Plastering Skill and Practice. American Technical Society, Chicago, Ill.

Walker, John W.

1971 Excavation of the Arkansas Post Branch of the Bank of the State of Arkansas. Arkansas Post National Memorial. U.S. Department of the Interior. Washington, D.C.

Westbury, William Arthur

1977 Artifacts from Fort Richardson Excavations, Fall, 1976. Archaeological Investigations at Fort Richardson State Park, Fall, 1976 (Texas A & M University Anthropology Research Laboratory Report No. 39). Texas A & M Research Foundation, College Station.

Wharton, Don

1953 "Things You Never Knew About Pencils." Saturday Evening Post, 226:40-1+. (5 December, 1953).

White, Henry P. and Burton D. Munhall

1950 Center Fire American & British Pistol and Revolver Cartridges. Combat Forces Press, Washington, D.C.

1963 Cartridge Headstamp Guide. H. P. White Laboratory, Belair, Maryland.

Worthington, George, Company

1909 George Worthington Company Hardware Catalogue. Cleveland, Ohio.

Wright, Muriel H.

1968 "A History of Fort Cobb." Prairie Lore, 5(1):28-44. Southwestern Oklahoma Historical Society, Lawton, Oklahoma.

Yeoman, R. S., Lee F. Hewitt, and Charles E. Green

1948 Handbook of United States Coins. Whitman Publishing Company, Racine, Wisconsin.

Yost, Nellie Snyder

1970 Medicine Lodge, The Story of a Kansas Frontier Town. Swallow Press, Inc., Chicago, Ill.

APPENDIX A

This appendix consists of transcripts of documents considered important and referred to in the text. They are presented here in their entirety so that referencing might be made more easily and that future researchers might be able to avoid some of the duplication of effort common to studies in the area.

No attempts have been made to edit or to correct original spelling or grammatical errors. While some attempt was made to reflect original spacing and format, this was difficult and had sometimes to be abandoned. For example, Document #6 could not be reproduced in its original, tabular form. Therefore, a summary of the essential information contained therein is presented. Almost all were hand written although letterhead was often used but not distinguished here. What errors may exist in transcription are the fault of the author.

Document #1

Article of agreement made & entered into this 29th of 6th mo 1869 by & between Lawrie Tatum U.S. Indian Agent, on behalf of the United States of the first party & Lew Hutson & John J. Dibble of the second party.

The said second party agrees to furnish the first party with as much good, well-burned lime as he may want for plastering the Agency house, as soon as it is practicable for the said second party to furnish it at the kilns.

The first party agrees to pay the second party seventy five cents pr bu for said lime.

Lawrie Tatum U.S.
Indian Agent (signature)

Lew Hutson (signature)
John. J. Dibble (signature)

Kiowa Indian Agency Records
Indian Archives Division
Oklahoma Historical Society
Oklahoma City, Oklahoma

Document #2

Kiowa & Comanche
Agency 7mo 7- 1869

Friend E Hoag.

My predicessor A.G. Boone has built a ware house for Indian goods & covered it with boards, it being impracticable for him to get shingles at that time. I believe he has expended all the money appropriated for such a building.

The roof leaks very much every time it rains, & the goods are being damaged thereby. I think that I can procure shingles in a short time. Will the proper authorities authorize me to put a good roof upon the building.

Respectfully
Lawrie Tatum (signature)
U.S. Indian Agent.

Kiowa Indian Agency Records
Indian Archives Division
Oklahoma Historical Society
Oklahoma City, Oklahoma

Document #3

Extract from Annual Report of Capt. A. G. Robinson AQM Fort Sill, I.T. for the fiscal year ending June 30, 1873.

Every building at Post (including Stables for 1000 horses and corral for 300 mules, both incomplete in roofing) is of stone quarried within a mile, a hard lime-stone of excellent quality for building. The parade ground is 800 feet square, two sides built up with Officers' quarters (20 sets) all completed. The other two with office and barracks for ten companies, four sets unfurnished, lacking mess house and out-buildings.

The ground enclosed has a very gentle natural slope to south-west corner, affording a perfect drainage.

The Hospital, located west of northern line of Officer's quarters, has just been completed; a neat picket fence enclosing some ten acres of ground (to be ornamented with walks, trees & shrubbery) above the main and out-buildings.

Quartermasters' and Commissary Store-houses South of one line of mens' quarters (each 200 feet long with office room and cellars) sufficient & completed since my arrival.

Stables, west of Cavalry barracks, convenient thereto.

Varieties of Oak and Black Walnut cut within 40 miles, of good size and quality, furnish excellent building material; while the Pecan

affords a superior wagon timber. The Post Saw-mill is worn out, but there is a good one at Indian Agency close by. Clay and sand in vicinity furnish good materials for brick, of which 50,000 were successfully burned last winter by me, for hospital and other buildings. A most superior lime is burned from quarry near by.

National Archives
Office of the Quartermaster General
Consolidated Correspondence File
Box 1035

Document #4

Proposals!

Sealed proposals, endorsed "Proposals for repairing Commissaries," will be received at the office of the Kiowa and Comanche Agency, near Fort Sill Indian Territory, until 2 o'clock, P. M. of the 8th day of December, 1877, for repairing the Wooden Commissaries at said Agency, which require re-shingling and straightening up, the sides of the buildings having settled out of plumb, causing the buildings to lean to one side. The amount of the roof in feet being 356 feet in length by 36 feet in width. The shingles to be of cottonwood, the lumber for which may be obtained on the Reservation, and the use of the Agency mill allowed for their manufacture. The work to be done within thirty days after the approval of the contract by the proper authorities. Bidders will state the price per thousand or square of the reshingling. The right by the Government of rejecting any and all bids is reserved. Bidders are invited to be present at the opening of the bids. Bonds will be required for the faithful performance of the contract.

J. M. Haworth
U.S. Indian Agent

Kiowa Indian Agency Records
Indian Archives Division
Oklahoma Historical Society
Oklahoma City, Oklahoma

Document #5

J.M. Haworth
U.S. Indian Agent
Kiowa & Comanche Agency I.T.

Sir

Agreeable to your advertisement inviting Proposals to repair the Commissaries at your Agency. I hereby propose to re-shingle the Buildings at Nine Dollars and fifty Cents per square. likewise put new saddle boards the full length of both Buildings $12.16. And I also propose to straighten the sides of each Building. and to secure them in proper place by 10 braces 12 feet long 4x4 on the inside of each building for the sum of 175\underline{00}$ the work to be done in a work manlike manner to the satisfaction of the Indian Agent

Very Respectfully
sgd William Wykes

All the work to be done within sixty days from receiving notice of the Approval of the Contract

sgd William Wykes

Kiowa Indian Agency Records
Indian Archives Division
Oklahoma Historical Society
Oklahoma City, Oklahoma

Document #6

Number and Description of Buildings belonging to the United States at the Kiowa, Comanche & Wichita Agency

1. "Agency" Doctors Residence: size 28'x39 1/2'; stone construction; painted; pine shingles; lathed and plastered; 9 rooms; 11'4" high; 1 1/2 stories; 15 doors; 14 windows; 1 1/2 miles from Agency; erected 1870; present condition Poor/Bad; present value $1200

2. "Dwelling"- Carpenters Residence
   Main Building: size 16'x30'; box frame construction; white washed; cottonwood shingles; 3 rooms; 12' high; 1 1/2 stories; 6 doors; 8 windows; 1 1/2 miles from Agency; erected 1871; present condition Fair
   Wing: size 10'x12'; box frame construction, white washed; cottonwood shingles; 1 room; 8' high; 1 story; 1 door; 2 windows; erected 1871; present condition Fair; present value $250

3. "Dwelling"- Blacksmiths Residence: size 16'x24'; box frame construction; white washed; cottonwood shingles; 4 rooms; 12 1/2'high; 1 1/2 stories; 5 doors; 8 windows; 1 1/2 miles from Agency; erected 1870; present condition Bad; present value $150

4. "Dwelling"- Farmers Residence
   Main Building: size 17 1/2'x81'; adobe construction; painted; pine shingles; plastered; 5 rooms; 12' high; 1 story; 8 doors; 8 windows; present condition Bad
   Wing: size 15'x36 1/2'; adobe construction; painted; pine shingles; plastered; 3 rooms; 12' high; 1 story; 4 doors; 4 windows; 2 miles from Agency; erected 1870; present condition Bad; present value $500

5. "Dwelling"- Employees Quarters (attached to shops): size 14 1/2' x16'; box frame construction; cottonwood shingles; 1 room; 8 1/2' high; 1 story; 1 door; 2 windows; 1 1/2 miles from Agency; erected 1871; present condition Fair; present value $50

6. Bakery; size 16'x47'; box frame construction; painted; cottonwood shingles; 2 rooms; 8 1/2' high; 1 story; 3 doors; 6 windows; 1 1/2 miles from Agency; erected 1873; present condition Fair; present value $200

7. Shops-Blacksmith & Carpenter: size 16'x52'; box frame construction; cottonwood shingles; 2 rooms; 8 1/2' high; 1 story; 5 doors; 6 windows; 1 1/2 miles from Agency; erected 1871; present condition Fair; present value $200

8. Coal and Lime House; size 12'x31'; log slab construction; slab roofing (?); 2 rooms; 7' high; 1 story; 2 doors; 1 1/2 miles from Agency; present condition Bad

9. Log House (for use of Herders): size 14 1/2'x38'; hewn log construction; cottonwood shingles; 2 rooms; 7' high; 1 story; 3 doors; 2 windows; 3 miles from Agency; erected 1877; present condition Good; present value $100

10. School House
    Main Building: size 30'x60'; stone construction; painted; pine shingles; lathed and plastered; 8 rooms; 11'2" high; 1 1/2 stories; 15 doors; 20 windows; erected 1870 for $5,700; present condition Bad
    Addition: size 27 1/2'x45 1/2'; frame construction; white washed; pine shingles; 3 rooms; 8' high; 1 story; 6 doors; 13 windows; erected 1870; present condition Fair
    Lean to: size 11'x17'; box frame construction; white washed; pine shingles; 1 room; 7' high; 1 story; 2 doors; 2 windows; 1 1/2 miles from Agency; erected 1870; present condition Fair
    (all of the above hold a present value of $1800)

11. Store House-Commissary, Council room & Quarters; size 30'x200'; box frame construction; white washed; cottonwood shingles; Quarters lathed and plastered; 7 rooms; 10'8" high; 1 story; 19 doors; 25 windows; present condition Bad

12. Store House-Annuities, Office & Quarters: size 30'x200'; box frame construction; white washed; cottonwood shingles; quarters and office lathed and plastered; 8 rooms; 10'8" high; 15 doors; 19 windows; present condition Bad

(Note: both #11 and #12 above are also listed as being the Agency, erected in 1869 by the Military at a cost of $17,500, and having a present value of $2000)

13. Saw and Grist Mill; size 38'x48 1/2'; frame construction; cottonwood shingles; 6 rooms; 2 doors; 6 windows; 1 run of stone; 1 saw; 1 1/2 miles from the Agency; erected 1870; present condition Bad; present value $2000

Dated September 30, 1878 P. B. Hunt, U.S. Indian Agent

Kiowa Indian Agency Records
Indian Archives Division
Oklahoma Historical Society
Oklahoma City, Oklahoma

Document #7

Office, U.S. Indian Agent
Kiowa, Comanche & Wichita Agency
Anandarko, Ind Terr September 16 1880

To the
Commissioner of Indian Affairs
Washington, D.C.

Sir.

I have the honor to request the authority to issue to Indians, on proper vouchers, taking their receipts therefor, the abandoned Agency buildings near Fort Sill, excepting the two Commissary warehouses which, I suggest, it would be to the interests of the Service to tear down and dispose of the lumber for use of the Indians.

Very respectfully
Yr. obt. Servt'
PB Hunt (signature)
U.S. Indian Agent

National Archives
Letters Received, Office of Indian Affairs
Kiowa Agency
Microcopy 234
Roll 386
Item 0427

Document #8

Fort Sill, I.T.
Nov 29th 1880

Agent B.P. Hunt
Sir
I write
you to obtain permition
to occupy the Old
Commicary & Anuity
Buildings and yard
for the purpose of
a Stage Stand for
the Several lnes that
consentrate hear
I will pledge myself
to keep Buildings in
repair
For Refference H Kuhn
Yours Respectfully
I N Bailey (signature)

Kiowa Indian Agency Records
Indian Archives Division
Oklahoma Historical Society
Oklahoma City, Oklahoma

Document #9

United States Indian Service
Kiowa, Com and Wich Agency,
Anadarko I.T. Jan'y 15, 1884

To the Hon Commissioner of Indian Affairs.
Washington, D.C.

Sir:

As to the disposition of the old Agency buildings at Fort Sill mentioned in your letter of 31st Ultimo. (Accounts 21, 815 / 23, 140) I have to say, the buildings are occupied by Indians in the summer time but not in winter.

No white persons have ever been allowed to use them. At this time they are vacant and all are in a very dilapidated condition, and would not sell for any-thing scarcely if auctioned off.

The old mill might be sold which I recommend.

Two of the buildings are stone and one adobe, which would not do to move.

The balance are wood and could be issued to the Indians as they stand and they could haul off the lumber and help build houses near their fields, which I respectfully recommend.

I inclose herewith a descriptive statement of the buildings referred to.

Very respectfully
PB Hunt (signature)
U.S. Indian Agent

National Archives
Letters Received, Office of Indian Affairs
Kiowa Agency
A
1501/ 84

Document #10

Department of the Interior
Office of Indian Affairs
Washington, Jan. 26th, 1884

P.B. Hunt
U.S. Indian Agent
Kiowa, Comanche and Wichita Agency
Indian Territory

Sir:

You will issue the old buildings at Fort Sill to deserving Indians taking their receipts, except the mill, which you will advertise by written posters for a reasonable time and sell at public sale to the highest bidder, depositing the gross proceeds to the credit of the United States in the usual manner and referring to this letter as your authority in both cases. The sale can be made by yourself or some of your employe's without expense.

Respectfully,
H. Price (signature)
Commissioner

National Archives
Letters Sent, Office of Indian Affairs
Kiowa Agency
A
1501/ 84

Publications of the

Museum of the Great Plains

Mary Louise McVicker

The Writings of J. Frank Dobie: A Bibliography

"J. Frank Dobie stands as a giant among those who have served as a chronicler of the lore, the legends, and history of the southwestern prairies and deserts. The size of his work and the measure of his genius is reflected by the circumstance that an entire volume is required to merely list the sum total of his effort."—*Chronicles of Oklahoma.*

Illustrated, 258 pages, $7.95
(Limited edition, boxed, numbered, signed by author, $25.00)

Frank C. Leonhardy

Domebo: A Paleo-Indian Mammoth Kill in the Prairie-Plains

"The Domebo monograph adds new and valuable information to the minute but growing body of data on western mammoth-hunting activities in the 10th millennium B.C."—*American Antiquity.*

Illustrated, 53 pages, $2.50

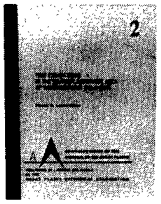
T. M. Hamilton

Early Indian Trade Guns: 1625–1775

"Hamilton has done a great service for the historical archaeologist concerned with the identification and dating of trade guns."—*Missouri Archaeologist.* "Unquestionably, a tool of considerable value for the archaeologist and historian."—*Historical Archaeology.*

Illustrated, 34 pages, $2.50

Frank C. Leonhardy



Test Excavations in the Mangum Reservoir Area of Southwestern Oklahoma

An archaeological study by the Museum of the Great Plains of sites in the Mangum Reservoir area along the Salt Fork of Red River, one site of Late Archaic age dated in the 9th century B.C., while another indicates an occupation in the 14th and 15th centuries A.D.

Illustrated, 72 pages, $1.50

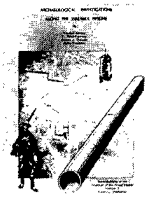
C. Ferring, D. Crouch, & T. Spivey

An Archaeological Reconnaissance of the Salt Plains Areas of Northwestern Oklahoma

A systematic study conducted in an area that is largely unknown from an archaeological perspective. Thirty-five prehistoric and three historic sites are examined and recommendations made for future investigations.

Illustrated, 136 pages, $3.65

T. Spivey, C. Ferring, D. Crouch & K. Franklin



Archaeological Investigations Along The Waurika Pipeline

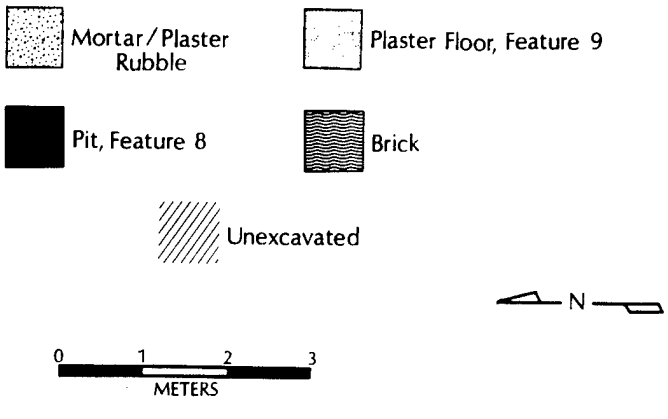
This monograph involves the reconnaissance, testing and excavation of 13 sites encountered along a pipeline right-of-way in southwest Oklahoma. The emphasis is on historic sites and a detailed study of historic artifacts is included.

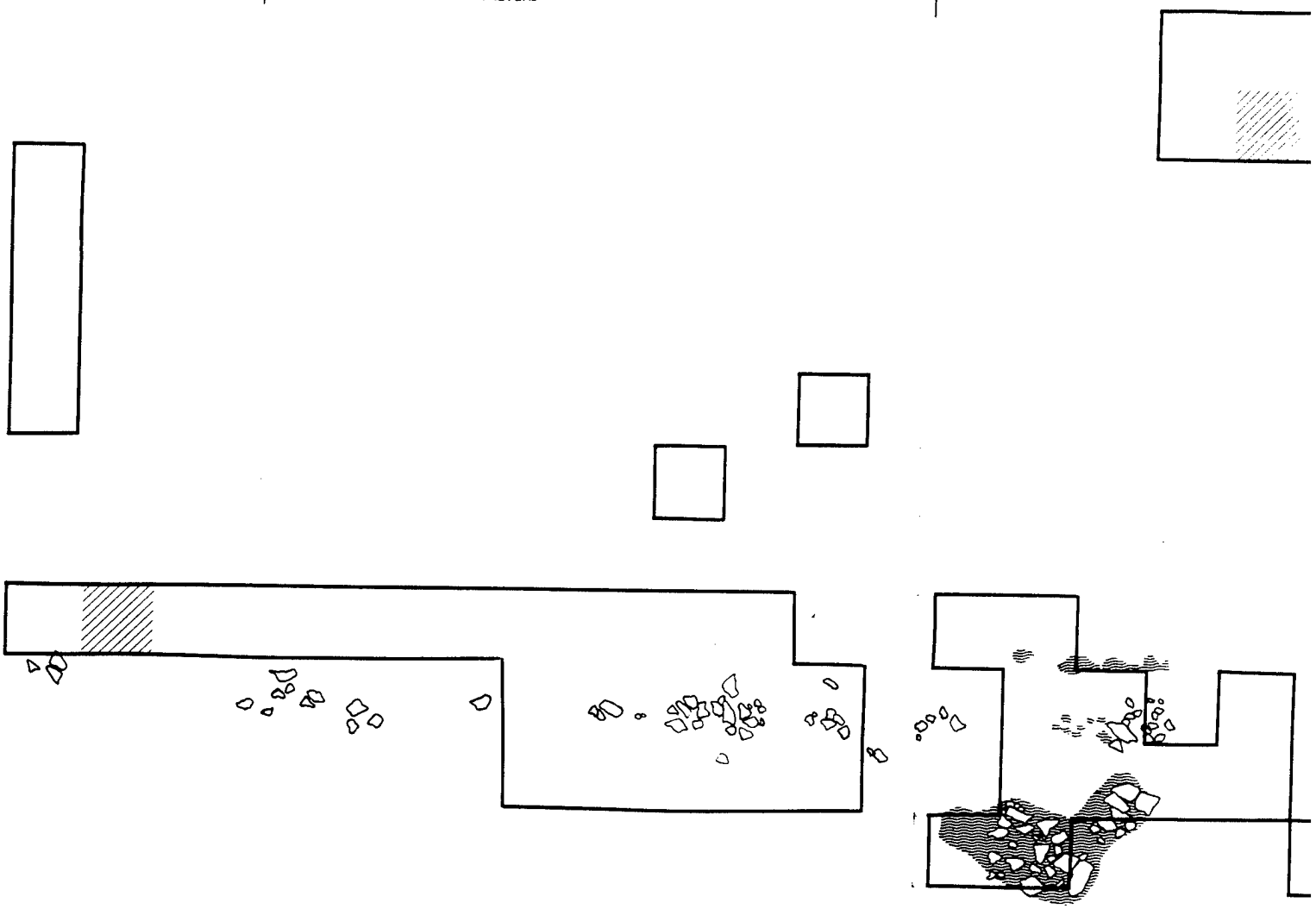
Illustrated, 381 pages, $10.50

MUSEUM OF THE GREAT PLAINS
P.O. Box 68, Lawton, OK 73502

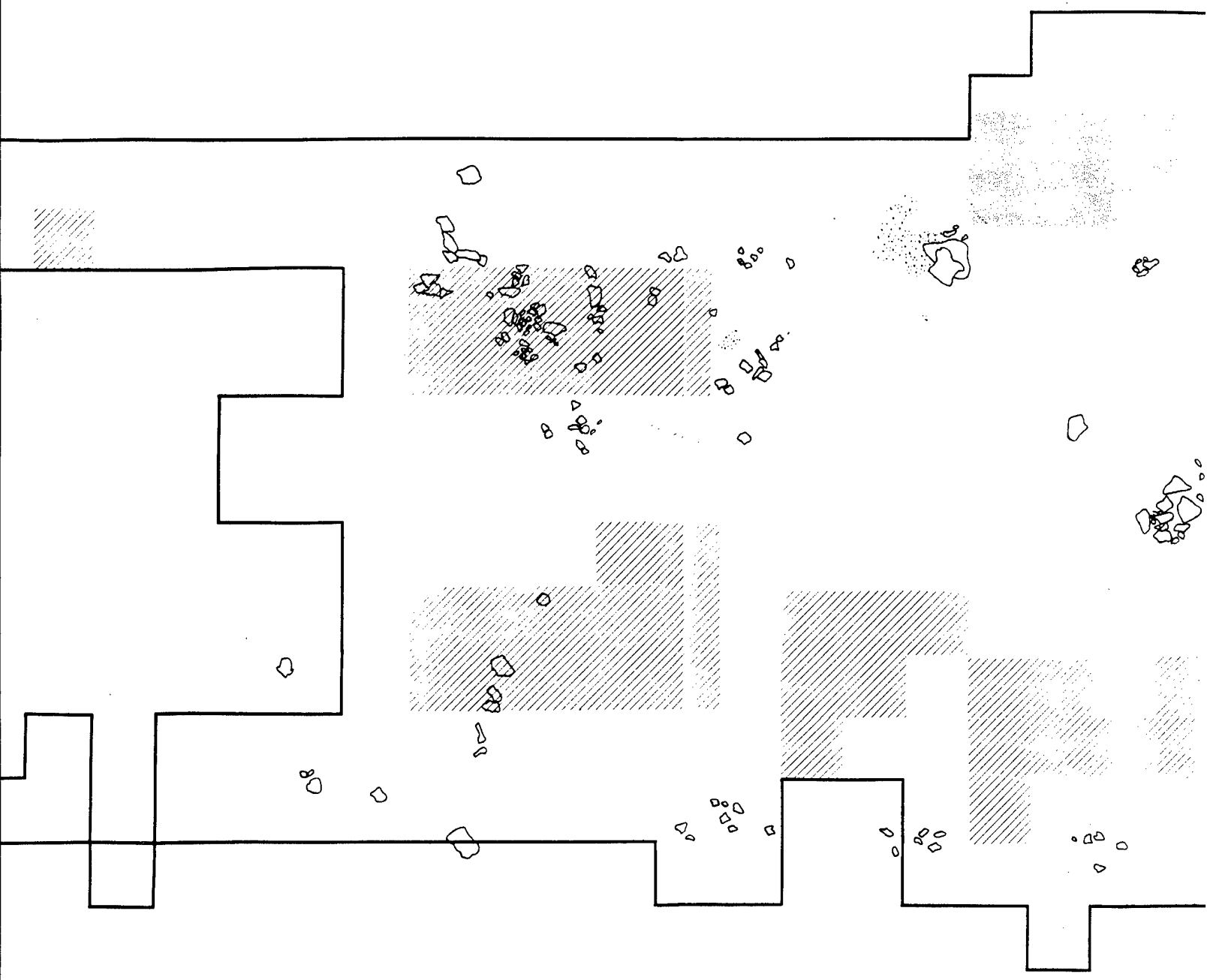
MAP 1

EXCAVATION OF WEST COMMISSARY BUILDING, CM-232

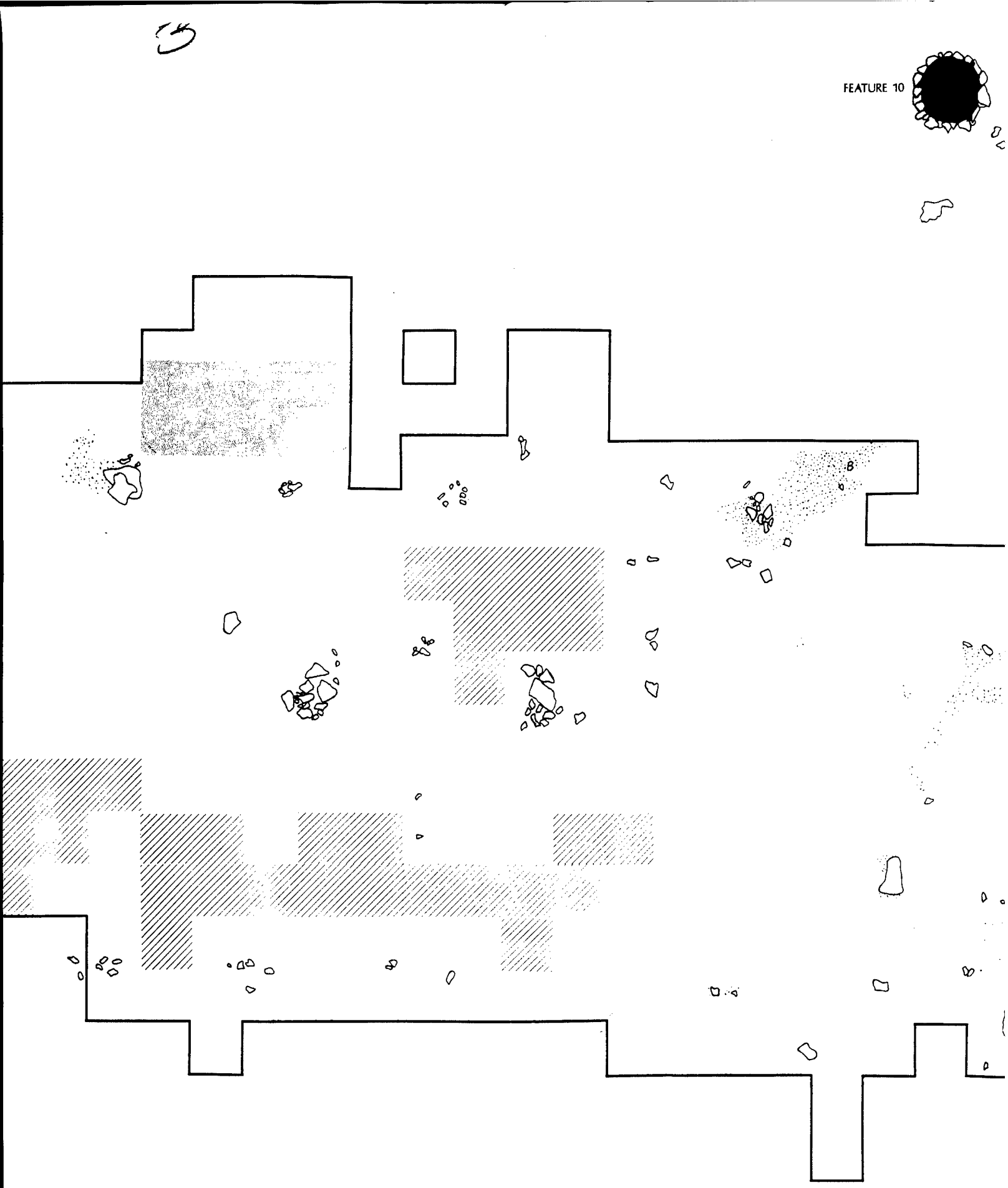




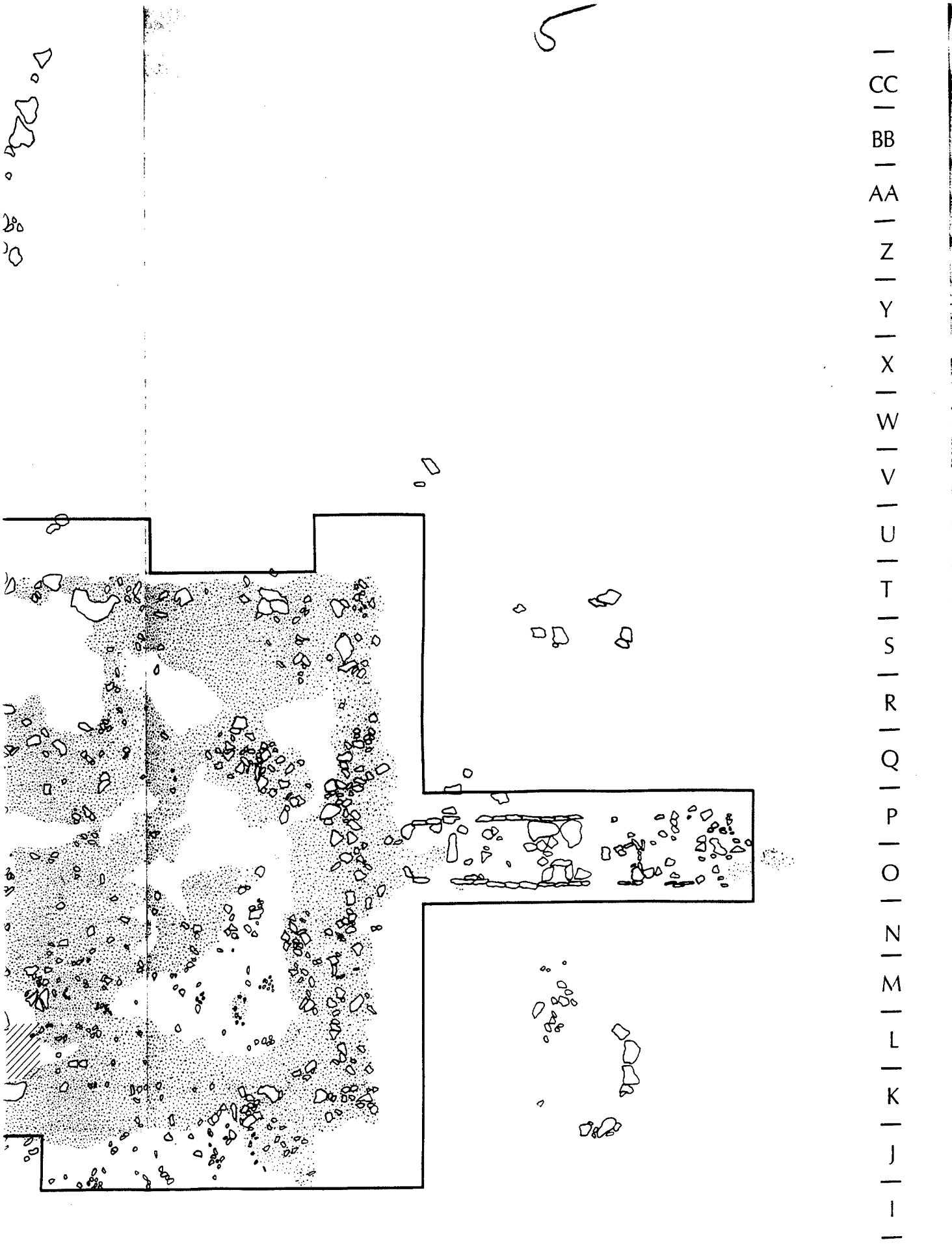
2



90 80


FEATURE 10
B
80
75
70


FEATURE 10
B
X'
80
75
70
65


CC
BB
AA
Z
Y
X
W
V
U
T
S
R
Q
P
O
N
M
L
K
J
I
60
55
50