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ARCHAEOLOGICAL INVESTIGATIONS AT LAKEVIEW LAKE: 1979
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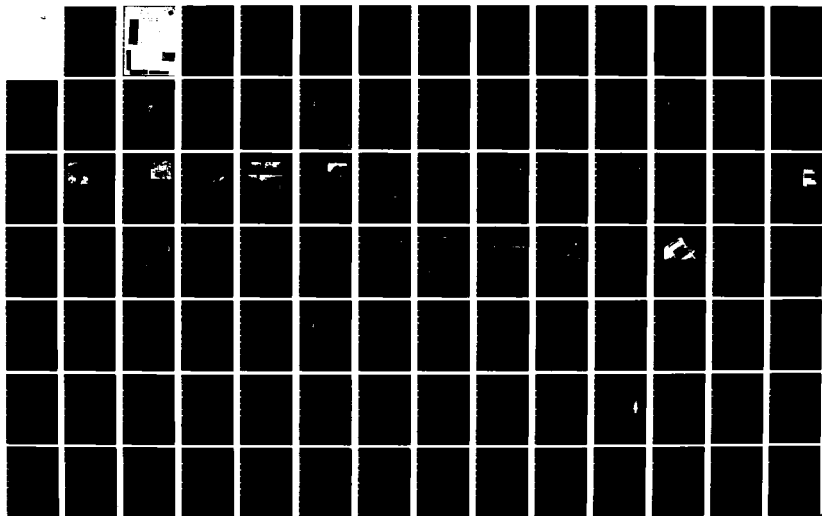
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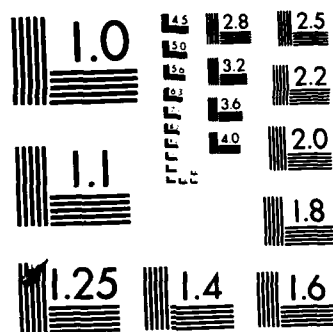
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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
	AD-A138 886	
4. TITLE (and Subtitle) Archaeological Investigations at Lakeview Lake: 1979 and 1980		5. TYPE OF REPORT & PERIOD COVERED Final 1979-1982
		6. PERFORMING ORG. REPORT NUMBER Archaeological Monographs, #2
7. AUTHOR(s) L Mark Raab, Allan J. McIntyre, James Bruseth, Daniel E. McGregor, C. Reid Ferring, and Nancy Reese		8. CONTRACT OR GRANT NUMBER(s) DACW63-78-C-009
9. PERFORMING ORGANIZATION NAME AND ADDRESS Archaeological Research Program Department of Anthropology Southern Methodist University, Dallas TX 75275		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS US Army Corps of Engineers, Fort Worth District SWFPL-R, PO Box 17300 Fort Worth, TX 76102		12. REPORT DATE Dec 1982
		13. NUMBER OF PAGES xiii and 302
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		15. SECURITY CLASS. (of this report) Unclassified
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report)		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Cultural resources testing Archaeological and Historical assessments Trinity River Basin, Texas Dallas, Tarrant, and Ellis Counties, Texas North Texas		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Testing was conducted in 1979 and 1980 on 15 prehistoric and 24 historic sites that will be impacted by the Lakeview (now Joe Pool) Dam and Lake. Results of testing revealed 5 prehistoric sites and 12 historic sites eligible for the National Register. Descriptions, procedure, and a theoretical basis for further investigations are given.		

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19. Archaeology

Prehistory

History

National Register of Historic Places

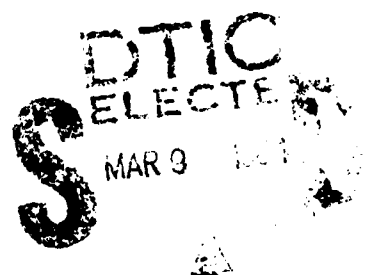
Lithic technology

Human ecology

Soil chemical analysis

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Archaeological Investigations
at
Lakeview Lake:
1979 and 1980



Archaeological Monographs, Number 2

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Archaeological Investigations at Lakeview Lake: 1979 and 1980

L. Mark Raab
Principal Investigator

Part I: Prehistoric Archaeology

L. Mark Raab
Allan J. McIntyre
James E. Bruseth
Daniel E. McGregor

Part II: Historical Archaeology

C. Reid Ferring
Nancy G. Reese

With contributions by:

Phillip Murry
David R. Pheasant
Anne Woosley
Bonnie C. Yates

Archaeology Research Program
Department of Anthropology
Southern Methodist University

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Southern Methodist University
Dallas, Texas 75275

Photo-typesetting by James E. Bruseth

1982, Archaeological Monographs, Number Two

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Acknowledgements

Archaeological research is never the product of the isolated individual. The material and intellectual divisions of labor within modern archaeology call forth contributions by many. The Lakeview researches are no exception. Many have contributed to the various phases of this project—too many to acknowledge in the space provided here—but the contributions of certain individuals require recognition and thanks. We gratefully acknowledge the assistance of these persons. We also absolve these colleagues from blame that may be due for mischief arising from interpretations of their ideas. We alone are responsible for errors of fact or interpretation.

We dedicate this report to the memory of R. King Harris. Certainly, if there was one person who believed in the importance of the archaeology of North Texas, it was King Harris. His encyclopedic knowledge and his first-hand participation in making much of archaeology's advance in the region set him apart as a most remarkable man. During his last days, King shared with us some of his ideas about the possible identity and function of sites in the Lakeview project, particularly the Cobb-Poole site. We regret that Mr. Harris did not live to see this report, for we hope that it contains results that would be pleasing to one so interested in advancing understanding of Texas archaeology.

Robert Burton deserves special recognition for efforts on behalf of the Army Corps of Engineers and his archaeological professionalism at large. As our primary professional and administrative contact with the COE, Bob smoothed the way for our work in any number of ways. He also acted as a colleague, offering substantive suggestions about research strategy and results. Also, with the COE, Southwest Division, Larry Banks offered both encouragement and substantive suggestions regarding the identity and sources of lithic raw materials from the project. Here we acknowledge his contributions as a colleague, rather than merely as an overseeing member of a governmental agency.

A number of consultants offered specific data without which questions about prehistory could scarcely be approached. Anne Woosley provided support with palynological analysis. Bonnie

Yates conducted faunal analysis for us. Dave Pheasant contributed essential geological data crucial to environmental reconstructions. Phil Murry also offered assistance with faunal analysis, particularly from an ecological perspective. Terry Jordan also receives our thanks for his comments on approaches to the historical archaeology, particularly folk architecture.

It is clear from the report that the efforts at Lakeview were a cooperative effort between Southern Methodist University (prehistoric sites) and the Institute of Applied Sciences of North Texas State University (historic sites). Kathleen Gilmore and Scott Hayes of the Institute deserve thanks for their help in contract negotiation and research administration of the historical-sites component of the work.

Alan Skinner, who conducted the first (survey) phase of work at Lakeview, was always available to share his knowledge of the project and of archaeology in North Texas. We called upon him for information from time to time, and we warmly acknowledge his unflinching willingness to help in any way he could.

Bill Young, of Corsicana, Texas, is perhaps the most knowledgeable amateur archaeologist in the region concerning the Lakeview sites. Indeed, Bill recorded many of these sites for the first time. We gratefully thank Bill for his endless enthusiasm and sharing his great knowledge of the archaeology of North Texas.

No acknowledgements are complete without recognition of those who do the hard hours of field and lab work. To these people, we extend our thanks for a job well done: Leonard Allen, Gerald Blow, Kim Coberly, Ronny Day, Linda Dorsey, Jim Garber, Marilee Irvine, Dave Jurney, Julie Kerestine, Nancy Mitchell, Jay Newman, Teresa Phalen, and Jim Rickards.

Archaeological work is often like the proverbial iceberg, in that we see the highly visible aspects of data collection. Less often do we see the efforts of those who labor to make research possible in the first place. To Mildred Haenel of the Office of Research Administration at SMU, we offer our gratitude for the administrative support so essential if we are to be free to do archaeology. We also thank Eric Brill for his fine art work, displayed in various illustrations within the report.

1

Introduction to Archaeology in the Lakeview Project

L. Mark Raab

The following report is a synthesis of archaeological investigations in the Lakeview Lake Project area. Following an archaeological survey of the project (Phase One) by Skinner and Connors (1979; see below), sequential years of test excavations (Phase Two, 1979; and Phase Three, 1980) were carried out. The results of Phase Two and Three investigations were accumulated in two annual reports (Raab, Bruseth and McIntyre 1979; Ferring and Reese 1979 and Raab, McGregor and McIntyre 1979; Ferring and Reese 1980). One of our tasks here is to synthesize the last two of years of investigation into a coherent statement. This job was made difficult because, as to be expected in any scientific enterprise, methods and objectives tended to evolve with increases in information. At the same time, however, we have attempted to keep such growth orderly by relating the investigations to central research design concepts. These are presented in detail. Some differences in approach and emphasis are apparent from one investigative stage to the next and these are an indication of changing research activities.

All of these studies were carried out under the terms of Contract No. DACW63-78-C-009 and subsequent modifications with the Army Corps of Engineers, Fort Worth District.

The fundamental objective was to harness the evolving research program mentioned above into a program that would (1) identify archaeological properties significant in relation to the criteria of eligibility for inclusion in the National Register of Historic Places, (2) formulate a reasonably clear projection of impacts of proposed construction on these properties, and (3) offer a series of resource management recommendations.

A dimension of variability in the archaeological work is the fact that work was divided between prehistoric and historic studies. The Archaeology Research Program of SMU was the prime contractor, and concerned itself with the prehistoric component of the work. The Institute of Applied Sciences of North Texas State University was a subcontractor to SMU, and investigated the historic sites. This division of labor in no way implies a value judgement about the relative merit of the two kinds of resources, but does reflect the fact that quite different kinds of expertise are at times required to deal with one or the other. The division does reflect an attempt to use differing areas of interest and expertise to best advantage. Accordingly, the report is divided into prehistoric and historic sections.

ENCAPSULATED HISTORY OF THE LAKEVIEW ARCHAEOLOGICAL PROJECT

PHASE ONE (1977-1979)

Between 1977 and 1979, the Archaeology Research Program of Southern Methodist University conducted an archaeological survey of the Lakeview project for the Army Corps of Engineers (Fort Worth District). That study, under the supervision of Dr. S. Alan Skinner (principal investigator), Dr. Mark Lynott, and Ms. Deborah T. Connors, culminated in a published report by Skinner and Connors (1979).

During the Phase One work, twenty-five historic sites and seventeen prehistoric sites were recorded. An important aspect of the survey is that it was restricted by contractual agreement to surface reconnaissance; i.e., none of the cultural resources located during Phase One was tested for subsurface remains. Consequently, it was not possible during Phase One to make reliable assessments of resource significance or recommend specific planning measures.

Two conclusions of the Phase One report (Skinner and Connors 1979) did, however, have a direct bearing on subsequent work. On an empirical level, fear was expressed (Skinner and Connors 1979:56) that cultural remains might be deeply buried in the flood plains as a result of alluviation caused by Euro-american land-clearing. The lack of test excavations during Phase One precluded any controlled data on such a possibility, but the presence of a few sites buried in the sediments of the stream banks of Mountain and Walnut Creeks urged caution, and suggested that the possibility of buried sites should be addressed in future archaeological investigations.

At the theoretical level, Skinner and Connors (1979:13-16) offered a central-based wandering model of prehistoric settlement in the project area, based on the models of Beardsley et al. (1956). Prehistoric settlement in the project area, following this model, was hypothesized (ibid: 530) to be seasonal in nature and limited by access to reliable water sources. The result, according to this view, was a prediction that prehistoric sites in the project area should be few in number and lacking in many features or heavy deposits of artifacts.

PHASE TWO (1979-80)

Phase One implicated the need for resource significance determinations as an obvious requirement of Phase Two investigations. Planning for Phase Two archaeological studies also had to take account of two other factors as well. One of these factors was related directly to project construction priorities. By the time that Phase Two studies could be scheduled (July, 1979), construction on the Lakeview Dam was imminent (October, 1979). As a result, one priority outlined in the Phase Two Scope-of-Work was testing of historic and prehistoric sites that were likely to be affected by construction activities. Testing was required to determine the possible significance of the endangered sites as soon as possible. The result, however, was

that it was not possible to stage the usual sequence of survey-testing-significance determination in a simple fashion. Although desirable to carry out appropriate testing of sites all at once, it was necessary to defer testing of some sites recorded during Phase One until some time after completion of Phase Two in the interest of meeting the objectives of the project construction schedule.

A second construction-related consideration in the second-phase work was that large "burrow" areas from which the dam's earthen fill would come were to be excavated into the flood plains of Walnut and Mountain Creeks (Figure 1-1). The concern expressed at the end of Phase One about the possibility of sites buried in the flood plains could not be ignored in view of these plans.

A two-pronged approach was planned for Phase Two on the basis of these considerations. Sixty percent of the time spent on Phase Two prehistoric work was expended on a program of subsurface testing of the flood plains for buried sites (See Chapter 4). Although the need for this work was clearly indicated, the data derived were largely of a negative sort. Six hundred twenty-five test trenches were excavated according to a statistically-determined plan within tracts totalling 340 ha (838 a) without discovering buried cultural remains. Certainly this work is reassuring with regard to fears about destruction of buried resources, but it did not increase our inventory of cultural remains. The subsurface testing program (and studies of alluviation in the project area; Raab, Bruseh, and McIntyre 1980) indicated that buried archaeological sites do not warrant further attention.

The second avenue of attack was testing of historic and prehistoric sites identified during Phase One. Archaeologists from North Texas State, as we noted earlier, entered into a subcontract with SMU to conduct testing of the historical sites (Ferring and Reese 1980). Testing and recording were carried out at four historic homesteads with standing or collapsed architecture, outbuildings, and artifact scatters (41DL181, Hintze site; 41DL182, Teodviski site; 41DL199, Poole site (not to be confused with 41DL148, the prehistoric Cobb-Poole site); 41DL196, Hintze Tenant site).

Ferring and Reese (1980) reported a variety of findings from these researches. Those authors make a strong appeal for recognition of a late Victorian archaeology in north-central Texas (Ferring and Reese 1980:278-280). Noting that archaeological attention to late 19th century and early 20th century sites has tended to be rare, owing to the relatively recent time to which these sites belong, they go on to show that a variety of important cultural data can be preserved from the study of comparatively recent sites. Work at the relatively well-preserved Poole site (41DL191), for instance, reveals a significant chronicle of changing trends in the family size, social organization, technology of farming and prosperity of a rural family, as reflected in architectural changes and material possessions. It is precisely these details, usually lost in conventional historical accounts, that provide an understanding of life in rural North-Central Texas in a time that touches on our own, but is fast fading into a purely archaeological context with the encroachment of urban-industrial society. A shift from extended family life to tenant farming is also reflected in the architectural history

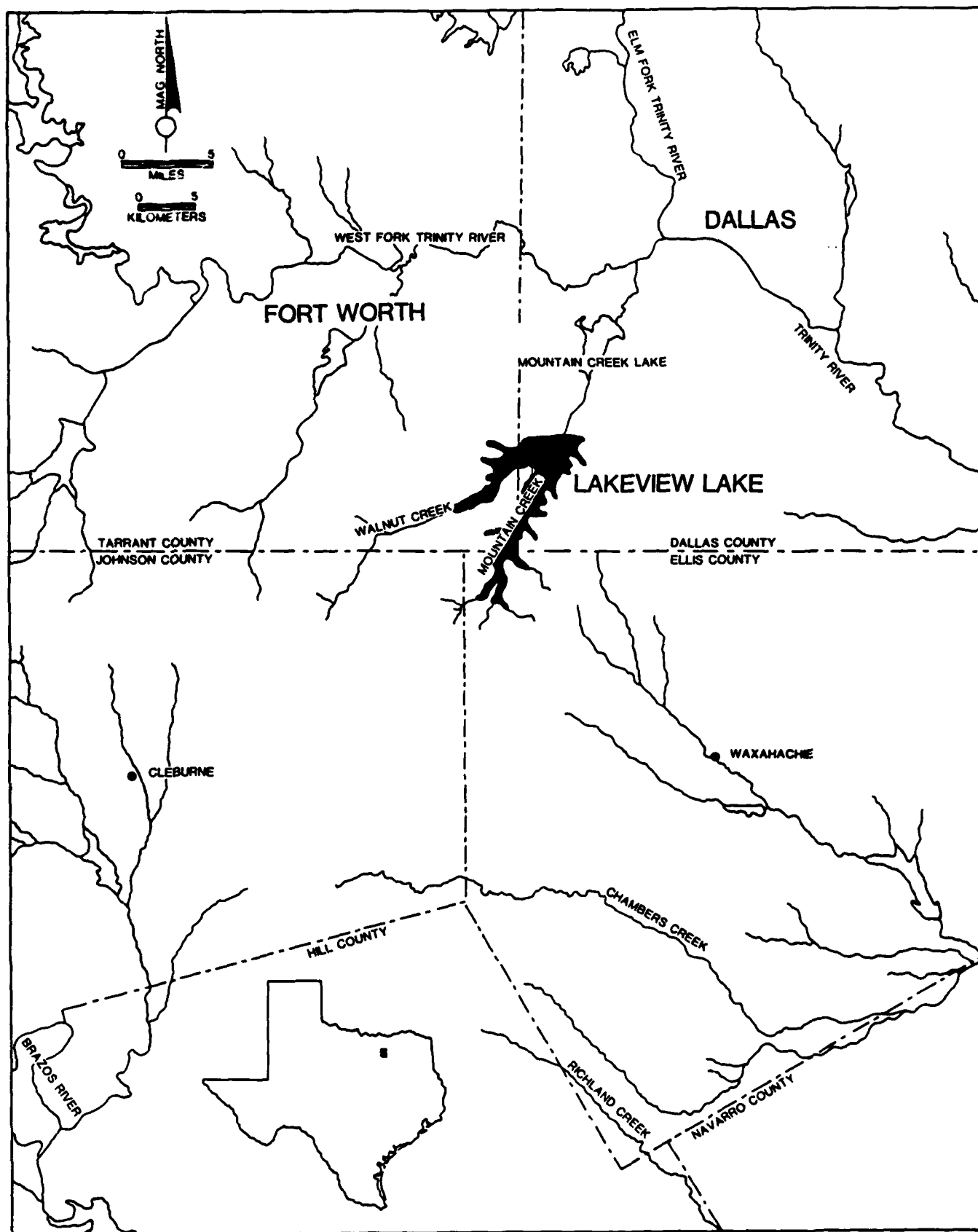


Figure 1-1. Location of Lakeview Lake in North-Central Texas.

of the Hintze site (Ferring and Reese 1980:329).

On a broader level, the Phase Two historical archaeological work suggested other significant problems. Archival data (Ferring and Reese 1980: Chapter 10) show that a variety of mid-nineteenth century homesteads were present in the project area, yet these are not represented well in standing architecture or in scatters of artifacts. It appears that much of this material will be accessible only in subsurface archaeological context. Yet another set of problems (ibid:392-397) revolved around changing land-use patterns. It appears that farming and ranching tended to promote significantly different forms of social organization, divisions of labor, economic prosperity, and other cultural expressions. Most of these differences, documented in a preliminary way during Phase Two, should be reflected archaeologically in architecture, changing size and spatial layout of sites, and consumption and discard of material items.

The principal thrust of the Phase Two work on historical sites was, once again, to direct attention to sites in early danger of destruction from construction activities and to develop more refined research objectives for possible Phase Three studies.

Four prehistoric sites were included in the Phase Two Scope-of-Work (41DL147, 41DL148, 41DL150, 41DL184) because they were located in areas to be impacted during early phases of construction. One site (41DL150) could not be relocated for testing, owing to ambiguity regarding its location. Two sites (41DL147 and 184) were found to contain few lithic (stone tool) flakes and bifacial tool fragments. These sites were determined to be potentially significant, depending upon the ability of subsequently tested sites to supply data of equal or better quality in relation to a stated research design serving as a standard for significance determinations (Raab, Bruseth, and McIntyre 1980). One site, Cobb-Poole (41DL148), was found to be definitely significant. That determination rests upon the presence of a well-preserved site containing a possible pithouse structure and associated features and refuse deposits dating to the Neo-American Stage (ca. A.D. 800 to 1200, based on

ceramics present in the site). Moreover, the site was shown (Raab, Bruseth, and McIntyre 1980; Chapters 3, 5, and 6) to contain important paleoenvironmental data in the form of a well-preserved pollen record. The data available from test excavations at the Cobb-Poole site suggest that it was part of a settlement pattern based on exploitation of a range of resources provided by greater effective moisture than is seen in the project area today. It should be noted here that this understanding is in marked contrast to the model offered by Skinner and Connors (1979:53); i.e., transitory settlement necessitated by lack of reliable water sources.

PHASE THREE (1980-81)

With these considerations in mind, Phase Three studies were undertaken in March, 1980 with the objective of test excavating the remainder of the sites found during the Phase One survey (sites that could not be tested during Phase Two for the reasons outlined above) but with the objective of clarifying and extending the research findings of Phase Two.

In the prehistoric studies, one site, 41DL149 (Baggett Branch) was found to be a "sister" to the Cobb-Poole site, opening up potential for understanding the late prehistoric settlement pattern in the project. A number of advances were also made in understanding Archaic Stage sites over what was known from Phase Two. Particularly important here were 41DL189 and 41DL199. Both of these sites contained buried lithics and faunal materials. Site 41DL189 also indicated a potential for correlating long-term depositional records and pollen to yield a paleoenvironmental record of the Archaic Stage.

Historic researches continued in the gathering of archaeological materials (i.e., buried deposits), architectural and archival data from 23 sites.

Part One: Prehistoric Archaeology

Contributors:

**L. Mark Raab
Allan J. McIntyre
James E. Bruseth
Daniel E. McGregor**

2

A Consideration of Theoretical Objectives

BACKGROUND CONSIDERATIONS

During the last decade, a number of large-scale archaeological projects have been conducted in North Central Texas as part of environmental planning studies. Issues that should be considered in planning future archaeological work within the Lakeview Project area, and within North Central Texas generally, are raised by these investigations. Most notably, recent reports (Dawson and Sullivan 1973:48; Lynott 1975:13-18; Lynott and Peter 1977:21-26; Skinner et al. 1978:15-24; Skinner and Connors 1979:13-16) express a desire to advance archaeological studies beyond the level of analysis afforded by the region's rudimentary culture-historical frameworks (summarized by Lynott 1977:39-129).

The scientific objectives of the reports cited above are to explain patterns of prehistoric settlement and subsistence. In recent reports (Skinner et al. 1978:15-24; Skinner et al. 1979:18-21), those objects are advanced in a formal model of hunter-gatherer settlement derived from Beardsley et al. (1956). Ignoring the specific theoretical and methodological implications of that model for the time being, we should recognize that such an approach is in keeping with a major emphasis of modern archaeological studies. Investigation of human settlement-

subsistence patterns has become virtually paradigmatic in archaeology for it offers a strategic vantage point for observing and explaining past human behavior. The conceptual level of these studies allows formulation of a wide and productive range of archaeological questions. These questions have great utility for archaeological science and the environmental planning process.

As we note in Chapter 8, the significance of prehistoric archaeological resources frequently is assessed best in relation to scientific utility. That is, resources are assessed in relation to their potential to answer important scientific questions about prehistory (Criterion 4 of the criteria for eligibility for inclusion in the *National Register of Historic Places*, 36 *Code of Federal Regulations* (CFR) 800.10). Settlement-subsistence studies provide a strategic point of attack on important scientific questions. An ability to understand factors that conditioned patterns of prehistoric settlement, for instance, have an immediate bearing on understanding important variables of human behavior such as technology, social organization, and economy.

Questions of this sort also have a direct benefit to environmental planners. An understanding of past human behavior, particularly at a regional level, should result in improved prediction of the kind and quantity of archaeological resources to

be affected by construction projects. Moreover, an ability to identify clearly the scientific importance of threatened resources allows more informed policies regarding resource protection measures.

It should be apparent that both scientific and management needs can be met through well thought-out, carefully planned scientific studies. This means that the process of scientific investigation from formulation of theoretical objectives to final reporting of results must be given careful consideration and planning. The need here, in a single term, is for adequate research design (cf. Vivian et al. 1977:70-73; Raab 1977; Goodyear, Raab and Klinger 1978).

Archaeologists also operate within a variety of scientific approaches. Some archaeologists committed to a strict empirical position may mistake formulating an explicit research design for unwarranted speculation. In the research design that follows we do indeed speculate about the nature of certain aspects of prehistoric settlement and subsistence in the Project area, but this we do from a foundation of facts and with the clear objective of empirical evaluation of our ideas. Speculation in this sense is not only a permissible scientific procedure but an essential one. Although offered in a different context of investigation, Thomas (1979:137) makes that point in suggesting that

...speculation has always played a vital role in the scientific enterprise, as long as (1) speculations are clearly labeled and (2) they do not take the place of hard-nosed hypothesis testing. Hypotheses can be derived, of course, from anywhere, and science provides no canons governing the genesis of good ideas... In each case we speculate in order to provide suggestions for further research and all such speculation ultimately requires rigid scrutiny in the unflattering light of new, independent evidence.

Furthermore, as regards the utility of research design, one of us (Raab 1977) points out elsewhere that research designs provide a way of "thinking out loud" that is valuable to contract archaeologists as a means of scientific communication, justifying significance determinations, project planning, and acting as a catalyst to successive cycles of increasingly focused research.

MIDDLE RANGE THEORY

Over a decade ago, before the impact of contract archaeology, Struiver (1968, 1971) drew attention to an increasing desire on the part of archaeologists to study broad, regional problems of culture process. He noted that attainment of that goal would require larger sums of money and more adequate forms of research organization. The growth of contract research during the last decade has gone a long way toward meeting both of these needs (Goodyear, Raab and Klinger 1978). We find, however, that even with more money and better institutional support, innovative research is still being blocked by lack of an important ingredient: theory development.

Contract archaeology provides an opportunity to develop badly needed scientific theory. Much of the country remains an archaeological *terra incognita*. In many instances superficial culture-historical schemes constitute the existing information, providing little from which to derive behaviorally meaningful

research topics. Although refinement of culture-historical frameworks unquestionably remains an important research goal, passive reliance on these schemes too often leads to aimless description. At another extreme, formulation of "processual models" that are largely abstract rhetorical devices unconnected in any essential way to the data at hand, do not lead to genuine scientific advance. An alternative to both extremes is a conscious attempt to develop theory at a strategic middle range of application. Middle range theory may be characterized as

...those constructs with assumptions and propositions whose applications can be examined *empirically*, but which are sufficiently *general* to be incorporated into ever broader generalizations. As a strategy of explanation, MRT (Middle Range Theory) stands in contrast to both descriptively oriented studies aimed at fact-finding and the total theoretical system approach, which assumes that a unified and comprehensive theoretical system can be produced without a prior period of theory building and refinement (Goodyear, Raab and Klinger 1978:161-162).

With regard to *content*, middle range theory (Binford 1977:6-7; Thomas 1979:395) should be aimed at translating static archaeological facts (the remains of now-dead systems of human behavior) into behavioral dynamics for specific segments of the archaeological record. In the broadest sense this means accounting for the formation processes of the archaeological record by developing theoretical ideas that will allow archaeologists to extract the human behavioral component of these processes. In the present context attempts to isolate the behavior patterns of prehistoric hunter-gatherers and horticulturalists in the Lakeview Project would constitute a significant problem of middle range theory development.

We can now consider factors with which a research design aimed at middle range theory of this kind must contend. In this way we hope to put the proposed research design in a context that will allow it to be better evaluated.

SETTLEMENT-SUBSISTENCE STUDIES AND THEIR PROBLEMS

As archaeologists have moved away from emphasis on chronology and artifact taxonomy to more behaviorally relevant topics, settlement-subsistence studies have grown in popularity. That trend is particularly apparent in the study of band-level hunter-gatherers (HGs) of both the past (e.g., Winters 1969; Lee 1968; Jochim 1976; Frison 1977) and the present (e.g., Yellen 1977; Binford 1978a, 1978b, 1980; Gould 1978).

Moreover, these investigations frequently follow the earlier lead of Binford and Binford (1966) and Binford (1973) in seeking to differentiate settlement types of HGs into a broad, functional dichotomy of maintenance (base camp) sites and extraction sites. The former sites are conceived to be relatively permanent camps where the whole social group assembles to carry out such "maintenance" (i.e., economic) activities as tool manufacture and repair and food storage and preparation. By way of contrast, extraction (synonymously, temporary-use, specialized-use) sites represent short-term occupations by individuals or task groups involved in "extracting" a specific resource from the group's effective environment. Extraction sites might be created, for instance, by killing and butchering

animals, gathering plant foods, and working stone raw materials into tools.

The essential objective of method and theory in these studies is to differentiate effectively sites into functional categories or at least convincingly assign sites to a position along a functional continuum between base and extraction settlements, thereby accounting for variation in tool types, features, food remains, and other archaeological "outputs." It should be obvious that success in this task, even modest success, confers considerable benefits; but it should be equally obvious that this task is a difficult one in the extreme. Settlement-subsistence studies present a vexing combination of theoretical, methodological, and empirical problems that must be overcome if coherent, predictive models of past behavior are to be developed. While many of the problems involved here are becoming better understood (e.g., Binford 1977, 1978a, 1978b, 1980; Wobst 1977; House and Wogaman 1978; Yellen 1977), a number of difficulties intrinsic to HG settlement-subsistence studies are sometimes overlooked. In these instances the outcomes frequently range from data that cannot be connected in any systematic way to theoretical expectations to instances where conclusions are more the result of the "data hammer" than the force of logic. Again, a better appreciation of the problems involved in the study of HG settlement-subsistence will not guarantee better research, but it should be helpful in pointing to problems in need of solution.

The following conditions present significant stumbling blocks to reconstruction of prehistoric settlement and subsistence:

1. *Reconstruction of the effective environment.* It is obvious that any attempt to predict past human subsistence behavior depends directly on information about the effective environment of those populations whether they are HGs and/or agriculturalists. It is not as clear perhaps what kind of information that kind of reconstruction should include or the degree of specificity that should be entailed. And, of course, the quality and quantity of environmental data, past and present, are quite variable topically and regionally.

Nevertheless, from a research design perspective, there are difficulties that the researcher should attempt to avoid. Principal among those problems is uncritical acceptance of basic assumptions. Assumptions regarding prehistoric settlement patterns and the availability of water in the Lakeview Project area are an example. As we see in Chapter 6, implicit assumptions about the past environment of the area based on current availability of water probably yields a highly distorted view of the past environment. In most areas a great deal of background information on water, soils, flora, fauna, and other environmental variables is available. Unfortunately, this information is usually dispersed in many disparate, specialized sources. Archaeologists need to become familiar with sources of background data and take the time to collect and synthesize this information if they wish to use environmental variables in their analyses.

The critical point of concern here is collecting information of sufficient specificity to generate reasonably precise test expectations. One reason that some settlement-subsistence models do not yield reasonable test results is that environmental variables are presented in such broad form that they cannot reveal patterns of settlement variability that might be apparent at finer levels of

environmental resolution. This problem is not an invitation to over interpret or place undue emphasis on "ecofacts" but is cause to gather and synthesize environmental data carefully.

2. *The myth of cultural stability.* Some conceptions of culture, particularly as applied to archaeology, may well promote unrealistically simplistic expectations about the stability of human behavior patterns. A number of recent analyses suggest that studies of HGs are specifically hindered by this problem. Stuart (1977) points out, for instance, that ethnographic descriptions of HGs often fail to account for a wide range of flexible, expedient behaviors, and great variability in how people actually organize themselves to deal with contingent circumstances. This point is made even more forcefully by Wobst (1978:306):

Thus, ethnographic field work may dichotomize the continuum of spatial process among hunter-gatherers into populations surrounded by boundaries, regardless of whether these boundaries have behavioral significance or not. Instead of these boundaries, ethnographic field work posits a set of personnel that shares patterns of behavior to a significant degree. And at the "boundary" itself, a marked discontinuity in behavior is expected. As a result, spatial variability is reduced, pattern and homogeneity are artificially produced or exaggerated, and "cultures" and "societies" are created.

At the archaeological level, Binford (1978b:456-457) criticizes a similar abuse, pointing to certain concepts of culture as the cause. According to his characterization of the problem, culture is conceived as a "design for living" or set of norms of behavior shared by a group of people. Since all members of the group share this "mental template," one would expect, accordingly to this logic, to find great regularity in patterns of behavior, including the behavior that results in manufacture of artifacts according to certain morphological styles and the activities that create assemblages of artifacts. In his study of contemporary HGs Binford finds (Binford and Bertram 1977; Binford 1978a, 1978b), however, that sharing a culture actually results in wide variability of behavior rather than a tendency toward simple pattern recurrence and results in wide variability in the sorts of archaeological remains that are created by the same "culture" as a result of these behaviors.

Binford's work is actually part of a broader criticism of archaeological culture concepts and their distortion of behavioral reality through oversimplification at both ethnographic (Bennett 1976; Boehm 1978) and archaeological levels (Binford 1978b; Cordell and Plog 1979; Dunnell 1978; Dumond 1978). There is growing appreciation in this body of criticism that behavioral analyses must recognize that human behavior is strongly goal-oriented through mechanisms variously described as "teleology" (Binford 1978b), "strategies" of adaptation (Cordell and Plog 1979), and "rational preselection" (Boehm 1978). The basic idea here is that HGs have definite settlement-subsistence strategies; but how they attempt to actually carry out these strategies is highly variable depending on a broad range of contingent factors such as resource locations, the bulk of the resource being sought, means of resource transport and storage, size of the task group, seasonal variation in temperature conditions, and many others (see Binford 1978b and 1980 for a detailed analysis of the interplay of contingencies affecting a HG group). Archaeologically, the result of these behaviors is likely to be a highly variable set of remains that defy simple

categorization.

What have these observations to do with settlement-subsistence studies in the Lakeview Project area? These observations suggest that reconstruction of HG settlement-subsistence at Lakeview—or anywhere else for that matter—will have to be based on models that address themselves to the possible goals of past behavior, the means by which these goals may have been pursued, the environmental setting of the behaviors, and the archaeological “outputs” of these goals and means of resource procurement. Some archaeological implications of such models are discussed specifically under Points 3 and 4 below.

These observations also suggest that design of research for possible future work at Lakeview should attempt to avoid an increasing tendency to reify the dichotomy between base camps and extraction sites. That dichotomy has been invoked so frequently (e.g., Lynott and Peter 1977; Skinner et al. 1978, 1980; Skinner and Connors 1979) that it is in danger of becoming an archaeological fact rather than a working hypothesis. It is important to avoid slipping into the implicit assumption that this dichotomy is real and then forcing the available data to fit the celebrated Procrustean Bed. The main point here is that the Lakeview Project provides an opportunity to assess the degree to which the base camp/extraction site continuum actually serves any useful purpose in modeling the behavior of HGs. This is an opportunity to assess whether the idea of a dichotomous settlement pattern is really the expression of an overly simplistic concept of HG behavior or a framework for building useful theory.

3. Site formation processes. A major obstacle facing the study of prehistoric HGs is lack of sufficiently detailed behavioral expectations in regard to how behavior should be reflected in archaeological remains. This difficulty bears directly on the issue of site formation processes.

We noted above that the ability to distinguish recurrent patterns of behavior from confusing behavioral variability requires some notion of the goals that behavior may have been oriented toward and the environmental context of the behavior. If one can specify an objective of behavior, and given certain constraints that goal-directed behavior must conform to, it may be possible to specify behavioral consequences. Second, these behaviors might be expected to produce certain patterns of archaeological remains, again given certain constraints on these processes. Both processes lead to the formation of static archaeological records that reflect a dynamic set of factors in the past.

The reason for attempting these admittedly difficult “flow” (*sensu* Schiffer 1972) models of behavior is the dim prospect that models based solely on broad comparative categories of artifacts will result in significant pattern recognition (cf. Gallagher 1978; Mallouf 1978) beyond a quite superficial level. Accordingly, the research design that follows in the second half of this chapter is aimed, in part, at developing specific flow models related to the use of stone tools in the prehistoric sites at Lakeview.

4. Archaeological visibility. It is apparent that not all behavior produces a detectable record. In the case of HGs some forms of behavior produce so few material remains that the latter are found by the archaeologist infrequently at best. Yellen

(1977:78), for instance, points to this problem in studying the material remains produced by !Kung groups of Africa.

This problem has important implications for settlement-subsistence studies. It may well be that a great deal of behavior devoted to extraction of particular resources, while it represents a large proportion of the total behavioral repertoire, produces archaeological records that are virtually never recorded. Examples of this phenomenon might include killing and butchering animals, gathering plant foods, cultivating a garden plot, or seining fish from a stream. The result is that only sites with a relatively large quantity of artifacts will be recorded because these are above the *threshold of archaeological visibility* (i.e., above the level of current site detection methods and within the scope of current definitions of what constitutes a “site”). If only relatively large, artifact-rich sites are used to generate settlement-subsistence models, it is hardly remarkable that in many cases sites are not amenable to reasonable separation into so-called base camps and extraction sites. It may be that severe violence is done to the data by attempting to force sites from a narrow segment of the whole functional range to fit an analytical model that presupposes a wide spectrum of settlement-subsistence variability.

The problem of archaeological visibility also indicates the danger of a purely inductive approach to model building. “Purely inductive” in this case means looking only at recorded sites in order to generate expectations regarding the whole range of variability in site types. In most cases it is impossible to know on strictly empirical grounds what the range of variability in site types actually is. Too often, however, investigators declare their aim to be functional analysis of settlement but, in fact, focus their attention on finding and reporting only the large, stratified, or artifact-rich sites. Frequently small sites, the kind that probably represent extraction sites such as small lithic scatters, are not detected at all or, if they are found, not recorded because they are not “worthwhile” sites. It goes without saying, however, that the *behavioral* and, consequently, scientific potential of sites bears no automatic relationship to size or artifact density. This observation is of course not an argument that archaeologists ought to ignore the more visible sites; it is an argument for attempting to locate and record the widest possible range of site types.

One can appreciate the problem of attempting to define the whole range of site variability on empirical grounds in the face of an (almost inevitably) incomplete archaeological inventory of site types. One possible solution to this problem that might be considered within the scope of research design is development of *baseline data* on settlement-subsistence variation through experimental archaeology. If arguments can be made that certain types of sites will be distinguishable, say, by the technological features of stone tools likely to be found on them, these technological features can be simulated to see what we ought to find in the empirical world. Experimental work with lithics is a particularly promising avenue of research in this regard. In the research design section of this chapter some baseline criteria for differentiation of sites according to replicative and empirical work with lithics will be presented. By these means, it may be possible to make testable inferences about components of settlement-subsistence systems that are difficult to formulate on

purely empirical grounds.

A PROPOSED RESEARCH DESIGN

Two basic problem domains offer a useful basis for planning future archaeological investigations in the Lakeview Project. These areas of study are: (1) more adequate reconstruction of the effective prehistoric environment, and (2) more adequate models for assessing functional differentiation of sites within settlement-subsistence systems. The data presented in earlier chapters indicate that these topics are pertinent to scientific data contained in prehistoric sites in the Project area. Moreover, the problem domains reflect an effort on our part to advance solutions to key theoretical and methodological problems of demonstrated interest to archaeological scientists at both regional and disciplinary levels.

Before proceeding, however, it might be helpful to identify some important theoretical and methodological issues involved in formulating hypotheses about the settlement systems of HGs in the Lakeview area. Two immediate areas of concern, following the problem domains above, are the kinds of predictions that one can make about settlement patterns on the basis of environmental data and methods for testing such predictions with lithic studies.

At a theoretical level, one can view a settlement system as a series of interactive parts, the structure of which system reflects attempts to deal with the distribution of subsistence resources. A simple but significant distinction can be made between settlement strategies that operate by moving people to resources and ones that move resources to consumers. As fundamental as such a distinction may be, a number of important archaeological implications follow from it.

It may be that the first strategy is most effective in environments where resource locations tend to be stable and predictable (e.g., permanent water sources, plant communities, and the territories of nonmigratory animals such as the white-tailed deer); and a relatively long growing season provides a variety of resources through most of the annual cycle. Binford (1980) has recently characterized this kind of pattern as a "foraging" adaptation. Some of the possible archaeological correlates of this pattern are worth attention. If HG groups were "mapping onto" seasonal, spatially discrete resources through a cycle of residential moves, one likely result is frequent site reoccupation. Over long periods of time, reoccupation would result in relatively visible but confusing archaeological records because of successive occupation episodes overlapping, disturbing, and obscuring previous visits to sites. Under these circumstances, it might be quite difficult to observe meaningful spatial patterning of artifact distributions on an *intrasite* basis. Furthermore, if the whole social unit is moving from one seasonal camp to another, it may be reasonable to expect a relatively broad array of socioeconomic activities to be repeated from site to site. If resources can be obtained at or near site locations, one might expect to find few or no "extraction" sites if the latter are taken to be sites with a restricted inventory of technological attributes. Predictions regarding likely degrees of site functional specialization are clearly dependent upon knowledge of the effective

environment. Suffice it to say, however, that one can imagine circumstances that would produce relatively little *intersite* variability in the archaeological record, certainly so when compared to interpretations of HG settlement patterns that assume sites are sharply differentiated on the basis of function and size.

At the same time, however, a relatively great degree of settlement differentiation may be a salient aspect of some HG adaptations of the type that Binford (1980) characterizes as "collectors." Under certain environmental conditions, it may be advantageous to emphasize movement of resources from points of procurement to consumers. Citing Eskimo hunters as one example of such an adaptation, Binford (1978a, 1978b, 1980) stresses the settlement consequences of a strategy whereby task groups locate, procure, process, and transport resources intended for use by the whole social unit. The point stressed here is the organizational characteristics of such an adaptation. The process of moving substantial resources to consumers involves a "logistical" mode of organization, i.e., placement of sites at the location of the resource being sought and selection of specific technologies for accomplishing the desired tasks. The result is a series of relatively small, transient, and technologically specialized sites. The above properties generally tend to produce sites of relatively low archaeological visibility and a relatively broad range of socioeconomic variability between sites within the whole settlement system. In many respects this pattern is the one that many archaeologists are seemingly attempting to verify through "testing" models based on the dichotomy between base camps and extraction sites.

The "restricted wandering" and "central-based wandering" models adopted from Beardsley et al. (1956), as extensively adapted to previous settlement pattern studies in North Central Texas (Skinner et al. 1978; Skinner et al. 1980), are not so much "wrong" as they are incapable of providing much coherent guidance in constructing testable, productive theories of settlement. The Beardsley model, for instance, is actually a series of definitions or type descriptions of settlement. That model provides little indication of the *environmental conditions under which we might expect certain kinds of socioeconomic strategies*. The Beardsley model also perpetuates the idea that settlement phenomena can be conceived as essentially a single developmental continuum from a state of "free wandering" to sedentary society. Unfortunately, that concept offers little insight into causal connections between the organizational properties of the environment, technology, social organization, and other variables or the means by which such connections might be tested.

The Lakeview Project offers an opportunity to assess the dynamics of HG settlement patterns. It may be useful to determine if sites in the Lakeview Project can be used to develop a model that accounts for a dynamic relationship between environment, technology, and other variables. A basic question of interest here is one related to the suggestion by Skinner and Connors (1979:51-53) that the Lakeview area was not a permanently inhabited area prehistorically but an area used intermittently by HGs. The question raised by this conjecture is what we might expect of the settlement patterns of intrusive groups. That is, if the archaeological record in the Lakeview area

reflects the remains of mobile HGs who entered the area to procure, process, and remove resources, would we expect a settlement pattern more like that of foragers or logistically organized collectors?

It should be reasonably clear from the foregoing discussion that predictions regarding the nature of settlement in the Project area require the best available information on resources and environmental conditions. It is equally clear that detailed data on the prehistoric Lakeview environment are scarce. There is little basis at present for identifying the kinds of resources in the prehistoric environment that might have made foraging expeditions in the Project area more likely than resident settlement, or whether both patterns obtained to some degree. On the basis of the evidence presented in Chapter 7 concerning the availability of water, it seems to us that a transient settlement pattern may not have been obligatory as suggested by Skinner and Connors (1979). Subsequent work in the Project area may reflect a longstanding resident population. We see no reason why prehistoric settlement at Lakeview cannot reflect a longstanding pattern similar to Binford's "forager" type, i.e., indicative of a stable seasonal round of settlement involving high rates of site reoccupation and relatively low technological variation between sites. This notion may be advanced as an alternate hypothesis to the conjecture by Skinner and Connors. Both hypotheses would

offer a useful point of departure for tying together information on the effective environment and data on the form and function of settlement patterns.

In Chapter 5 we stress the role of lithic analysis as the bulwark of attempts to reconstruct HG settlement patterns. At the level of hypothesis formulation in the Lakeview Project, we can identify two complementary methods of analysis by which settlement studies can be carried out. The first of these methods is examination of *manufacturing-related* variability in lithic artifacts as an indicator of settlement variability. The second method is *use-related* variability in lithics as an indicator of variability in settlement. Chapter 5 reviews a number of approaches to gauging site variability based on differences in the extent to which bifacial manufacturing has occurred at a site. Manufacturing related criteria of site use are relatively well developed though by no means free of difficulties. Studies of use-related variability in lithics have been less common even though such an approach offers a means of dealing with the whole range of behaviors (presumably across site types) related to use of stone tools once they come into existence after being manufactured. Attempts to deal with the "flow" of tools through a settlement system during their use-lives are certainly warranted if we are to understand relationships between tool use and settlement.

3

Site Descriptions

A note on testing methodology may be in order. Each of the prehistoric sites tested in the Lakeview Project is described below, with specific reference to methodological approaches employed at each site. In general, however, testing was designed to recover a maximum of information with a minimum of adverse impact on the sites. That objective required a flexible approach that matched a set of specific techniques to the character of the site at hand. Excavation methods ranging from small, shovel-dug tests to test pits to backhoe trenches were employed. The specific combinations of these techniques were dictated by site specific objectives, indicated below. All excavated earthen "matrix" was passed through 6 mm (¼ in.) screen, except where specific sampling methods were used in addition. Virtually all of the soils encountered in the project are Blackland Prairie clays. These soils are difficult to deal with in the extreme. When dry, these soils become quite indurated, making it difficult at times to work through them even with a pick. When wet, these same soils become extremely sticky, tending to form stiff lumps of soil that adhere to any kind of tools.

Consequently, soils from large exposures such as backhoe trenches were sometimes exposed for periods of time to rain, before they were examined in detail for artifacts, color changes, and other signs of cultural remains. For processing of large

volumes of soils, the 6 mm screens were usually the smallest mesh size that could be employed in any practical fashion. In all cases, the sampling methods and rationales are indicated in the site descriptions and analytical sections of the report. All information was recorded on standard record forms, in field notes, and on photographs. These materials are on file at Southern Methodist University, along with artifact collections, and are available to all qualified investigators.

41DL147 (1979)

ENVIRONMENTAL SETTING

This site was originally recorded in 1940 by R.K. Harris and T.B. Gwinn and identified as a prehistoric camp located on a floodplain knoll near Mountain Creek. Artifacts observed on the surface of the site included mussel shell, arrow points, and lithic blades. This locality was relocated during the 1977 survey of the lake area (Skinner and Connors 1979:37), but no artifacts were found on the surface. The site was recommended for subsurface testing to confirm the existence of an archaeological deposit.

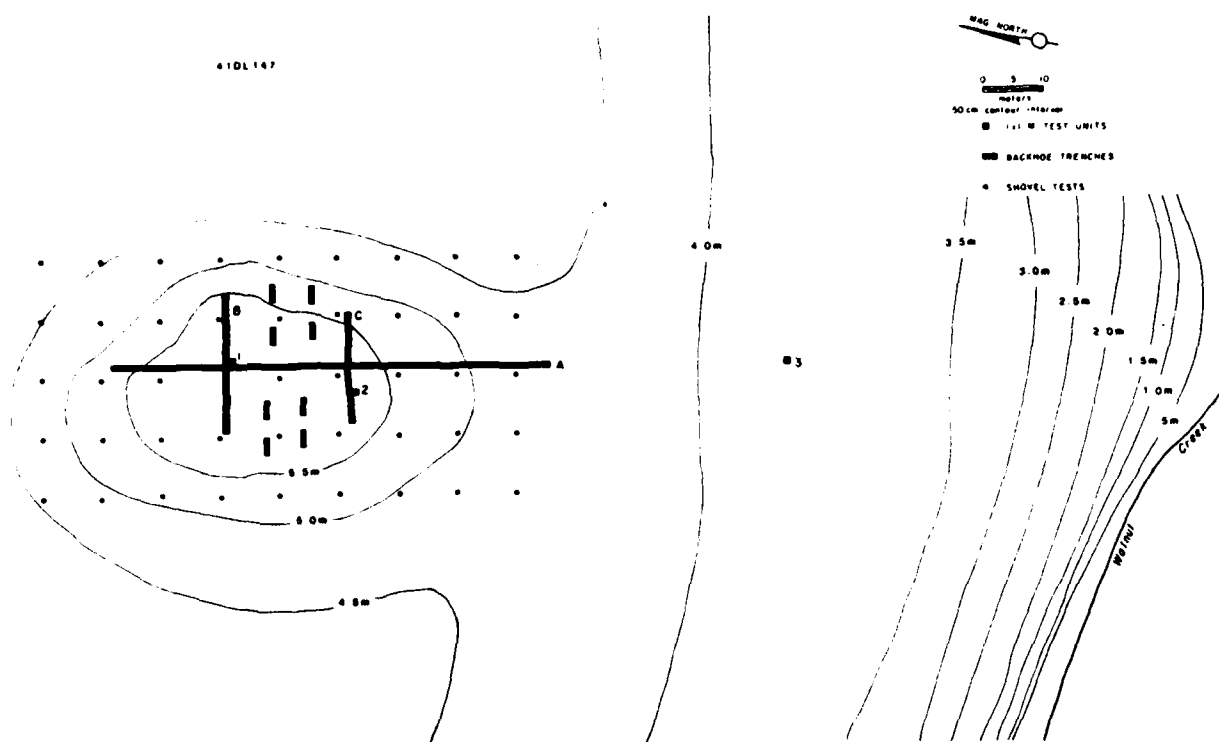


Figure 3-1. Map of site 41DL147.

The knoll on which the site is situated (490 ft. m.s.l.) is elongated in shape, measures 100 m north-south and 70 m east-west, and is 3 m in height above the surrounding floodplain (Figure 3-1). Ovan series soils deposited through alluviation occur on and around the site (U.S. Department of Agriculture, Soil Conservation Service 1974). Below the Ovan soil, which is 5-10 cm thick, is a yellowish clay/gravel zone similar in appearance to the subsurface zone described at 41DL184.

The knoll is today covered by tall grasses and sunflowers. In the past the site and surrounding areas have been cultivated, but no other disturbances are evident.

TESTING METHODOLOGY

Three field testing methods were employed at the site: (1) Backhoe trenches were used to examine the natural subsurface stratigraphy and cultural deposits; (2) Test units were excavated to retrieve a controlled sample of artifacts; and (3) Shovel tests were dug to help define site limits.

The layout of backhoe trenches is shown in Figure 3-1. Initially a long trench (A) was dug parallel and over the long axis of the site, and two shorter trenches (B and C) were dug perpendicular to Trench A. Additional short trenches 3 m in length were systematically placed to investigate areas missed by the longer backhoe trenches. During trench excavation, all dirt from the first 30 cm was placed on one side of the trench, and the deeper soil was placed on the other side. Backdirt piles were

examined for artifacts after sufficient rain had fallen. Trench depths varied from .5 to 1 m. To examine the soil profile along the trench walls, shovel width (12-16 cm) vertical sections were scraped down at 1 m intervals.

To obtain a better sample of artifacts from the site as well as a quantitative estimate of artifact density, 1×1 m test units were excavated (Figure 3-1). Unit 1 was placed in the highest part of the site to determine if artifact density correlated with topography. Unit 2 was located over what appeared to be a fired clay layer that was observed in the side of a backhoe trench (this layer was found to be a natural clay accumulation). Unit 3 was excavated between the knoll and the creek to see if the cultural deposit extended off the knoll. The direction towards the creek was selected as the most likely area.

Units 1 and 2 were excavated in 10 cm levels with as much soil as possible screened through 6 mm (1/4 in.) mesh. Due to the clay content of the soil, screening was extremely difficult and only about 10% to 15% of each level could be processed in this manner. The remaining soil was troweled to expose artifacts. One quarter of each level (25,000 cc) was saved for flotation and fine screening; and from this sample 300 cc was reserved for soil analyses.

The final testing technique employed at the site was shovel tests placed systematically across the knoll (Figure 3-1). The shovel tests were placed at intersections on a 10 m map grid superimposed over the site. The tests were dug to a depth of 25 cm, the practical limit for quickly digging a shovel test. A No. 14 bucket (9 liters) of soil was collected from each hole and

screened through 6 mm (1/4 in.) mesh. More indurated residues were troweled through.

TESTING RESULTS

Artifact Inventory

Testing at 41DL147 recovered only 32 artifacts indicating a low density site (Appendix IV). In addition, bone, shell, and burned clay were located, but these were quantified by weight (bone and clay) or minimum number of individuals (shell) and not by simple frequency. Lithic debris is the most common artifact category.

Chronology

A single Alba type arrow point provides the only chronological information on the site and suggests a period of occupation between A.D. 1 and A.D. 1200 (Suhm and Jelks 1962).

Site Features

Based on the three test units and the backhoe trenches, site size was found to be 72 m north-south by 36 m east-west, i.e., extending over the higher elevations of the knoll on which the site is located. This area is somewhat conjectural, however, since the artifact density is quite low. Unit 2 had the highest density (4.7 artifacts per 10 cm x 1 m x 1 m) and Unit 7 the next highest density (1 artifact per 10 cm x 1 m x 1 m). Due to the low artifact density, the shovel tests only recovered two artifacts and thus were ineffective for defining site limits beyond that established by the test units. Test Unit 3, located midway between the knoll and the creek in the floodplain, uncovered no artifacts. More detail on specific artifact proveniences can be found in Appendix IV and in the files of the Archaeology Research Program.

The site is in good condition with no noticeable disturbance by erosion or human activities other than plowing. As with other sites in the area, plowing seems to only have affected the upper 10-12 cm of soil. The significance of the site is discussed in Chapter 8 on recommendations for further work.

Artifacts were found to a depth of 40 cm, or within the yellowish clay/gravel zone (Figure 3-2).

41DL148 (1979)

ENVIRONMENTAL SETTING

The Cobb-Poole site (41DL148) was originally discovered by R.K. Harris and F. Kirkland in 1941 during an archaeological survey of Dallas County. Harris and Kirkland described the site as a Caddoan camp measuring 100 x 200 yds. The site was relocated during a 1977 survey of the proposed lake

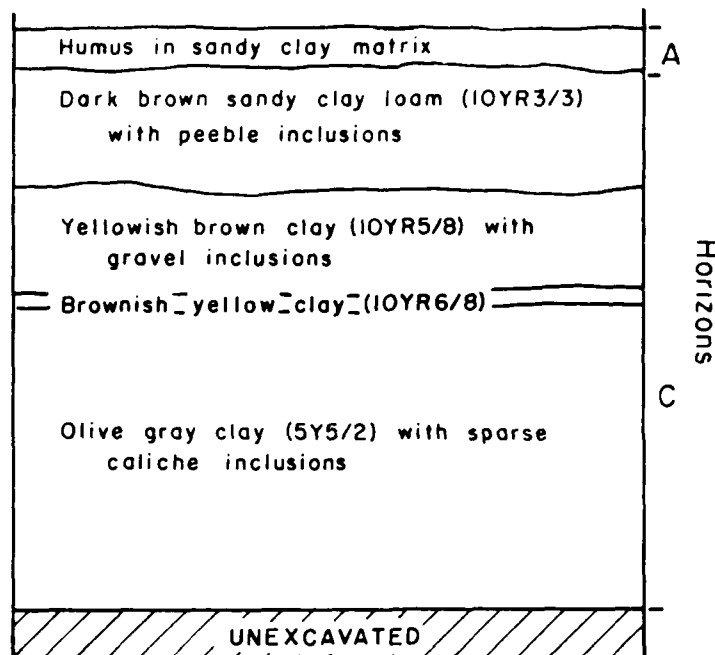


Figure 3-2. 41DL147, west wall, Unit 1.

area (Skinner and Connors 1979:7) and was noted to be similar to Harris' and Kirkland's description.

The site is located on a T-2 terrace (Pemberton Hill/Lewisville) near its juncture with a T-1 terrace (Union Terminal/Carrollton) (Crook and Harris 1952). This locale overlooks the confluence and floodplains of Mountain and Walnut Creeks. A gravel pit has removed a portion of the site (Figure 3-3), although the exact extent of that disturbance cannot be determined. The portion of the site that remains today lies in a pasture that has been cultivated in the past. Dense stands of trees, predominantly mesquite, cedar, and native elm, occur around the site and the gravel pit. An understory of greenbrier and grasses is found in the woods (cf. Skinner and Connors 1979:7).

The site is situated at the edge of the T-2 terrace (510 ft. m.s.l.) containing fine, sandy loam soils. These soils have high natural fertility and represent alluvial deposits from a time when the terrace was part of the Mountain Creek floodplain.

TESTING METHODOLOGY

The Cobb-Poole site is located in the axis of the Lakeview Dam. Consequently, testing was intended to reveal the area and significance of the site. To accomplish these ends, varied but complementary testing methods were employed. First, backhoe trenches were excavated across the site to explore subsurface soil stratigraphy in relation to cultural deposits (Figures 3-3 and 3-4). Initially, Trench A (Figure 3-3) was excavated northwest from the gravel pit on the southeastern site margin to the northwest for 75 m. From this trench, several perpendicular trenches (B-E) were excavated at various locations. In addition, several isolated trenches were placed at other locations on the

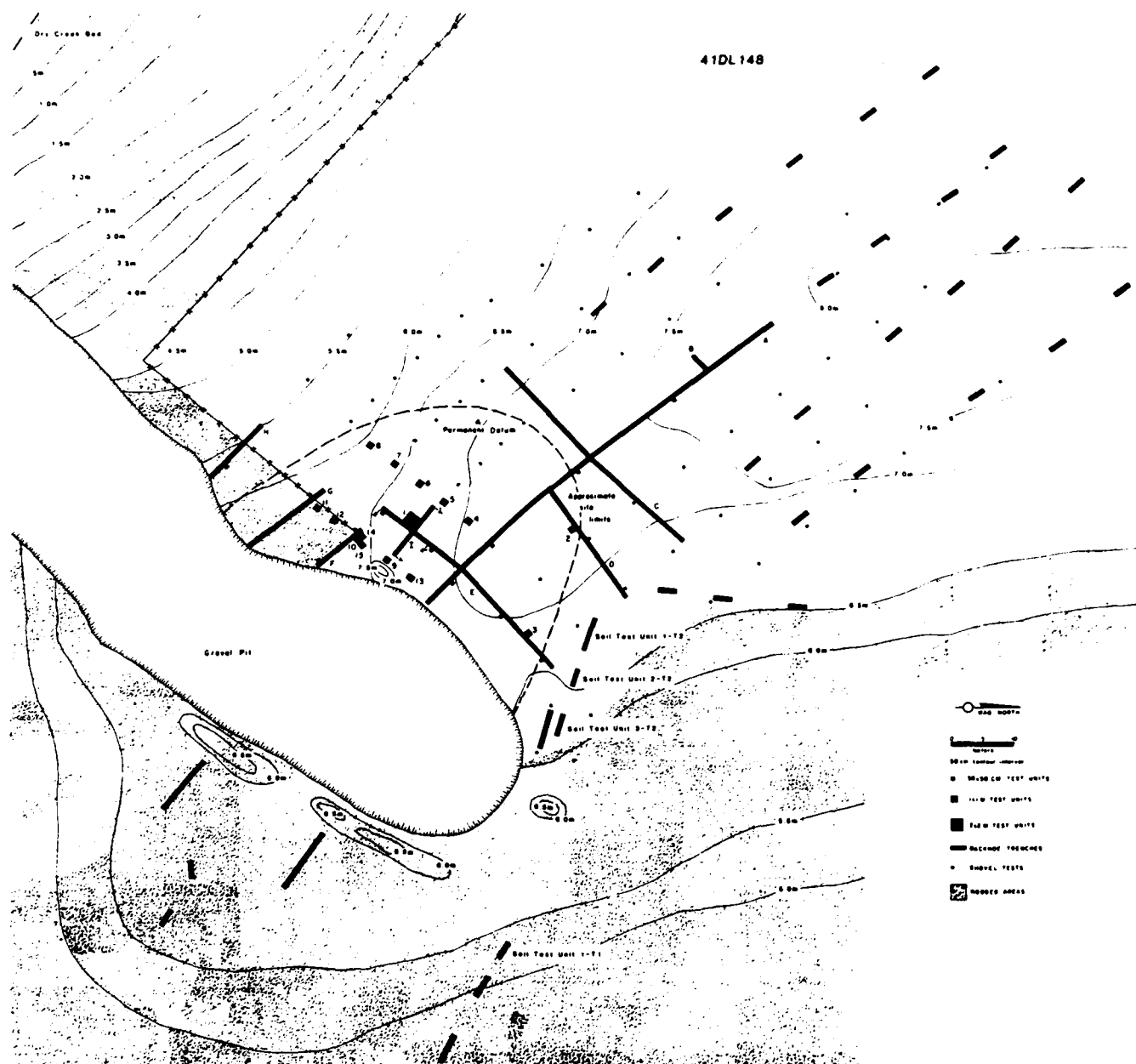


Figure 3-3. Map of site 41DL148 (Cobb-Poole).

site to check for cultural material in topographically prominent areas.

All trench profiles were examined. Trench faces were cleared with shovels when some stratigraphic characteristic needed better definition. Trench depths varied, depending upon the subsurface stratigraphy, but generally varied from 30 cm to 1.5 m. The first 30 cm of soil from the trenches was placed on one side of the trench for examination, and the deeper soil was placed on the other side to provide some degree of vertical provenience separation. The backdirt piles thus created were examined for

artifact content after rain had fallen.

To gain a better estimate of density across the site, 50 x 50 cm units were excavated in series along selected trenches (Figure 3-3). This size unit was considered large enough to assess artifact density while enabling the units to be excavated quickly. These units were placed along Trenches A, E, F, and H to provide optimal areal coverage of the site. In addition to the 50x50 cm units, several 1x1 m units were excavated. Units 1-3 were dug early in the field season to assess artifact densities with larger samples than provided by the 50x50 cm units. Later in the

TESTING RESULTS

Artifact Inventory

Testing at the Cobb-Poole site enabled a relatively good assessment of the site's extent and character. A total of 1027 artifacts were collected from the surface, shovel tests, and test units (Appendix IV). The most common artifact category was bone which comprised 53.0% of all material found. However, this number is based on bone pieces, a variable biased to some degree by post-excavation breakage. Other than bone, lithic artifacts are most common and represent 37.5% of the total. Within the lithic grouping, chipping debris are most numerous.

Chronology

Several temporally diagnostic artifacts were recovered from the Cobb-Poole site, suggesting a time range of occupation. Three of the 4 arrow points are untypable, but the remaining point is classifiable as an Alba. Temporally, this type is indicative of the Early Ceramic through Early Caddoan periods of East Texas, or a time frame of A.D. 1-1200 (Suhm and Jelks 1962). In addition to the projectile points, a biface was recovered that is similar, with the exception that it is smaller in size, to Gahagan and Mineral Springs varieties from the Caddoan area (Bohannon 1973). An Early Caddoan time frame (A.D. 800-1200) is suggested also by the biface. Ceramic sherds offer additional temporal markers for site occupation. The ceramics are made of a coarse, grog tempered paste. Decorations consist of three types: (1) body and rim punctations, (2) body and rim punctations with incised line zoning, and (3) rim horizontal-line incising. These ceramics are similar in design to Ceramic Phase I specimens from Lake Fork Reservoir in East Texas where they have been radiocarbon dated to A.D. 860 ± 50 years (Bruseh and Perttula 1981). The designs are similar also to the established types Canton Incised and Davis Incised of the Caddoan area (Suhm and Jelks 1962). Similar specimens are reported from Cobb-Poole by Harris (Skinner and Connors 1979:37). A time range of A.D. 800 to 1200 is consistent with the ceramics and, combined with the other time markers, gives the probable temporal range within which the site was occupied.

Site Features

The site area was determined through testing to be approximately 50 m north-south by 45 m east-west (Figure 3-3). With the exception of the possible effects of the gravel pit located on the southeastern site periphery and plowing activity, the site appears to be undisturbed. The amount of site removed by the gravel pit is unknown, as noted above, but the midden and distribution of artifacts trend toward greater density at the northwestern edge of the gravel pit, suggesting that a significant portion of the site was removed. However, the remaining portion of the site is in good condition and little disturbed by more than



Figure 3-4. Air photo of site 41DL148 (Cobb-Poole Site) excavation units from approximately 300 m altitude. Facing west.

season, when more time was available for testing at Cobb-Poole, 10 additional pits (Units 4-13) were excavated for similar reasons. All units, including the 50x50 cm, were dug in 10 cm levels. All excavated sediments were passed through 6 mm (1/4 in.) screen. From the 1x1 m and 2x2 m units, a 25% sample (25,000 cc) was saved for flotation and fine screening. From this sample, a 300 cc subsample was saved for soil analyses.

One meter square and 2x2 m units were located to investigate features (described below) discovered by backhoe trenching or the site artifact content. Unit 1 was located in the center of a large, filled depression (Feature 2; see description below) to sample the contents of the depression. Unit 2 was placed in another similar depression located 25 m north of Unit 1. The remaining units were placed around the large depression into which Unit 1 was dug since the depression appeared to be cultural; and a sample from around it was considered desirable for understanding the depression.

The final testing method was systematically placed shovel tests (Figure 3-3). The methods described above had shown the artifact deposits to be relatively shallow. Given this fact, 50x50 cm units were found to be an effective size for defining site horizontal extent but were time-consuming to excavate. Since large parts of the site had not been tested by the above methods, shovel tests were employed to define the site bounds more precisely. The 50x50 cm units were not used because the shovel tests were quicker, given the shallow cultural deposits. Tests were dug to an average of 20 cm, and sufficient soil to fill a No. 14 bucket (9 liters) was screened through 6 mm (1/4 in.) mesh.

shallow (10-20 cm) plowing. The fact that several intact subsurface features are present is testimony to the integrity of the remaining part of the site.

Artifact density within the site as seen through the excavated units is variable with some units showing as little as 1 artifact per m^3 , and others as much as 20 artifacts per m^3 (see Appendix IV). The variability is seen in neighboring units which show density extremes. Artifact frequencies are to a large extent highest from units in a midden deposit (Units 1, 9, 10, 12, 14, and 15; Appendix IV) located in the southeastern half of the site. Units 3 and 4 are exceptions in that both units have high densities and are located away from the midden. The midden is noted by a darker soil color, the presence of charcoal and fired clay flecks, and a deepening of the A horizon of the soil.

In addition to the midden, three other features were observed and specifically numbered. Feature 1 consisted of a small cluster of mussel shells located in the midden, 25 cm below the surface (Figure 3-5). The shell concentration measured 18 cm in diameter and 6 cm in thickness. No other artifacts were found associated with the feature.

Feature 2 bears extended discussion. Easily the most complex feature encountered at the Cobb-Poole site (or any site within the Lakeview Project to date), interpretation of Feature 2 was a major stimulus to formulation of hypotheses regarding the site's function within a prehistoric settlement-subsistence system (Chapters 7 and 8). Feature 2 was first encountered in Trench E (Figure 3-3) during excavation of test trenches with a backhoe. Examination of Trench E immediately revealed evidence of a large disturbance into the natural soil strata, indicating that the natural strata had been interrupted by some kind of disturbance originating at or near the present ground surface. The cause of this disturbance was not apparent from the Trench E profile, but prehistoric artifacts, including bone, mussel shell, lithics, and ceramics, were recovered from the fill of the disturbance. In order to get a more definitive look at the composition and extent of the disturbance, Trench I was excavated perpendicular to Trench E at the estimated center of Feature 2. When the profiles of the two trenches were cleaned and examined, it was apparent that Feature 2 was a roughly basin-shaped depression about 7-8 m in diameter and 180 cm deep. Moreover, the sediments within Feature 2 were seen to contain a number of complex stratigraphic characteristics, suggesting that different kinds of episodes were responsible for filling the depression.

Several possible identities had to be considered for Feature 2. The fact that the feature is located a few meters from a gravel pit (Figure 3-3) raised an obvious question about whether Feature 2 could have been caused by mining operations. The possibility that Feature 2 might be related to farming or ranching activities (e.g., a cattle watering "tank") had to be considered as well. Several lines of evidence suggest, however, that Feature 2 is of prehistoric origin and possibly the remains of a prehistoric habitation structure.

What evidence indicates the age or function of Feature 2? Two sources of information were cut off to us. First, materials suitable for radiocarbon dating were not recovered by the limited testing accomplished at Feature 2 (or the Cobb-Poole site as a whole). While bone and shell artifacts could be lumped into



Figure 3-5. Feature 1, Site 41DL148. Mussel valves in suspected pit.

datable samples by the radiocarbon method, the fact that both materials were taken from various parts of the fill in Feature 2 places the value of such dates in doubt. Since prehistoric ceramics of known age (see below) were recovered from Feature 2, an estimate of the feature's age could be obtained if it could be determined that the ceramics were contemporaneous with the creation of the feature. Second, based on limited testing, Feature 2 did not reveal obvious structural remains such as a hearth or postholes that would unambiguously indicate a prehistoric construction of some kind. Those limitations notwithstanding, there are other lines of evidence to consider.

The first line of evidence, available during fieldwork, was the relatively good preservation of bone and mussel shell within Feature 2. Although bone and shell were found within Feature 2 and within a shallow surface (10-30 cm thick) midden deposit surrounding the feature, the bone and shell artifacts within the feature sediments were generally larger and better preserved. This suggested that bone and shell artifacts deposited at or near the surface have deteriorated to a greater degree than more deeply buried specimens. On that basis, it seems unlikely that Feature 2 could have been excavated recently and then filled with midden material scooped up from around the feature. More likely, the artifacts within Feature 2 (Appendix IV) were deposited there directly as refuse or discarded there as a part of midden before the artifacts could undergo extensive weathering at the surface of the ground. Either way, rapid burial of the shell and bone seems to account for their superior preservation. A similar effect seems to hold, incidentally, for the shells in Feature 1. This interpretation is also compatible with indications of fill episodes in the profile of Feature 2 (Figures 3-6 and 3-7) where one can see a mottling effect similar to the "basket loading" sometimes found in prehistoric mound sites.

The stratigraphic configuration of Feature 2 provides some hints that it may have served as a prehistoric habitation

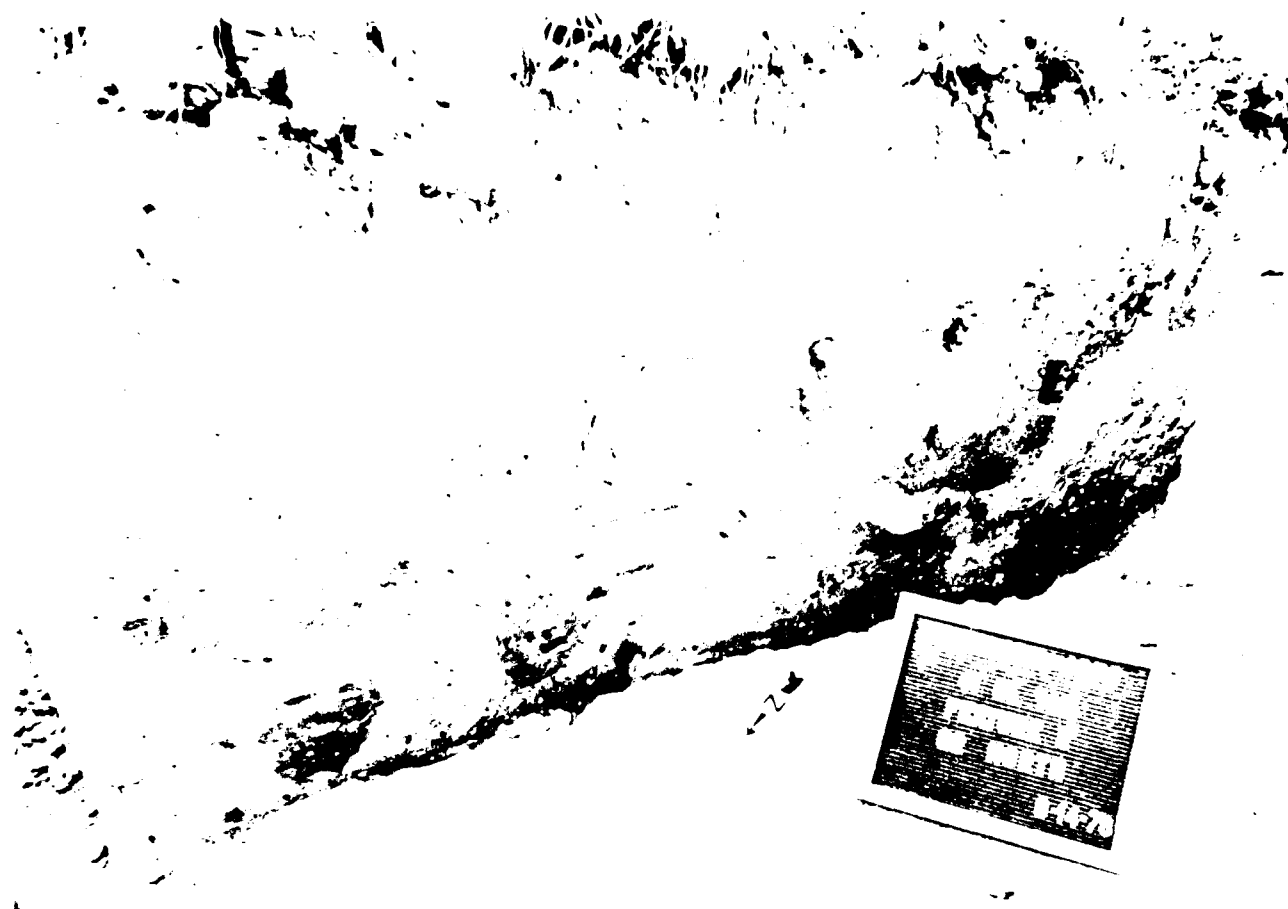


Figure 3-6. Profile of Feature 2, Site 41DL148, Trench X-X'.

structure. Detailed examination of the feature profiles suggested two salient characteristics. First, although the lowest levels of the feature indicate a complex stratigraphy marked by multiple intrusions of feature fill material (pits) into a culturally sterile substratum of sandy, yellow clay there are indications of a continuous "bottom" stratum at a depth of about 140 cm below the surface. Figures 3-6 and 3-7 show, for instance, that Feature 2 penetrates the sterile sandy, yellow clay of this bottom stratum. The same figures show that remnants of this stratum form a horizontal distribution across Feature 2 at about 140 cm below the surface. The discontinuous distribution of these remnants is caused by a number of pits or intrusions that originated at about 140 cm level and that penetrated the bottom stratum to various depths. The fact that these remnants are present at all, however, indicates that Feature 2 must have been excavated originally to a depth of about 140 cm from the surface, forming a more or less basin-shaped depression. Subsequently, pits or other features (indicated in Figure 3-7 by the designation of F.2A-F.2E) were excavated into the bottom of Feature 2, deeper into the bottom stratum, isolating remnants of the stratum when seen in cross section.

This pattern, perhaps, is not a "textbook" example of a

prehistoric occupation surface. It should be borne in mind, however, that repeated episodes of digging pits or postholes through the "floor" of a structure would produce a complex stratigraphy such as the one seen at the bottom of Feature 2.

A second aspect of Feature 2 is noteworthy in connection with possible occupation surfaces. Sand and silt laminae (at about 90 cm below surface) and a suspected pit feature (F.2F) suggest that a surface must have existed within Feature 2 at a depth of about 90-100 cm below the surface. The sand and silt laminae indicate water deposited sediments in the feature. Interestingly, similar laminae are not found anywhere lower in the feature, suggesting that Feature 2 was never open to the elements until a surface was formed at about 90-100 cm from the surface. The mottled clay lenses in the profile (Figures 3-6 and 3-7) immediately below this level may well reflect an episode of "basket loading" within the feature, creating a new surface at the 90-100 cm level. Here we may have evidence of a possible second and final occupation level within feature 2.

The above patterns were isolated on stratigraphic evidence. We were also concerned whether or not other kinds of information could be collected to strengthen or reject the indicated patterns. Accordingly, horizontal and vertical columns of soil

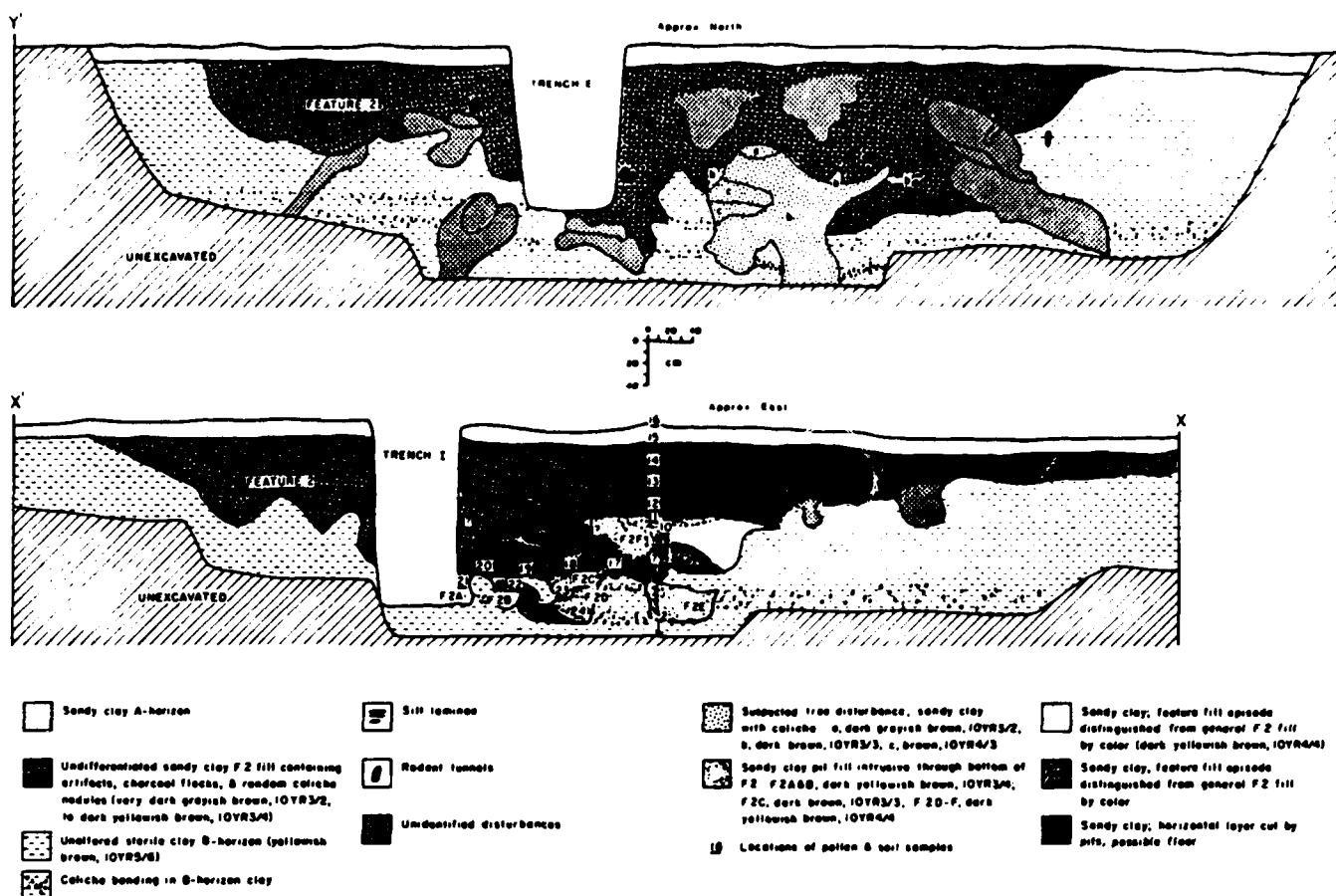


Figure 3-7. Profile drawing of Feature 2, 41DL148 (Cobb-Poole).

samples were collected from the profile of Feature 2 (Figure 3-7). One collection of samples was split, half being sent off for extraction of pollen and the other half used for chemical analysis. The detailed results of these analyses are presented in Chapters 5 and 6. It is sufficient to say here, however, that both analyses lend good support to the interpretation of two occupation levels within Feature 2. Chapter 5 presents evidence for two stratigraphic levels in Feature 2 that are almost certainly anthroposols, i.e., soils modified by human activities. Chapter 6 presents pollen data that indicate the lower levels of Feature 2 are prehistoric and that these levels contain pollen from a large number of plant families and genera of economic significance.

We want to be clear about the interpretations presented here. We are not offering *final conclusions* about the identity of the Cobb-Poole site or its functions. We are suggesting that the evidence at hand requires serious consideration of the hypothesis that Feature 2 was a prehistoric habitation structure, perhaps containing two sequent occupation levels. The evidence from Feature 2 establishes the plausibility of this hypothesis, but additional information reported by Dawson and Sullivan (1973) may provide a regional context for this hypothesis as well.

Dawson and Sullivan (1973:22-26) report a possible pit-house from the McGuire site on the East Fork of the Trinity

River. Although their description of that feature is somewhat ambiguous, the configuration of Feature 2 is generally similar to the McGuire site feature. Both features are basin-shaped with indentations along the "floors" and "walls" which could serve as postholes for roof supports. Like Feature 2, the feature reported by Dawson and Sullivan (1973:22-26) had an irregular configuration measuring 2.0-2.5 m in diameter and from 60-94 cm to the "floor." Comparison on the basis of age is somewhat difficult in that most of the artifacts from the McGuire site are assigned to the Archaic Period, although Neo-American artifacts are present as well. As we saw earlier in this chapter, ceramics from Feature 2 are Gibson Aspect (A.D. 800-1200) Caddoan types. It is clear, however, that the possibility of prehistoric subterranean structures in North Central Texas deserves careful consideration in future work. Such a possibility may not be unlikely when one considers that pit-houses or houses built within pits are well known from regions of North America surrounding North Texas.

The above discussion may also provoke comparison of Feature 2 with the large pits of the Wylie Focus sites. The latter are enigmatic features associated with Neo-American sites in the drainage of the East Fork of the Trinity River. Although the Cobb-Poole site contains midden and other features suggesting

that it, like Wylie Focus sites, was a locus of relatively permanent occupation. Feature 2 is much smaller than the pits located on the Wylie Focus sites, the latter of which are reported to be up to 30 m in diameter and 4 m deep (Stephenson 1949, 1952; Lynott 1977:72-74). Also, the pits excavated into the lower levels of Feature 2, as noted earlier, are consistent with storage or construction activities commonly found in prehistoric houses, a pattern notably missing to date from Wylie Focus pits.

Feature 3 consisted of three postholes observed in the floors of Units 10 and 15 (Figure 3-3). The postholes are approximately 15 cm in diameter and form an arch which, if extended, would encircle Feature 2, the large depression. Only one of the postholes was cross sectioned (Figure 3-8) and was found to be straight to slightly tapering with a rounded bottom.

All three postholes became visible only after the upper midden deposit (35 cm) was removed and the orange C horizon was exposed. Whether the postholes are part of a prehistoric structure or a modern fence line cannot be ascertained definitively at present. However, the postholes were not visible in the sandy, midden soil, as would be expected if they were part of a modern fence. This lack of visibility suggests that the postholes are of sufficient antiquity for their outlines to have leached from the sand of the midden.

The features discussed above, plus the wide range of preserved data in the site, indicate that Cobb-Poole site is significant and warrants further work. Discussion of the site's significance and specific recommendations regarding the site's disposition are in Chapter 8.

41DL149 (1980)

ENVIRONMENTAL SETTING

The Baggett Branch site (41DL149) was originally recorded by F. Kirkland in 1941 during an archaeological survey of Dallas County, Texas. He reported evidence of a small midden and artifacts, including animal bone, mussel shell, flakes, and a grit tempered plainware sherd. In 1976 the site was revisited by Mr. Ronald Ralph for Texas Parks and Wildlife. Ralph also reported the presence of a midden, as well as animal bone, mussel shell, and charcoal (Skinner and Connors 1979:37, 43).

The site is located on the west bank of Baggett Branch (540 ft. m.s.l.), an intermittent tributary of Mountain Creek. The stream is currently eroding this bank in the northern portion of the site, exposing a dark midden stain just below the present ground surface. During a visit early in the 1980 field season, several mussel shells were observed eroding from this context.

Most of the site is heavily wooded, but a portion has been cleared and plowed in the past. Local vegetation includes an overstory of walnut, hackberry, and mesquite, and an understory of greenbriar and assorted grasses.

TESTING METHODOLOGY

A variety of methods were employed in testing 41DL149.



Figure 3-8. Feature 3, Site 41DL148. Postholes in plan and section views.

The initial step was the excavation of a backhoe trench into the site deposit from the eroding west bank of Baggett Branch. The purpose of this trench was to expose a vertical profile of the deposit and to investigate the possibility of additional buried occupations.

The trench was 4 m long and had a maximum depth of 1.3 m. During excavation, the upper 50 cm of fill was deposited separately and was subsequently screened through 6 mm (1/4 in.) mesh.

A series of 20 shovel tests were excavated across the site in an attempt to define its horizontal limits. The basic procedure consisted of digging a circular hole 30 cm in diameter to a depth of about 40 cm below the surface. The excavated fill was then carefully troweled in search of artifacts and examined for changes in soil color. Archaeological materials were recovered from eight of these shovel tests. The locations of all shovel tests are presented in Figure 3-9, and the recovered materials are tabulated in Appendix IV.

Five 1x1 m test units were excavated (Figure 3-9). Vertical control was maintained by digging in arbitrary 10 cm levels. The 6 mm (1/4 in.) screens were used, and two No. 10 buckets (totaling 16 liters) of soil from each level were saved for fine screening through window screen mesh.

Processing of fine screen samples yielded macrobotanical remains from Units 4 and 5. Because of this, an additional test unit (50x50 cm) was excavated in 10 cm levels, and all fill was collected for flotation. This unit was placed immediately south of Unit 4 and was designated 4a.

The depths of these test units are presented in Table 3-1, and the recovered artifacts are tabulated in Appendix IV.

TESTING RESULTS

Stratigraphy is relatively uniform over all tested portions of

41DL149

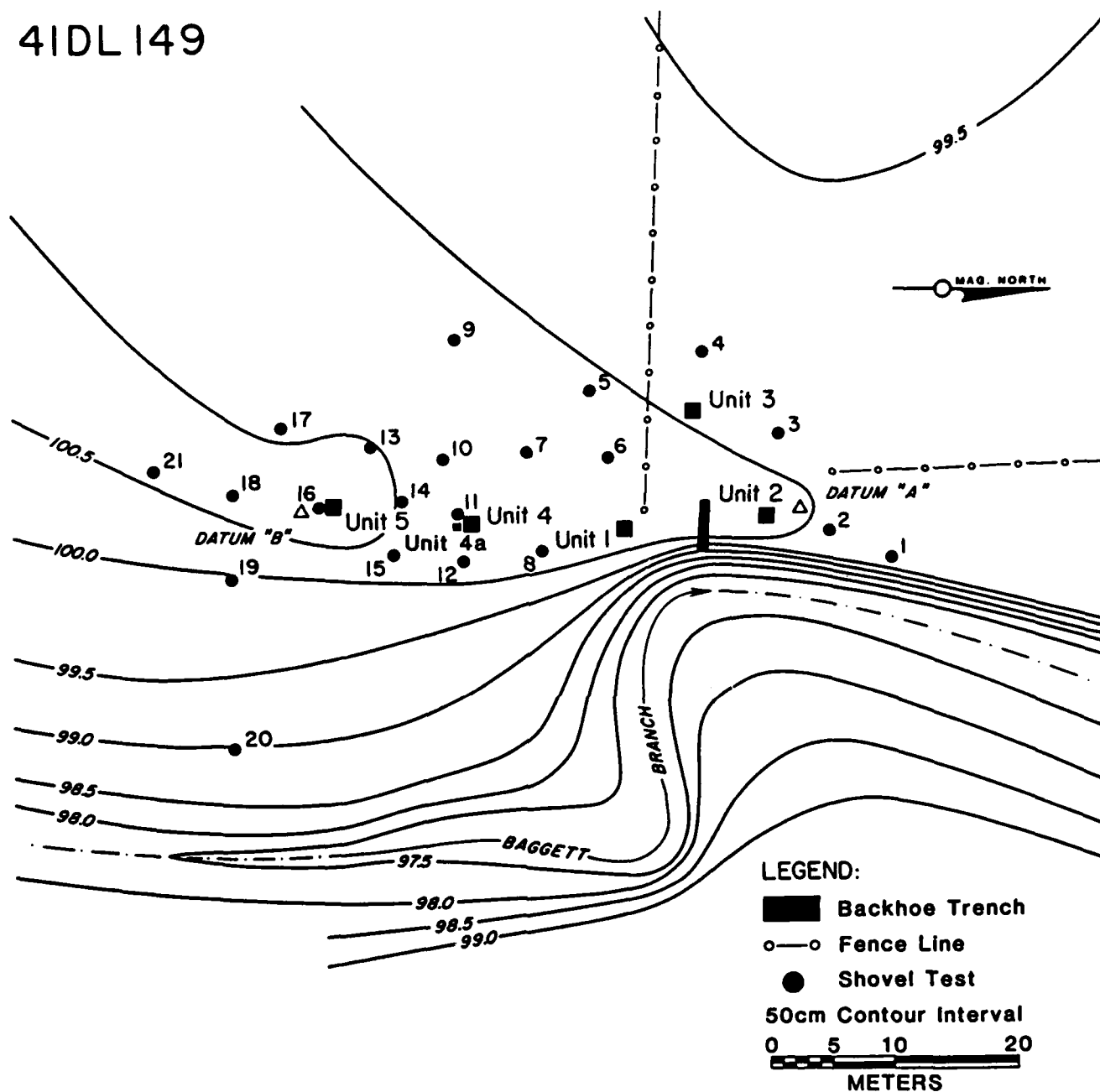


Figure 3-9. Map of site 41DL149 (Baggett Branch).

the site. This consists of an upper layer of black, loamy clay, about 35 cm thick, which grades into an underlying brown clay (Figure 3-10). Underlying this is a deposit of gravel and sand encountered at about 75 cm below surface in the backhoe trench and at 50 cm below surface in Test Unit 5. This gravel/sand lens is about 20 cm thick and is underlain by a compacted, gray clay.

Artifacts were confined almost exclusively to the upper 30 cm of the site deposit, although limited amounts of lithic debris and animal bone were recovered from as deep as the 40-50 cm level of Test Unit 4. In addition, materials from the upper 10 cm of all test squares were extremely limited, indicating that a post-occupation soil deposit mantles the site.

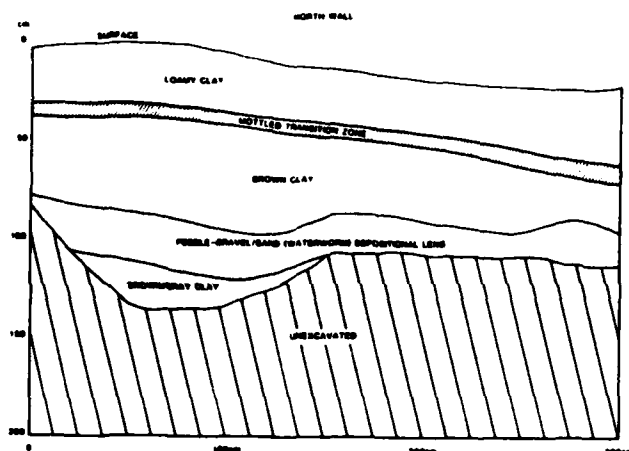


Figure 3-10. Site 41DL149 (Baggett Branch), profile of backhoe Trench 1, north wall.

Subsurface testing suggests that the major midden deposit is located along a low ridge in the wooded, southern portion of the site. This is reflected in the fact that 87% of the artifacts and over 80% of the faunal materials in the total site assemblage were recovered from Units 4, 4a, and 5.

Faunal remains were plentiful and their preservation was excellent. The results of their analysis are discussed in detail in Appendix III. We note here that a wide variety of species were identified, of which white-tailed deer predominates. Also notable are a phalanx of *Bison bison* and several fragments of long bones that are probably assignable to that species.

Processing of fine screen samples and flotation of the fill from Unit 4a produced a limited sample of macrobotanical remains from the major midden deposit of the site (Units 4, 4a, and 5). These consisted of wood charcoal, small amounts of carbonized walnut shell (*Juglans nigra*), both charred and uncharred seeds of juniper (*Juniperus* sp.) and hackberry (*Celtis* sp.), and a single fragment each of sunflower (*Helianthus* sp.) and doveweed (*Croton* sp.) seeds.

Artifact Inventory

A complete tabulation of artifacts from the Baggett Branch site is presented in Appendix IV. We note here, however, that the site produced both a relatively large number of artifacts and a diverse array of artifact types. A relatively large amount ($N=555$) of lithic debris was recovered from the site. Finished tools included one Alba and three Perdiz arrow points (Suhm and Jelks 1962:2, 293) as well as two arrow points unidentified as to type (Appendix IV). One possible dart point (Appendix IV) was recovered from the 40-50 cm level of Unit 4. Since only its base remains intact, it cannot be assigned to any known type.

Three fragments of bifacially-worked artifacts were also recovered. One is the medial section of a large biface made of petrified wood (Appendix IV). One is a small, unfinished tool that may well be an arrow point preform. The third is probably

the distal tip of an arrow point. Unifacial tools included one steep-bitted end-scraper (Appendix IV) and five retouched flakes.

A total of 65 ceramic sherds were recovered, of which 63 came from the fill of the backhoe trench and may all be from a single vessel. None of these are rim sherds, but most of the vessel's base was present and reconstructible (Appendix IV). These sherds are grog and bone tempered, and the vessel base measures 15 mm in thickness and about 13 cm in diameter. Most of the body sherds are decorated by shallow incising and brushing. The two additional sherds are a plain, grog tempered body sherd from the 10-20 cm level of Unit 5 and an undecorated, shell tempered rim sherd from the 10-20 cm level of Unit 1. One small slab of hematite (3 cm x 2.5 cm x 4 mm) was recovered also. One of its faces has been worked and is covered with numerous striations.

Site Features

The only feature (Feature 1) encountered during testing was located in Unit 2. This was an apparent refuse pit extending to a depth of 85 cm below the surface (Figure 3-11). The pit outline was indistinguishable in the dark upper stratum but appeared as a dark stain within the underlying brown clay. The feature was profiled and the pit fill was excavated as a separate unit. This fill was found to contain fire-cracked rocks, mussel shell, animal bone, and charcoal. A sample of the fill (16 liters) was saved, but subsequent flotation failed to produce any macrobotanical remains. Charcoal from this feature was submitted for radiocarbon dating, the results of which are discussed in the Chronology Section below.

Chronology

The Perdiz and Alba arrow points, as well as the presence of ceramics, indicate a Neo-American Stage occupation dating to the interval between A.D. 800 and A.D. 1500. This time range also indicates that the Baggett Branch site may have been contemporaneous with the Cobb-Poole site, 41DL148 (Raab, Bruseth and McIntyre 1980), located in the Project area and investigated during the Phase II work.

The estimate of the site's age based on the artifacts is in agreement with one radiocarbon date derived from a charcoal sample taken from Feature 1 (discussed above). This date is 750 ± 200 radiocarbon years (TX 4001), or A.D. 1200 ± 200 years (1950 baseline date minus radiocarbon years).

41DL150 (1979)

Site 41DL150 was scheduled to be tested during the Phase II field season but could not be relocated by the field crew; consequently, the site was not tested. First recorded in 1941 by W.B. Prickett, the site was discovered during an archaeological survey of sites in Dallas County, Texas, by members of the Dallas Archaeological Society. At that time, the site had been

TABLE 3-1
Depths Below Surface of 1x1 m Excavation Units

Unit	Depth
1	40 cm
2	90 cm
3	40 cm
4	60 cm
4a	50 cm
5	50 cm

plowed and several flakes and a mano were observed. A site survey form was filled out which today serves as the only information on the site.

During the Lakeview Lake survey of 1977, the site was not definitively relocated, although the survey crew found a possible location (Skinner and Connors 1979:43). The difficulty of relocation for the present study was that both narrative and longitude/latitude locations were originally given for the site, neither of which corresponds to any presently visible surface artifact manifestations. The written location describes the site as located "just northwest" of and 100 yds. from the Belt Line Road Bridge over Mountain Creek. The longitude and latitude coordinates fail to corroborate the written description, instead giving the site location 1.6 km northwest of Mountain Creek and in the middle of a field.

Review of other longitudinal and latitudinal information given by Prickett on neighboring sites showed this information often to be in error. Consequently, the written description by Prickett of the site being just northwest of and 100 yds. from Mountain Creek was considered more likely correct, and subsurface testing was undertaken at this location. Sixty-eight backhoe subsurface trenches were dug to a depth of approximately 1 m. All backdirt piles were examined for artifacts after sufficient rain had fallen. Two flakes were found and represent the only artifacts found at the testing location. Based on the paucity of artifacts and the clayey sediments in the area, in contrast to a sandy soil described by Prickett, this location does not fit the 1941 description. The site's exact location remains unknown.

41DL184 (1979)

ENVIRONMENTAL SETTING

First located during the 1977 survey of the lake area, site 41DL184 is recorded as covering an area 75 m in diameter. A surface collection produced a dart point fragment, three pieces of lithic debris, faunal remains, and burned sandstone fragments (Skinner and Connors 1979:43). Re-examination of the site

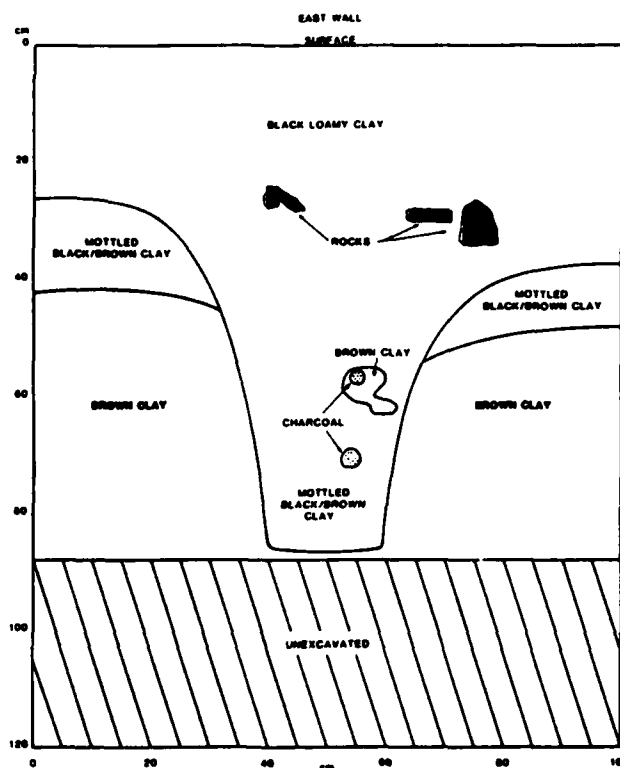


Figure 3-11. Site 41DL149 (Baggett Branch), profile of Feature 1, Unit 2, east wall.

during the 1979 season found the site condition to be similar to that described in 1977, with the exception that more surface artifacts were visible over a larger area.

The site is situated adjacent to Mountain Creek (500 ft. m.s.l.) on a floodplain rise that extends for a considerable distance beyond the limits of the cultural deposit (Figure 3-12). The rise consists of black alluvium, the product of overflow of the present stream regime, over a layer of yellow clay with interspersed pea-sized gravels. Surface soils belong to the Ovan series, a moderately fine grained, blocky clay, formed through frequent flooding (U.S. Department of Agriculture, Soil Conservation Service 1974). Approximately one-third of the site nearest Mountain Creek (Figure 3-12) is presently forested, and the remainder of the site is periodically cultivated. The forested area consists of an overstory of various hardwoods and mesquite and an understory of greenbrier and assorted grasses (Skinner and Connors 1979:7). The portion of the site periodically cultivated is at present invaded by tall grasses and sunflowers. The northern half of the site has been disturbed by sheet erosion, leaving a relatively high density of surface artifacts, but otherwise appears to be in good condition.

TESTING METHODOLOGY

The extent of the subsurface soil stratigraphy and cultural

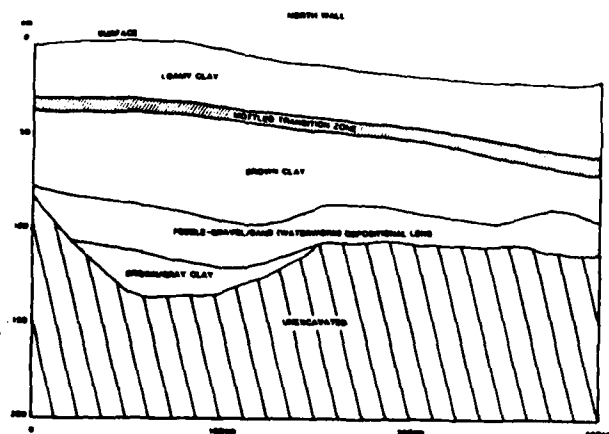


Figure 3-10. Site 41DL149 (Baggett Branch), profile of backhoe Trench 1, north wall.

Subsurface testing suggests that the major midden deposit is located along a low ridge in the wooded, southern portion of the site. This is reflected in the fact that 87% of the artifacts and over 80% of the faunal materials in the total site assemblage were recovered from Units 4, 4a, and 5.

Faunal remains were plentiful and their preservation was excellent. The results of their analysis are discussed in detail in Appendix III. We note here that a wide variety of species were identified, of which white-tailed deer predominates. Also notable are a phalanx of *Bison bison* and several fragments of long bones that are probably assignable to that species.

Processing of fine screen samples and flotation of the fill from Unit 4a produced a limited sample of macrobotanical remains from the major midden deposit of the site (Units 4, 4a, and 5). These consisted of wood charcoal, small amounts of carbonized walnut shell (*Juglans nigra*), both charred and uncharred seeds of juniper (*Juniperus* sp.) and hackberry (*Celtis* sp.), and a single fragment each of sunflower (*Helianthus* sp.) and doveweed (*Croton* sp.) seeds.

Artifact Inventory

A complete tabulation of artifacts from the Baggett Branch site is presented in Appendix IV. We note here, however, that the site produced both a relatively large number of artifacts and a diverse array of artifact types. A relatively large amount (N=555) of lithic debris was recovered from the site. Finished tools included one Alba and three Perdiz arrow points (Suhm and Jelks 1962:2, 293) as well as two arrow points unidentified as to type (Appendix IV). One possible dart point (Appendix IV) was recovered from the 40-50 cm level of Unit 4. Since only its base remains intact, it cannot be assigned to any known type.

Three fragments of bifacially-worked artifacts were also recovered. One is the medial section of a large biface made of petrified wood (Appendix IV). One is a small, unfinished tool that may well be an arrow point preform. The third is probably

the distal tip of an arrow point. Unifacial tools included one steep-bitted end-scraper (Appendix IV) and five retouched flakes.

A total of 65 ceramic sherds were recovered, of which 63 came from the fill of the backhoe trench and may all be from a single vessel. None of these are rim sherds, but most of the vessel's base was present and reconstructible (Appendix IV). These sherds are grog and bone tempered, and the vessel base measures 15 mm in thickness and about 13 cm in diameter. Most of the body sherds are decorated by shallow incising and brushing. The two additional sherds are a plain, grog tempered body sherd from the 10-20 cm level of Unit 5 and an undecorated, shell tempered rim sherd from the 10-20 cm level of Unit 1. One small slab of hematite (3 cm x 2.5 cm x 4 mm) was recovered also. One of its faces has been worked and is covered with numerous striations.

Site Features

The only feature (Feature 1) encountered during testing was located in Unit 2. This was an apparent refuse pit extending to a depth of 85 cm below the surface (Figure 3-11). The pit outline was indistinguishable in the dark upper stratum but appeared as a dark stain within the underlying brown clay. The feature was profiled and the pit fill was excavated as a separate unit. This fill was found to contain fire-cracked rocks, mussel shell, animal bone, and charcoal. A sample of the fill (16 liters) was saved, but subsequent flotation failed to produce any macrobotanical remains. Charcoal from this feature was submitted for radiocarbon dating, the results of which are discussed in the Chronology Section below.

Chronology

The Perdiz and Alba arrow points, as well as the presence of ceramics, indicate a Neo-American Stage occupation dating to the interval between A.D. 800 and A.D. 1500. This time range also indicates that the Baggett Branch site may have been contemporaneous with the Cobb-Poole site, 41DL148 (Raab, Bruseth and McIntyre 1980), located in the Project area and investigated during the Phase II work.

The estimate of the site's age based on the artifacts is in agreement with one radiocarbon date derived from a charcoal sample taken from Feature 1 (discussed above). This date is 750 $\pm$ 200 radiocarbon years (TX 4001), or A.D. 1200 $\pm$ 200 years (1950 baseline date minus radiocarbon years).

41DL150 (1979)

Site 41DL150 was scheduled to be tested during the Phase II field season but could not be relocated by the field crew; consequently, the site was not tested. First recorded in 1941 by W.B. Prickett, the site was discovered during an archaeological survey of sites in Dallas County, Texas, by members of the Dallas Archaeological Society. At that time, the site had been

TABLE 3-1
Depths Below Surface of 1x1 m Excavation Units

Unit	Depth
1	40 cm
2	90 cm
3	40 cm
4	60 cm
4a	50 cm
5	50 cm

plowed and several flakes and a mano were observed. A site survey form was filled out which today serves as the only information on the site.

During the Lakeview Lake survey of 1977, the site was not definitively relocated, although the survey crew found a possible location (Skinner and Connors 1979:43). The difficulty of relocation for the present study was that both narrative and longitude/latitude locations were originally given for the site, neither of which corresponds to any presently visible surface artifact manifestations. The written location describes the site as located "just northwest" of and 100 yds. from the Belt Line Road Bridge over Mountain Creek. The longitude and latitude coordinates fail to corroborate the written description, instead giving the site location 1.6 km northwest of Mountain Creek and in the middle of a field.

Review of other longitudinal and latitudinal information given by Prickett on neighboring sites showed this information often to be in error. Consequently, the written description by Prickett of the site being just northwest of and 100 yds. from Mountain Creek was considered more likely correct, and subsurface testing was undertaken at this location. Sixty-eight backhoe subsurface trenches were dug to a depth of approximately 1 m. All backdirt piles were examined for artifacts after sufficient rain had fallen. Two flakes were found and represent the only artifacts found at the testing location. Based on the paucity of artifacts and the clayey sediments in the area, in contrast to a sandy soil described by Prickett, this location does not fit the 1941 description. The site's exact location remains unknown.

41DL184 (1979)

ENVIRONMENTAL SETTING

First located during the 1977 survey of the lake area, site 41DL184 is recorded as covering an area 75 m in diameter. A surface collection produced a dart point fragment, three pieces of lithic debris, faunal remains, and burned sandstone fragments (Skinner and Connors 1979:43). Re-examination of the site

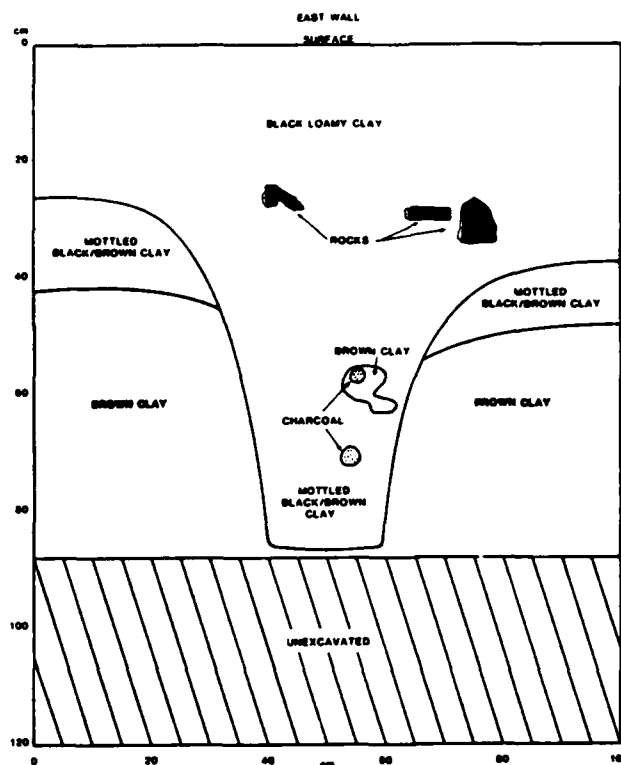


Figure 3-11. Site 41DL149 (Baggett Branch), profile of Feature 1, Unit 2, east wall.

during the 1979 season found the site condition to be similar to that described in 1977, with the exception that more surface artifacts were visible over a larger area.

The site is situated adjacent to Mountain Creek (500 ft. m.s.l.) on a floodplain rise that extends for a considerable distance beyond the limits of the cultural deposit (Figure 3-12). The rise consists of black alluvium, the product of overflow of the present stream regime, over a layer of yellow clay with interspersed pea-sized gravels. Surface soils belong to the Ovan series, a moderately fine grained, blocky clay, formed through frequent flooding (U.S. Department of Agriculture, Soil Conservation Service 1974). Approximately one-third of the site nearest Mountain Creek (Figure 3-12) is presently forested, and the remainder of the site is periodically cultivated. The forested area consists of an overstory of various hardwoods and mesquite and an understory of greenbrier and assorted grasses (Skinner and Connors 1979:7). The portion of the site periodically cultivated is at present invaded by tall grasses and sunflowers. The northern half of the site has been disturbed by sheet erosion, leaving a relatively high density of surface artifacts, but otherwise appears to be in good condition.

TESTING METHODOLOGY

The extent of the subsurface soil stratigraphy and cultural

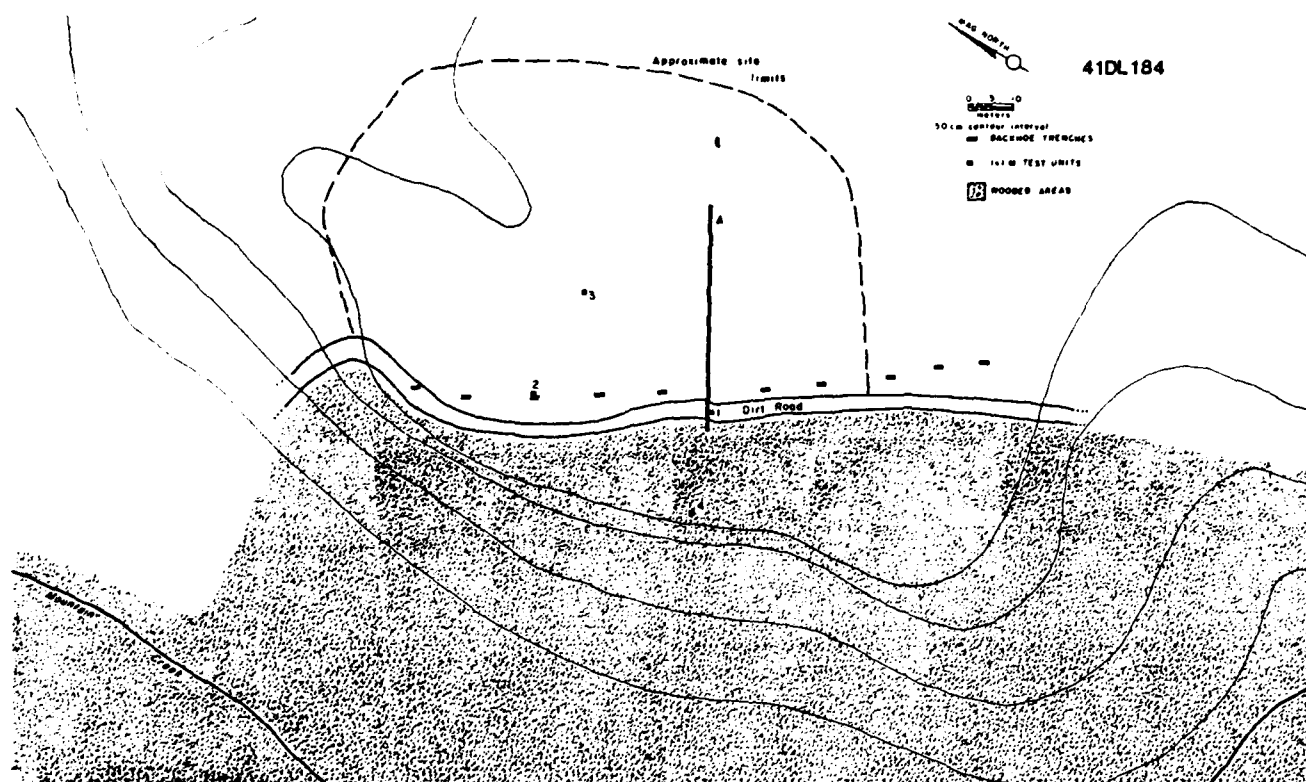


Figure 3-12. Map of site 41DL184

deposits were tested by several backhoe trenches (Figure 3-12). The initial trench (Trench A) was a long excavation perpendicular to and northeastward from a road bisecting the site. Southwestward from the road, dense woods prevented backhoe testing. Several short trenches (1 m in length) were excavated perpendicular to Trench A to examine the subsurface nature of the site on a northwest-southeast gradient.

Trench depths varied from 1 to 1½ m, depending on subsurface stratigraphy. Since much of the site was underlain by a yellow clay/gravel stratum, the trenches were excavated to this stratum when possible to investigate the possibility of a buried cultural surface. The first 30 cm of soil was placed on one side of the trench and the remaining soil on the other by the backhoe. After sufficient rainfall, the backdirt piles were examined for exposed artifacts with the soil on either side of the trench providing a rough vertical indicator of artifact depth. At 1 m intervals, shovel-width (12-15 cm) "scrapes" were made to expose a clean soil profile.

In addition to the backhoe trenches, 1x1 m test units were excavated across the site (Figure 3-12) to provide a quantitative assessment of artifact occurrence. Due to the extremely hard

condition of the soil, only four units could be dug. Unit 1 was excavated in the approximate center of the site, as defined by surface artifact density, and also in the highest part of the site. Units 2 and 3 were excavated in the northwestern and northern areas of the site, respectively, where high surface artifact densities occurred. Unit 4 was placed in the wooded portion of the site to examine artifact distribution in an area where surface visibility was obscured.

Ten-centimeter levels were used as a vertical provenience control, and all soil was screened through 6 mm (1/4 in.) mesh to the extent possible. Due to the rock-like character of the soil, only 10-15% was screenable; the rest was examined during troweling. One quarter of each level (25,000 cc) was removed for flotation and fine screening. From this sample, 300 cc was taken for soil analyses such as pH and phosphate.

The final method of testing was a general surface collection from the site. No horizontal provenience was kept since the site has been subject to erosion, as evidence by areas lacking vegetation and cut by small gulleys. Present surface artifact distributions are partly the result of this natural process as well as differential vegetation patterns.

TESTING RESULTS

Artifact Inventory

The limited testing at 41DL184 provides only a minimal understanding of the site. A total of 517 artifacts was uncovered (Appendix IV). Of this total, 13.7% were collected from the surface and the remainder from the test units. Lithic artifacts account for the vast majority of material found, or 85.2%. Lithic debris is by far the most common artifact class.

Chronology

Four of the projectile points from the site were typable according to Suhm and Jelks (1962), providing the only temporal information. The typed points are Palmillas, Gary, Carrollton, and a variety similar to Ensor but smaller and thinner than the type description. The points suggest a span of occupation from Middle Archaic to Late Archaic, or about 2000 B.C. to A.D. 500 (Lynott 1977).

Site size, as estimated by the surface collection, is 130 m north-south and 100 m east-west. The site area may actually be larger since this estimate is only based on artifacts visible on the site surface—a variable highly biased by differential exposure.

Site Features

Based on four test units, only a general picture of intrasite artifact distribution can be produced. All units showed that subsurface artifact deposits do exist, even in the woods where no surface manifestation was noted. Also, artifacts were found to extend down into the yellow clay/gravel stratum. The highest density of subsurface artifacts per unit volume (1x1 m x 10 cm level) was found in Unit 2 (24.0), located where a high surface density (based on subjective estimation) also was found. Units 1 (9.4) and 4 (8.5) were similar in artifact frequency and next in density; Unit 3 (2.0) was the lowest in density. Based on the four test units, variations in subsurface artifacts can be seen to exist with a general increase in density toward Mountain Creek, but whether these are due to sampling bias or significant horizontal variability is uncertain.

An objective of testing was to determine if the yellow clay/gravel stratum underlying the black clay was a buried surface with cultural debris on or in it. As a test of this possibility, the fine screened sample of artifacts from Unit 1 was examined by depth. Unit 1 was selected for examination since it is the deepest test unit, penetrating deepest into the yellow clay/gravel stratum. Only the fine screen sample was used for comparison since it represents the most complete recovery of artifacts. The excavated sample, by contrast, comprises artifacts observed during the screening and troweling process, a sample potentially biased by intercollector variability and the larger 6 mm screen size. The fine screen sample thus offers a better measure of artifact frequency by depth.

Figure 3-13 shows that two major peaks in artifact density occur: the first between 10 and 40 cm and the second between 50 and 90 cm. The yellow clay/gravel begins at 56.0 cm below the surface, the level of the lower peak in artifact density. The lower layer, therefore, may be a culturally significant surface. However, since the artifact samples are small and based on only 25,000 cc soil samples from each level, this conclusion remains conjectural. The other three units were not excavated deeply enough to pick up this trend.

Based on the foregoing indication of subsurface cultural stratigraphy, together with the apparent Archaic occupation(s), the site is potentially significant and may warrant further work. Chapter 8 presents our recommendations concerning site 41DL-184.

41DL186 (1980)

ENVIRONMENTAL SETTING

Site 41DL186 is a small, thinly scattered lithic deposit. The site is located on a T-1 terrace remnant knoll (515 ft. m.s.l.) on the west bank of Mountain Creek (Figure 3-14). The site is situated on a grass-covered knoll surrounded by cedars, hackberry, and mesquite on the north, east, and far south margins of the site. The site proper, as well as the western aspect, is covered with grasses and a few low shrubs.

The site was originally discovered during Phase I work at Lakeview carried out by Archaeology Research Program members at Southern Methodist University, Dallas, Texas (Skinner and Connors 1979:43). At that time, an estimate of the site's diameter was 60 m; however, due to the lack of subsurface testing, ground cover, and the low density of artifacts, the determination of horizontal extent was difficult to determine (Skinner and Connors 1979:43).

TESTING METHODOLOGY

Preparatory to subsurface testing, a surface reconnaissance was made to determine the approximate center of the site as well as its horizontal magnitude. The surface survey revealed a very thin lithic scatter (less than one artifact per square meter of site surface) with no apparent spatial integrity. However, several flakes were located at highly variable intervals on the north side of the knoll. Based on the proximity of several flakes on the surface, subsurface testing was begun.

Initially, seven backhoe trenches (A-G) were distributed across the ridge of the knoll in a north-south direction (Figure 3-14). Two other trenches (H, I) were aligned at right angles to the west of Trenches A-G. Trench J was employed as an aid in determining the geologic stratigraphic sequence in the vicinity of Trench C.

When trenching with the backhoe, a consistent methodology was employed. The upper 30-40 cm of soil from each trench was placed on the north side of the unit while the remainder of the trench backdirt was placed on the southern side. Following this,

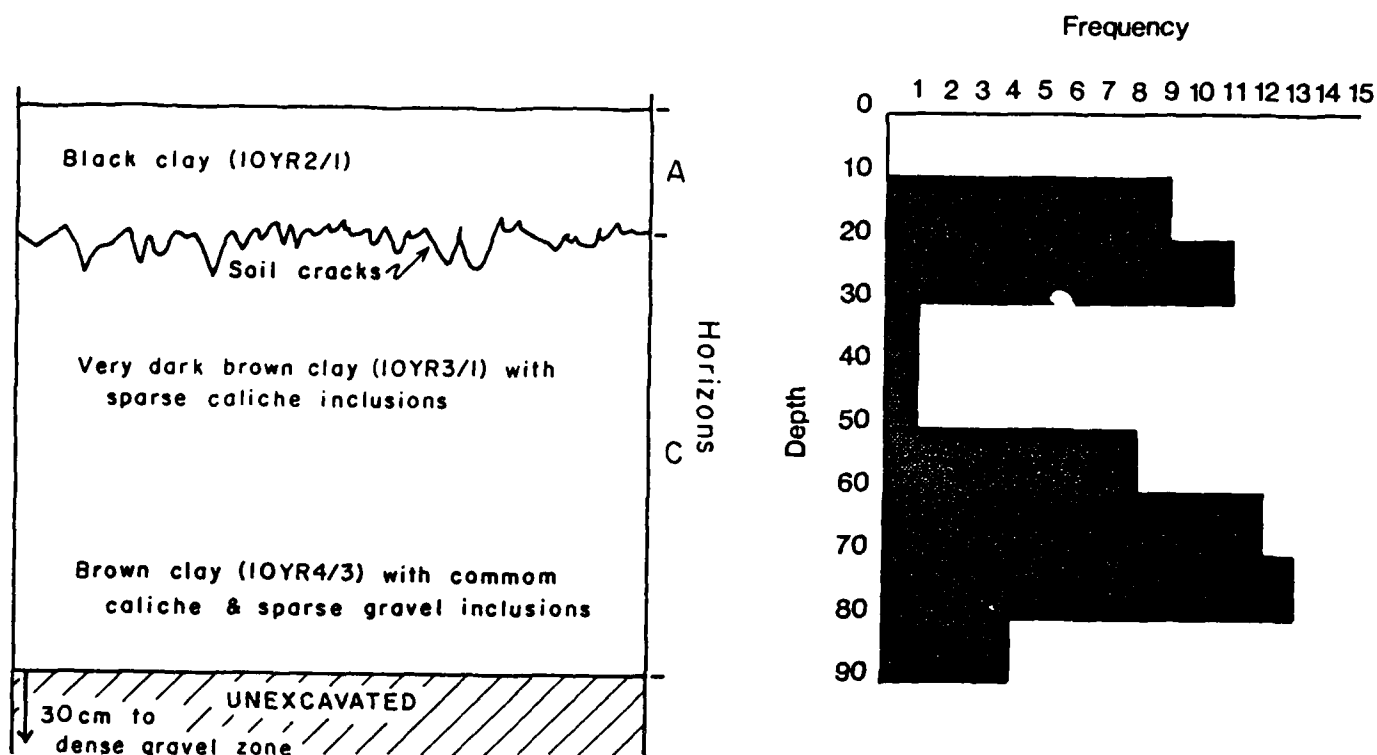


Figure 3-13. Site 41DL184, profile of south wall, Unit 1 with associated graph of debitage frequency recovered by fine-screening.

the soil was then dispersed with the aid of the backhoe's front end loader. This layer was then left *in situ* until it had been rained upon, thereby freeing the artifacts for easier visibility.

Based on the light surface artifact density of the site, as well as on the paucity of materials recovered from the backhoe trenches, it was determined that several hand dug 1x1 m units (Units 1-5) should be placed across the central portion of the site. Additionally, a separate unit (Unit 6) was placed at a distance at 75 m south of the rest of the site where, during the surface reconnaissance, a few flakes had been located.

TESTING RESULTS

Artifact Inventory

Surface and subsurface testing at 41DL186 recovered only 12 flakes, 3 retouched flakes, 6 pieces of mussel shell, and 1 piece of a rodent bone.

Chronology

No diagnostic artifacts were located during testing opera-

tions. However, during the 1977 survey (Skinner and Connors 1979:43), a fragment of what appeared to be a dart point (untypable) was recovered from the site surface. Based upon this information, a tentative time frame for the occupation of 41DL186 may be in the Archaic Stage.

41DL188 (1980)

Site 41DL188 was scheduled for testing but could not be located with certainty. At the time of its discovery during the 1977 survey (Skinner and Connors 1979:45), surface indications consisted of two flakes and several pieces of mussel shell. The site was described as being situated on a slight rise in the floodplain near the base (490 ft. m.s.l.) of a (T-1) terrace. The plowed floodplain field (fallow at the time of investigation) had excellent ground visibility when visited prior to testing, but an extensive and thorough surface search of an area of about 40,000 sq. m. between the terrace and Mountain Creek resulted in the recovery of only three mussel shell fragments. The discovery of these on an elevated ridge near the base of the terrace served to conform to the earlier (1977) site description, and subsurface testing was initiated at this location.

Subsurface testing consisted of excavating both backhoe

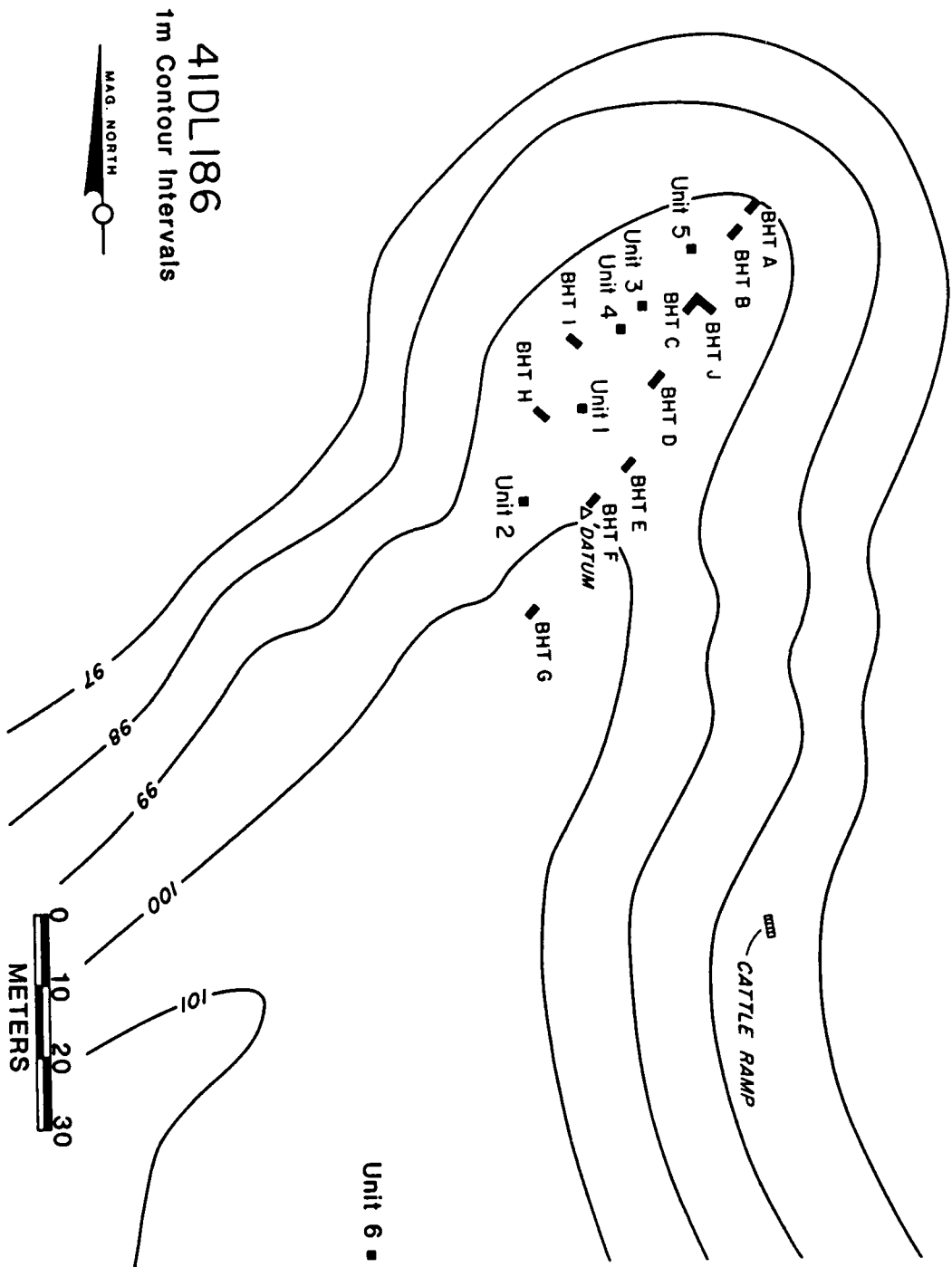


Figure 3-14. Map of site 41DL186.

41DL188

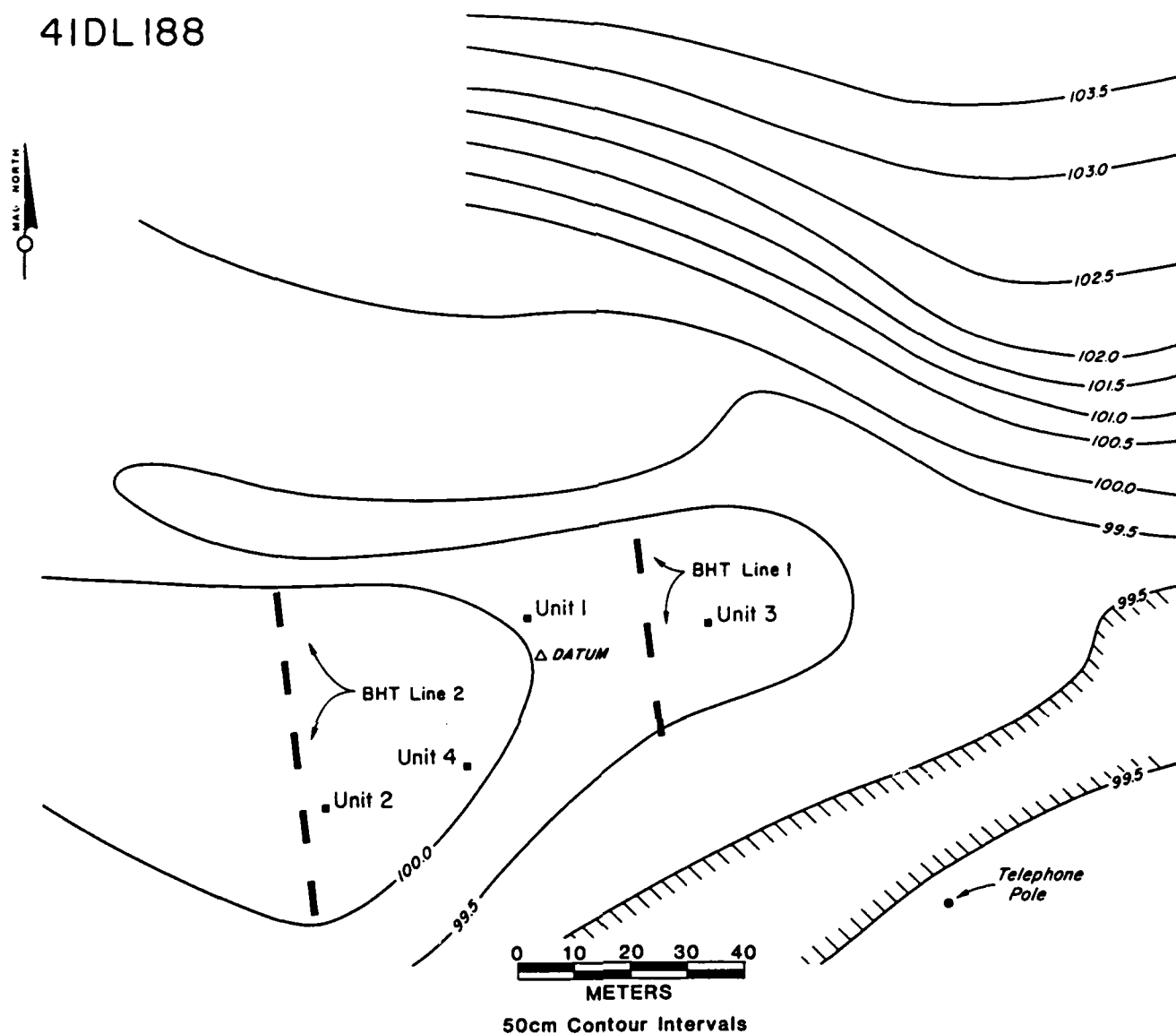


Figure 3-15. Map of site 41DL188

trenches and square-meter test units. Two lines of backhoe trenches were placed across the ridge (Figure 3-15), providing vertical profiles of uniform floodplain clay deposits. The fill from these trenches was inspected for artifacts but not screened, as in previous cases.

Additionally, four 1x1 m test squares were excavated in

arbitrary 10 cm levels. The fill was passed through 6 mm (1/4 in.) screen, and two No. 10 buckets of matrix (totaling 16 liters each) from each level were saved for fine screening.

No archaeological materials were discovered either during testing or in the processing of the fine screen samples.

The actual location of 41DL188 remains in doubt.

41DL189

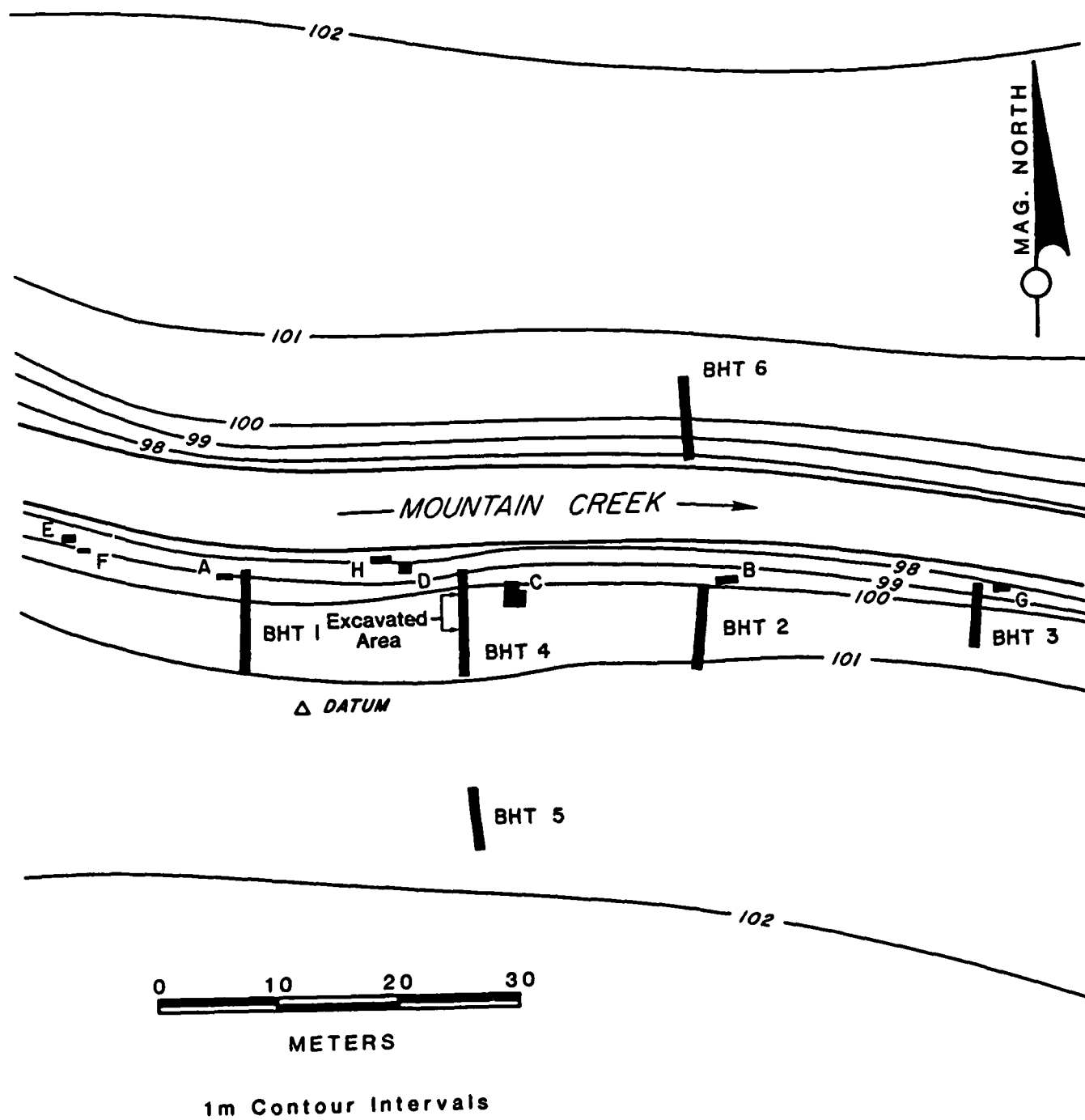


Figure 3-16. Map of site 41DL189.

41DL189 (1980)

ENVIRONMENTAL SETTING

Originally located during the 1977 survey, the site consisted of surface artifacts and a concentration of fire-cracked rocks eroding from the eastern bank of Mountain Creek (510 ft. m.s.l.) (Skinner and Connors 1979:45). No obvious occupation layer had been noted in the creek bank and surface materials extended for 40 m along the bank. Artifacts included flakes of Edwards Plateau chert, animal bone, mussel shell, and a Carrollton dart point. The floodplain along this portion of Mountain Creek has been cleared and is currently in pasture. A few mesquite trees remain along the creek's west bank directly across from the site.

After being relocated, several features were observed eroding from the creek bank. These ranged from individual hearths to discrete occupation surfaces and are discussed individually in the Testing Results Section below.

TESTING METHODOLOGY

Initial testing consisted of the excavation of six backhoe trenches. Four of these (1-4, Figure 3-16) were located to expose vertical profiles of the site deposit from the east bank of Mountain Creek well back into the floodplain deposit. Trench 5 was excavated into the floodplain deposit approximately 20 m east of the creek bank. Trench 6 was placed into the west bank of Mountain Creek. In all cases, the trench walls were shovel-scraped and profiles were carefully checked for evidence of stratigraphy and cultural materials.

Additional testing consisted of exposing all cultural features observed in the creek bank. Excavation entailed excavating back into the bank from the feature's exposed edge. Overburden was removed with pick and shovel, with the final 10 cm troweled and passed through 6 mm (1/4 in.) screen. From all features, a sample of two No. 10 buckets of fill (totaling 16 liters each) was saved for fine screening. The exposed areas varied in size, being dictated by individual feature configuration and the amount of overburden removal that was necessary.

TESTING RESULTS

Site stratigraphy consisted of an upper stratum of very dark brown, sandy clay overlying brown clay. These strata were separated by a transitional zone that appears to be a mixture of the two (see profile of Backhoe Trench 4, Figure 3-17). The surface of the profile is stepped upward away from the creek channel. In the portion of the profile closest to the creek, the upper stratum has been eroded away, and the uppermost stratum recognized was the transitional zone.

All cultural features were located in the lower brown clay stratum. Because this clay lacks internal stratigraphy, it is difficult to correlate these features stratigraphically. The horizontal nature of two areas of burned clay (in Area C and Backhoe Trench 4, described below) suggests that, prehis-

torically, the occupied surfaces of the site were relatively flat. The relative ages of these features should correlate with their relative depths below the site datum.

The eight features observed in the creek bank were investigated by limited excavation. Each was given a letter designation (A-H). They occurred at variable depths below the current floodplain surface, and their elevations, relative to the site datum, are presented in Table 3-2. A complete tabulation of the archaeological materials recovered from each provenience is also presented in Appendix IV.

Area A was the location of a concentration of fire-cracked rock, eroded out of primary context. A horizontal area, 1 m x 50 cm was exposed, revealing that only two rocks remained *in situ*. No charcoal or other materials were present. The original feature configuration could not be determined.

Area B was a lense of mussel shell mixed with small gravels, exposed for about 2 m along the creek bank. An area 170x50 cm was excavated, and mussel shell, animal bone, three pieces of lithic debris, and small amounts of charcoal were recovered. This thin lens of material appears to represent an occupation surface subsequently buried by alluvial deposition. It extends for an undetermined distance into the creek bank.

Area C was originally observed as a layer of burned clay eroding from the creek bank. An area 2x1.5 m was opened, and this oxidized clay was found to be present on a horizontal level throughout the excavation unit. Limited amounts of charcoal were recovered, as were a few mussel shell and animal bone fragments. The interpretation of Area C is difficult. Evidence of fire is obvious from flecks of charcoal and the burned clay, but a prepared hearth area was lacking. Additionally, no artifacts of definite human manufacture were recovered. On the basis of the present evidence, this feature cannot be attributed with certainty to human activity.

Area D contained a partially eroded hearth. This feature was a basin-shaped lens of charcoal in association with small, flat limestone slabs. The feature was roughly circular in plan and measured about 35 cm in diameter. An area 1 m x 80 cm was exposed, and both burned and unburned mussel shell, animal bone, and a single broken flake were recovered.

Area E was the location of an *in situ* rock-lined hearth. This circular, basin-shaped feature was approximately 40 cm in diameter. The rocks lining this hearth were small, flat slabs of limestone. An area 90x50 cm was excavated, and mussel shells and animal bones were found within and adjacent to the hearth. This hearth contained a large amount of charcoal which was collected but not dated.

Area F was first observed as a few mussel shells exposed in the creek bank. All were at the same level vertically, and an area 30 cm x 1 m was taken back into the bank. This uncovered a limited number of mussel shells, but no definable lens was observed. No charcoal, bone, or artifacts were present, so this shell deposit could be of natural origin.

Area G was considered a possible hearth, as fire-cracked rock was observed eroding from the creek bank at this location. Subsequent excavation of an area 120x60 cm uncovered a concentration of five small slabs of limestone and small amounts of charcoal. It appears as though the major portion of this feature had eroded away, and its disturbed nature does not allow the

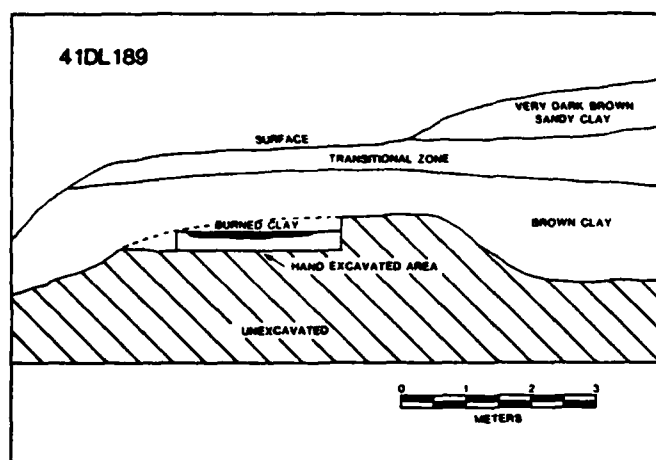


Figure 3-17. Profile of backhoe trench 4, indicating area of hand-excavated burned clay deposit in north wall.

determination of this proposed hearth's original configuration.

Area H was a slightly disturbed rock-lined hearth very similar to the one uncovered in Area E. Mussel shell, animal bone, and a bone awl were recovered from a 170x50 cm excavated area. The hearth contained a large amount of charcoal, and a sample was submitted for radiocarbon analysis. The results are discussed in the Chronology Section below.

During the excavation of Backhoe Trench 4, a concentration of charcoal and oxidized clay was encountered at an elevation of 2.28 m below the site datum. An area within the trench (see Figure 3-17), 2.5 m x 65 cm, was taken down to just above this level at which point excavation by trowel proceeded in 5 cm levels. Two levels were excavated with all artifacts confined to the uppermost of these.

The oxidized clay contained numerous pieces of charcoal and appears as a horizontal lens (about 2 m long and 5 cm thick) in the trench wall profile. Its east-west extent could be defined, but it continues for an undetermined distance into both the north and south walls of the trench. A sample of charcoal from this context was submitted for radiocarbon analysis, and the resulting date is discussed in the Chronology Section below.

Two retouched flakes, nine pieces of lithic debris, and limited amounts of mussel shell and animal bone were recovered from the excavation in Backhoe Trench 4. Of these materials, three flakes and one piece of non-diagnostic shatter could be refitted to demonstrate their sequential removal from a chert pebble-core. Two of these flakes exhibited apparent use-retouch along an edge, suggesting their *in situ* production and use on this buried occupation surface.

Artifact Inventory

In addition to the artifacts mentioned above, one chert core fragment and four projectile points were collected from the surface of the eroded bank of Mountain Creek. The points are all dart points and are pictured in Appendix IV. One of these was

found during the 1977 survey and was assigned to the Carrollton type (Skinner and Conners 1979:45). One is a side-notched specimen with a very long, narrow blade that is not assignable to a known type. Also included are a Gary and an Edgewood. All are considered diagnostic of the Archaic Stage.

Chronology

Two radiocarbon dates were obtained from site 41DL189 in an attempt to determine the temporal range of occupation. The first of these came from the hearth in Area H which is at the greatest depth below site datum of all tested features. This date is 2430 ± 80 radiocarbon years (TX 2999), or 480 B.C. ± 80 years.

The second date derives from the occupation layer in Backhoe Trench 4, the uppermost feature from which an adequate charcoal sample was available. This date is 2140 ± 250 radiocarbon years (TX 3000), or 190 B.C. ± 250 years.

The Carrollton point type is generally believed to date earlier in time than these radiocarbon determinations. It should be noted that the recovered point is not a "classic" example of this style and may be misclassified. Alternatively, this point may have originated from a position in the creek bank below these dated features. The other identified point styles fit well with these dates.

41DL198 (1980)

ENVIRONMENTAL SETTING

Site 41DL198 is situated approximately 100 m south of site 41DL199. Originally located by Mr. Bill Young of Corsicana, Texas, the site is positioned on a small knoll (a T-1 terrace remnant, 520 ft. m.s.l.) at the base of a series of upland ridges and rolling hills overlooking Mountain Creek about 150 m to the west. The site area is currently under cultivation (wheat).

Young's collection from this site consists of Gary, Wells, Trinity, Godley, Marshall, and Edgewood point types (Skinner and Conners 1979:45).

TESTING METHODOLOGY

The site area had been plowed just prior to the initiation of testing, so surface visibility was excellent. Surface artifact density was greatest on the western slope of the knoll in the area of test Units 2 and 3 (Figure 3-18). Six 1x1 m test units and one backhoe trench were employed in testing 41DL198. Depths of these test units are presented in Table 3-3. All 1x1 m units were excavated in arbitrary 10 cm levels using 6 mm (1/4 in.) screen. From each level, two No. 10 buckets of fill (totaling 16 liters each) were saved for fine screening. The backhoe trench provided a profile of the site's stratigraphy. All surface artifacts observed during testing were collected.

Table 3-2. Locations of Features A-H,
Site 41DL189.

Area	Depth Below Datum	C-14 Date
A	2.32 meters	no
B	2.86 meters	no
C	2.08 meters	no
D	3.02 meters	no
E	3.03 meters	no
F	2.64 meters	no
G	2.27 meters	no
H	3.15 meters	2430 $\pm$ 80 RY's
Trench 4	2.38 meters	2140 $\pm$ 250 RY's
*RY's = radiocarbon years		

TESTING RESULTS

Stratigraphy of the site deposit consists of an upper stratum (about 30 cm thick) of sand mixed with large amounts of pebble-sized gravel. Below this, the gravel inclusions drop off markedly in frequency, and the deposit consists primarily of sandy clay.

TABLE 3-3
Depths of 1x1 m Excavation Units

Unit	Depth
1	20 cm
2	50 cm
3	50 cm
4	30 cm
5	30 cm
6	30 cm

Testing showed that the subsurface artifact distribution mirrored that observed on the site's surface, with Units 2 and 3 containing most of the recovered subsurface artifacts (Appendix IV). Prehistoric artifacts were confined to the upper 10 cm level of Units 1, 4, 5, and 6, while Units 2 and 3 contained some lithic

debris as deep as the 30-40 cm level. In general, subsurface artifacts were relatively small in number, and no faunal or floral remains were recovered.

Artifact Inventory

A complete tabulation of artifacts by provenience of recovery is presented in Appendix IV. We note here that the vast majority of these were recovered from the site's surface. In addition to lithic debris, 10 flakes were recovered (8 from the surface and 2 from subsurface contexts). Other artifacts included a chert core fragment, one quartzite hammerstone, and a pitted stone ("nutting stone") made of siltstone, all collected from the site's surface.

Chronology

Since no temporally-diagnostic artifacts were recovered during testing, the projectile points in Young's surface collection are the best evidence for the chronological placement of 41DL189. These point types (Gary, Wells, Trinity, Godley,

41DL198

1m Contour Intervals

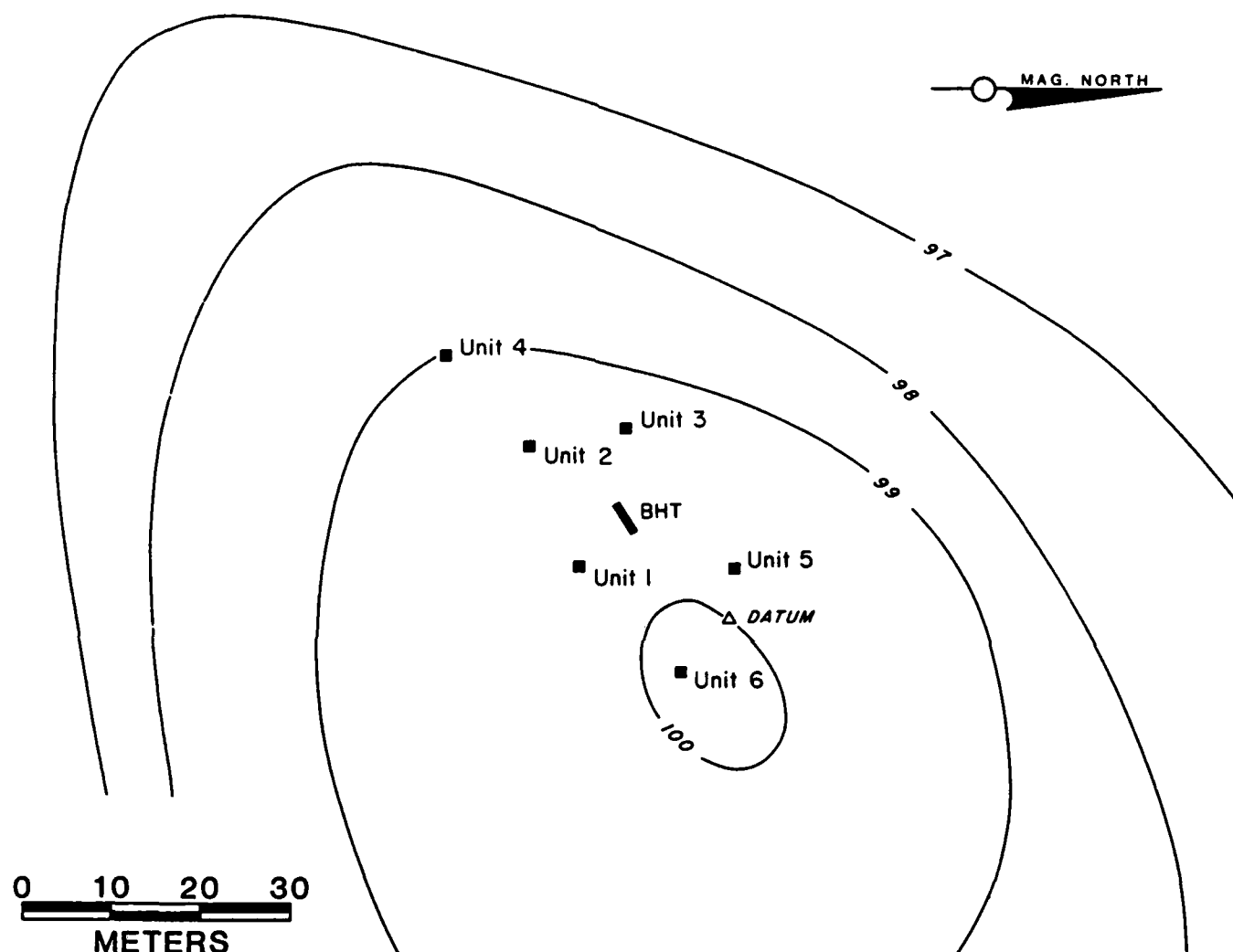


Figure 3-18. Map of site 41DL198.

Marshall, and Edgewood) suggest occupation during the Middle and Late Archaic Stages (ca. 4000 B.C. to A.D. 1000).

41DL199 (1980)

ENVIRONMENTAL SETTING

Site 41DL199 is situated approximately 100 m north of site 41DL198 (Figure 3-19). Originally located by Mr. Bill Young of Corsicana, Texas, the site is positioned on a small floodplain gravel knoll (a T-1 Terrace remnant, 520 ft. m.s.l.) at the base of

a series of upland ridges and rolling hills overlooking the Mountain Creek floodplain. The western portion of the site has been eroded away by the meandering action of Mountain Creek. Young's collection from the site consists of 12 chert flakes, 2 broken biface fragments, 1 complete chert biface, 6 chert dart point fragments, fragments of 1 Gary and 1 Godley point, and 1 complete Elam point made of chert (Skinner and Connors 1979:46).

A good deal of historic debris covers the upper portion of the knoll area. Testing with a backhoe (Figure 3-19) showed that a depression near the western perimeter of the site was a filled-in historic privy. A portion of the site was in cultivation (wheat)

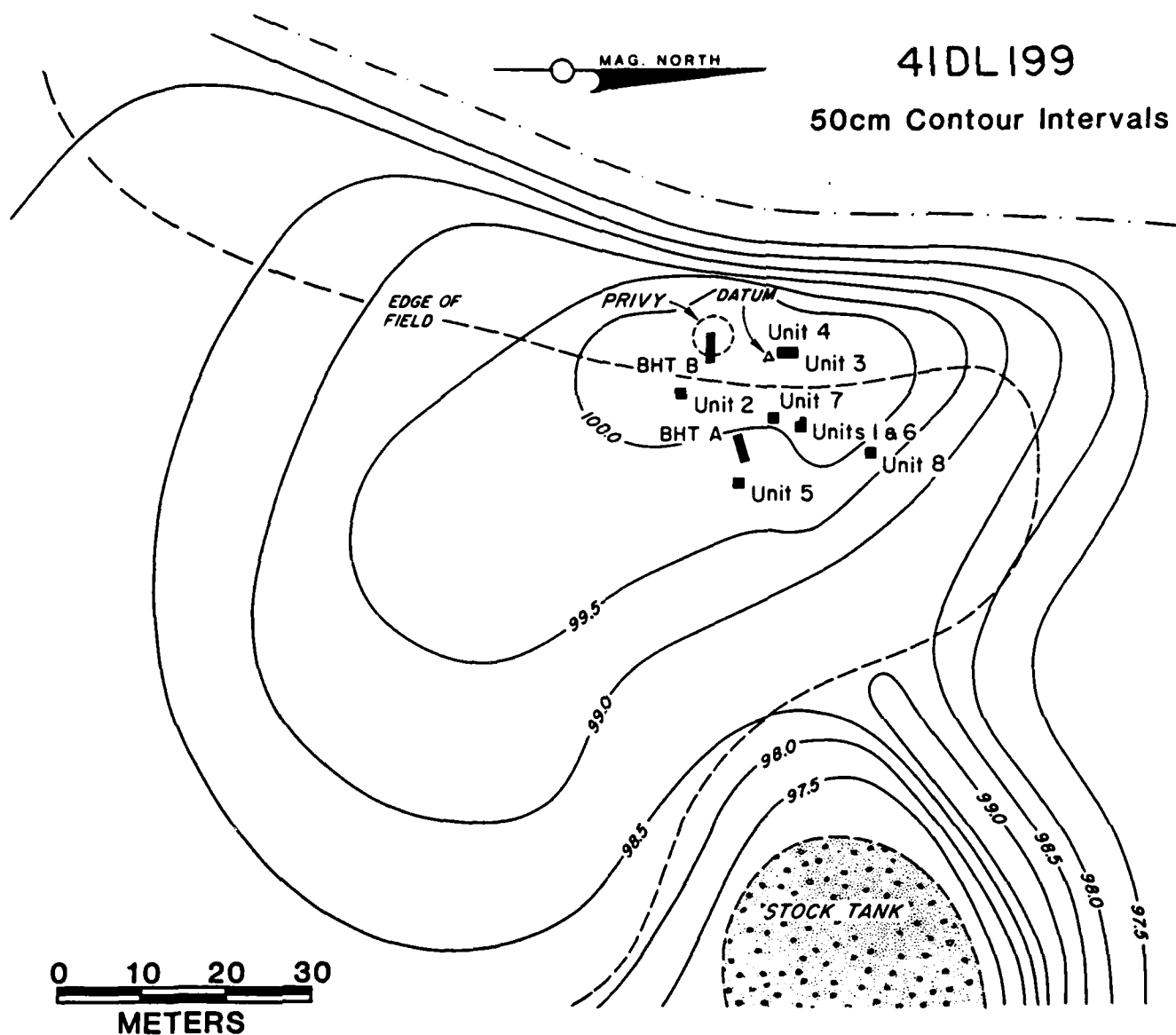


Figure 3-19. Map of site 41DL199.

during testing while the southwestern and northern margins of the site were forested. The overstory consists of locust, hackberry, and mesquite trees with an understory of grasses and greenbriar.

TESTING METHODOLOGY

Eight 1x1 m excavation units and two backhoe trenches were used in the testing of 41DL199. Six 1x1 m test units (Units 1-4, 6 and 7) were placed near the top of a knoll where the surface artifact density appeared greatest. Two test units (Units 5 and 8) were placed a small distance down slope from the top of the knoll

where fewer surface artifacts were discernible. In addition to the eight excavation units, two backhoe trenches (A and B) were used to determine the substratum of the site. Trench A was placed between Test Units 2 and 7 at the top of the knoll while Trench B was used to test a subsurface depression within the wooded western portion of the site.

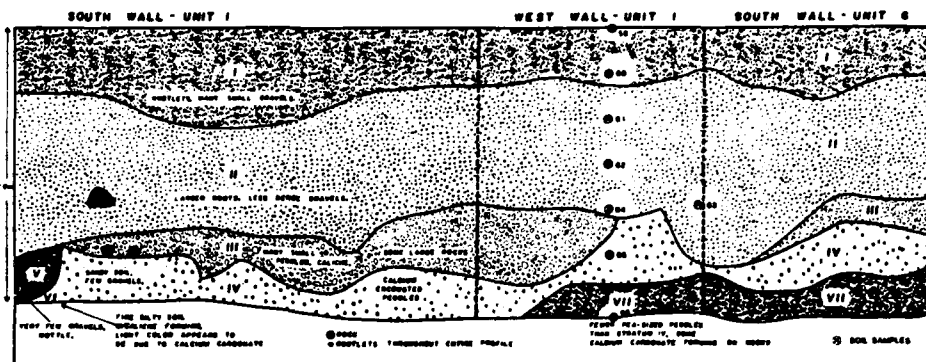
TESTING RESULTS

Artifact Inventory

The density of recoverable artifacts varied across the site with

41DL199 UNITS 1 & 6

WALL PROFILE



PLAN VIEW

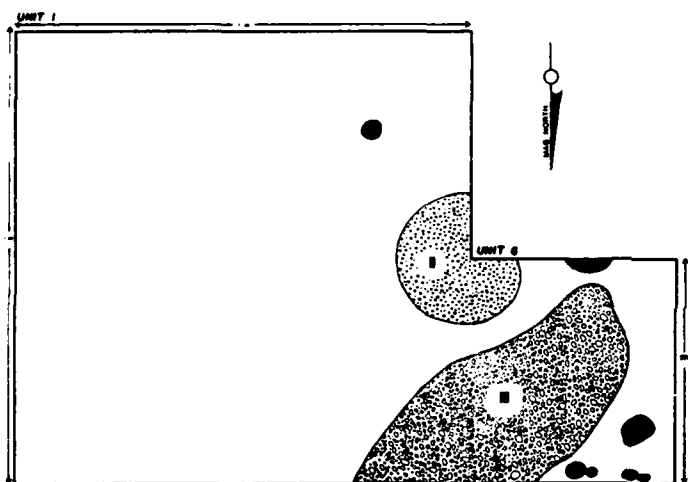


Figure 3-20. Site 41DL199, profile and plan view of Units 1 and 6.

a tendency for artifact frequency to increase near the top of the knoll. The surface and subsurface artifact collections made at 41DL199 represents a wide range of prehistoric lithic materials. A complete listing may be found in Appendix IV. Site 41DL199 displayed the highest number of groundstone artifacts of all the sites in the Lakeview area (6 mano fragments, 1 ground and battered "nutting stone," and a large metate fragment) and were all recovered from the surface of the site. Two chert nodules, one from the surface and one from Unit 7, Level 5, display a battered surface as a consequence of utilization. Both nodules are of an apparently local chert variety (based on comparison with reference collections) similar to varieties found throughout the Uvalde gravels of North Central Texas (Byrd 1971). Both of the chert nodules display evidence of multiple use and are best described as hammerstones rather than cobble cores.

Four hundred and fifty-nine lithic artifacts were recovered from 41DL199; of this number, 70.5% (or 324 artifacts, 318 of which are chipped lithic artifacts) were recovered from two of the eight units, Units 1 and 7. In Unit 1 a majority of the artifacts (83.4% of the artifacts recovered from Unit 1, or 91 lithic

artifacts) were extracted from the upper three levels of the unit (six levels were excavated in Unit 1).

Two hundred and fifteen artifacts (or 46.8% of the total artifact assemblage) were recovered from Unit 7. However, unlike Unit 1 (Figure 3-20) where artifacts were highest in the first three levels, Unit 7 (Figure 3-21) artifact frequencies remained consistently dispersed down through Level 8, at which point the artifact frequency declined to 9 lithic fragments and then to zero artifacts in Level 9. The discrepancy in artifact frequency between two units (Units 1 and 7) only 2 m apart appears to suggest that Unit 7 was excavated into a possible aboriginal pit. This assumption is further discussed in the Site Features section below.

Of the faunal material recovered from 41DL199, the most interesting information thus far noted is of a single large vertebra (Unit 4, Level 7, or 70-80 cm below surface) of either a large (20-30 lbs.) channel or blue catfish (*Ictalurus punctatus* or *Ictalurus furcatus*). As referenced in Appendix III, the habitat of either of these catfish is a large stream of clear, flowing water. It is possible that in the past the flow of Mountain Creek, or other

streams in the area, may have been greater than it is today.

The projectile points from 41DL199 are discussed in the Chronology section below.

Site Features

Testing produced evidence of two definite features and possibly a third. Feature 1 (Unit 1) was eventually shown to be a naturally-occurring cluster of 10-12 cm in length sandstone rocks. Feature 2 was a possible posthole or pit located in the west wall of Unit 1 (Figures 3-20). This feature was identified through an accumulation of charcoal flecks and a dark soil stain. An additional test pit (Unit 6, a 50x50 cm pit) was added to the northwest corner of Unit 1 as an aid in further defining Feature 2 (Feature 2 is further discussed in Chapter 6, Soil Sample 63, in connection with soils work). A third feature (Figure 3-22) was a mussel shell concentration similar to one found at the Cobb-Poole site (41DL148). Located between 30 cm and 40 cm below the surface, Feature 3 contained mussel shell, a few flecks of charcoal, and some possibly burned rock. The preservation of the material was good, as was the integrity of the surrounding soils. An additional feature (which was suspected but not clearly recognized) was a possible aboriginal pit into which Unit 7 appears to have been excavated. Suggested by the depth and frequency of artifacts (Table 3-4), a noticeable difference was detected in the quantity of artifacts being recovered from Unit 1, where the numbers were relatively low as opposed to Unit 7, where the artifact recovery was fairly high. (For further discussion of differences existing between Units 1 and 7 and the results of a Kolmogorov-Smirnov Test on the lithic artifacts; see Chapter 6). The gross difference in the numbers of artifacts being retrieved from these two units suggests that an unrecognized aboriginal pit feature existed in the vicinity of Unit 7. Soils work at 41DL199 was undertaken with this hypothesis in mind (Chapter 6 presents evidence in support of the proposition) and appears to substantiate the assumption that was developed during field work. The soil samples which were extracted from Units 1 and 7 correspond well with artifact frequencies. When lithic frequencies are low, P is low, similarly, when lithic frequencies are high, P is high.

One additional factor of difference between Units 1 and 7 was an apparent stratum of water-worn, pea-sized, ovoid gravels which lie at about 25 cm below the surface in Unit 7 but nonexistent in Unit 1. This gravel deposit must be the result of alluvial washing of the terrace remnant gravels (on which the site is situated) into a depression not present in the area of Unit 1.

Chronology

Seven temporally diagnostic projectile points were recovered during the testing of 41DL199. The dart points indicated a span from the Late Archaic to the Early Neo-American Stages. Three points were recovered on the surface of the site (2 Edgewoods, A.D. 0-800; and 1 Ensor, 1500 B.C. to A.D. 750). One projectile point came from Unit 2, Level 2 (1 Yarbrough, 500

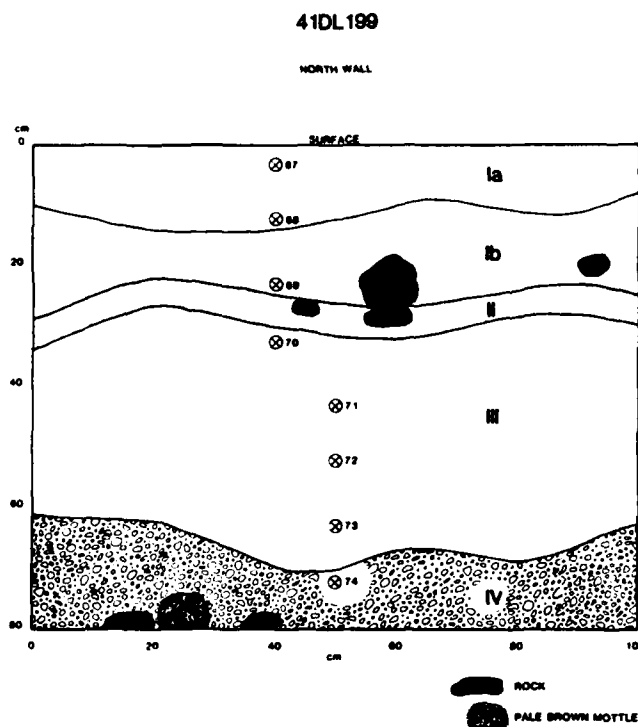


Figure 3-21. Site 41DL199, profile of north wall of unit 7.

B.C. to A.D. 1000). One point came from Unit 7, Level 6 (1 Yarbrough), and two came from Unit 7, Level 7 (2 Wells, 1000 B.C. to A.D. 1000).

41EL29 (1980)

ENVIRONMENTAL SETTING

Site 41EL29 is the southernmost site located within the Project area. Situated within a frequently inundated portion of the Mountain Creek floodplain (500 m from the stream) at the base of a T-1 Terrace (525 ft. m.s.l.), the surface of the site had recently been plowed in preparation for a sorghum crop (Figure 3-23). The ground cover vegetation found close to the site was grasses, thistles, and some other woody shrubs near the edge of the road. The site is also located near a slough.

TESTING METHODOLOGY

At three separate times, surface surveys of 41EL29 and the surrounding vicinity were made. Only on one occasion (following a rain storm) were artifacts likely to be visible. Based upon the paucity of artifacts recovered from the surface of the site (Appendix IV), one 1x1 m test unit and one backhoe trench were placed in the suspected center of the site (Figure 3-23).

Table 3-4 Site 41DL199
Chipped Lithic Material
Units 1 and 7

Levels	Unit 1 Counts	Unit 7 Counts
0-10cm	32	43
10-20cm	29	33
20-30cm	28	24
30-40cm	4	42
40-50cm	6	27
50-60cm	9	32
60-70cm	*	9
<u>70-80cm</u>	<u>*</u>	<u>0</u>
TOTAL	108	210 = 318
*Not excavated		

TESTING RESULTS

Artifact Inventory

Survey and testing at 41EL29 revealed 4 flakes, 1 biface, 1 retouched flake, 1 dart point fragment, and a few hematite fragments, none of which were retrieved from the one 20 cm deep 1x1 m test unit or the backhoe trench. All artifacts were recovered from the surface. Based upon surface and subsurface investigations, it is believed that the artifacts recovered from the site are not due to the human occupation of the location but rather that the artifacts were washed into the area via a nearby slough. Surveys of the terrace areas to the west and north were made; however, it is most probable that the artifacts are being washed in from the terrace area to the south. Permission to enter this land was sought but was denied by the land owner.

Chronology

The only artifact recovered from this site with which to make an assessment of chronological placement is an unidentified dart point fragment located during the survey. Therefore, if a gross

estimate of site chronology is made, an occupation in the Archaic Stage appears likely.

41TR1 (1980)

ENVIRONMENTAL SETTING

The site of 41TR1 is located on a slight floodplain rise (505 ft. m.s.l.) immediately west of 41DL189 and southwest of the confluence of Mountain Creek and Low Branch (Figure 3-24).

The site was originally discovered by a group of boys (reported as the "Fosters") from Mansfield, Texas, in the spring of 1964. In the fall of 1964, J. Cochran and R.L. Tapscott, of the Tarrant County Archaeological Society (TCAS), visited the site and examined the recovered materials. According to the records kept by the TCAS, the site had already been destroyed during the construction of a stock tank. During the stock tank construction, two burials were uncovered along with "some non-associated items" including 2 Gary dart points, 1 Carrollton dart point, and 1 Wells dart point, as well as 4 unidentifiable dart points and 2 bifaces. In addition, the site file indicates that 1 mano and 6 lithic flakes are recorded as being recovered



Figure 3-22. Site 41DL199, Feature 3.

approximately one-fourth of a mile from 41TRI. These artifacts may lie in the vicinity of 41DL189 on Mountain Creek; however, this remains uncertain. During January, 1979, personnel from the Archaeology Research Program (ARP) of Southern Methodist University, Dallas, Texas, revisited the site but were unable to locate any archaeological materials (Skinner and Connors 1979:46-47).

During testing operations, members of ARP once again visited the area. A surface reconnaissance of the area was once again unable to locate any definable site location. However, several lithic flakes were found scattered in a diversion canal which runs northeast of the stock tank.

TESTING METHODOLOGY

Eleven backhoe units were employed during the subsurface testing of 41TRI (Figure 3-24). The sediments from the excavations, as well as the trench walls, were searched for artifacts. All trench walls were shovel-scraped to reveal a clean, observable surface. Ten of the backhoe units (A-J) were located north of the stock tank between the confluence of Low Branch and Mountain Creeks. One additional trench (K) was placed south of the stock tank to test for archaeological deposits in the area. This arrangement was thought to conform to possible

artifact distributions, based on the sketchy surface evidence of artifacts.

TESTING RESULTS

No artifacts were recovered from any of the backhoe trenches.

Artifact Inventory

The best assemblage available from the site is the collection mentioned above (TCAS, which includes several dart points). The human burials noted above, reported to have come from 6 ft. below the present ground surface, may have been interred when the ground surface of the area was lower (in relation to stream grade) than today. It seems unlikely that prehistoric groups digging in the stiff floodplain clays with primitive implements would have excavated graves to a depth of 6 ft. The depth of the burials appears to suggest that the surface of the site has been aggrading, which is not an unexpected consequence of being located on a floodplain and in proximity to streams. However, the entire discussion of whether or not aggradation occurred after interment remains unanswerable as long as the exact burial location is unknown. The 6 flakes and 1 biface located during

41EL29

50cm Contour Intervals

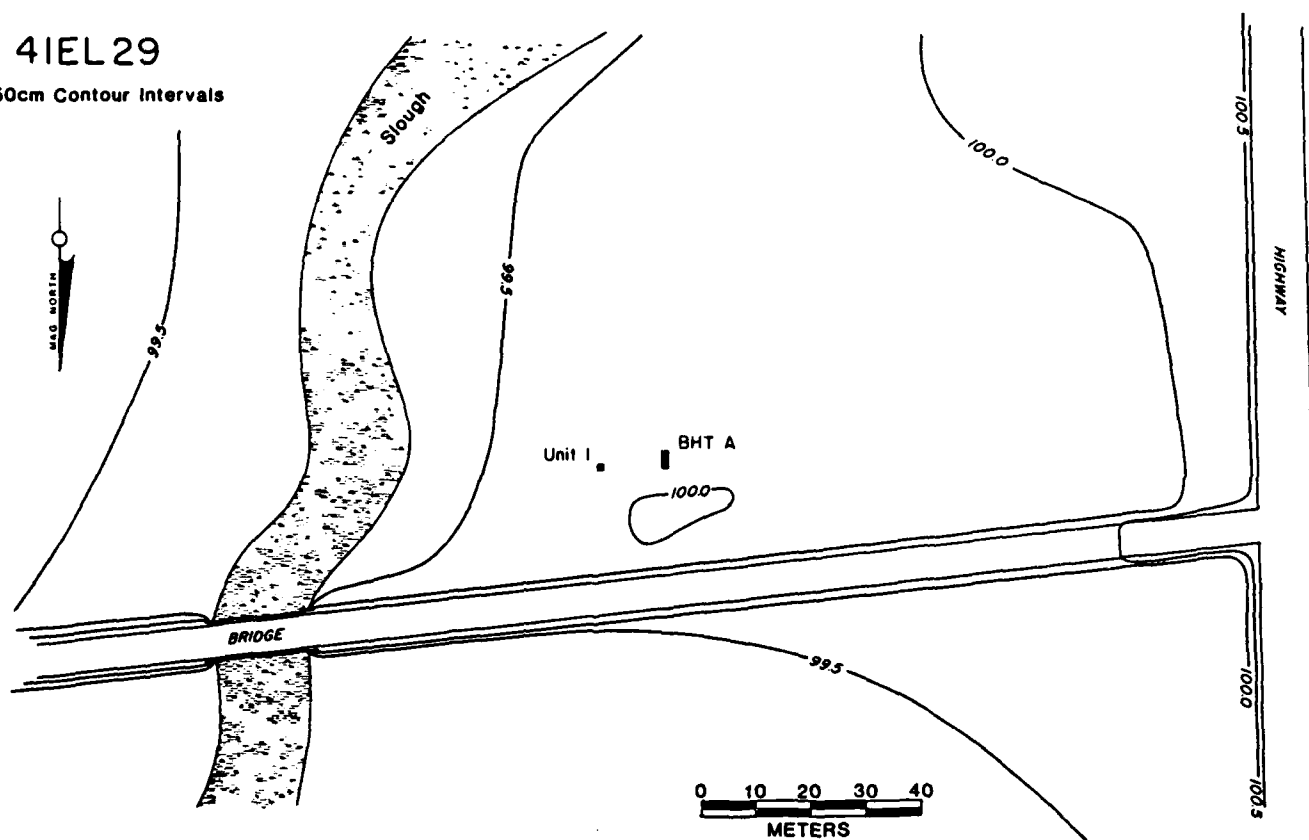


Figure 3-23. Map of site 41EL29.

testing operations were all found in the bottom of dry slough between Backhoe Trenches E and J.

Chronology

The dart point types reported by the TCAS suggest an Archaic component at the site (ca. 2000 B.C. to A.D. 1000).

41TR58 (1980)

ENVIRONMENTAL SETTING

Site 41TR58 was first recorded by Mr. Bill Young, an avocational archaeologist from Corsicana, Texas. It is situated at 520 ft. m.s.l. on a T-1 Terrace remnant at the foot of an upland ridge and is bisected by Mountain Creek Road. The main channel of Mountain Creek flows approximately 130 m to the northwest.

Most of the site area was planted in wheat during testing, but a portion of the site on the south side of Mountain Creek Road remained uncultivated. This is also the location of an historic house indicated by the rubble of a brick chimney and a standing metal shed. Historic artifacts were scattered over all portions of

the site.

The prehistoric remains consisted of a thin scatter of lithic materials confined almost entirely to the north side of Mountain Creek Road. The upper portions of the knoll on which the site is situated are mantled by a loamy clay deposit. This is underlaid by terrace gravels which are exposed down slope along the northern edge of the knoll.

TESTING METHODOLOGY

Initially, a backhoe trench 3 m long and 1.5 m deep was excavated to the north of Mountain Creek Road (Figure 3-25). This provided a profile view of the site's stratigraphy. Another trench was excavated in the area of the historic house site mentioned above to detect possible subsurface historical artifacts.

Next, a series of five 1x1 m units was dug to test for the presence of artifacts in the subsurface deposits. Three of these (Units 1, 2, and 3) were positioned on the knoll north of the road where surface artifacts had been collected. The others (Units 4 and 5) were placed in the cultivated field south of the road. All test squares were excavated in arbitrary 10 cm levels with the fill passed through 6 mm (1/4 in.) screen. Two No. 10 buckets of soil (totaling 16 liters each) were saved from each level for fine screening. All prehistoric artifacts observed on the surface

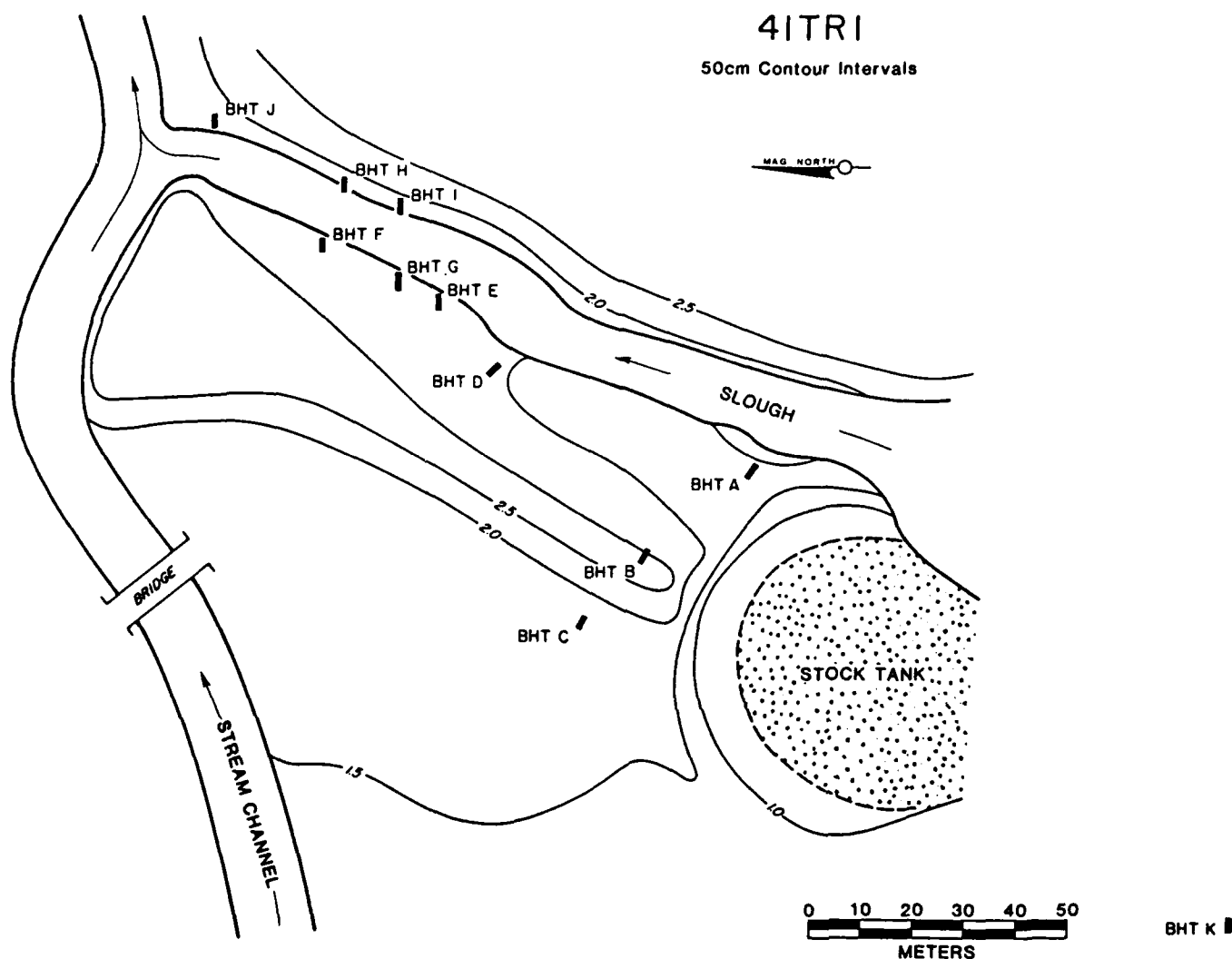


Figure 3-24. Map of site 41TRI.

during testing were collected.

TESTING RESULTS

The test squares varied in depth from 20–40 cm below the surface before reaching culturally sterile deposits (see Table 3-5). Unit excavation was abandoned when two successive 10 cm levels produced no prehistoric artifacts. Of the relatively small prehistoric artifact assemblage from 41TR58, only 3 broken lithic flakes and 2 bone fragments were recovered from these 1 x 1 m units (see Appendix IV for the distribution of these), all from the upper 20 cm of the deposit. The remainder was collected from the site's surface.

Artifact Inventory

The artifact collection by Mr. Young remains the best assemblage of material from the site. Types of projectile points in the Young collection from this site include Wells, Godley, Ensor, Marshall, Perdarnales, Gary, and Williams (Skinner and Connors 1979:47).

Chronology

The projectile point types indicated above suggest a Middle and Late Archaic Stages (ca. 4000 B.C. to A.D. 800) affiliation for 41TR58.

41TR58

1m Contour Intervals

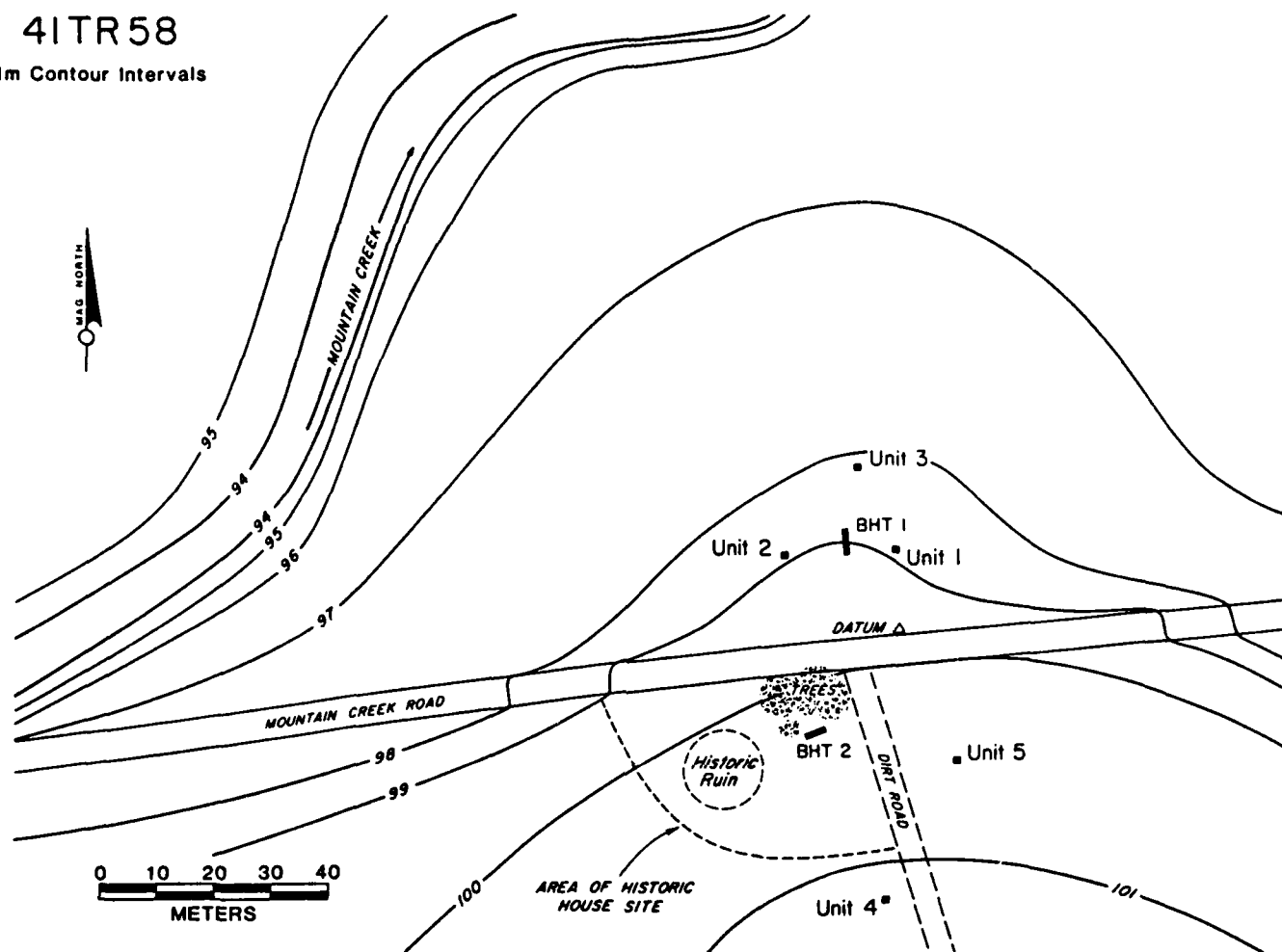


Figure 3-25. Map of site 41TR58.

41TR59 (1980)

ENVIRONMENTAL SETTING

Originally recorded by Mr. Bill Young, the site is situated at 510 ft. m.s.l. on a knoll in the floodplain 50 m east of Mountain Creek. This knoll appears to be a T-1 Terrace remnant. The site area was under cultivation (sorghum) during testing. Recent plowing showed the site's sediments to be composed predominantly of gravel and sand. A slough runs between the site and the main channel of Mountain Creek. The field opposite the slough is not currently in cultivation and contains tall grasses, shrubs, and stands of cane. Prehistoric artifacts occur as a diffuse surface scatter atop the knoll and down its slopes. Young reported collecting lithic flakes from the site (Skinner and Connors 1979:47). Unidentified local informants report that the general area was the location of several tenant houses dating to the 1920-30s.

TESTING METHODOLOGY

Subsurface testing was accomplished with the excavation of a single backhoe trench and six 1x1 m test units (Figure 3-26). The backhoe trench, 3 m long and 1.5 m deep, was placed on top of the knoll to provide a stratigraphic profile of the subsurface deposit. The six 1x1 m test units were distributed across the site to provide coverage of the areas where surface artifacts were observed. Their purpose was to investigate the possibility that archaeological materials were present in a subsurface context. All excavation units were excavated in arbitrary 10 cm levels with the soil matrix screened through 6 mm (1/4 in.) mesh hardware cloth. From each level, two No. 10 buckets of fill (totaling 16 liters each) were saved for fine screening.

TESTING RESULTS

Site stratigraphy, best observed in the backhoe trench profile,

consisted of an upper deposit (25 cm thick) of sand mixed with pebble-sized gravel. Below this (and continuing to the bottom of the 1.5 m trench profile), the deposit consists primarily of sand with gravel inclusions much reduced in frequency.

All 1x1 m test squares were excavated to a depth of 20 cm, except Unit 6 which was continued to 30 cm. No artifacts were recovered from the lowest 10 cm level of all units. Three pieces of lithic debris were the only prehistoric artifacts recovered from the test squares, all from the upper 10 cm of the site deposit (the distribution of these is presented in Appendix IV). The remainder of the assemblage was collected from the site's surface. The scatter of surface artifacts covered an area of about 3,000 sq. m on the top and sides of the knoll.

Artifact Inventory

Artifacts from 41TR59 include 1 metate fragment of sandstone, 2 hammerstones, 1 chert core, 1 biface fragment of chert, 1 large quartzite scraper, 3 retouched pieces, and 1 small, expanding-stem dart point (Appendix IV). All of these were collected from the site's surface.

Chronology

The recovered dart point does not fit any established type description but is most similar to various point types believed to date to the Late Archaic Stage (ca. 1000 B.C. to A.D. 800).

41TR60 (1980)

ENVIRONMENTAL SETTING

The site of 41TR60 is located 250 m east of Mountain Creek and south of Mountain Creek Drive at 510 ft. m.s.l. The site was situated in a freshly plowed field, providing excellent surface visibility of the T-1 Terrace remnant as it overlooks a portion of the Mountain Creek floodplain. To the west is a meandering slough of Mountain Creek and to the north 41TR59. Originally located by Mr. Bill Young, the site represents an extremely diffuse Archaic lithic scatter (50x75 m) intermixed with a thin historic surface component (20x20 m) upon the uppermost section of the knoll. The Young collection consists of 5 retouched flakes (1 quartzite, 4 chert) and 1 broken Gary point made from a quartzite material (Skinner and Connors 1979:48). The western margins of the site are covered with an overstory of hackberry, mesquite, and bois d'arc, with an understory of grasses and thistles.

Unidentified local informants in the area spoke of the Clark/Seeton field (in which the site is located) as being the location of three or four historic tenant structures occupied up until the 1920s and 1930s. Since the removal of the homes, the field has been farmed by the Seeton family. However, in recent years, John Clark, of Midlothian, Texas, has leased the parcel and is currently growing sorghum on the land.

TABLE 3-5

Depths Below Surface of 1x1 m Units

Unit	Depth
1	40 cm
2	30 cm
3	30 cm
4	30 cm
5	20 cm

TESTING METHODOLOGY

Five 1x1 m test units were deployed in subsurface testing of 41TR60 (Figure 3-27). Units 1, 3, 4, and 5 were utilized to test the continuity of the prehistoric deposit, while Unit 2 was located to best sample the historic materials. The prehistoric component of the site appears limited to a few flakes and stone tools. However, a large area of the site is covered with historic debris. Two backhoe trenches were utilized in testing for subsurface archaeological deposits as well as in determining the geologic depositional sequence at the site.

TESTING RESULTS

Artifact Inventory

Like site 41TR60, this site appears to be confined almost entirely to the surface. Of the 36 pieces of lithic material recovered from the site (Appendix IV), only 2 were recovered from test units; both of these pieces come from the 1-10 cm level in Units 1 and 3. An exact breakdown of the recovered artifacts from 41TR59 includes 3 complete flakes, 27 broken flakes, 1 piece of non-diagnostic shatter, 1 Palmillas dart point, 1 biface, 1 core, and 2 lithic pieces.

Chronology

The basal fragment of an apparent Palmillas dart point (Suhm and Jelks 1962:229) suggests a Late Archaic or transitional late prehistoric component most likely between A.D. 1-1000.

41TR61 (TSN 3) (1980)

During the Phase II testing season of 1979 (Raab, Bruseth, and McIntyre 1980), site 41TR61 was located during a soils survey. At that time, the site was assigned Temporary Site No. 3; subsequently, the Texas Archaeological Research Lab provided us with the permanent site number. The site is situated in sandy loam soil on a T-2 Terrace (510 ft. m.s.l.) approxi-

41TR59

50cm Contour Intervals

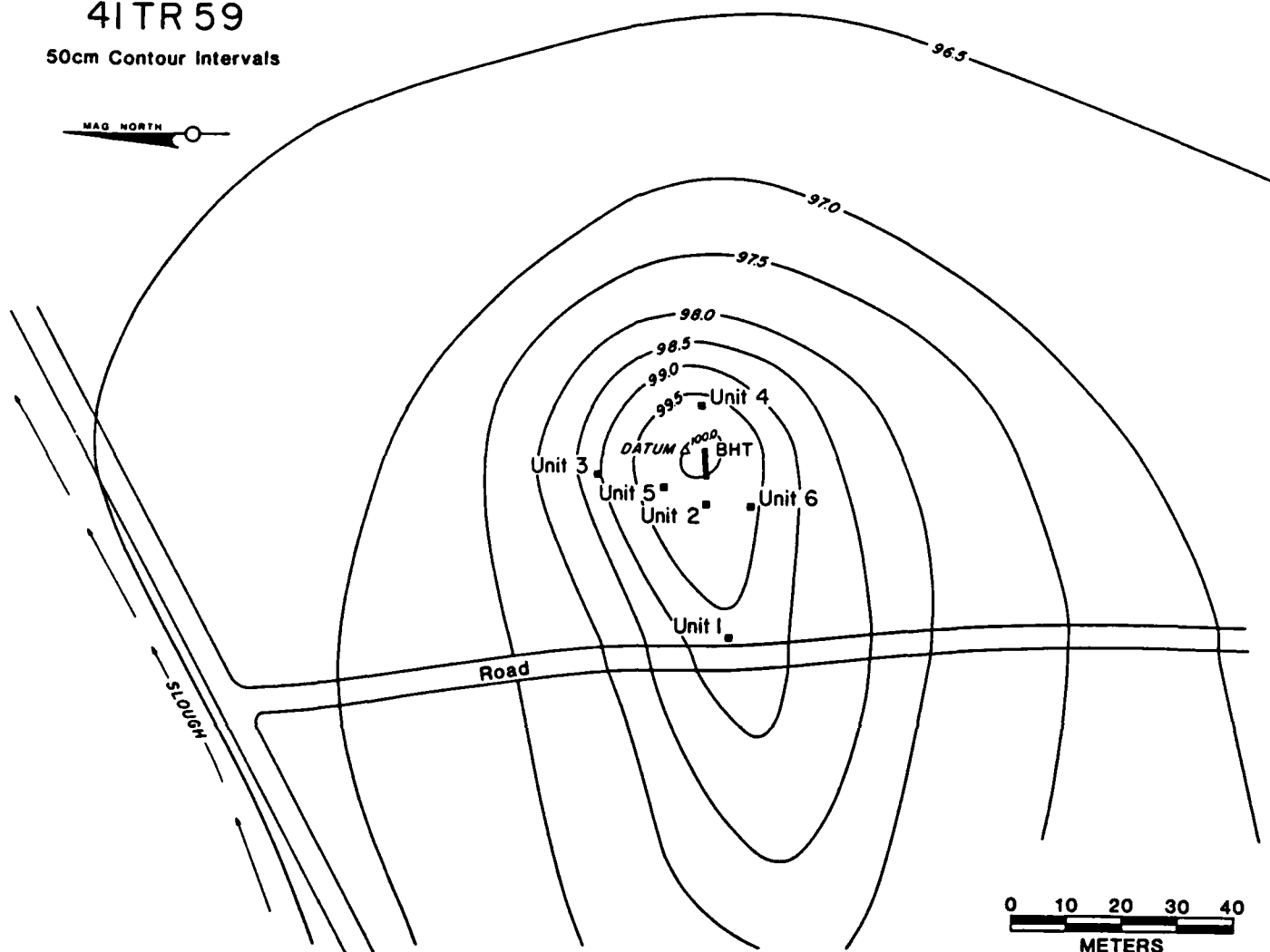


Figure 3-26. Map of site 41TR59.

mately 700 m from Walnut Creek (Figure 3-28). The site appears as a diffuse scatter of lithic material about 100 m in diameter. The site is situated in a pasture with a sparse cover of grass. A small, intermittent drainage is located along the eastern edge of the site area. It appears that sand deposits were mined at the northeast periphery of the site. A large portion of the terrace edge has been removed, exposing an area of perhaps 10,000 m² to erosion.

TESTING METHODOLOGY

At the time the site was located during the Phase II work, two backhoe trenches were excavated into the site in order to detect subsurface cultural deposits that might be present. This work failed to produce any evidence of artifacts below 30 cm of the surface. Examination of these trenches also revealed a homogeneous reddish-yellow sandy loam soil giving way to a dense

sandy clay in the T-2 Terrace at about 70 cm depth. This profile is similar to that described at site 41DL148 (Cobb-Poole; Pheasant 1980:221-222). During the Phase III testing investigations, eight 1x1 m test pits (Figure 3-28) were placed in the site according to apparent surface densities of artifacts (low in all cases) in order to determine if artifacts and features could be found that had escaped detection during backhoe trenching during the previous field season. Vertical control was maintained in the test units by digging in 10 cm levels. The soil matrix was passed through 6 mm (1/4 in.) screen. Two No. 10 buckets of soil (totaling 16 liters each) were removed from each level for screening through window screen (approximately 1.5 mm).

TESTING RESULTS

Soil stratigraphy was uniform across all excavated areas. A dark brown, fine sandy loam, from 0-25 cm, grades into a

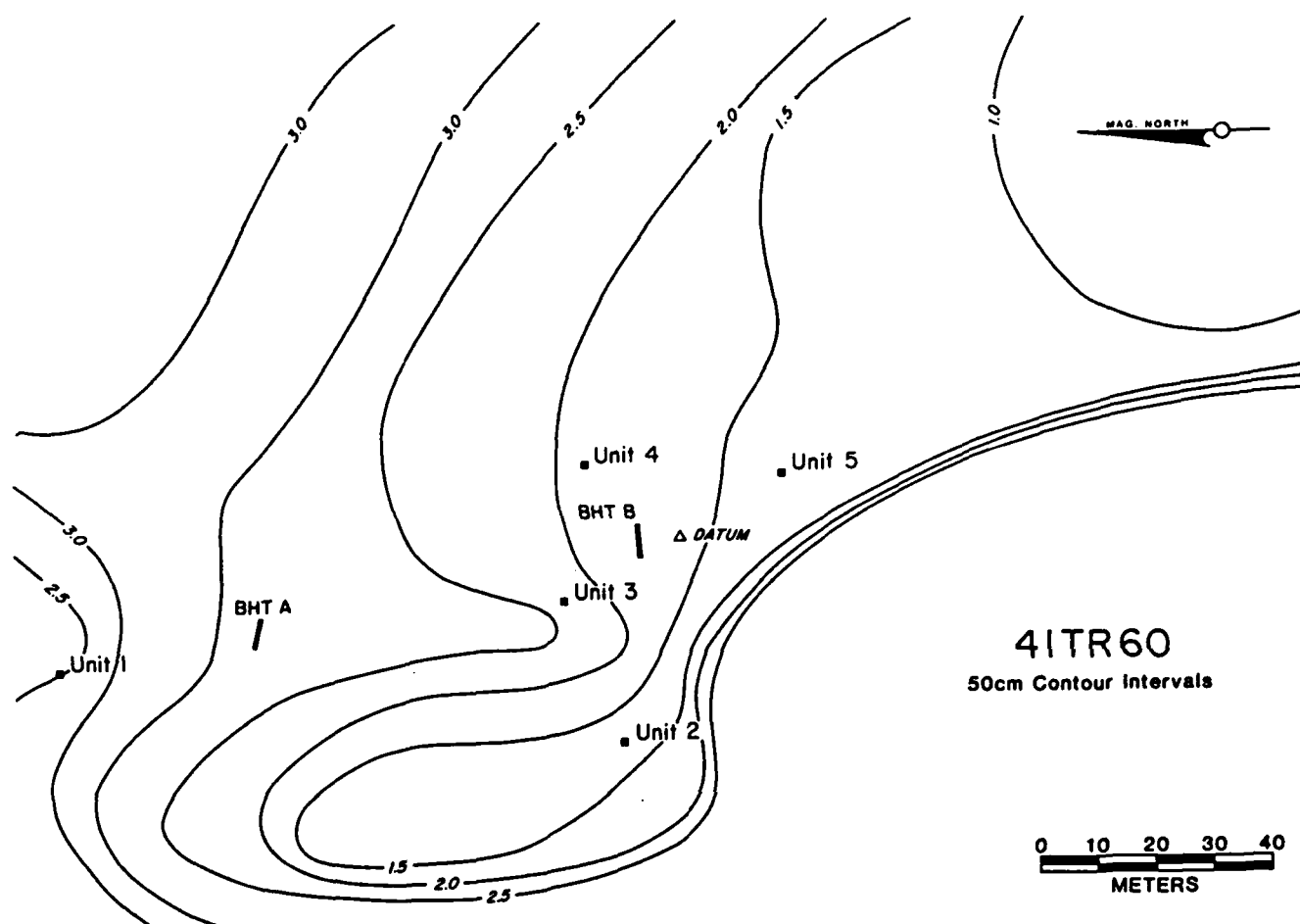


Figure 3-27. Map of site 41TR60.

reddish-yellow, compacted sandy layer that in turn grades into sandy clays in the T-2 Terrace. All test units were excavated to 30-40 cm below the surface. Artifacts recovered from these tests (Appendix IV) were few in number, including 10 pieces of lithic debris and 1 dart point. These results suggest that the site is essentially a low artifact density surface site.

Artifact Inventory

A complete tabulation of recovered artifacts is presented in Appendix IV. We note here that the surface collection included four projectile points or point fragments. Two of these were typable, an Ellis dart point and the lower half of a Fresno arrow point (Suhm and Jelks 1962:187, 273). A complete but untypable dart point, and the base of a straight-stemmed dart point also were collected. Of special interest are three tools made from what appears to be Edwards Plateau cherts (based on comparisons with reference collections of lithic material iden-

tified by Larry Banks, archaeologist with the U.S. Army Corps of Engineers). One of these is a large blade (13x5x1.8 cm) with retouch on all of its edges. Another is an end-scraper made on the distal end of a broken blade. The third is a large broken flake with retouch along one edge. These pieces of material are relatively large and hint, perhaps, at material cached on the site but exposed by plowing or erosion. Another artifact of special interest is a large (10x7.5x2.4 cm) bifacially-worked chert tool that appears to be an axe or hoe. Obvious traces of wear on the end opposite the bit of this specimen suggests that the tool may have been hafted for use.

Chronology

The Fresno arrow point and Ellis dart point suggest Neo-American (ca. A.D. 800-1600) and Archaic Stage (1000 B.C. to A.D. 800) of occupations.

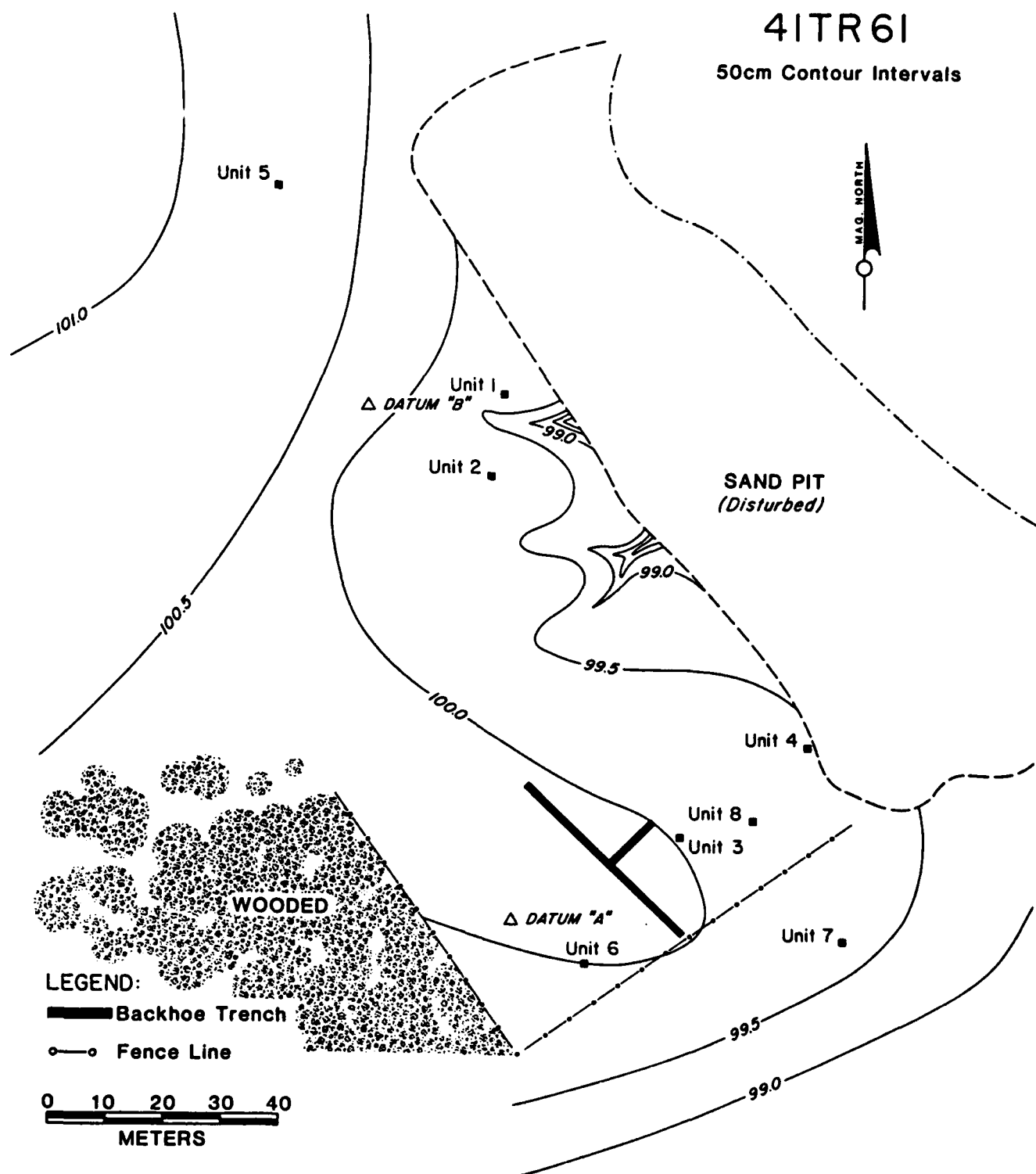


Figure 3-28. Map of site 41TR61.

4

Subsurface Testing of Designated Dam and Construction Borrow Areas

INTRODUCTION

Subsurface testing of the proposed lake area, including four construction borrow areas and the Lakeview Dam site, was the primary focus of prehistoric investigations during Phase II of the Lakeview Archaeological Project. Records indicated that sixty percent (60%) of the time spent on Phase II work was devoted to that task. There are two basic reasons why such an emphasis was placed on subsurface testing. First, Phase I archaeological work established the possibility that significant cultural resources might be buried under alluvium deposited on the floodplains of Mountain and Walnut Creeks. Skinner and Connors (1979:56) caution that:

A recent study of archaeological site locations within the City of Dallas (Skinner et al. 1978:51-60) suggests on the basis of local topography, soil types, and available archaeological information that buried sites can be expected in floodplain deposits along Mountain Creek.

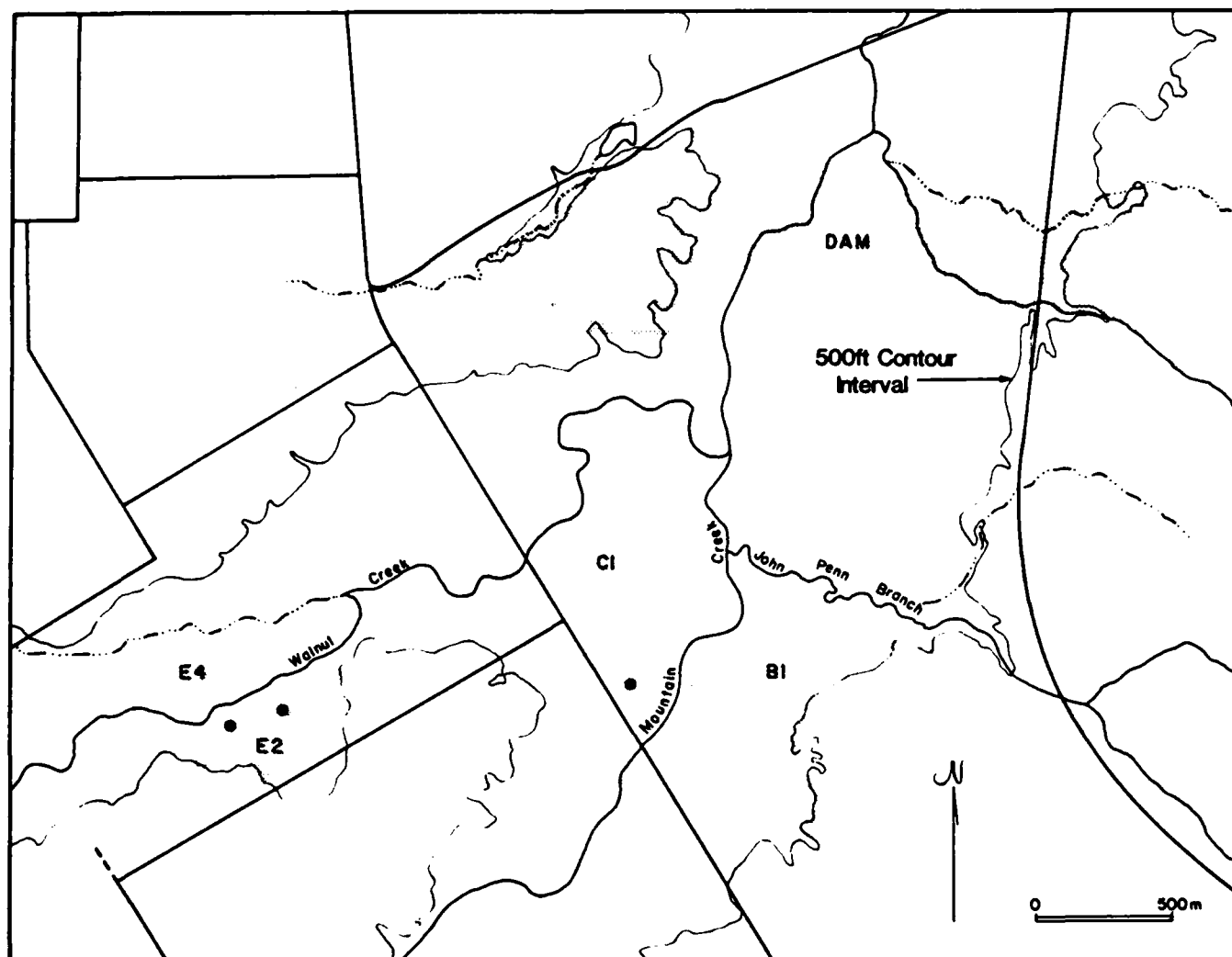
Much of North Central Texas has undergone serious erosion resulting from the destruction of the native vegetation by early farming and ranching practices (see Chapter 7 for the effects of this trend on ground water availability). Since the project area was affected by these activities, one could not rule out the possibility that a mantle of recent alluvium was deposited over

prehistoric and historic sites in the bottomlands. Consequently, subsurface testing was undertaken to: (a) locate archaeological sites that may be buried, estimating the frequency and character of any such sites, and (b) to establish the extent to which recent alluviation has affected the project area.

The second reason for the emphasis on subsurface testing had to do with the construction plans for the Lakeview Dam. The area of the proposed dam, as well as the four "borrow" areas (areas to be mined for the dam's earthen fill) were designated by the Army Corps of Engineers as localities that had to have immediate attention vis-a-vis the possibility of buried sites. Accordingly, subsurface testing was carried out in these areas (Figure 4-1).

A geomorphologist (Appendix I) was also involved to help determine the possibility of locating subsurface deposits. By inspecting the natural stratigraphy of open subsurface units, questions regarding the degree and extent of alluviation were answered, thus allowing more effective subsurface testing methodologies.

The intent of subsurface testing was to determine if there were significant cultural resources in the project area under recent (or "old") alluvial sediments and to functionalize this information by estimating the cultural resources that might be located in construction areas. Additionally, the long-term objective was to



Sampling Intervals on Transects: Dam - 50m, 70m, & 140m shovel tests; BI - 70m tests; CI - 53m, 66m, & 132m tests; E2 - 70m tests; E4 - 70m tests.

- Soil Test Unit (see Appendix I)
- Borrow Areas

Figure 4-1. Location of construction borrow areas and soil test units within Project area.

anticipate buried resources throughout the project.

EXCAVATION METHODS

Approximately 340 ha (838 a.) of land had to be tested in a period of nine weeks, a formidable logistical problem. A

subsurface testing methodology was desired that met five criteria. The first criterion was man-power/time efficiency. The second criterion was the ability to provide reliable detection of artifacts, cultural features, alluvial deposits, and other natural stratigraphic characteristics to a minimum depth of 2 m. The third criterion was easy deployment and accessibility of subsurface test units. The fourth criterion was an ability to excavate hundreds of test units with reasonable speed. The fifth criterion

was the need for a systematic, dispersed deployment of test units via a probability sampling method in order to insure a data base compatible with statistical analysis.

A number of subsurface excavation tools were considered for use. Hand and power augers, although easily maneuverable, time efficient, and capable (with extensions) of sampling to depths of more than 2 m, do not provide a sufficient view of the stratigraphic profile showing alluvial and stratigraphic sequences. Moreover, it is questionable that these devices can reliably detect low-density artifact deposits. Shovel-dug units clearly could not provide a deep enough test within acceptable time and labor limits. Hand excavated test pits were considered and rejected for the same reason.

It was decided that a backhoe (though difficult to maneuver in broken terrain) would be the most feasible means of subsurface testing. The backhoe provided the necessary test unit depth (2 m+), width (.75 m+), and length (3 m+) to allow the examination of subsurface strata quickly and systematically.

SAMPLING STRATEGY

As noted above, a probability, or statistically-based, sampling scheme was desired for subsurface testing. In the event that archaeological sites were found during testing, it was deemed desirable to make projections regarding the expectable frequency of sites within unit areas of land. This objective requires some kind of probability sampling measure (e.g., Donaldson 1975; Doelle 1977). In practice, however, probability sampling techniques must be adapted to constraints imposed by the character of the areas to be tested. The subsurface sampling design for the Lakeview Project was an interval or systematic sampling technique (e.g., Wallis and Roberts 1956:340, 488; Blalock 1960:397-398) adapted to the logistical constraints of the project area. The following discussion presents the sampling design, along with the logistical constraints with which the design had to deal.

Some means had to be identified by which hundreds of test units could be excavated, examined, recorded, backfilled, and if possible relocated for future reference. Simply placing the test units haphazardly could develop into a major problem. For that reason it was decided to sample along transects that were laid out perpendicular to a baseline. The difficulties of laying out the sampling design in the field and maneuvering the backhoe were simplified by being able to operate in this "linear" or "right angle" orientation. In this manner a sampling grid was imposed over the areas to be tested, providing a highly dispersed sampling method. It was assumed that the ability of the sampling design to detect buried archaeological sites would be enhanced by a standardized dispersion of the sample units. Moreover, while it was acknowledged that an interval sample may fail to detect sites which have a frequency of occurrence that occurs between or outside the sampling unit intervals (samples and sites would be "out of sync"; c.f. Wallis and Roberts 1965:488), the probability of such an occurrence in the project area was quite small. With the aid of a transit, a series of parallel transect lines was cleared through the forested areas to present a line-of-sight view. Dense stands of sunflowers were removed by lowering the front

end loader of the backhoe and driving a straight course through the plants. In dense, heavy vegetation, as found in the dam area, a Brunton compass (in place of the transit) was used to facilitate location of subsurface units.

Within each borrow area, an arbitrary location near the borrow center was picked as a datum. From this location, a random number (picked from a table of random numbers) was chosen. For instance, if the number was 29, the baseline was begun 29 m from the datum point. The baseline direction was determined to be the shortest axis through the borrow area on a cardinal direction. By having a short baseline and long transects, fewer transit set-ups were required. From the first coordinate on the baseline, additional points along the baseline were set at regular intervals. In both directions away from the baseline (at right angles to the baseline), coordinate transects were formed at equidistant sequences. The placement of the first subsurface unit along transects (away from the baseline) was also randomly selected. The random number designated in meters the location of the first subsurface unit away from the baseline on a transect. From this location, then, all other subsurface units along the transect were placed at a standardized interval frequency equal to distances forming the baseline intervals; i.e., if transect intervals along the baseline were positioned every 70 m, then sampling intervals along the transects were also placed at 70 m intervals. Once the location of a baseline, transect, or excavation unit was made, it was marked and recorded on a map.

After backhoe units were dug, their walls were shovel-scraped in search of cultural materials and then backfilled. Following the first rain of the season, an on-foot reconnaissance was made of all backfilled units so that artifacts either initially overlooked or washed out by the rain might be picked up. No artifacts were observed, though modern faunal material (22 pieces of *Bos taurus*, cow) was recovered from three units.

RESULTS

BORROW AREAS

Borrow Area C1, adjacent to Belt Line Road, is located 200 m north of Mountain Creek. Ground cover at Borrow Area C1 consisted of high grasses, dense stands of sunflowers, and weeds. The topography is generally flat with several small, ephemeral sloughs flowing across the area. Borrow Area C1 covers 49.4 ha (122 a.) and was the first area to be tested. The first eight transects were measured at 53 m intervals. The choice of 53 m as our initial interval measurement insured the placement of at least one subsurface unit per acre of the borrow area. However, 53 m intervals proved too time consuming, and longer test intervals were subsequently chosen. The choice of 66 m intervals, however, also proved to be unsatisfactory and were incompatible with the goal of making up field time which had been lost during the testing phase using the 53 m intervals. To avoid throwing the entire subsurface testing phase off schedule, the borrow area was concluded with two transects of 132 m intervals. One unidentifiable white chert dart point was located upon the surface of C1. No other artifacts were found.

After the experimentation with frequency intervals at Borrow

TABLE 4-1
Number of Subsurface Testing Units and Sampling Intervals

Area	Hectares (Acres)	Number of Units, Landforms, and Intervals
Dam Area	208.0 (514)	44 in T-0 at 140 m; 285 in T-1 and T-2 at 50 m; 31 shovel tests in White Rock Escarpment slope at 70 m.
B1	48.6 (120)	96 in T-0 at 70 m.
C1	49.4 (122)	61 in T-0 at 53 m; 39 in T-0 at 66 m; 15 in T-0 at 132 m.
E2	20.6 (51)	34 in T-0 at 70 m.
E4	12.5 (21)	20 in T-0 at 70 m.
TOTAL	339.12 (838)	625 Units

Area C1, a standard interval measurement of 70 m was employed for all remaining borrow areas. Seventy meter intervals proved to be most cost-and-time-efficient and were used for the balance of the Borrow Area testing.

Borrow Area B1, a parcel of 56.7 ha (140 a.) is located off Belt Line Road just south of Borrow Area C1. Borrow Area B1 was located in an abandoned farm field which had recently been mown for hay. Ground surface visibility and backhoe accessibility to all subsurface units were good. Twelve transects consisting of 96 subsurface units, each tested at 70 m intervals, were used. No archaeological materials were located; although off the surface of the borrow area, one possible flake was discovered.

Borrow Area E2 is located on a farm road west of Borrow Area C1. This borrow area, a 20.6 ha (51 a.) tract of land along Walnut Creek, was tested with 34 subsurface units, and eight parallel transects tested at 70 m intervals. Two subsurface units (Appendix I) were studied for geomorphological characteristics pertinent to understanding the formation and stability of the Mountain Creek floodplain. Ground cover at E2 consisted of grasses, sunflowers, and assorted low shrubs.

Twenty subsurface units were used to test Borrow Area E4, a 12.5 ha (31 a.) parcel of land, located across Walnut Creek, just north of Borrow Area E2. Before parallel transects could be systematically aligned, dense stands of sunflowers had to be cleared away with the front end loader on the backhoe. Twenty test units at 70 m intervals along four transects were used to sample this borrow area. Additionally, a small portion of Borrow Area E1, just west of E4, was tested.

PROPOSED DAM AREA

The area of the proposed dam, approximately 208 ha (514 a.), presented a range of problems during testing operations. The dam axis is a narrow strip of land measuring approximately 3000 m east-west by 500 m north-south. Elevations range from 460 ft. m.s.l. in the floodplain area to a maximum elevation of 590 ft. m.s.l. at the dam's eastern edge. Vegetation varies from mesquite forests, grasses, and sunflowers in the floodplain terrace (T-0) to mesquite-cedar forest on the T-1/T-2 terraces. Previous borrow area testing (B1, C1, E2, E4) failed to produce any evidence of buried archaeological sites in the floodplain. Consequently, interval measurements within the dam's floodplain area were expanded to 140 m. Fifty meter test intervals were chosen for the T-1 and T-2 terraces in the dam area to compensate for the high probability of site occurrence. Skinner et al. (1978) have indicated the ratio of site occurrence on the terraces to be 1/65 sq. mi. (1/170 ha), the highest for any site land form in the City of Dallas. Furthermore, the existence of one known site (Cobb-Poole Site, Chapter 3) within the T-2 terrace necessitated the use of a prudent sample interval. One minor modification to the testing design held that in the event randomly placed units occurred in an arroyo bottom, these would not be tested. Several justifications for this decision can be made, but the primary problem lays with the near inability of getting a backhoe into and out of a steep arroyo without significant danger to the machine and the field crew. Though bottoms of arroyos were not sampled, all arroyo embankments were intensively surveyed for eroding cultural materials.

Testing of the area east of Road 1382 was conducted at 140 m intervals up to the 500 ft. contour line. The area between 500 ft. and the 520 ft. contour line was shovel tested (shovel test: a small irregularly shaped excavation unit dug without the benefit of stratigraphic controls) at 70 m intervals to an average depth of 20 cm. The hills above the 520 ft. (158.5 m) contour line—a part of the White Rock Escarpment—had been heavily eroded and disturbed by gravel quarrying, no subsurface testing was conducted in this area. However, an on-foot reconnaissance was made, no artifacts were found.

SUMMARY

Though previous surveys (Richner and Lee 1977; Richner and Bagot 1978; Skinner et al. 1978; Skinner and Connors 1979) have located archaeological deposits in floodplain areas, a stratified random search of 339.13 ha (838 a.) of land within the Lakeview Project Area was unable to locate any buried prehistoric cultural deposits. Two artifacts (one possible stone flake and one unidentifiable dart point) were found during the survey; both artifacts were found on the surface.

A series of variables may be responsible for the failure to locate buried cultural deposits.

1) High velocity flood waters of Mountain and Walnut Creeks can wash or erode and disperse cultural deposits located close to water courses.

2) Subsurface testing did not go deep enough. Sites may be buried deeper than 2 m below the present day ground surface.

3) Sampling intervals were too great, thus missing smaller deposits.

4) Prehistoric activities in the area were selective and did not favor the floodplain for long-term site location. It seems reasonable to assume that floodplain occupation corresponds with seasonal weather conditions. During the rainy season, in the fall and the spring, flooding would most certainly force the abandonment of the lower elevations. Floodplain occupation probably coincided with drier periods and occurred in the late summer and late winter when water levels in the streams are at their lowest (assuming that weather patterns we observe today hold true for prehistoric times).

5) In general, sites of short-term occupation do not, when profile sectioned, display a great enough site area for the visual detection of low frequency archaeological remains. For optimal detection a plan view rather than a profile would be necessary.

The failure to detect archaeological deposits in the floodplain does not preclude the possibility that prehistoric groups did occupy and exploit it, e.g., farming or hunting, rather than these behavioral patterns are not yet recognizable. The evidence provided by Pheasant (Appendix I) suggests that, contrary to the expectations of previous investigators in the project area, there has been little alluviation in the project area during the last 125 years. This impression is supported also by the finding of Archaic period (ca. 5500 B.C. to A.D. 500) artifacts in shallow sediments at site 41DL184 (Chapter 3). It seems likely on the basis of present evidence that floodplain sites occur at low (but currently unmeasurable) frequency and represent thin scatters of lithics, and perhaps a few other artifact classes such as ceramics, bone, or shell.

5

Prehistoric Lithic Technology in the Lakeview Project

Human ecology, particularly as reflected in patterns of prehistoric settlement and subsistence, was a major emphasis of archaeological investigations in the Lakeview project. The present chapter assesses the contribution that lithic (stone-tool) artifacts can make to understanding the prehistoric human settlement of the project area.

Chipped-stone artifacts are essential to the Lakeview investigations. As in many parts of the world, lithics are one of the few classes of artifacts that have consistently survived to the present in a wide variety of site types. As such, stone tools and the debris produced by their manufacture and use afford a critical "common denominator" of information from within and between sites. Furthermore, it can be expected that lithic artifacts will reflect a broad spectrum of human activities because stone tools were a fundamental prehistoric technology. For our purposes, lithic artifacts were examined primarily from the perspective of potential contributions to settlement-subsistence studies.

In this chapter we have not attempted to explain in detail the theoretical basis of lithic analyses in settlement-subsistence studies. That discussion is presented in Chapters 2 and 7. There, we develop detailed rationales for settlement-subsistence studies that combine several kinds of data, including lithics. The presentation of those rationales in separate chapters avoids

lengthy digression from presentation of basic data here. Also, coherent development of a research design for possible future work seems best carried out in a chapter devoted expressly to that goal.

We can state briefly, however, that perhaps the most fundamental technoeconomic distinction that has been drawn from the study of lithics is a functional dichotomy between *maintenance* activities and *extractive* activities. Binford and Binford (1966:291) have suggested that a relatively full range of tool manufacture and repair should characterize "basecamp" settings, where relatively large numbers of people, probably differentiated by age and sex roles, lived for relatively long periods of time, carrying out a wide range of life-support activities. Conversely, extractive sites (synonymously special-use, transitory, or specialized-activity sites) should produce stone tools reflecting relatively short-term, narrowly focused activities related to production of various kinds of resources.

There is, of course, good reason to suspect that anything as complicated as a past cultural system did not actually segregate its behaviors into such a neat dichotomy. Nevertheless, this rudimentary model does allow one to generate testable ideas about certain tendencies of past behavioral systems. It should be possible to assign differing degrees of function to a group of sites

based on an understanding of stone tool manufacture and use. Where information from studies of bones, ceramics, physiochemical tests, or other sources of data are available, more complex models can be constructed.

As we indicated in the report's introduction, the work reported here was carried out over two field seasons. Not unexpectedly, perhaps, this work evolved in its emphases and methods as more information became available, and as different kinds of prehistoric sites were encountered. Our objective was to recognize that this evolution of results was expectable and desirable, so long as analytical goals were not sacrificed. There was a fundamental question of balance. On the one hand, we wished to explore a variety of analytical techniques in order to evaluate relative effectiveness in answering questions about settlement and subsistence. On the other hand, it is important to have the flexibility to shift analytical priorities according to the actual returns of information from various studies. The issue is one of cost-effectiveness in answering stated research questions.

The work on lithics is reported in two sequent phases (field seasons) to illustrate an analytical trend. During Phase Two work (1979), we dealt with four prehistoric sites, one of which was relatively "rich" in artifacts (41DL148, Cobb-Poole). Three Archaic-Stage sites (see below) tested during this phase presented much less artifacts but did afford opportunity to look at a different kind of technological system of tool-making and use. We sought to evaluate a relatively broad range of approaches, using qualitative and quantitative variables. As we shall see below, this work suggested a variety of different, if not conflicting, interpretations of the data. Now while this work suggested a number of interesting possible explanations of variability in assemblages from site to site, it became clear that we need some analytical datum point; i.e., some kind of analytical technique that we could refer to as a baseline of interpretation for looking at conflicting results in other kinds of information. Without some anchor-point of this kind, scientific analyses tend to generate confusion rather than insights.

For this reason, we decided to emphasize analysis of bifacial reduction as measured by bivariate graphs during the Phase Three work. What advantages does this work have? There are several. First, previously published work by one of the authors (Raab, Cande and Stahle 1979) had established both a theoretical and practical basis to this approach. Moreover, this technique is based in part upon a body of experimentally controlled results of bifacial tool manufacture. In few instances do archaeologists have experimentally controlled data upon which to base their results. While the work with bivariate graphs is certainly far from perfect in its methods and interpretations, it does offer a relatively well understood foundation for certain lithics studies.

Secondly, many of the prehistoric sites tested during Phase Three produced few artifacts (see Chapter 3). This fact hinders analytical techniques that require a wide range of artifact types. On the other hand, nearly all sites in the project produce some flakes of bifacial reduction, the data upon which the bivariate analysis depends. Therefore, the bivariate graphs have relatively good feasibility of application to the data as they really are.

Thirdly, recognizing the need for certain kinds of equipment to do the bivariate analysis, the Archaeology Research Program

acquired this equipment at the end of Phase Two work and trained personnel in the protocols for making the necessary observations on the lithics. By the time Phase Three work commenced, it was possible to shift attention to bivariate analyses.

We also want to emphasize that our statements here are not final results. The work in Lakeview Lake was *testing*. And yet by looking at the combined results of the Phase Two and Phase Three lithics work, we should now be in a position to design an effective data recovery plan for any future excavations that might be needed. Those are presented in Chapter 8.

PHASE TWO (1979): TECHNOLOGICAL VARIATION

Examination of the lithics from prehistoric sites in the Lakeview Project (Chapter 5) indicated that two principal technological modes were involved in their manufacture and maintenance. One of these techniques was bifacial reduction. With this technique a tool is formed by removing flakes, either by percussion or pressure, from two opposing "faces" of the workpiece. During the manufacturing process, the workpiece is progressively thinned and shaped into a desired tool configuration; e.g., a projectile point. The waste flakes from bifacial reduction (debitage) tend to display characteristic features, such as a striking platform, a bulb of percussion, multiple flake scars on the dorsal (back) side of the flake, and an unfaceted, undulating ventral (bottom) flake surface. Figure 5-1 presents an idealized bifacial reduction process. Bifacial manufacturing processes have been described and/or experimentally reproduced by a number of investigators (e.g., Muto 1971; Raab, Cande and Stahle 1979; Newcomer 1971; Henry, Haynes and Bradley 1976; Chandler and Ware 1976; Collins 1975; Raspet 1979; House and Wogaman 1978; House and Ballenger 1976; Shafer 1978). These reports have shown that studies of bifacial manufacturing processes can be useful in reconstructing a wide range of human behaviors.

A second technological strategy evidenced by the Lakeview sites, in reality several related flake production techniques, involved production of flakes that were in turn modified into tools. One aspect of this strategy was production of flakes of bifacial reduction by freehand-percussion, which were then modified into flake tools. Although no cores were found that indicated this mode of production, several flake tools exhibited well defined striking platforms and bulbs of percussion. It may be, of course, that cores produced during bifacial reduction were used as tools rather than discarded as waste materials. This possibility is the more likely, in view of the fact that the Project area is poor in stone of sufficient size and quality to make large flakes and tools (greater than approximately 3 cm in length).

Two other methods of flake production were also found. A few flakes indicate that they were produced by bipolar percussion. Although more difficult to identify than flakes of bifacial reduction, particularly with small samples, the elements produced by bipolar percussion in the Lakeview sites reflect the columnar, rectangular to triangular cross-sections and occasional crushed, bipolar platforms (cf. Goodyear 1974:61-62;

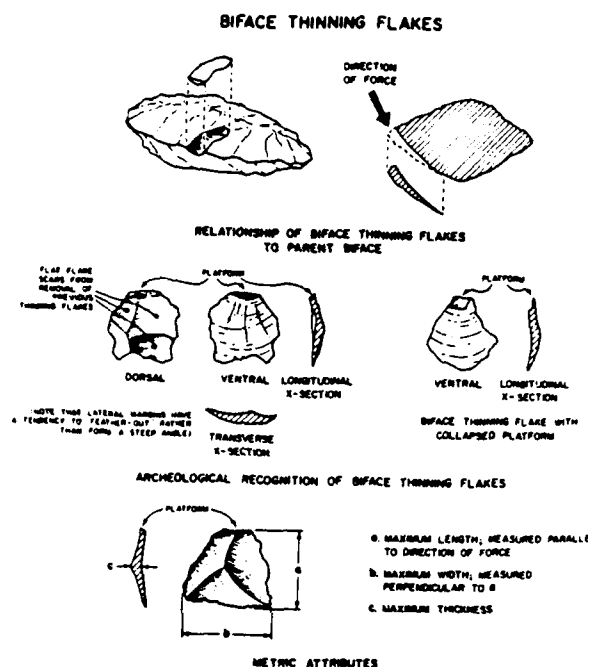


Figure 5-1. Idealized bifacial reduction sequence. (From House and Ballenger 1976:90).

Mallouf 1976:189 and 198; Shafer 1973:64-66; MacDonald 1968:68). Figure 5-2 illustrates and idealized bipolar production process, including the process that gives this technique its name; i.e., fracture of small work pieces, typically pebbles, between a stone hammer and anvil.

Technologically, the bipolar techniques are significant in that they offer an alternative to bifacial reduction. Since the bipolar methods can produce tool forms with smaller initial workpieces and with less waste of raw material than bifacial reduction, comparison of the frequency of the two techniques through time and within technological traditions may provide a wider range of information on such variables as importation of raw materials and changing technological requirements in stone-poor localities such as Lakeview.

The final flake production technique discernable in the Lakeview lithic sample is what has been synonymously termed the "Orange Core" (Goodyear 1974:74) and "Tangerine Core" (Schiffer 1976:105) technique. Perhaps a variation in the end product of the bipolar technique, this production method results in small flakes backed by pebble cortex. Ideally, several flakes may be struck from a pebble core much in the manner that one would separate the sections of a citrus fruit.

ANALYTICAL CATEGORIES

Analytical categories were set up to record attributes of the lithic assemblages pertinent to the technological dimensions

discussed above. These are as follows:

Flakes as used here refer to flakes of bifacial reduction. These are pieces of lithic debris that possess observable striking platforms, bulbs of percussion, and dorsal and ventral surfaces. Broken flakes are included if they possess the proximal end. Several flakes show use wear or retouching.

Orange core flakes are wedge-shaped or lunate flakes removed from a pebble. They are naturally backed by cortex due to their method of detachment from the core (cf. Schiffer 1976:105). This method, noted above, consisted of removing a "cap" from a cobble and taking flakes off perpendicular to the plane of the platform in a manner analogous to slicing an orange.

Pieces esquillees are short spalls or blocky fragments produced by bipolar flaking (McDonald 1968:88). These items possibly were used as bone-working tools, perhaps as wedges and slotting implements (cf. McDonald 1968:88).

Nondiagnostic shatter are all types of lithic debris that lack the essential characteristics of flakes, orange core flakes, and pieces esquillees. This category includes the presumed distal ends of flakes and "chunks" produced during bipolar and freehand-percussion.

Pebble fragments are major portions of pebbles which lack multiple flake scars that would classify them as cores. They appear to be cobbles that, through removal of a single large flake, were tests for material quality.

Bifaces are bihedral and bifacially worked pieces of stone and are divided for this analysis into arrow points, dart points, and non-hafted-tool subcategories. Arrow and dart points are symmetrical, stemmed bifaces which were hafted. This is not to imply that the other bifaces were not also hafted but rather that the hafting element is not morphologically visible. Non-hafted bifaces are also symmetrical but lack a stem element. These may be blanks for projectile points or for tools in their own right. Consequently, this definition reflects a morphological rather than functional classification.

The frequencies of artifacts by the above categories are presented by site in Table 5-1.

At all sites, flakes are the most common lithic artifact, with nondiagnostic shatter the next most frequent. Orange core flakes were recovered only at the Cobb-Poole site, raising a question as to whether this technique was only used at this site. *Pieces esquillees* were recovered from both 41DL148 and 41DL184. The arrow points from 41DL147 and 41DL148 were made from flakes, while the bifaces from 41DL184 appear to have been made from cobbles.

Although the above information is far from clear-cut, some generalizations can be made. Bifacial reduction was the dominant methods of stone working at all sites. Evidence of bipolar flakes for the production of flakes was observed at 41DL148 and 41DL184, while information indicating an orange core flaking technique was only noted at 41DL148.

RAW MATERIAL

In an attempt to establish possible correlations between lithic material types and tool types, raw materials were sorted into categories by color and texture. These were then examined by

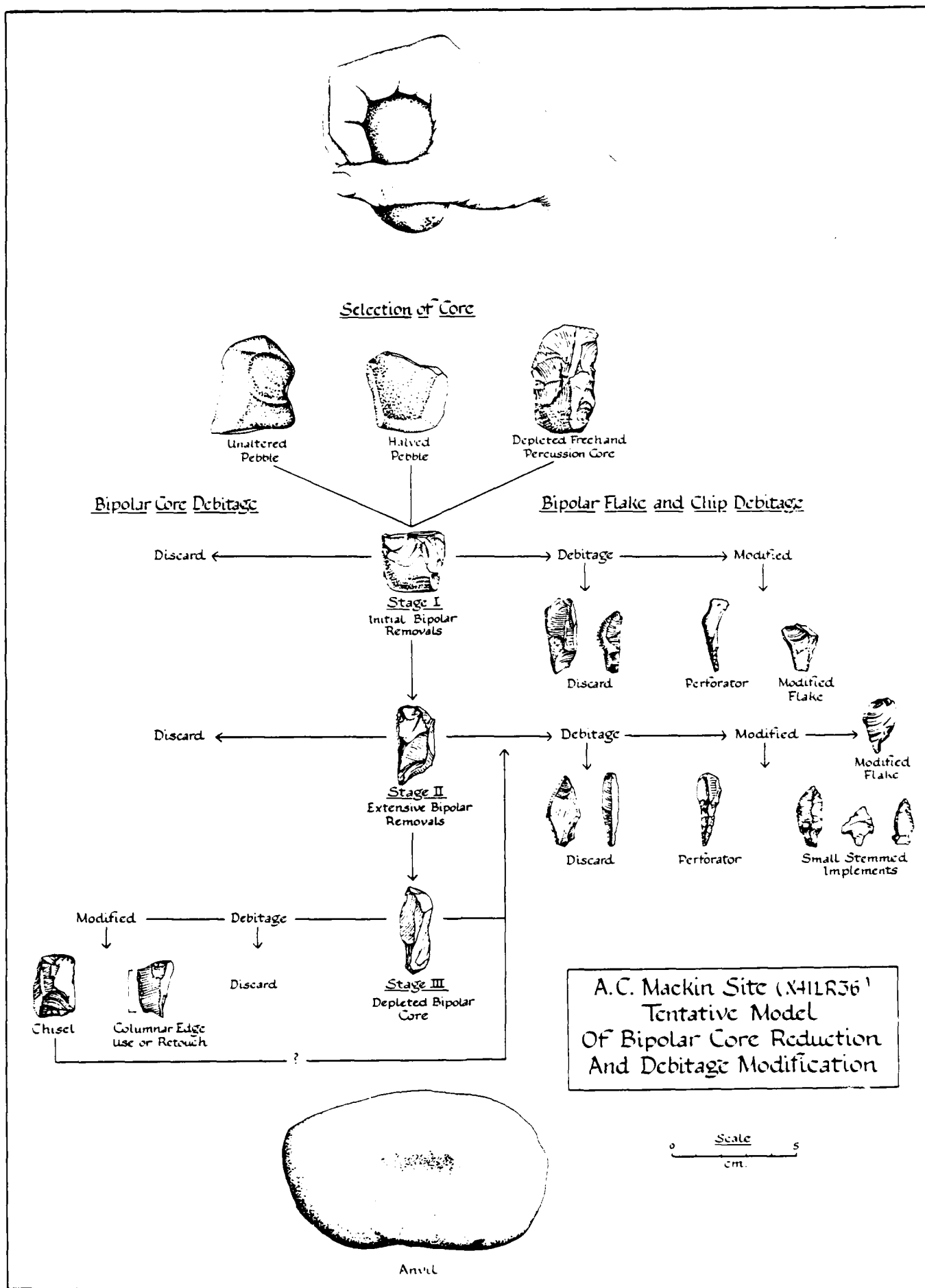


Figure 5-2. Idealized bipolar production process. (From Mallouf 1976:198).

TABLE 5-1
Frequencies of Chipped Lithics by Site

Category	Site		
	41DL147	41DL148	41DL184
Flake	9	291	314
"Orange Core" Flake		4	
<u>Pieces Esquillees</u>		1	2
Nondiagnostic Shatter	1	76	66
Pebble Fragment		1	
Nonstemmed Biface	2	1	2
Arrow Point	1	4	
Dart Point			5
Total	13	378	389

Mr. Larry Banks, Archaeologist for the Southwest District, Army Corps of Engineers, for advice in type division and information on raw material sources. Mr. Banks is an acknowledged authority in lithic raw materials for the Southern Plains and neighboring regions and was extremely helpful in determining source locations for the Lakeview lithics.

Eight raw material types were tentatively identified from this consultation: four local types and four imported types. Local raw materials are defined as originating along the Trinity River or its tributaries within a 30 km radius of the Project. Imported raw materials are those which were acquired from a greater distance and generally were obtained from the Edwards Plateau region of Central Texas. Since many of the imported materials showed evidence of cortical surfaces, these evidently were not obtained from tabular outcrops but from derived contexts such as talus slopes or stream beds. The Brazos River approximately 60 km southwest may be the closest location for this material.

Variety No. 1. This fine-grained chert varies in color from black to grey with several examples containing white to bluish-white specks. Rounded cortical surfaces, apparently weathered tabular pieces, were observed on about five percent of the specimens. The probable source locality for this type is the Edwards Plateau region. Much of the raw material from the Edwards Plateau region is noted for its high quality flaking characteristics (Hughes and Willey 1978:47).

Variety No. 2. This lithic type is a white to bluish-white fine-grained stone. Weathered exterior surfaces of tabular pieces were observed on five percent of the specimens and source location is likely the Edwards Plateau region.

Variety No. 3. This is a fine-grained chert of white to tan color. The distinctive characteristic is its translucent quality. Only non-cortical surfaces were observed, however, since only a few examples of this variety are present, the absence of cortex may be due to sampling error. Source location is the Edwards Plateau region of Central Texas.

Variety No. 4. This variety is termed Ogallala chert and is a medium-grained, opaque silicified siltstone that occurs in mottled grey, tan, red, and brown colors. Ogallala chert possesses fair flaking characteristics. It occurs locally in Uvalde gravels throughout much of north Texas (Menzer and Slaughter 1971). The variety occurs in cobbles with weathered exterior surfaces.

Variety No. 5. This material is coarse-textured, chalky chert with poor conchoidal fracture. Colors are tan to reddish tan. Both stream tumbling and surface weathering are apparent through frequently observed cortical surfaces on specimens from archaeological contexts at Lakeview. This variety is locally available.

Variety No. 6. This is a coarse-grained petrified wood and is tan in color. The material is found locally (exact source locations are not known) and possesses poor flaking characteristics.

Variety No. 7. This variety is a fine-grained chert that varies in color from light tan to brown to dark brown. Several of the examples from the Project area are mottled with the above colors. Water-worn cortex is visible on several pieces suggesting that they were derived from stream bed gravels. This material occurs locally.

Lithics which do not fit into the above categories are represented in low enough frequencies (i.e., only one or two examples) not to warrant a separate variety type and are classified as Miscellaneous. Since these are rare items, no effort was made to find their source localities. However, comparison with all known local materials indicates that they are imported.

The frequencies of raw material types for the three sites are listed in Table 5-2.

It is interesting to note that all lithics from 41DL147 are imported. However, due to the small sample size, the significance is questionable. Eliminating 41DL147 because of this low sample, Cobb-Poole and 41DL184 are seen to be similar in frequencies. The major difference between the two is the presence of Variety No. 3, an imported stone from the Edwards Plateau area of Central Texas. This type was not present at

TABLE 5-2
Frequencies of Chipped Lithics by Raw Material by Site

Raw Material	Exotic vs. Local	Site					
		41DL147		41DL148		41DL184 ¹	
		#	%	#	%	#	%
Variety No. 1	imported	4	30.8	75	21.9	92	24.7
Variety No. 2	imported	3	23.0	35	10.3	69	18.5
Variety No. 3	imported	2	15.4	35	10.3		
Variety No. 4	local			13	3.8	18	4.8
Variety No. 5	local			3	.9		
Variety No. 6	local			1	.3		
Variety No. 7	local			176	51.6	172	46.1
Miscellaneous	imported	4	30.8	3	.9	5	
Total		13		341		356	

¹ Although, as presented in Chapter 3, testing at 41DL184 indicated a possible buried component below the primary artifact deposit, only one test unit sampled this lower component. The sample sizes for this lower component are small and, therefore, not broken out separately in the table.

41DL184 and suggests that its usage was restricted to the period of occupation represented at Cobb-Poole, or Early Neo-American (Lynott 1977), and the Archaic Period inhabitants at 41DL184 apparently did not utilize this stone. The overall similarity between the two sites indicates that generally the same raw materials were utilized during the Archaic and early Neo-American stages. Variety No. 7, a local type, was most popular of all lithic types and accounts for nearly half of all material. Varieties Nos. 1 and 2, both imports from the Edwards Plateau, are next most common and together account for approximately 40% of the lithic assemblages. The consistency in raw material exploitation implies that the Archaic occupants at 41DL184 and the Neo-American occupants at Cobb-Poole had similar knowledge of raw material locations in the area. This argues against the possibility of the Cobb-Poole inhabitants representing a transient Caddoan population from East Texas, since it seems doubtful that a transient population would utilize raw material sources similarly to an indigenous Archaic population. This assumes, however, that the Archaic population was indeed indigenous.

ANALYTICAL APPROACHES

Four analytical approaches were selected during Phase Two for their potential of interrelating the Lakeview lithic data with the larger objective of understanding prehistoric human settlement of the Project area. These are: (1) paradigmatic classification (Raspet 1979), (2) bivariate graphs (Raab, Cande and Stahle 1979), (3) measures of central tendency (House and

Ballenger 1976; House and Wogaman 1978), and (4) systemic ratios (House and Ballenger 1976; House and Wogaman 1978). These approaches have been selected since they represent methodologies used successfully in other parts of the country in relating lithic data into prehistoric settlement patterns. Theoretical integration of these approaches into the settlement-sub-sistence model for the Reservoir is left to Chapter 8.

Analytical approaches are examined with two goals in mind. First, they are used as a means of unifying the lithic data from the 1979-1980 season into a coherent theoretical objective, i.e., helping to understand prehistoric settlement patterns. To that end, the lithic data facilitate formulation of the research design for future work in the Project area (Chapter 8). A second goal is assessing the suitability of data from Lakeview to the four kinds of analyses listed above. The Lakeview data are limited, partly due to the limited nature of the sampling but also partly due to sparse cultural deposits. Are the present samples sufficiently large to be analyzed in the ways indicated or are more data required? Can the data be obtained within reasonable expenditures of time? After examining each of the proposed analytical approaches against the present data sample, feasibility for future work and data collection objectives will be discussed.

Paradigmatic Classification

Paradigmatic classification is a method by which two or more dimensions, or sets of mutually exclusive attributes, are cross-classified (Dunnell 1971:70-76). Raspet (1979) recently has outlined a method of paradigmatic classification to account for

the presence and stages of a bifacial tool reduction strategy. By determining which stages of bifacial reduction are represented, sites can be more reliably ascribed to "maintenance" or "extraction" functions. Maintenance sites are assumed to have the entire range of bifacial reduction represented while extraction sites are assumed to evidence only the finishing and resharpening stages of reduction and reuse (cf. Raab, Cande and Stahle 1979:169).

Raspet's (1979) method uses a contingency table (Table 5-3) with platform categories designated as cortex, unfaceted, and faceted along one dimension, and cortex amounts classified as 100%, 50-100%, 1-49%, and "none" along the other. A chi-square test of independence is used to determine if the cross-classified data are dependent or independent in their distribution among the table cells. It is expected that in the positive diagonal cells (those marked with a "+" in Table 5-3) observed frequencies should be greater than the expected frequencies if a complete reduction sequence was operative. This method assumes raw material employed in tool manufacture has cortex. As seen in the raw material descriptions from Lakeview, most of the raw material types show evidence of cortex surfaces. Varieties that could not be confirmed to have cortex exteriors (Nos. 3, 6, miscellaneous) are removed from this analysis.

When the Lakeview lithic debris are cross-tabulated by these two variables (Table 5-4), the results show that significantly nonrandom distributions are seen at Cobb-Poole (chi-square value of 9.91 with d.f. of 6, and P of .14), but at 41DL184 the significance of the distribution cannot be determined with a chi-square due to low cell frequencies (Dixon and Massey 1969:238). Too few debris was recovered from 41DL147 for analysis. Second, the results indicate that not all aspects of the reduction sequence are represented at both sites. Although the approximately positive diagonal cells of each table have greater observed, as opposed to expected, values, the table for 41DL184 shows that no 100% cortex flakes were recovered. This

contrasts sharply with Cobb-Poole, where 100% cortex flakes account for 8% of all flakes. Moreover, flakes with less cortex account for a higher percentage at 41DL184 than Cobb-Poole. Initial decortification of raw material was not taking place and greater emphasis was placed on later stage reduction at 41DL184 whereas the entire reduction sequence was undertaken at Cobb-Poole. The sequence from 41DL184 suggests that partially manufactured lithic tools were brought to the site and further modified.

The approach proposed by Raspet (1979) seems reasonably appropriate to the data base at hand. Cell samples were too small from 41DL184 for chi-square analysis, and the Cobb-Poole data, although amenable to analysis by chi-square, also had cell frequencies of marginally useful size. Thus, future usage of this approach would benefit from larger sample sizes.

Measures of Central Tendency

A partial measure of the bifacial production stage present at a site can be obtained by comparing the mean and coefficient of variation (CV) for flake lengths among sites (House and Wogaman 1978:83). CV is a measure of variation which ranges from 0, or no variation relative to the mean, to 1.0, or maximum variation, with respect to the mean (McMillan 1952). Sites of maintenance activities should be observable by the occurrence of flakes with a large mean length and CV (i.e., large variability), these measures reflecting the entire range of bifacial production. Sites of extraction activities, by way of contrast, should be characterized by low mean flake length and CV (i.e., low variability), the result of bifacial resharpening but not extensive manufacturing.

The mean flake lengths for Cobb-Poole and 41DL184 are 9.93 mm and 13.15 mm, respectively. The CV for Cobb-Poole, on the other hand, has a lower mean and CV suggesting that

TABLE 5-3
Flake Cross-Classification of Striking Platform by Dorsal Cortex Amount

Platform	Dorsal Cortex Amount			
	100%	50-100%	1-49%	none
cortex	+	+		
unfaceted		+	+	
faceted			+	+

+ Indicates positive diagonal or bifacial reduction trajectory (slightly modified from Raspet 1979).

TABLE 5-4
Flake Cross-Classification of Striking Platform by Dorsal Cortex
Amount for the Cobb-Poole Site and 41DL184.

Platform	Cortex Amount				row%
	100%	49-100%	1-49%	none	
cortex	4/1.6**	3/1.1	4/4.1	10/14.2	15.2%
unfaceted	4/4.2	2/2.7	10/10.4	37/35.7	38.4%
faceted	3/5.1	2/3.2	13/12.5	46/43.1	46.4%
column %	8.0%	5.0%	19.6%	67.4%	N = 130

41DL184

Platform	100%	49-100%	1-49%	none	row%
cortex		1/0.3**	7/1/3	2/8.5	9.1%
unfaceted		1/1.2	2/5.7	42/38.0	40.9%
faceted		1/1.5	5/7.0	49/46.5	50.0%
column %	0.0%	3.0%	12.7%	84.5%	N = 110

more extractive specific tasks were performed. These results are confusing, however, in that the Cobb-Poole site possesses structural features which suggest permanence of occupation and 41DL184 possesses no features. The confusing results may be due to several possibilities. First, 41DL184 may in fact be a maintenance site and features simply were not encountered during the limited testing at the site. Second, it is possible, without replicative studies as a baseline of comparison, that both sites' means and CVs indicate the full range of bifacial reduction. However, the data on the amount of cortex (Chapter 3) clearly indicate early stage reduction was not undertaken at 41DL184. Finally, it may be, too, that since the samples from each site are limited, the results may not be representative of the true lithic variability of the sites. This possibility is less likely from Cobb-Poole since it was sampled more intensively, but may be a distinct possibility at 41DL184 where only four, widely scattered test pits were excavated.

Samples sizes, again, were sufficient for comparison provided that they are representative of the site population overall. Future sampling should be oriented not only towards gathering an adequate sample in terms of numbers, but also a sample representative of intrasite variability.

Systemic Ratios

House and Ballenger (1976) and House and Wogaman (1978) have devised two ratios to measure the degree of early stages and late stages of bifacial manufacture and use in systems of stone tool use. The first ratio is the Index of Biface Discard (BD¹) and a high value would suggest a high degree of biface use, exhaustion, breakage, and discard versus biface manufacture in a site assemblage. The other ratio is the Index of Early Stage Reduction (ER²) and a high ratio would indicate a low degree of biface use, exhaustion, breakage, and discard relative to biface manufacture. Both ratios have been adapted to the Lakeview artifact categories. A high-ratio value signifies that biface manufacture and use represent a dominant aspect of an assemblage. These ratios assume that maintenance sites will be

¹BD = number of bifaces, including fragments and projectile points divided by number of unfaceted and cortex platform flakes.

²ER = number of nondiagnostic shatter plus number of unfaceted and cortex platform flakes divided by bifacial thinning flakes.

identified through greater amounts of debris associated with biface manufacture, and extraction sites will be observable through greater amounts of debris from biface resharpening, usage, and discard. The ratios afford a precise means of comparing assemblages.

The Phase Two lithics work was hampered by small samples. Nevertheless, the available material was subjected to a variety of analyses and classifications designed to elucidate the place of the materials in stages of tool manufacture or in the variability of tool forms found in sites. These analyses were attempts to assess the feasibility and desirability of using various analytical approaches in future archaeological work in the Project. For the purpose of evaluating the various approaches, two sites were selected for comparison, 41DL148 (Cobb-Poole) and 41DL184. The former is a late prehistoric site (Neo-American, ca. A.D. 800 to A.D. 1200), and the latter, based on projectile point types, is believed to be an Archaic Stage site (ca. 2000 B.C. to A.D. 500). It was reasoned that if the various analytical techniques could distinguish between site functions and manufacturing techniques, the later site (with arrow points, bipolar tools, and substantial evidence for permanent occupation) should be distinguishable from a much smaller (seasonally occupied?) site containing essentially a bifacial technology (dart points).

A paradigmatic classification method demonstrated by Rasper (1979), following Dunnell (1971:70-76), suggested that 41DL184 contains materials representing later stages of bifacial tool manufacture and maintenance, implying a specialized-use site. On the other hand, 41DL148 was much more suggestive of the entire spectrum of tool manufacture (Raab, Bruseth, and McIntyre 1980:78).

Comparison of the same sites in relation to mean length of FBRs, and a coefficient of variability derived from flake lengths produced somewhat different results. Following House and Wogaman (1978:83), flake lengths were taken to indicate bifacial manufacturing stages. For example, sites characterized by extensive manufacturing of bifacial tools, starting with raw materials and ending with a finished tool, should reflect a relatively high mean flake length and coefficient of variability; extraction sites would have the opposite tendency. The results of the comparison of 41DL148 and 41DL184 indicate, contrary to the results of the paradigmatic classification, that 41DL184 might be characterized as a maintenance site rather than one oriented to, say, tool resharpening as part of specialized activities. On the other hand, according to this measure, 41DL148 looks more like a specialized-use site, despite other evidence of permanency of occupation.

Taking a lead from House and Ballenger (1976) and House and Wogaman (1978), we also looked at "systemic ratios" derived from stages of biface manufacture. Essentially, these measures are ratios of numbers of bifacial tools to FBRs with cortex and to FBRs without cortex. Comparisons of products of the various manufacturing stages place a numerical value on stages of bifacial tool manufacture. Once more, the assumption is that the degree to which manufacturing has taken place can serve as an index to site function. The systemic ratios analysis suggested that more early-staged bifacial reduction tool place at 41DL184 than at the Cobb-Poole site, as well as more use,

discard, and breakage of bifacial tools.

SMALL SITES, SAMPLING VARIABILITY, AND BEHAVIORAL REALITY

The Phase Two lithics work at Lakeview points out problems of archaeological interpretation. As the brief discussion of analyses above may serve to indicate, several factors make it difficult to know whether our analyses are revealing past behavioral realities or merely the vagaries of sampling problems or the measurement techniques themselves.

There are two kinds of problems to be solved in understanding past settlement-subsistence at Lakeview through lithics studies. The first, and perhaps the most readily (though by no means easily) solved problem, is attaining an adequate representation of lithics. Our efforts, as planned, have been limited to brief test excavations. Without excavation of a large portion of a site(s), it is difficult to know whether analysis reflects sampling variability or the site's actual contents. Selection of a few sites for extensive excavation could solve this problem. Second, however, is the problem of dealing with artifact-poor sites (Appendix IV).

Even if many of the Lakeview sites were to be extensively excavated, it appears that the number of artifacts recovered would be relatively small compared to "richer" sites in other parts of Texas and North America. Test excavations during both Phase Two and Phase Three have produced lithic artifacts that range in number from a few hundred in cases of relative abundance (Appendix IV) to only a handful. In absolute terms we can expect sizable assemblages to result from large-scale excavations at some of the larger sites such as Cobb-Poole. Nevertheless, in many cases it can be anticipated that relatively few lithic (or any kind of) artifacts will be recovered from many sites in the Lakeview Project, regardless of the extent to which the sites are excavated. That is, the number of artifacts from many sites will be low in relation to the unit volume of site matrix that is excavated. This fact raises a number of important theoretical and practical questions.

Is it worthwhile to seek relatively small collections of lithics or other kinds of artifacts? The answer depends on a number of factors. Historically, archaeologists could avoid this quandary by simply choosing to work on "rich" sites; i.e., sites capable of producing an abundance of artifacts. There are reasons, however, why one cannot and should not pursue such a strategy as a general principle. In the case of cultural resource management studies such as the present one, federal and state laws do not recognize that some sites should be ignored for the convenience of the archaeologist. All cultural resources are supposed to receive reasoned, even-handed treatment. Moreover, there are scientific reasons that bolster consideration of smaller sites.

Archaeologists increasingly desire to understand not merely the archaeological record itself, but the past systems of behavior that were responsible for creating the record. The goal of analysis therefore becomes an understanding of behavior rather than artifacts themselves. Once behavioral reconstructions become the objective, the number of artifacts within a site ceases to be, in and of itself, a meaningful criterion for deciding whether an investigation is scientifically justified. The Lakeview sites are

a case in point.

There are ample cases (Gould 1978, 1980; Binford 1979; Yellen 1977) that demonstrate that much of the behavior of hunter-gatherers leaves few archaeological remains (e.g., butchering animals at a kill site of a temporary camp). This fact is true even though such circumstances may account for most of the behavior of some groups. One implication is clear: in some cases most of a past group's behaviors will be accessible to us only through "thin" artifact remains. If it is important to understand these behaviors (we suspect most archaeologists will agree it is), then we must somehow come to grips with archaeological records composed of few physical traces. Few physical remains is itself a hallmark of some kinds of hunting-gathering adaptations (Deetz 1967:285)!

What about the practical considerations of dealing with low-density sites (few artifacts per unit volume of site matrix)? Low sample sizes are a persistent problem. Archaeologists feel more secure in their conclusions if they have large bodies of data. The kind of low-density sites under discussion here, however, are unlikely in any single instance to produce large collections of artifacts. We must bear in mind that the kinds of activities that formed many of the Lakeview sites probably produced few artifacts. If we want to advance our understanding of these sites, what are we to do?

First, if it can be shown that meaningful problems (in this case the settlement-subsistence behaviors of prehistoric hunters in north-central Texas) have the potential of being solved with low-density sites, these sites deserve full consideration within cultural resources management. The value of these sites as a source of important scientific information (not necessarily large collections of artifacts) warrants such consideration. In a more concrete fashion, the following steps may help to handle low-density sites:

(1) Generalizations regarding the functions of low-density sites will probably have to emerge from a project-wide or even regional set of investigations. These investigations are likely to span a number of years and involve a number of investigators. Owing to the low frequency of artifacts in many sites such as 41DL184, 41DL147 (Raab, Bruseth, and McIntyre 1980), 41DL189, and 41DL199, it may be necessary to accumulate information from a number of sites before reliable pattern recognition can take place.

(2) Of course, such recognition assumes that a reasonable, coherent program of data collection and analysis will be instituted in order that such patterns can be detected. Currently, no such program exists, but one can be developed.

(3) A period of methodological development and refinement must be systematically undertaken and can be expected to show some promising leads while eliminating others.

With these considerations in mind, we have attempted to continue the exploratory studies of lithics begun during Phase Two. Below, we explore some analytical dimensions of dealing with low-density lithics sites that could not be addressed during Phase Two, but should be helpful in planning future work.

PHASE THREE (1980): BIVARIATE DEBITAGE GRAPHS

Since the Phase Two studies, the equipment necessary to carry out metrical studies of flakes of bifacial reduction (FBRs) was obtained. These measurements allowed us to conduct a feasibility study on FBRs from sites tested during Phases Two and Three in order to determine if bivariate debitage graphs might help to better understand the place of Lakeview sites in prehistoric settlement-subsistence systems. These studies continue a series of methodological explorations initiated by one of the authors (Raab), and published elsewhere in part (Raab, Cande, and Stahle 1979).

THEORETICAL RATIONALE

As used here, "debitage" refers to flakes of bifacial reduction (FBRs), defined earlier in this chapter. The fundamental rationale for studying debitage is that such study can provide us with information about the "trajectory" of the bifacial tool manufacturing process. This process can be described as a trajectory in the sense that it has a known starting point (initial reduction of a core) and a known end point (completion of a bifacial tool, such as a projectile point/knife). Between these two points a continuous, attritional process takes place by which characteristic flakes are struck or pressured from the workpiece in the characteristic bifacial manner (Figure 5-1). This process has been replicated and described in detail by many investigators (e.g., Newcomer 1971; Muto 1971; Henry, Haynes, and Bradley 1976; Raab, Cande, and Stahle 1979). By accounting for the morphology of FBRs produced at various points on the manufacturing trajectory, it should be possible to make accurate inferences about the form of the trajectory.

Graphing certain attributes of the debitage allows display of the manufacturing trajectory. With such a display, it becomes possible to make relatively precise comparisons of trajectories from different assemblages of debitage from different sites, features, etc. For instance, the length of the graphed trajectories allows one to compare the extent to which the total manufacturing process has taken place between two or more collections of debitage. The slope of the trajectories provides insight into the rate at which bifacial reduction has taken place.

Why should we want to do this? Information about the manufacturing process per se may satisfy certain kinds of curiosity, but what larger inferences can be made? A fundamental premise of studying debitage, as we noted earlier, is that tool manufacture may be a useful indicator of site function. For example, if certain kinds of special-use sites were devoted to short-term hunting expeditions, where tools were repaired and resharpened and game was butchered and cooked, we might expect to find a short-trajectory site in which the debitage indicates a relatively short graph, reflecting the termination point of the manufacturing process. We might infer from this that

little tool manufacture has taken place, but bifacial tools have been resharpened or reworked. A series of sites might be compared to see if a characteristic "signature" trajectory emerges. It goes without saying, too, that the debitage data must be combined with other classes of information to build a more adequate picture of site function.

METHODS

Bifacial reduction is an attritional process. It is also a process by which the workpiece is continuously thinned by removing flakes from the biface's edges. This process, by its nature, produced debitage with certain characteristics. Two of these characteristics were selected for measurement because they allow one to "track" the reduction process.

Maximum flake length reflects the progressive diminution of the workpiece. Although not every flake detached in a sequence is smaller than the one that preceded it, it can be shown (Raab, Cande, and Stahle 1979) that a sequence of measurements of maximum flake length will produce a clear trend of reduction in flake size (mean length) owing to the reduction in size of the workpiece. Flake length is measured at the maximum dimension of the flake parallel to the striking axis (dimension "a" of Figure 5-1).

In a somewhat more complex way, it can also be shown (Raab, Cande, and Stahle 1979) that the angle of the flake striking platform tends to become more acute (angle diminishes) as thinning progresses. This effect occurs because the striking platform (Figure 5-1) of the FBR is actually a small remnant of the edge of the biface at the instant that the flake was detached. Like maximum flake length, it can be shown that a sequence of measurements of the angles of the striking platforms of flakes will reveal a clear trend toward a more acute mean angle.

Measurement of flake platform angle is a more complex procedure than determination of flake length. First, flakes were selected for measurement as flakes of bifacial reduction when they were complete (i.e., each flake had a measurable striking platform, a bulb of percussion, and the distal end of the flake "feathered out") and when they possessed flake scars on the dorsal side of the flake, indicating previous flake detachments.

It might be argued that selection of flakes based on these criteria leads to a selective bias in the data. For instance, some flakes may be included in the sample that in fact were not produced by bifacial reduction. In addition, it might be that complete flakes are not representative of the range of the flakes produced by bifacial reduction. We assume, however, that if bifacial reduction was in fact responsible for most of the debitage that we were studying, this technological process would be sufficiently "robust" to be reflected in the analysis, despite relatively minor "noise" introduced in the analysis by our flake selection criteria.

Measurement involved aligning the flake with a protractor in such a manner that the edge of the striking platform was positioned at the "0" of the protractor, the vertex of the flake (tip of the flake opposite the bulb of percussion) aligned along "0" line. In this position the dorsal side of the flake is oriented toward

the observer (Figure 5-3). The plane of the platform was then read to the nearest whole degree, within 5 degree increments. Flakes were mounted in a billet of modeling clay for stability and read at 7X magnification through a binocular stereozoom microscope containing an eyepiece retical (example pictured in Burgess and Kvamme 1978:485) engraved with a protractor graduated in 5° increments.

Taken together (flake length and platform angle), these measurements afford a means of graphing the bifacial reduction process. In cases where flakes have been produced by replication and then measured, it is of course possible to sort the flakes into actual order in which they were produced. In cases where aboriginal flakes are involved, it is possible to graph flakes by sorting flakes into flake-length categories of a given size and then plot these against the mean platform angle. Figure 5-4 presents a case where three aboriginal collections of debitage have been compared to debitage produced by replication. This case, involving Archaic Stage sites and debitage resulting from manufacture of dart points, shows that as flake length decreases, so does platform angle, producing a series of similar trajectories for aboriginal and replicated assemblages of debitage. In this case, it was possible to show that a bifacial industry, the result of production of projectile points and other bifacial tools, produced a series of similar, sloping graphs. With these graphs as a point of reference, we now turn to the Lakeview data.

THE LAKEVIEW DEBITAGE DATA

Figures 5-5, 5-6, and 5-7 present graphs of debitage from two of the sites tested during Phase Three and one site from Phase Two. Site 41DL199, tested during Phase Three, was selected for analysis in part because it was determined to be an Archaic Stage site (Chapter 3) and in part because it contained a relatively large collection of lithics (though the size of the assemblage is still not large in absolute terms, a point about which we will have more to say below). Archaic sites from much of North America are characterized by extensive bifacial tool technologies, offering a possible technological contrast with later (in this case Neo-American) sites that relied heavily on the bow and arrow, as reflected in production of stone arrow points. Site 41DL149 (Baggett Branch), a Neo-American Stage site with the characteristic arrow points (Chapter 3), also had a reasonably abundant lithic assemblage and offered a contrast to the materials from 41DL199. Debitage from Site 41DL148 (Cobb-Poole), investigated during Phase Two, was retrieved and examined, as were all the assemblages, according to the protocol outlined above. Since the Baggett Branch and Cobb-Poole sites are closely related culturally (Chapter 3), and perhaps chronologically, examination of these sites allowed us to expand our data on the Neo-American Stage.

The graphs presented here differ only in plotting flake length and platform angles by different increments of measurement of the flake lengths. This manipulation has the effect of lengthening or contracting the graphs. The value of this procedure is in seeing whether any apparent differences between the graphs of flakes from different technological traditions (Neo-American vs. Ar-

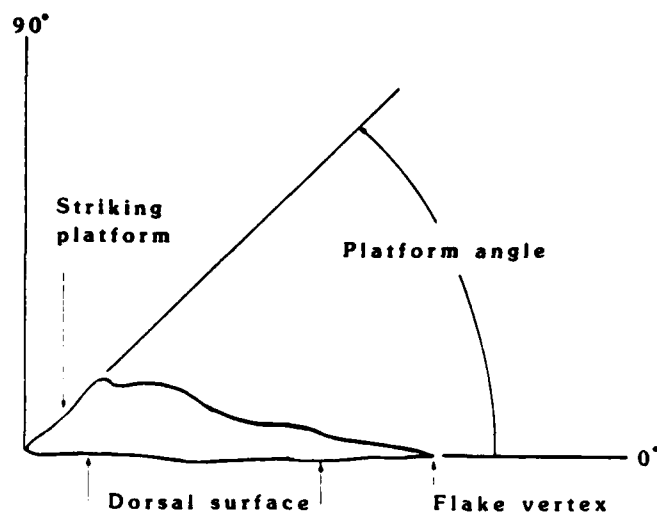


Figure 5-3. Flake of bifacial reduction in position for measurement of striking platform angle. (From Raab, Cande, and Stahle 1979:180).

chaic Period technologies) are brought into greater contrast by varying measurement increments of the flakes. Remember that these flakes are drawn from continuous processes of reduction, and the form of their graphs is partly a function of the measurement intervals employed to represent these processes. Varying the measurement intervals allows one to estimate whether the reduction process is brought into a higher degree of resolution by one interval or another.

The small sample sizes in the graphs deserve comment. Certainly a larger sample would increase our confidence in adduced results. We stress, nonetheless, that our efforts here are in the nature of an exploratory study. We believe this effort is justified in that, as we point out below, certain relationships in the data suggest potentially productive lines of investigation for future research. The problem of small sample sizes that we discussed earlier is relevant here, too. We reiterate that some of the behaviors that formed the sites in question probably resulted in only small deposits of artifacts. Our assumption here, however, is that major technological variables (such as bifacial manufacturing) are likely to have a heavy impression on the character of assemblages, as small as these assemblages may be. If it can be shown that analysis of small assemblages leads to useful insights, we can presumably begin to accumulate inter-site data bases that ameliorate the small intra-site assemblage problem (by condensing comparable assemblages into a larger data base).

Several points are worth noting in Figure 5-5, 5-6, and 5-7. The trajectory of the Archaic Stage assemblage from 41DL199 is similar to the graphs in Figure 5-4, also Archaic Stage aboriginal sites. The relatively gentle, even slope of these trajectories seems to be a "signature" of bifacial reduction, reflecting a gradual, but steady process of reduction (flakes getting smaller and platform angles getting more acute simultaneously). The beginning and termination points of the 41DL199 graph both reflect mean platform angles within the range

of these values found in Figure 5-4. The length of the trajectory at 41DL199 also suggests, by comparison with the graph for the replicated debitage in Figure 5-3, that the whole range of bifacial reduction, from initial core reduction to finished tools, is represented.

Perhaps the most intriguing aspect of Figure 5-5, however, is the contrast between the graphs of the two Neo-American sites and 41DL199. Compared to the relatively gentle slope of 41DL199, the graphs of the Cobb-Poole and Baggett Branch sites show a much steeper trajectory. Interestingly, too, the graphs of the two Neo-American sites are clearly more like one another in the form of their trajectories than they are like 41DL199 or the graphs of Figure 5-4.

An explanation for the observed pattern may be related to fundamental technological change in stone tool manufacturing through time. It may be that the graphs reflect a technological trend from primary reliance on bifacial reduction of cores into projectile points/ knives in the Archaic Stage to heavy reliance on bow and arrow, with bifacial reduction of cores directed largely at production of flakes suitable for reworking into arrow points during the succeeding Neo-American Stage. It may be that flakes suitable for making arrow points could have been obtained in other ways (e.g., blades from prismatic cores or flakes from bipolar percussion). It might also be that flakes produced during the manufacture of bifacial tools (this practice never ceased)—flakes that would have been discarded as waste, perhaps—were selected for arrow point manufacture.

In fact, one explanation of the differences in the graphs between the Archaic and Neo-American Stages is that certain flakes tended to be selected during the latter for arrow points. Figures 5-5 and 5-6 suggest, for instance, that flakes from Cobb-Poole and Baggett Branch in the length category 1.0 to 2.0 cm have larger mean platform angles (ca. 60 degrees) than flakes of the same length from 41DL199 or in Figure 5-4 (ca. 54 degrees for 41DL199 and 47 to 49 degrees for Figure 5-4). Could this be because flakes in this length range are those that remain after thinner flakes with more acute angles have tended to be selected out for arrow points, leaving behind the relatively thicker flakes for the archaeologist? The way in which the graphs of the Neo-American sites cross the trajectory of 41DL199 is perhaps even more dramatic. In the interval of .5 to 1.0 cm (Figures 5-5 and 5-6) the Neo-American graphs take a sharp downward plunge. If we are correct in assuming that the platform angle is the remnant of the biface that it comes from, such a plunge would imply that a thinner workpiece was being reduced than was the case in the preceding interval of 1.0 to 2.0 centimeters. Is this effect the result of a sudden drop in the thickness of the workpiece, as compared to the "classic" biface trajectory, where a steady reduction of thickness and angles is reflected in the smoother graph? Is it possible that this relatively abrupt drop in platform angle reflects bifacial reduction of the flakes produced in the 1.5 to 2.0 cm range (as, say, by pressure flaking arrow points from the larger flakes in a bifacial manner)? Such a sequence is one possible way to explain a plunge in the trajectories of Cobb-Poole and Baggett Branch.

At the same time it should also be cautioned that such differences might conceivably be explained in terms of different

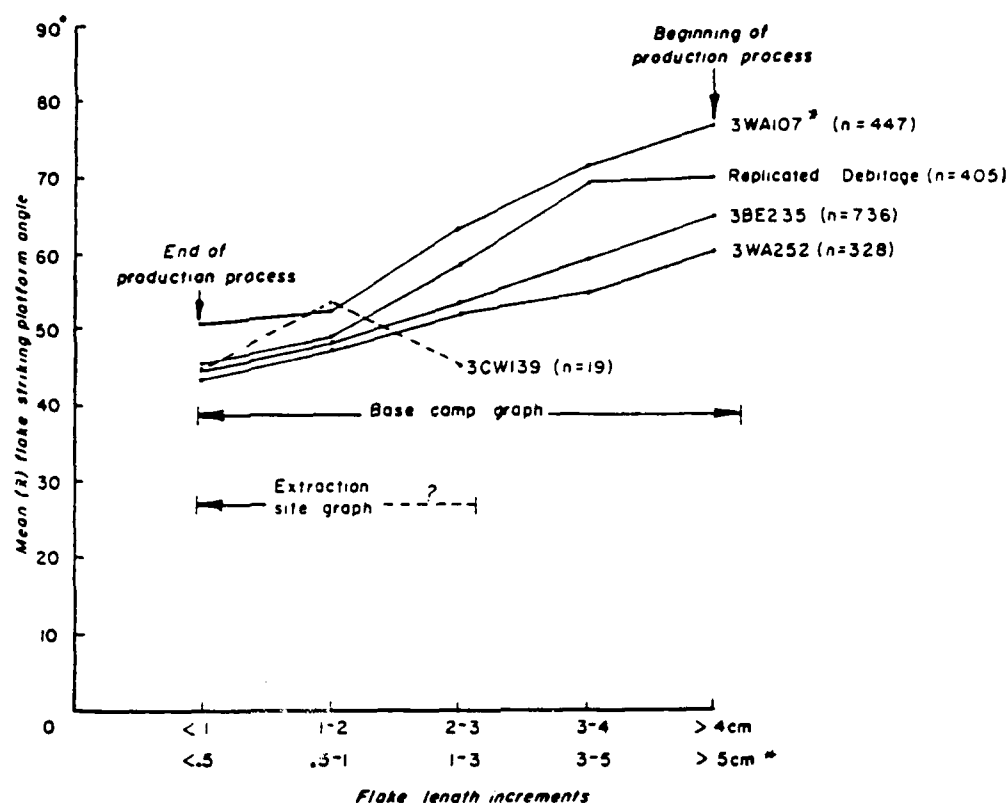


Figure 5-4. Comparison of graphs of bifacial reduction. (From Raab, Cande, and Stahle 1979:181).

functions carried out with stone tools on different sites of the same time period. This hypothesis is one that should also be considered in further work.

Clearly, the data here are too limited to argue for a definitive answer to these questions. However, the questions posed here could easily be framed as hypotheses for investigation during any possible mitigation work in the Lakeview Project. Sites could be compared on the relevant variables to determine if similar patterns hold up with more data and to see if more in-depth collection of data on the debitage can answer the questions posed here. The value of answers to these questions is potentially great. If, for instance, we can reliably differentiate the debitage of Archaic and Neo-American sites on bivariate graphs, it may be possible to make important lithic technological, chronological, and cultural inferences on the basis of debitage collections. This technique would tremendously aid in understanding sites composed primarily of debitage, which includes many sites in North-central Texas.

Projectile Point Use-Lives

Thus far we have looked at lithic technology from the perspective of tool manufacture. A variety of analytical pos-

sibilities also revolves around study of stone tool use. Site 41DL199 offers an insight regarding the use-life of projectile points/knives.

In a number of places above we have referred to "projectile points/knives" as one product of tool manufacture. This term reflects an assumption the "projectile points" may have served in fact as multifunctional tools. Goodyear's (1974) influential study of the resharpening of Dalton points, for instance, has alerted investigators to the possibility that projectile points served as much the function of knives as tips of projectiles. Goodyear's (1974:19-33) demonstration that Dalton points have a use-life involving, typically, several stages of resharpening is only explicable within a system of usage where the points serve as hafted knives as well as dart tips. Parenthetically, there is no reason why both functions could not be efficiently combined in the use of compound-shaft atlatl darts, where the foreshaft containing the point is used as a knife. It is also possible, of course, that some "projectile points" actually served solely as hafted knives.

Whatever the exact combination of functional roles that may have been adopted, two projectile points/knives (Figure 5-8) recovered from Level 7 (60-70 cm below surface) of Test Pit 7 at 41DL199 offer an interesting, albeit limited, insight into possible resharpening of PP/K's (projectile points/knives).

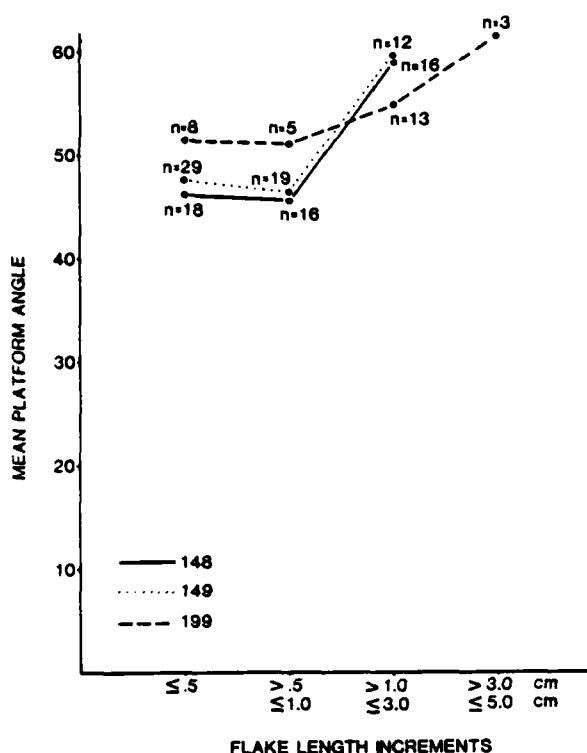


Figure 5-5. Bivariate graph of debitage lengths and striking platform angles.

These two points are classified as Wells types (Suhm and Jelks 1962:257-258), indicative of an Archaic Stage cultural affiliation. The larger of these points (5.4 cm in length) is of interest because of a small spur projecting from one shoulder of the point (arrow, Figure 5-8). Examination of this spur shows that it is located immediately adjacent to a mass of material that could not be removed during the process of thinning the workpiece from which the point was manufactured. This kind of defect occurs occasionally, causing flakes detached during the thinning process to terminate at the margins of the remnant in characteristic step fractures.

In this instance, it appears that resharpening of the point was prevented in the area immediately adjacent to the defect. Although fine pressure flaking scars are apparent along the length of both blade margins, any attempt to detach these flakes at the affected shoulder would terminate immediately as a step fracture. For this reason, it appears that no attempt was made to resharpen the point too closely to the defect, with the result that a spur of material was left at the shoulder as the point margins shrank from resharpening. In other words, the spur is a remnant that indicates where the point's margin had once been before a resharpening episode(s). This evidence provides us with a strong inference the PP/K's were being resharpened.

Moreover, if we examine the second point in Figure 5-8, we see another possible consequence of resharpening: exhaustion of a point as a result of successive resharpening episodes. Of interest here are two observations. First, the haft area of the

small (3.0 cm in length) point is quite similar to the haft of the larger point in shape and size. Presumably, hafting elements are more stable in their dimensions because they are protected by being lashed to a wooden shaft or handle. Second, the cross-section view of the smaller point shows a tendency toward a rhomboidal (parallel beveled edges) cross-section that Goodyear (1974:30) identified as a characteristic of terminal resharpening of points that begin with a bi-convex cross-section. Originally identified in connection with Dalton points (Goodyear 1974), the idea that hafted projectile-point/knives underwent successive resharpening episodes, leading to a "terminal" point beyond which further resharpening was not practical, has become a well-recognized one in North America. The idea is attractive, if one assumes that prehistoric peoples used their hafted "points" as knives, as well as projectile points. Used as knives, these artifacts would require periodic resharpening in order to maintain their cutting effectiveness. The result is attrition of the point from the margin inward, creating an increasingly beveled cross-section and ultimately leading to a diamond-shaped cross-section somewhat resembling a "drill." It may well be that artifacts identified as the latter have in fact been points that survived in the cultural system in the function of hafted knives for a long enough period to become terminally resharpened.

The means of identifying this trend is to recognize and look for points with relatively stable haft sizes, but a larger range of variability in blade morphology, including the attritional effects

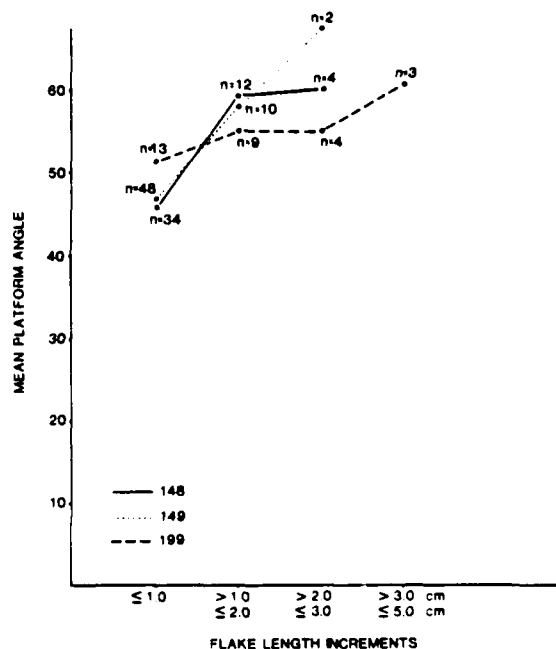


Figure 5-6. Bivariate graph of debitage lengths and striking platform angles.

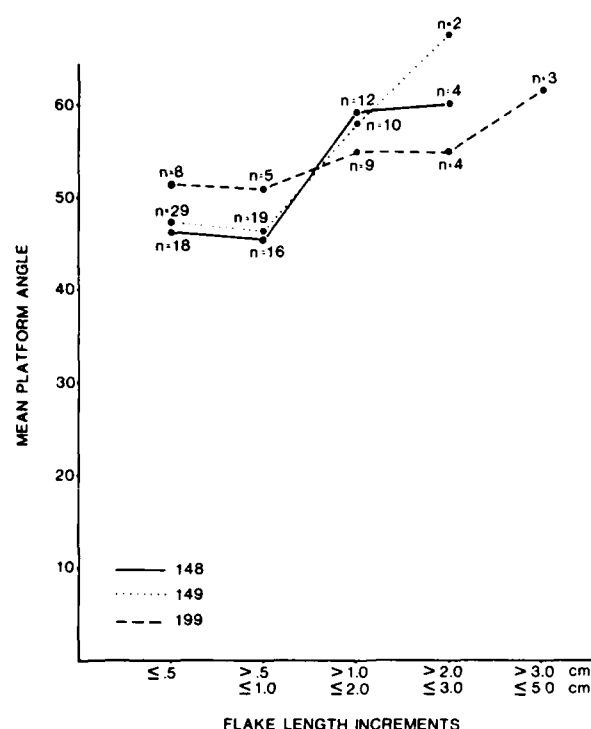


Figure 5-7. Bivariate graph of debitage lengths and striking platform angles.

described above. The discovery of a proportionately large number of points displaying these attritional effects would be significant evidence in favor of a technological system that included resharpening techniques. The two points at 41DL199 are certainly not a sufficiently large body of proof to establish such an effect, but they are cause to look further for more evidence.

A larger theoretical objective here, however, is to recognize that artifacts were once part of living systems that included artifacts with characteristic functions and use-lives. The nature of these use-lives resulted in patterns of loss, discard and other means of depositing artifacts into the archaeological record. One major objective of lithic analysis should be to understand as

much as possible about the functioning of the technological system, and how this system is reflected in the archaeological record.

Operationally, the search for artifact use-lives, proportions of different kinds of tools within sites, insights into manufacturing gleaned from study of debitage, use of various raw materials and development of distinctive tool assemblages such as flake tools should all be combined to build up a multi-dimensional picture of past lithic technology and, more importantly, to tell us what the variability in the technology reveals about settlement and subsistence behaviors. Toward that objective, we have incorporated a series of specific research objectives into the recommendations presented in Chapter 8.

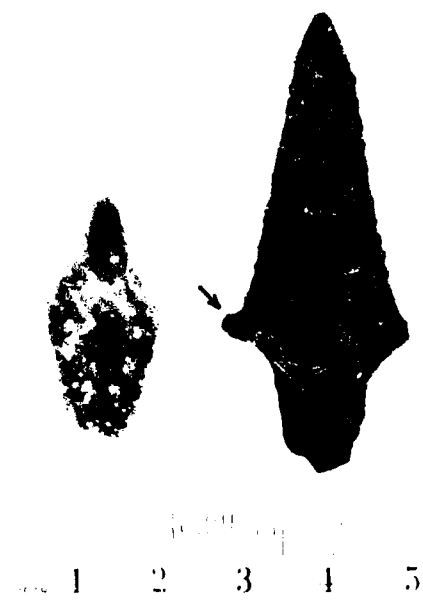


Figure 5-8. Wells point, showing similar size hafts and remnant spur after resharpening (arrow). Specimens from 41DL199, Unit 7, Level 7.

6

Chemical Analysis of Anthropic Soils

INTRODUCTION

The basic premise underlying the analysis of anthropic soils, i.e., soils from archaeological contexts, is that areas of cultural activity can be identified by their differential chemical composition. It is suggested that chemical alterations which have taken place in these contexts can be interpreted as the residual effects of human settlement. The analysis of soil samples recovered from five archaeological sites in the Lakeview Lake area focuses on the relative amounts of soil pH, nitrogen, potassium, magnesium, and calcium with a special emphasis placed on phosphorus as an indicator of occupation. Before turning to that analysis, however, it may be useful to summarize briefly the rationale and applications of soils analysis in archaeology.

Cook and Heizer (1965:4) have outlined four ways in which anthrosols can be created:

First, in all primitive and many civilized societies the urine and feces of man and animals are not disposed of by sewage systems but are deposited on the surface of the living area. Secondly, dead bodies, unused portions of animal flesh, rejected parts of wild or cultivated food plants are scattered as refuse over the surface, or buried just underground. Thirdly, in some primi-

tive and many civilized communities the excreta of domestic animals are saved and applied to the local soil as manure. Fourth, a special case, and one which must be watched for and excluded when possible, is the use of mineral fertilizers as a function of modern agriculture.

From these examples it can be seen that a variety of human activities may cause soils to be enriched in chemical elements above levels that one would likely encounter under natural conditions.

Anthropic soils were first studied in Europe. Arrhenius (1931, 1934, 1935, 1954, 1963), a pedologist working for the Swedish Sugar Manufacturing Company, conducted studies to define the land best suited to sugar beet farming. He collected and analyzed 500,000 samples from 500,000 ha of land (Arrhenius 1934:29; Woods 1975:6). The results of Arrhenius' study indicated high concentrations of soil phosphate were associated with three primary sources: 1) Stone from apatite ($\text{Ca}_5\text{F}[\text{PO}_4]_3$), a phosphorus mineral compound; 2) Concentrations of phosphate found in plant materials; and 3) Human activity.

Utilizing Arrhenius' method, Schnell (1932) examined several sites in Sweden and was able to establish phosphate isobars across the site surface, demonstrating strong correlation be-



tween potsherd frequency and phosphate levels. In 1935 Christensen analyzed samples from Stokkerup Village (in Denmark) that showed a 10:1 increase of phosphate over surrounding soils (away from the site area) and an increase of 2:1 phosphate in abandoned farm fields as compared to surrounding non-farmfield soils. Lorch (1939) not only attempted to predict site settlement patterns but also developed a theory that differing economies leave characteristic patterns of phosphate distribution (Woods 1975:7). By graphing the results of samples retrieved from transects in abandoned settlement areas, Lorch defined differential economic activities as well as intrasite economic fluctuations.

Other archaeologists interested in the phosphorus content of anthropic soils include: Krieger (1940); Buehrer (1950); Lutz (1951); Solecki (1951, 1953); Dauncey (1952); Dietz (1957); Cruxent (1962); Cook and Heizer (1962, 1965); Schwarz (1967); Provan (1971); Van Der Merwe and Stein (1972); Davidson (1973); Ahler (1973); Woods (1975, 1977); Sjoberg (1976); Proudfoot (1976); and Eidt (1973, 1977).

In addition to phosphorus, pH (potential of hydrogen) has been used to designate archaeological sites and features. The earliest use of pH analysis in the measurement of anthropic soils was conducted by Deetz and Dethlefsen (1963) when they were successful in their attempts to define soil profiles via pH measurements. In the Southwestern United States, Eddy and Dregne (1964) were unable to perceive any correlation between refuse areas and pH fluctuation. They were, however, successful in locating areas of high bone content. Through pH measurements, Weide (1966) was able to map the boundaries of several small sites in southern California. O'Neil (1972) applied pH analysis in the interpretation of the midden sequence at the San Jorge Site in Sabona de Bogota, Columbia. This analysis helped to identify midden depositional sequences when no other visible determination could be observed. Laville (1975) proposed the measurement of a Δ (delta) pH, in potassium chloride, which is assumed to detect small fluctuations in sediment sequences where no other differences can be detected.

SAMPLING AND ANALYTICAL METHODS

Samples were taken to aid in: 1) The interpretation of on-site/off-site soil variability with regard to the question of human occupation; 2) To quantify visual changes in soil strata; 3) To aid in the determination of variance of soil chemistry in relation to artifact frequencies; and 4) To help define archaeological features, their possible origin, structure, and use.

Seventy-two samples were analyzed for their pH, nitrogen (N), phosphorus (P), potassium (K), magnesium (Mg), and calcium (Ca) content. Samples were also compared to the standardized Munsell color chart system to aid in observing color changes in soil strata. The data from these analyses are presented in Tables 6-1 through 6-8. All chemical quantifications are described in parts per million (ppm). The pH measurement was determined by using a liquid suspension solution of one part soil to two parts water. Nitrogen and potassium were determined through flame emission spectroscopy while phosphorus was determined colorimetrically. Cal-

cium and magnesium were measured with an atomic absorption spectrophotometer. Each soil sample weighed more than 100 mg and was analyzed by the Soil Testing Laboratory, Texas Agricultural Extension Service, Texas A & M University.

The Lakeview II soil study focused its attention on the chemical differences existing within three archaeological sites, 41DL147, a Late Archaic prehistoric site, 41DL148, a Late Prehistoric site, and 41DL184, a Middle to Late Archaic site.

During the Phase III study attention was centered on the variances within two archaeological sites, 41DL149, a Late Prehistoric site, and 41DL199, an Archaic site.

RESULTS OF SOIL ANALYSIS AT 41DL148

Soil analysis was undertaken at 41DL148, the Cobb-Poole site, in order to verify the possibility of a prehistoric habitation structure. A total of 30 soil samples were extracted from the Cobb-Poole site. Of these, 24 were from a suspected prehistoric house structure (Feature 2, Chapter 3). Sixteen were taken in a vertical column (Table 6-1 through 6-3) within the pit, ranging from the surface to 190 cm in depth. Four samples were taken at slightly varying depths in an attempt to follow a suspected floor contact at the bottom of Feature 2. The locations of these samples are indicated by sample numbers in Figure 3-7 (Chapter 3). Another four samples were taken from small pits within Feature 2. Three control samples were taken from a sterile subsurface test unit remote from the site. Three more control samples were recovered at 15 cm levels from three units surrounding Feature 2. These samples (Table 6-3) were recovered from known midden areas in conjunction with Feature 2.

It will be recalled that in Chapter 3 we described Feature 2 as a possible pit house containing two sequent occupation levels and pits or postholes excavated into the bottom of the feature. On the basis of stratigraphic evidence, it appears that Feature 2 was first created as a large basin-shaped pit about 130 to 140 cm deep. Later, pits and/or postholes were excavated through the "floor" level at 130-140 cm. Subsequently, fill material composed of sandy clay and midden appears to have been introduced into Feature 2, creating a new occupation surface at about 90 to 100 cm below the surface. Horizontal laminae of water-carried sediments in the fill of Feature 2 at the 90 to 100 cm level indicate deposition on a surface. A pit with its origin at the 90 to 100 cm surface is also indicated.

Soil sampling was undertaken to see if these interpretations were corroborated by the presence of anthrosols. It was thought that if occupation levels and pits did exist within Feature 2, they would likely reflect the breakdown of organic materials incident to human occupation.

VERTICAL SAMPLING COLUMN

Figure 3-7 (Chapter 3) shows a profile of Feature 2 with a vertical column of soil samples, numbers 1 to 16. It can be seen that these samples cross-cut the suspected occupation levels and one of the pits (F.2E) at the bottom of Feature 2. Accordingly,

TABLE 6-3. Chemical Values of Control Sample Series at 41DL148 (Cobb-Poole).

Depth (cm)	pH	Nitrogen (ppm)	Phosphorus (ppm)	Potassium (ppm)	Calcium (ppm)	Magnesium (ppm)	Munsell Color	Notes			Sample Number
15	8.1	Low	23	292	4000+	235	10YR3/2	Midden	Unit 6		38
15	8.1	Low	55	264	4000+	245	10YR3/2	Control	Unit 9		39
15	7.6	Low	26	196	4000+	250	10YR3/2	Samples	Unit 13		40
0	8.0	Low	42	336	4000+	230	10YR3/2	Off-site	Unit 9	Surface	25
20	8.0	Low	20	228	4000+	190	10YR2/1	Control	50x50cm	Plowzone	26
50	8.0	Low	5	260	4000+	250	10YR2/1	Samples	Unit	C Horizon	27

TABLE 6-4. Chemical Values of Samples from 41DL184.

Depth (cm)	pH	Nitrogen (ppm)	Phosphorus (ppm)	Potassium (ppm)	Calcium (ppm)	Magnesium (ppm)	Munsell Color	Notes	Sample Number	
25	7.0	Low	141	120	4000+	220	10YR3/1	Test Unit 1	Black clay - Many large	30
45	7.0	Low	76	240	4000+	490	10YR3/1	Test Unit 1	cracks in soil. Soil	31
65	7.0	Low	45	188	4000+	500+	10YR4/2	Test Unit 1	color changes from dark at	32
85	7.0	Low	43	236	4000+	500+	10YR4/3	Test Unit 1	surface to light tan at bottom	33
25	8.0	Low	34	412	4000+	480	10YR3/2	Test Unit 2	unit.	34
5	7.8	Low	150+	756	4000+	415	10YR3/2	Test Unit 4		35
25	7.9	Low	58	420	4000+	465	10YR3/2	Test Unit 4		36

Table 6-5. Chemical Values of Soil Sample Series at 41DL149, Unit 2, East Wall.

Depth (cm)	pH	Nitrogen (ppm)	Phosphorus (ppm)	Potassium (ppm)	Calcium (ppm)	Magnesium (ppm)	Munsell color	41DL149 Notes (Suspected Refuse Pit) Unit 2 (east wall)	Sample Number
0-10	8.3	Low	150+	492	4000+	500+	n/a*	Possible post-occupation soil deposit	41
10-20	8.6	Low	113	408	4000+	500+	n/a		42
20-30	8.5	Low	70	360	4000+	500+	n/a	Black loamy clay	43
30-40	8.7	Low	58	364	4000+	500+	n/a	Feature outline indistinguishable	44
40-50	8.6	Low	25	332	4000+	500+	n/a	Feature 1 Dark midden stain	45
50-60	8.7	Low	32	324	4000+	500+	n/a	Fire-cracked rock, mussel shell, faunal remains, charcoal	46
60-70	8.5	Low	26	292	4000+	500+	n/a	600 ppm Salt	47
70-80	8.9	Low	21	256	4000+	500+	n/a	700 ppm Salt	48
80-90	8.6	Low	17	192	4000+	500+	n/a	Bottom of feature	49

Table 6-6. Chemical Values of Soil Sample Series at 41DL149, Unit 2, West Wall.

Depth (cm)	pH	(ppm) Nitrogen	(ppm) Phosphorus	(ppm) Potassium	(ppm) Calcium	(ppm) Magnesium	Munsell Color	41DL149 Notes Unit 2 (west wall)	Sample Number
0-10	8.4	Low	150+	512	4000+	500+	n/a*	Possible post-occupation soil deposit	50
10-20	8.2	Low	150+	432	4000+	500+	n/a		51
20-30	8.6	Low	117	360	4000+	500+	n/a	Black loamy clay	52
30-40	8.5	Low	60	312	4000+	500+	n/a		53
40-50	8.8	Low	24	276	4000+	500+	n/a	Grades into	54
50-60	8.7	Low	15	244	4000+	500+	n/a		55
60-70	8.8	Low	14	232	4000+	500+	n/a	Brown clay	56
70-80	8.6	Low	15	240	4000+	500+	n/a		57
80-90	9.0	Low	17	216	4000+	500+	n/a		58

Table 6-7. Chemical Values of Soil Sample Series at 41DL199, Unit 1.

Depth (cm)	pH	(ppm) Nitrogen	(ppm) Phosphorus	(ppm) Potassium	(ppm) Calcium	(ppm) Magnesium	Munsell Color	41DL199 Notes Unit 1 (west wall) Control Pit	Sample Number
0-5	8.3	Low	150+	520	4000+	500+	10 YR 3/1	Thin layer of topsoil underlain by sandy soil intermixed with pea gravels	59
10-15	8.3	Low	150+	448	4000+	425	10 YR 3/1		60
20-25	8.0	Low	150+	464	4000+	490	10 YR 3/3	Dark midden soil with gravels	61
30-35	8.3	Low	125	312	4000+	445	10 YR 3/3		62
35-40	8.3	Low	150+	320	4000+	410	10 YR 3/3	Feature 2, charcoal flecks in a midden stain, a possible pit feature.	63
40-45	8.0	Low	54	248	4000+	500+	10 YR 3/3	Calcium-encrusted pebbles, mottled soil with fewer gravels than the upper strata.	64
50-55	8.0	Low	27	232	4000+	490	10 YR 4/3		65
60-65	7.4	Low	27	176	4000+	480	10 YR 4/4		66

Table 6-8. Chemical Values of Soil Sample Series at 41DL199, Unit 7.

Depth (cm)	pH	(ppm) Nitrogen	(ppm) Phosphorus	(ppm) Potassium	(ppm) Calcium	(ppm) Magnesium	Munsell Color	41DL199 Notes Unit 7 (North Wall) Suspected Pit	Sample Number
0-5	8.4	Low	150+	508	4000+	500+	10 YR 2/2	Thin layer of topsoil underlain by sandy soil intermixed with pea gravels	67
10-15	8.5	Low	150+	448	4000+	500+	10 YR 2/2	Dark midden soil with gravels	68
20-25	8.4	Low	150+	396	4000+	500+	10 YR 2/2		69
30-35	8.6	Low	150+	376	4000+	500+	10 YR 3/3		70
40-45	8.4	Low	150+	356	4000+	500+	10 YR 3/3		71
50-55	8.5	Low	150+	348	4000+	500+	10 YR 3/3		72
60-65	8.5	Low	150+	356	4000+	500+	10 YR 3/3	Calcium-encrusted pebbles, mottled soil with fewer gravels than the upper strata.	73
70-75	8.3	Low	150+	352	4000+	495	10 YR 5/4		74

TABLE 6-9

Lithic Debitage Graph for Site 41DL199

Level	Unit 1 Counts	Cumulative %	Unit 7 Count	Cumulative %	Difference
0-10 cm	32	0.296	43	0.213	0.083
10-20 cm	29	0.564	33	0.378	0.186
20-30 cm	28	0.824	24	0.497	0.327
30-40 cm	4	0.861	42	0.706	0.155
40-50 cm	6	0.916	27	0.840	0.076
50-60 cm	9	1.0	32	1.0	0.0
60-70 cm	*	n/a	9	n/a	-
70-80 cm	*	n/a	0	n/a	-
	108		210		
			201**		

* Not excavated.

** Sum derived for the Kolmogorov-Smirnov Test.

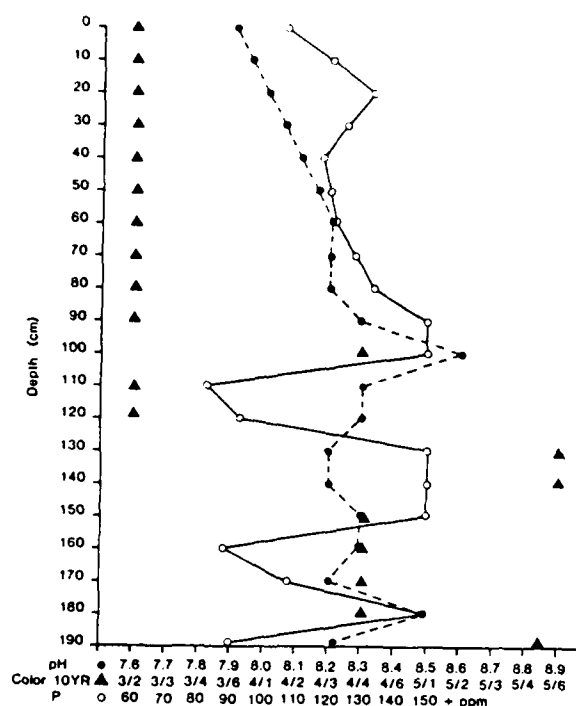


Figure 6-1. Graph of Phosphorus (P), pH, and color changes in vertical profile within Feature 2, 41DL148.

one might expect that breakdown of organic matter on an occupation surface or within storage pits might produce relatively large amounts of P, as well as other chemical changes.

Of course, one problem that must be dealt with in interpreting variation in the chemical composition of a vertical series of soil samples is whether observed differences can be attributed to movement of chemicals downward in the soil by leaching or other processes. Phosphorus, a key indicator of the breakdown of organic material, would be of particular interest in this regard. The vertical sampling series results suggest that phosphorus has a stable distribution in Feature 2. Table 6-1, for instance, shows that P amounts are relatively consistent until reaching the 90 and 100 cm levels, at which point the readings exceed 150 ppm. Below the 100 cm level, the values of P drop sharply to 82 ppm (110 cm level) and 93 ppm (120 cm level). In view of the fact that sediments in the 90 and 100 cm levels do not present any sort of barrier to the downward percolation of water, it appears that P is immobile in the sediments of Feature 2 in relation to the locus of their deposition (Figure 6-1). This interpretation is supported by the relative immobility of P in soils represented by a basic pH and Ca content (Cook and Heizer 1965; Ahler 1973:116-131), both of which are characteristic of soils surrounding the Cobb-Poole site.

What kinds of patterns can be detected in the vertical soil series? As noted above, P exceeds 150 ppm at 90 cm and 100 cm levels. Moreover, pH becomes slightly more basic (8.6) at the 100 cm level, and a shift in soil color occurs from 10YR3/2 (very dark greyish brown) marking previous levels to 10YR4/4 (dark

yellowish brown) at 100 cm (Figure 6-1). The causes of the shifts in pH and soil color are difficult to relate to human occupation, but the increase of P at the 90 cm and 100 cm levels corresponds precisely with the stratigraphic interpretation (described in Chapter 3) of the 90 cm to 100 cm level as a possible occupation surface.

The same phenomenon repeats itself at the 130 cm to 140 cm level (Figure 6-1). Table 6-1 indicates that P values exceed 150 ppm. Again, the correlation of these readings with the interpretation of the 130 cm to 140 cm levels as an occupation surface at the bottom of Feature 2 is notable. A color change from 10YR3/2 at the 120 cm level to 10YR5/6 (yellowish brown) at the 130 cm and 140 cm levels is indicated as well.

It should be pointed out that the magnitude of increase of P is a conservative reading. The methods used to determine P were oriented to agricultural problems where readings of greater than 150 ppm of P would be an unnecessary measurement, hence the cut-off of information at 150 ppm. We only know that the samples had greater than 150 ppm P. Future soils studies should attempt to determine the true magnitude of P content in samples from sites in the Lakeview Project.

Samples were also taken from a suspected storage pit at levels ranging from 150 cm to 180 cm. Once more, high P readings are encountered, although on a somewhat more irregular basis (Figure 6-1). For instance, a reading of 150 ppm P was obtained for the 150 cm level and the 180 cm level, with lower amounts in-between (Table 6-1). Table 6-1 shows that a color shift in the sediments occurred in the stratigraphic interval also. These results might be interpreted as the consequence of a pit filling with sediments containing variable amounts of organic matter.

Finally, at the 190 cm level, the P value drops off sharply (Figure 6-1). This shift would be predicted by the stratigraphic interpretation of the sediments at 190 cm as the culturally sterile substratum of Feature 2.

HORIZONTAL SAMPLE SERIES

Four soil samples (Nos. 17-20, Table 6-2) were taken from along a suspected floor at the bottom of Feature 2 (Chapter 3). The results of the chemical analysis reveal a high degree of homogeneity in these samples. All four samples have a P reading of 150+ ppm. This pattern would be predicted for an occupation surface, a surface that would receive considerable organic debris.

Samples were also taken from pits excavated through the suspected floor at the bottom of Feature 2. Like the vertical series samples taken between 150 cm and 180 cm, the intent was to determine if these pits registered high readings of P. Table 6-2 shows that all samples from pits, samples 21 through 24, have high readings of P with three of these registering 150 ppm. Again, we have good confirmation of these features containing sediments with large amounts of organic matter.

CONTROL SAMPLES

Three midden control samples (Nos. 38-40, Table 6-3) were

removed from 15 cm levels in test Units 6, 9, and 13 of 41DL148 (Chapter 3, Figure 3-7). None of the samples approach the quantity of P measured within Feature 2. Our expectation was that samples taken from the midden surrounding Feature 2 would show P levels equal to or approaching those found in this feature. Measurements of 23 and 26 ppm P and 55 ppm P were lower than expected for a midden area surrounding the extremely high P levels observed within Feature 2. The precise explanation for this occurrence is not as yet known. However, there may be some loss of phosphorus from the surface (plowzone) levels due to leaching of soluble phosphates (Proudfoot 1976).

Three control samples (Nos. 25-27, Table 6-3) were taken from a sterile test unit (Unit 9, a 50 x 50 cm control unit) located at the northern terminus of Trench A. As expected the amount of P declined from 42 ppm at the surface to 5 ppm at the 50 cm level. The pH levels were also low at 8.0 and are probably representative of natural soils in the area. A comparison between a 60 cm sample (No. 13) recovered from Unit 1 (within Feature 2) and a 50 cm control pit sample (No. 27, 66 m distant) reveal significant variation in phosphorus quantities, from 5 ppm in the control pit sample compared with 121 ppm in Feature 2.

Of the 30 samples analyzed from the Cobb-Poole site, the N was low, whereas Ca exceeded 4000+ ppm. The mid-range values of both K (168-336 ppm) and Mg (190-325 ppm) may be stable indicators that leaching at the Cobb-Poole site has occurred at a minimum.

RESULTS OF SOILS ANALYSIS AT 41DL184

Seven soil samples were analyzed from site 41DL184 (Table 6-4). Removed from scattered units and levels across the site, an attempt was made to isolate chemically any possible changes within the site that could not be observed during site testing, such as possible buried occupation surfaces.

The fluctuation in pH, from 7.0 (neutral) in Unit 1 to pH 8.0 in Unit 2, is characteristic of soils where the pH has been "washed out" by floodwaters. The temporary inundation of the site may tend to reduce the pH of basic soil (thus becoming more acid) through accumulations of carbon dioxide and by release of organic acids from microorganism metabolism (Etherington 1975:193-196). The high Ca and base pHs (Units 2 and 4) indicate that the phosphates within the site are probably immobile. However, any discussion of the immobility of P in a periodically inundated soil may be a moot point. Phosphorus levels within the upper 25 cm of Unit 1 are very high (141 ppm); however, P quantity declines with depth to 43 ppm at 85 cm. Unit 4, situated inside a wooded area, reflects a P level of 15 ppm for the upper 5 cm of surface soil. This may be the result of natural forest ground cover (i.e., leaves, grasses, etc.). As at the Cobb-Poole site, N is low while Ca is high (4000+ ppm). The extreme fluctuations of K (120 to 756 ppm) and Mg (220 to 500+ ppm) may be indices of a frequently flooded site. The Ca in Unit 1 (120 ppm) appears to indicate that leaching has taken place, removing K from the soil matrix. However, this is not the case near Unit 4, in the woods, where the surface value of K is 756 ppm.

RESULTS OF SOILS ANALYSIS AT 41DL147

One soil sample from 41DL147 was analyzed to provide baseline information regarding bone preservation and general soils background data. The results are in keeping with those obtained from both the Cobb-Poole site (41DL148) and 41DL184. The soil chemical profile at 41DL147 is one of alkaline soil (pH 8.1), low N, high Ca (4000+ ppm), and upper-range amounts of K (260 ppm) and Mg (420 ppm). Phosphorus (38 ppm) is equivalent to results obtained from the 15 cm midden control samples (Table 6-3) at the Cobb-Poole site and subsurface levels of Units 1 and 2 within 41DL184 (Table 6-4). Though the site appears disturbed through frequent flooding, P seems stable and immobile.

RESULTS OF SOILS ANALYSIS AT 41DL149

Eighteen of the 72 samples which were submitted for analysis to Texas A & M were recovered from 41DL149. Of these 18 samples, 9 came from a suspected refuse pit feature (Nos. 41-49, Table 6-5) in the east wall of Unit 2 (Figure 3-11). The first 9 samples recovered from within Feature 1 were taken at 10 cm intervals from the surface (0 cm) down through the 80-90 cm level. The remaining 9 soil samples, acting as control samples (Nos. 50-58, Table 6-6), came from the west wall of Unit 2 (immediately across from the pit, Feature 1).

The results of two vertical soil columns of 9 samples each, indicate that there was strikingly little difference between samples taken from the interior of a suspected pit (Feature 1, Table 6-5) in the east wall of test Unit 2 and a control column in sterile soil 1 m distant in the west wall of the same excavation unit (Table 6-6).

Based upon soil chemical differences, artifact frequencies, and bone fragment counts, Unit 2 appears to lie on the site's northern perimeter. The high P values (150+ ppm) which were found in the upper 10 cm of both soil columns are probably the result of natural organic materials in the surface stratum mixing with midden material. Some of the P in the upper levels can be attributed to the return of P to the soil after it has been absorbed by plants (Black 1960:249). In the interval between 10 cm and 90 cm the P and K values drop correspondingly in both columns, indicative of non-archaeological soils. The pH values from both columns display a slight tendency to rise in alkalinity as depth increases. This moderate increase in pH with depth, corresponding with the rise in quantities of water-soluble salt (Table 6-5) in the 60 to 80 cm levels of the east wall of Unit 2 (from within the pit feature), may be indicative of concentrated organic material at the lower unit levels (Cornwall 1958:197). However, no hard data are present to substantiate this fact. The occurrence of salts may be due to the general structure of the pit collecting salts within its basin. Both the alkaline conditions and the low supply of N may be due to the development of soils under conditions of limited rainfall (Black 1960:249).

Magnesium (500+ ppm) and Calcium (400 ppm) remain equal in both columns at all levels. The high values of Ca are probably originating from the parent bedrock material in the area.

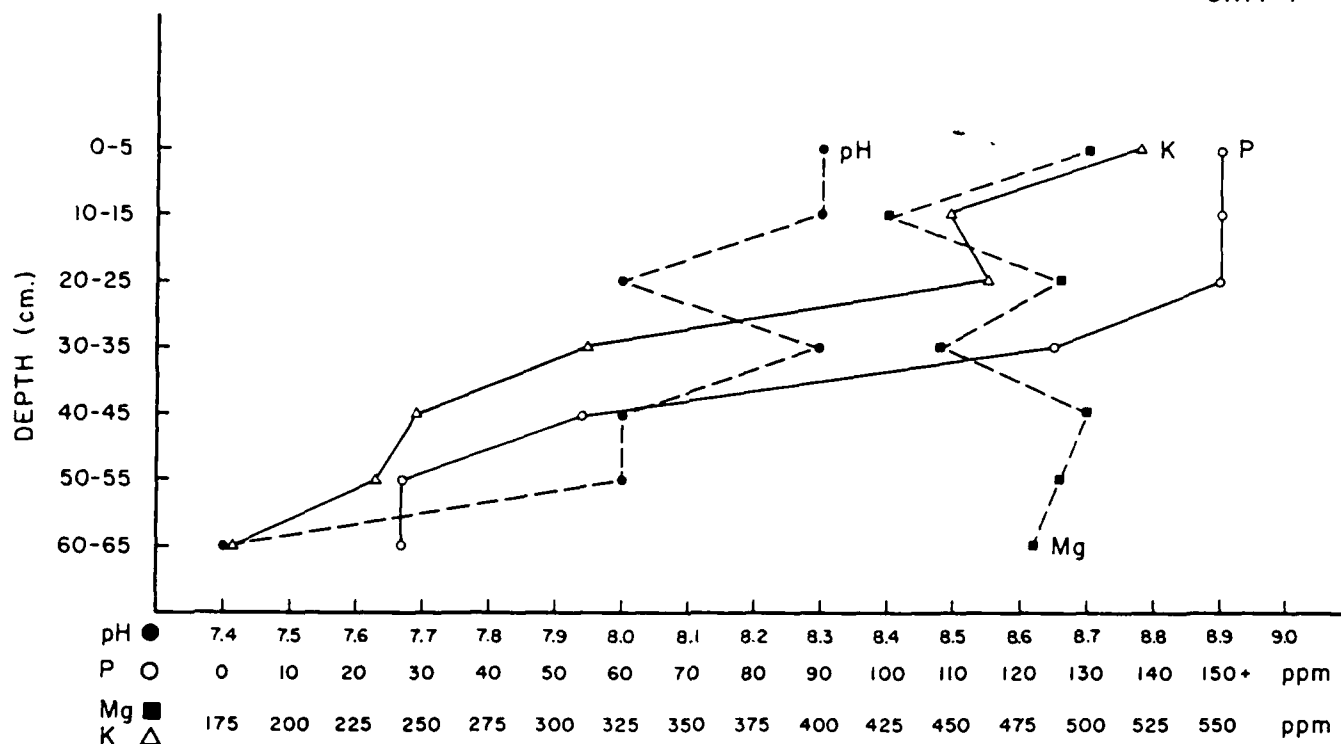
41DL199
UNIT 1

Figure 6-2. Stratigraphic variability in chemical elements (P = Phosphorus, Mg = Magnesium, and K = Potassium), and pH, Unit 1, site 41DL199.

The overall picture that emerges here is one of little difference in the tested soil elements between the pit (Feature 2) and the surrounding soil matrix. This result is perhaps surprising if one assumes that a visible feature should, because of its visibility, represent a different kind of soils environment than surrounding sediments. More about this below.

RESULTS OF SOILS ANALYSIS AT 41DL199

Analysis of soil samples from 41DL199 was undertaken in order to quantify the existence of a presumed but not visually distinct feature in the vicinity of Unit 7.

Sixteen samples (Nos. 59-74, Tables 6-7 and 6-8) were recovered and analyzed from 41DL199. Eight samples were extracted from Unit 1 (Figure 3-20) with 7 coming from a vertical column extracted at 10 cm intervals and with an additional sample being recovered separately from within Feature 2 in the west wall (Table 6-7, Sample 63). The remaining 8 samples (Table 6-8) were recovered from a vertical column in the north wall of Unit 7 (Figure 3-21). Samples were taken in 10 cm intervals from the surface level down to the test unit floor (75 cm below surface datum).

During subsurface testing operations, it was observed that a disproportionately higher number of lithic artifacts were being found in Unit 7 as compared to Unit 1 (2 m to the north). After fieldwork was completed, a lithic artifact frequency tabulation

(Table 6-9) comparing Units 1 and 7, level by level, was created. When this tabulation was compared with the soil chemistry data (Figures 6-2 and 6-3), the assumption that was made in the field was verified. There was a significantly higher number of artifacts in Unit 7 coming from greater depths than was noted in Unit 1.

Using the Kolmogorov-Smirnov 2 Sample Test (or KS Test), the frequencies of recovered lithic materials from Units 1 and 7 were compared. Since the levels beneath 60 cm were not excavated in Unit 1, these levels (60 cm to 80 cm) from Unit 7 which were excavated were left out of the test procedure. The Kolmogorov-Smirnov Test is similar to the Wilcoxon Test but examines the difference between two samples which has been converted into ordinal categories (Thomas 1976:322-326). The result of the KS Test proved significant at the .01 level.

$$0.01 \text{ level: } D = 1.63 \sqrt{\frac{n_1 + n_2}{n_1 n_2}} = .19$$

where: D = the maximum deviation between the various pairwise comparisons;

n1 = the sum of Unit 1 lithic counts; and

n2 = the sum of Unit 7 lithic counts, excluding the 60 to 80 cm levels.

As a statistical test, the KS Test tends to be conservative, with the probability of erroneously rejecting a null hypothesis actually smaller than the set level of significance (Roscoe 1975:277).

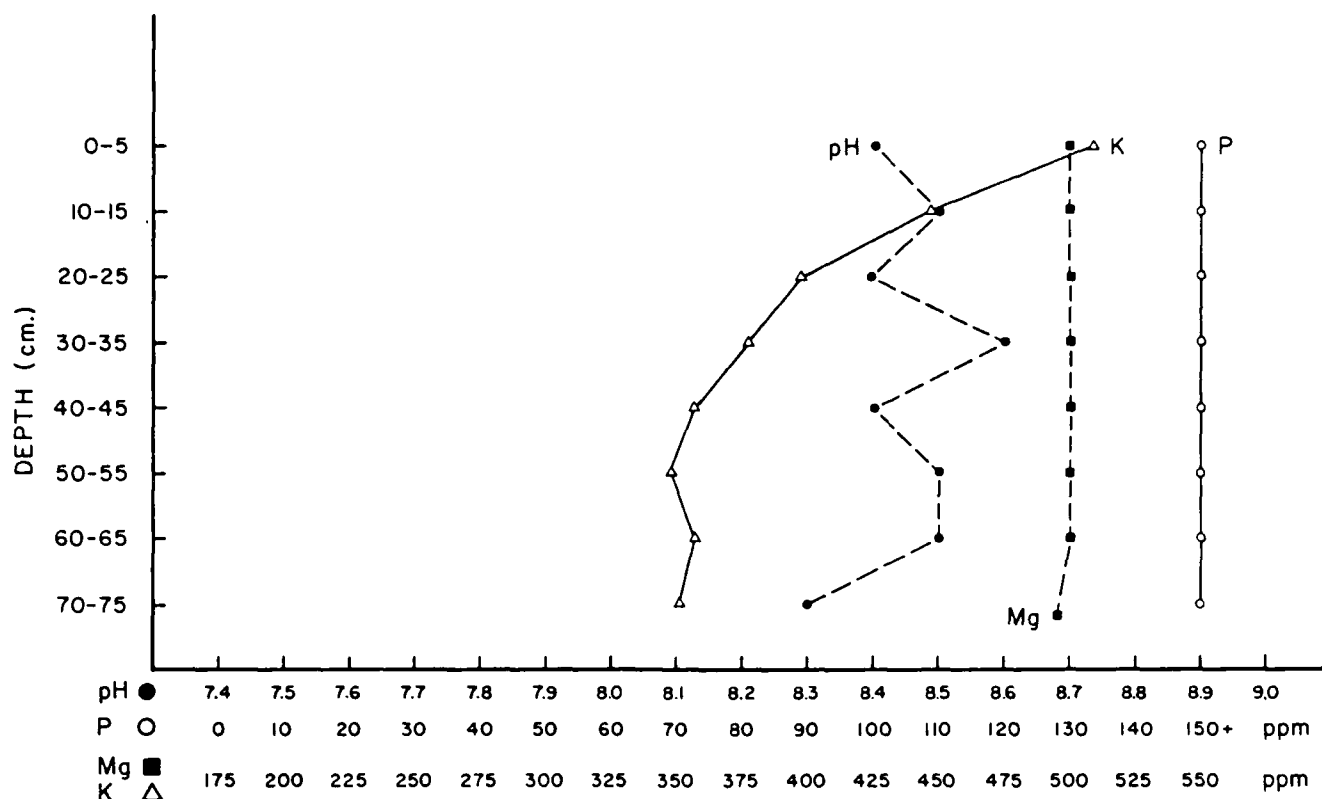


Figure 6-3. Stratigraphic variability in chemical elements (P = Phosphorus, Mg = Magnesium, K = Potassium), and pH, Unit 7, site 41DL199.

Though only separated by 2 m in distance, the difference in the obtained soil chemistry results from Unit 1 compared with Unit 7 may be accountable by the disturbance resulting from prehistoric human occupation.

As noted in Table 6-7 (Figure 6-2), the P levels in Unit 1 are very high (150+ ppm) between 0 cm and 35 cm, at which point the P readings decline to 25 ppm at the 65 cm level. In Unit 7 (Table 6-8 and Figure 6-3) the P values remain high (150+ ppm) from the 0 cm level down through the 75 cm level. In addition to the P values, the pH frequencies also vary between the two units. The pH in Unit 1 (8.3 to 7.4) tends toward a more acid environment as depth increases. The pH fluctuation in Unit 7 is minor and tends to reflect the uniformity of the soil matrix from which the samples were extracted. The K values from Units 1 and 7 are similar between the surface levels (0 cm) down to the 35 cm levels. At this point, the K value in Unit 1 begins to lessen with greater depth whereas in Unit 7 the K value appears to stabilize at approximately 353 ppm. The Mg value in both units are high, however, the amounts in Unit 1 are a bit lower than in Unit 7. The high value of Mg in both units indicated that the soils at the site are not being subjected to a great deal of leaching. The Ca from both units is high (4000+ ppm), and the N is low.

Soil Sample 63 retrieved from Unit 1 (Feature 2, 35-40 cm) is high in P (150+ ppm). Prehistorically this small pit may have been used for storing organic material such as foodstuffs. An additional explanation of the pit feature may be a posthole

remnant in which the post has decayed. Van De Merwe and Stein (1972:253) believe that the decomposition of a post in the soil sets up a local reduction reaction which tends to inhibit the removal of phosphates. The low value of Mg in Feature 2 may be due to the decay of a wooden post. Hardwoods such as oak or hickory are low in Mg quantities (ibid:253) and would provide little quantifiable Mg value to the soil matrix.

CONCLUSION

Seventy-two soil samples recovered from five archaeological sites, 41DL147, 41DL148, 41DL149, 41DL184, and 41DL199 within the Lakeview Project Area, were analyzed for soil pH, nitrogen (N), phosphorus (P), potassium (K), magnesium (Mg), and calcium (Ca).

Though only one soil sample was analyzed from 41DL147, it displayed a noticeable similarity to the average results obtained at the four other sites. The soil was alkaline, nitrogen was low, calcium exceeded 4000 ppm, and magnesium and potassium extended into the upper levels of measurability.

Thirty samples were collected from the Cobb-Poole site, 41DL148. Sampling from within the large pit feature at 41DL148 was carried out in order to verify if interpretations of occupation surfaces could be corroborated by chemical means. High P values in direct association with observable stratigraphic changes in the pit feature appear to substantiate the presence of

anthrosols within Feature 2. Variation in amounts of P, particularly within Feature 2 of 41DL148, correlates well with the interpretation of this feature as a human occupation structure.

Tables 6-5 and 6-6 illustrate the difference between the control and test samples for all of the chemical readings (pH, N, P, K, Mg, Ca) at site 41DL149. The uniformity in sample response may be accounted for by certain site formation processes. If a pit were dug into the site during prehistoric occupation and then abandoned to be filled in by aeolean and alluvial sediments, we may expect that the pit would consist of both local midden and sterile soils. Thus, the high values in the pit which we might have expected to measure are not present. If the pit were used prehistorically, either for storage or for food preparation, it seems plausible to assume that the only chemical traces we might expect to find may be in the pit wall where organic materials may have decayed and then absorbed. An auxiliary sampling strategy might have been not only to take the vertical test column as was done, but also to have taken a sample series along the outline of the pit silhouette.

Of minor mention here is the occurrence of salts within the pit feature. At the 60-70 cm and 70-80 cm levels respectively, quantities of salt (600 ppm and 700 ppm) were measured from inside of the pit. This is probably due to salts within the fill of the pit moving through the upper soil stratum and collecting in the bottom the pit which is forming a natural hardpan area. No salts were measurable from comparable control samples.

The 7 soil samples recovered from 41DL184 indicate a site that has been heavily alluviated. Fluctuation in pH appears characteristic of a site that is periodically inundated. The extreme variations in K and Mg may also be representative of a site that is temporarily flooded.

Sixteen soil samples analyzed from 41DL199 taken in two vertical sample columns 2 m apart and acting as complementary data appear to indicate the presence of a feature. The variable frequencies of lithic artifacts, a layer of gravels, and a marked difference in the soil element readings between Units 1 and 7 all suggest a pit feature in the site's lower levels.

The low N values, recorded from all five sites, appear

characteristic of soils in the Lakeview Project area possibly deriving from the matrix of local terrace deposits. Nitrogen proved of little value in anthropic soil interpretation. Nitrogen in the form of nitrate is highly soluble and will not combine with insoluble soil compounds. In this soluble state it is easily transported by ground water action and lost through leaching (Black 1960:205; Cook and Heizer 1965:18).

Though K and Mg were quantitatively determined, their significance to the analysis of anthropic soils has yet to be ascertained. At the present time, too little is known of their stability in archaeological contexts to state adequately that their quantity or fluctuations are determined by past human behaviors. One study (Van Der Merwe and Stein 1972) has used Mg and P amounts to differentiate between postmolds and rodent burrows when these are compared with their surrounding soil matrices. Potassium has been suggested as an indicator of wood ashes (Eddy and Dregne 1964) present within archaeological deposits. At present, however, Mg and K appear best employed as indicators of leaching and elemental stability.

Calcium values were consistently high (4000+ ppm) at all sites tested. Though in this study Ca was not used as a direct indicator of anthropic soils, Ca (coupled with pH) does provide valuable information pertaining to the relative mobility of P. When there is plentiful Ca and base pH levels, the consequence will be a limited mobility of P.

Future work at the Lakeview sites should carefully monitor fieldwork in order to be alerted to the potential uses of soils testing. In the case of Archaic sites, careful sampling in conjunction with suspected features may be valuable in defining the presence of features that are not apparent as obvious patterns of soil coloration or texture. Conversely, soils analysis at Late Prehistoric sites cautions that more effective sampling must be done in order to "filter out" function induced soil chemistry differences from site formation processes and "noise" introduced by pervasive midden material.

With the use of pH and Ca as indices of P mobility and K and Mg used as indicators of leaching, P appears to provide the single best method for determining anthropic soil variation in the Lakeview Project Area.

7

Prehistoric Human Ecology and Settlement: A Working Synthesis

From the beginning, archaeological investigations in the Lakeview Project have been oriented toward a human ecological understanding of settlement. During Phase II (1979-1980), models of prehistoric settlement focused on two sequent stages of aboriginal cultural development, the Archaic Stage (ca. 5000 B.C. to A.D. 800), and the Neo-American Stage (ca. A.D. 800 to A.D. 1600). In both cases an effort was made to understand the form of settlement and the biophysical factors that may have conditioned those forms (Raab, Bruseth, and McIntyre 1980). Owing to disparities in the quantity and quality of data recovered from the two cultural stages, Phase II resulted in a far more detailed model of settlement during the Neo-American Stage than during the Archaic Stage.

An attempt was made to compensate to some degree for this disparity. Certainly, the ability to reconstruct settlement patterns from various time periods is a function of data availability rather than any intent on our part to favor investigation of some cultural remains over others. More data on the Archaic Stage—though still less than that recovered for the Neo-American Stage—was obtained during Phase III (1980-1981). Accordingly, we have attempted to expand our settlement-subsistence

studies beyond the point to which it was possible to take them during Phase II.

The data from the Archaic Stage sites remain relatively scanty. As we argued in Chapter 5, however, the paucity of these remains is probably the direct result of the kinds of transitory, hunting-and-gathering behaviors that created the sites. Sites of this kind will be closer to the threshold of archaeological visibility than sites that were more permanently occupied (as in the case of some of our Neo-American Stage sites).

Understanding of hunting and gathering adaptations requires us to deal with these kinds of sites. Here, we have attempted to indicate some ways that future research might take these into account in dealing with Archaic Stage hunters and gatherers.

The sections that follow explore potential research utilities of both Archaic and Neo-American sites, spanning the known phases of prehistoric occupation of the Project area. As such, these explorations attempt to extend what was learned during all phases of survey and testing within the Project area. We offer these as an evolving set of problem orientations to guide future research.



ASSUMPTIONS AND GOALS

We assume that, while human beings do not shape all of their activities in response to the natural environment, in some instances the biophysical world does structure human behavior in a relatively direct way. The prehistoric hunter-gatherers and, conceivably, horticulturalists who occupied the Lakeview area are an example of those instances. Considerable insight into the social organization, economy, settlement patterns, technology and other aspects of these peoples' lives can be achieved by looking at the interaction of behavior and variability in the natural environment. This kind of scientific strategy is profitable owing to the close connection between behavior and environment in "low energy" societies. Lacking the technologies necessary to produce, transport and preserve sufficient quantities of essential resources, simple prehistoric societies found it necessary to adapt the timing, organization, and location of their behavior to the availability of resources. Indeed, one could consider these adaptations to constitute the human ecology of such groups (cf., e.g., Thomas 1979:242-270; Jochim 1976; Hole, Flannery, and Neely 1969).

We have narrowed this perspective somewhat to a focus on prehistoric settlement and subsistence. Settlement-subsistence studies are perhaps the best developed aspect of archaeological human ecology, having undergone extensive theoretical and empirical development during the last decade (e.g., Binford 1964; Struever 1968; Hole, Flannery, and Neely 1969; Thomas 1973; Plog 1974; Jochim 1976; Yellen 1977; Gould 1978). These studies emphasize settlement patterns as one mode of adaptation to variability in the natural environment. A settlement-subsistence approach was selected for the Lakeview archaeological project because it allows scientific (Chapter 2) and resource management (Chapter 8) goals to be pursued within a coherent regional framework.

Settlement-subsistence studies assume that human behavior and environment are linked in a systemic manner. For the sake of convenience, however, we have divided our analytical efforts between information on settlement on one hand and the natural environment on the other. This distinction is not wholly arbitrary. Separation of settlement and environmental variables follows the concept of the effective environment (e.g., Binford 1964; House and Wogaman 1976). This concept suggests that predicting the responses of a human population to an environment depends upon recognition of the biophysical resources that were available and the socioeconomic means used by the population to exploit those resources. The concept is useful in that it emphasizes the role of both cultural and natural variables, and it encourages attention to both classes of phenomena. The present chapter, however, will emphasize the causal role of past natural resources in the Project area because data of this kind offer an effective starting point for ecological studies.

NEO-AMERICAN STAGE SETTLEMENT

MODELS OF THE EFFECTIVE ENVIRONMENT

An ideal model of the past environment would account for the entire range of habitats utilized by humans. While that objective is seldom attained completely, it is a goal that can be approximated to increasing degrees of accuracy. Substantial scientific benefits are derived from environmental information that is far from complete. In that vein we attempted to improve existing models of the prehistoric environment within the Project area. Our efforts were successful in some aspects more than others due to disparities in the amount of information available from regional archaeology and from site testing. Of the four prehistoric sites tested during Phase II operations (Chapter 3), the Cobb-Poole site, 41DL148, produced by far the largest quantity of information. Moreover, a variety of data was available on the biophysical setting of the Cobb-Poole site. By combining the information obtained from test excavations at Cobb-Poole with data on the site's biophysical setting, we were able to synthesize a relatively detailed model of a prehistoric terrace habitat.

Phase II work in the Lakeview Project suggested that previous models of the area's prehistoric effective environment may need revision. Before considering new data, however, a brief review of current ideas about the prehistoric environment is in order.

Although, as Lynott (1977:130-131) indicates, models of the prehistoric environment of North Central Texas currently exist in unsystematic, rudimentary form, there are two fundamental assumptions supporting current thinking about the topic. The first and more influential of these is that permanent water tended to be scarce, thereby acting as a crucial limiting variable on human occupation. The drought-prone character of the Southern Plains during the last few millennia (e.g., Lynott 1977:16; Skinner et al. 1978:7-8; Skinner and Connors 1979:6; Gunn 1979; McMillan and Klippel 1981), coupled with few permanent sources of surface water today, and a presumed warming and drying trend in the region over about the last 4000 years (Dillehay 1974; Bryant and Shafer 1977), are all offered in support of this idea. The second assumption is that if water was in short supply, settlement can be expected to have been ephemeral and tied closely to major streams. Both assumptions are reflected in an assessment of prehistoric settlement patterns in the Lakeview area:

The shift in site locations from upstream for Archaic sites to downstream for NeoAmerican sites may be a reflection of a general drying trend which decreased the amount of effective moisture during this period of time (Bryant and Shafer 1977; Skinner et al. 1978:133-135). We believe that the presence of intrusive peoples along Mountain Creek may indicate that this was an area which was not considered part of any group's home

territory and into which mobile intruders could have moved without suffering reprisals from the local inhabitants. This may be due to the absence of permanent water and the brief periods of water retention which made Mountain Creek a marginal environment for the indigenous population along the Trinity. Reconstruction of the carrying capacity of the Mountain Creek area will be a necessary part of adequately explaining the prehistoric utilization of this area (Skinner and Connors 1979:53).

Subsequent data from the Lakeview Project suggest, however, that even if this scenario were ultimately proven to be valid in broad outline, it is a picture that obscures important "micro-level" variability in resources and settlement. Current data suggest, in fact, that meaningful reconstruction of prehistoric settlement-subsistence systems will depend upon: (a) models of the effective environment with finer levels of resolution, and (b) thorough integration of information from a variety of scientific disciplines.

THE TERRACE HABITAT

Chapter 3 indicates that most of the substantive results obtained from site testing during Phase II at Lakeview were from the Cobb-Poole site. In Chapter 3 we presented information indicating that the Cobb-Poole site was a late prehistoric (A.D. 800-1200) settlement containing a possible pithouse and attendant features. That site was also instrumental in the initiation of research into specific aspects of the prehistoric effective environment. Early in our testing the character of the artifacts and features at Cobb-Poole suggested a substantial degree of residential stability, a degree of stability possibly indicating year-round occupation. Permanent occupation would clearly represent a departure from the model proposed by Skinner and Connors (1979:53). But whether or not the Cobb-Poole site was occupied on a seasonal or permanent basis, the question remains as to the variables responsible for its location. If the effective environment played an important role in selection of the site's location, we assumed that we should be able to identify at least some basic categories of environmental resources that would favor settlement. It now appears that several important environmental resources combined prehistorically to create a relatively favorable habitat for human settlement on a system of terraces located at the northern end of the Project.

The terraces are part of a more extensive system of Quaternary terraces formed by aggradation and degradation of the floodplain of the Trinity River and its tributaries (U.S. Army Engineer District, Fort Worth 1972:II-1; Pheasant 1975; Richner and Lee 1977:19-24; Willimon 1970; Slaughter, Crook and Harris 1962). In the Project area these terraces rise in two levels above the floodplains of Mountain and Walnut Creeks. At the Cobb-Poole site, terraces range in elevation from about 460 ft. (140.3 m) m.s.l. on the floodplains of Mountain and Walnut Creeks to about 480 ft. (146.4 m) m.s.l. at T-1 and about 500 ft. (152.5 m) m.s.l. at T-2. Rising gently from the floodplains, these terraces form a ribbon of "uplands" environment at the margins of the bottomlands. The Cobb-Poole site is located on the margin of the T-2 terrace overlooking the floodplains of Mountain Creek to the east and Walnut Creek to the south.

Water Resources. There is nothing about the contemporary environment to suggest that the Cobb-Poole site was located for easy, reliable access to water. No springs exist in the vicinity of the site for at least several kilometers. Although Walnut Creek can be reached within 400 m to the south of the site and Mountain Creek can be reached within 500 m to the east, both streams are fed by runoff and are therefore intermittent (U.S. Army Engineer District, Fort Worth 1972:II-3 to 10). What was the site's source of water? This question began one of the first lines of investigation into the site's effective environment.

One possible answer is that the site was located near an active prehistoric spring. Review of the Lakeview Project's Environmental Impact Statement with this idea in mind produced an intriguing reference:

Within the limits of the Project, a shallow groundwater table exists in the semi-pervious terrace deposits. In these deposits, which range in thickness from 10 to 20 ft., groundwater was encountered at 10 ft. below ground surface. These shallow water-bearing deposits were quite important to agriculture in earlier days. However, due to heavy use with low yields and subsequent contamination, these *terrace aquifers* have become insignificant (emphasis ours; U.S. Army Engineer District, Fort Worth 1972:II-2).

Further research indicates that these shallow aquifers are not well documented, though they were apparently widespread in Dallas, Tarrant, and surrounding counties. In an early geological survey of Dallas County, Shuler (1918:39) notes that good drinking water could be obtained in many localities from seepage at the base of thick sand and gravel deposits in the Quaternary terraces. Shuler (1918:40) also indicates that farm wells produced adequate supplies of potable water at depths of 10 to 50 ft. (3.5-17.0 m) in the alluvium of the terraces.

Shuler's observations are important because they indicate that terrace aquifers are formed by beds of sands and gravels. These deposits, owing to their relatively good permeability and superposition over comparatively impermeable clays, can act as aquifers (Shuler 1918: Plate XXI). The terrace margins, depending upon the presence of the sand-gravel strata and erosion cuts, present natural exposures of the water-bearing deposits that form seep springs. Moreover, sand and gravel deposits are widespread in the Quaternary terraces of the Trinity River and its tributaries (Pheasant 1975; Shuler 1918; U.S. Army Engineers, Fort Worth District 1972:II-2) though these sediments have been intensively mined for over 50 years.

Color aerial photographs of the site, in the files of the Fort Worth Corps of Engineers and brought to our attention by Mr. Robert Burton of the C.O.E., also reveal what appear to be relict stream channels (Pleistocene Age?). These appear as dark, serpentine bands against lighter sandy loam soil. These buried channels may also serve as aquifers if they contain sand deposits.

What bearing do these facts have on the Cobb-Poole site? First, as indicated by Skinner and Connors (1979:37), the Cobb-Poole site is situated adjacent to an abandoned gravel pit. The presence of the gravel pit and exposure of sand and gravel strata during subsurface testing of the site area (Chapter 3) clearly indicate extensive deposits within the terrace that could

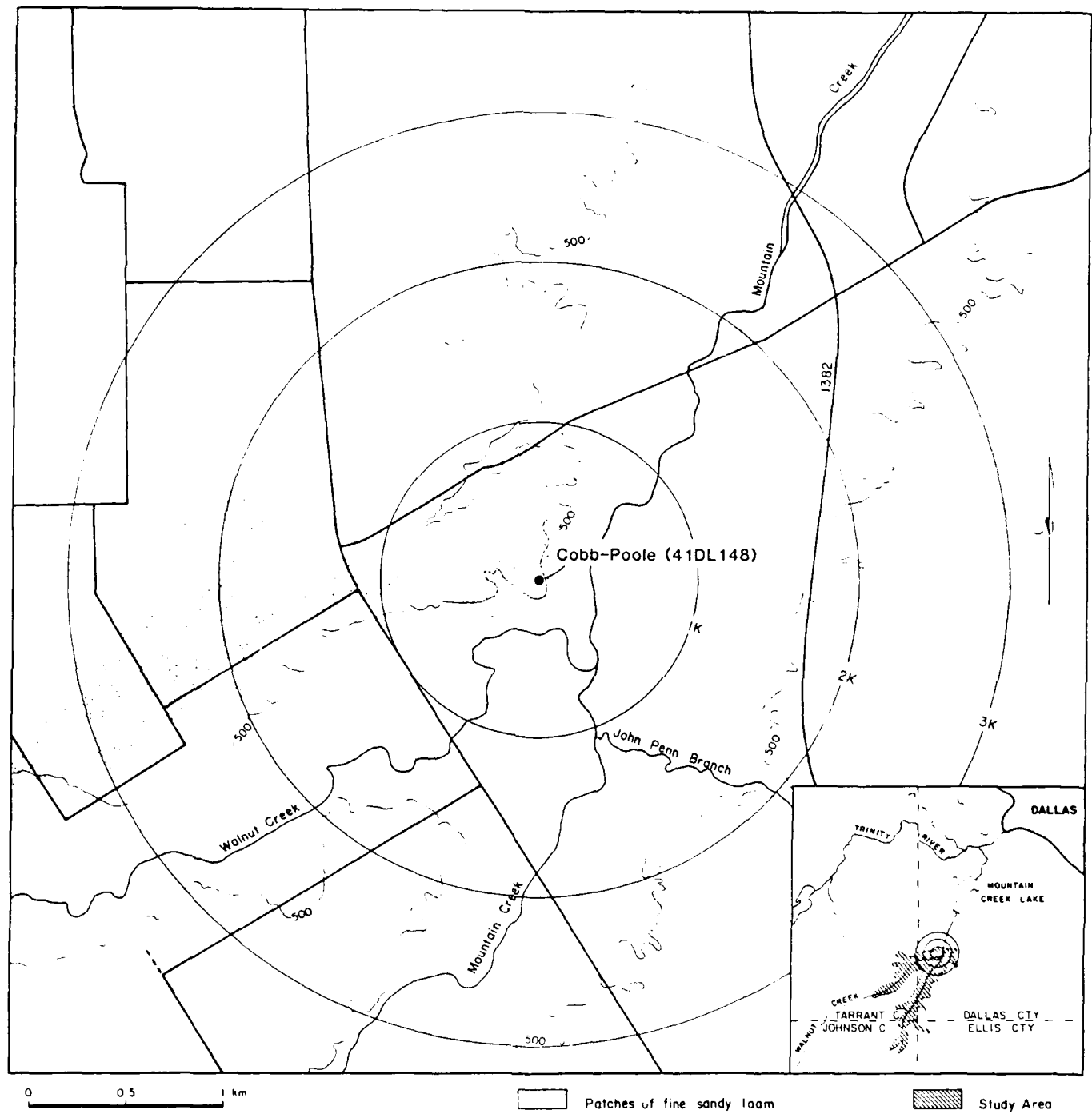


Figure 7-1. Patches of fine sandy loam soil near the Cobb-Poole site (41DL148) within 1 km, 2 km, and 3 km catchment radii.

function as an aquifer. Still, the fact that no spring is active today near the site means that other lines of evidence will have to be adduced in order to determine if a spring was active in the area prehistorically. Two sources of data can be presented in that connection.

Pollen. Pollen extracted from sediments within Feature 2 (Chapter 3) of Cobb-Poole site warrant several conclusions of importance to prehistoric settlement studies at Lakeview. Of interest here is the fact that Figure 1 of Appendix V indicates that pollen from families and genera of water-loving plants, including Typhaceae (cattails), *Scirpus* (bulrush), Juncaceae (rush) and Nymphaeaceae (water lily), were identified from soil samples taken from below the 88 cm level of Feature 2. Two of these groups (Juncaceae and Nymphaeaceae) are not represented in the modern pollen rain of the site area, and the other two (Typhaceae and *Scirpus*) are represented by low frequencies (Figures 1 and 2 of Appendix IV) in the surface control sample. One possible explanation of pollen from hydrophytic plants in the lower sediments of Feature 2 is that the site environment enjoyed a higher level of effective moisture during the occupation of the site than at present.

An active spring near the site could well produce the indicated pollen. At the same time, however, it should be borne in mind that economic exploitation of rushes, cattails, and water lilies collected from along Mountain and Walnut Creeks could also account for pollen in the site. The rootstock and seeds of bulrushes and water lilies, and the rootstock, stems, and heads of cattails (Fernald and Kinsey 1943:82-83, 110-111, 198-199) are recognized as foods used by historic North American Indian groups. Interestingly, Schulz (1928:28) reports that flour made from dried cattail roots contains as much protein as that made from rice and corn. If a spring were active on the terrace flanks, the relatively gentle topographic relief of the area (1-3% slope) might well impound standing water in localized depressions, creating small ponds where hydrophytic vegetation would thrive. This effect can in fact be seen today in the Dallas-Fort Worth area where roads have been cut through terraces. Seepage from terraces and from drainage runoff sometimes creates stands of *Typha* where there is scarcely any "pond" at all. Even without standing water, hydrophytic plants can be seen growing in soil that is saturated with water for long periods of time.

Information presented in Appendix I on the pedology and geomorphology of the T-1 and T-2 terraces near the Cobb-Poole site strongly indicates the presence of a shallow paleo-aquifer within the T-2 terrace. Sand and gravel deposits were exposed in backhoe trenches cut into the T-1 and T-2 terraces that conform closely to the kind of stratigraphic configuration indicated by Shuler (1918) as a source of springs. Three soil test units were cut into the T-2 terrace near the Cobb-Poole site, and one test unit was cut into the T-1 terrace (Chapter 3). Pheasant's analysis of these tests in Appendix I indicates abundant evidence of a shallow water table in all of the test units. Test Unit 1 of the first terrace is notable in that connection since the detailed description of the profile in that unit reflects the action of a water table within about 20 cm of the surface of the T-1 terrace. The same water table can be linked to deeper (ca. 160-190 cm)

strata of sands and gravels in the three test units of the T-1 terrace. It seems reasonably clear that the pedological and geological structure of the terrace system on which the Cobb-Poole site is situated did support a water table that could have reached the surface on the T-1 terrace immediately below the site. It would be interesting, parenthetically, to know how this situation might have been affected by the sand and gravel deposits that were mined from the large pit adjacent to the site.

Soils. Like many of the Quaternary terraces in Dallas and Tarrant Counties, the terrace upon which Cobb-Poole is located contains sandy loam soils. The available data on the distribution of soil types, largely unpublished, indicate that some of these sandy loam soils are restricted to particular levels of the Trinity River terrace system (Pheasant 1975:6-7). Unfortunately, the designations of the terrace soils (indeed, of soils in general) are not entirely consistent from one county to another but vary according to mapping units, the soil scientists that assign designations, and changing soils classifications systems. This problem is of no particular concern here, however, since soils can be assigned to classes based on broad similarities in physiochemical properties, the main interest here. Figure 7-1 illustrates the patchy distribution of light-textured soils in the northern reaches of the Project area. The site is located within a patch of Silawa fine sandy loam about 24.9 ha (61.5 a.) in extent, and adjacent to other sandy loam soil patches within a few kilometers of the site. In general terms, these soils are alkaline, relatively permeable and stratified into horizons marked by a 0-6 in. (0-15.2 cm) level of brown fine sandy loam, a 6-30 in. (15.2-76.2 cm) level of reddish to yellowish clay/clay-loam, and 30-80 in. (76.2-203.2 cm) level of pale yellowish clay/clay-loam (Soil Survey of Grand Prairie, Texas 1974:30-32; General Soil Map of Dallas County, Texas 1978).

It is well recognized that the settlement patterns of prehistoric peoples in the Eastern United States can be correlated with the distribution of sandy loam soils. Moreover, this correlation appears to have an expansive temporal dimension in view of the fact that both Archaic (Fish 1978:338-339) and Mississippian Period (Ward 1965; Larson 1972:389; Smith 1978:481; Peebles 1978) sites evidence settlement on light-textured soils. There appears to be little doubt that settlement preferences are involved in these cases since sandy loam soils represent a small percentage (10%) of all soil types in the study regions. The fact that early sites with no evidence of agriculture and late sites that were undoubtedly agricultural can be correlated with sandy loams suggests that a variety of resources may have been involved. Two resources, soils suitable for agricultural use and wild plant resources, may be pertinent to the Cobb-Poole occupation.

There is no evidence currently available that the inhabitants of the Cobb-Poole site practiced agriculture, at least in so far as "tropical" cultigens (Struever and Vickery 1973; Marquardt 1976) such as corn, beans, or squash are concerned. However, in view of the limited testing at the Cobb-Poole site (Chapter 3), it would be unwise to rule out the possibility of this kind of agriculture. It would be even more risky to exclude the possibility that an "Eastern Complex" (Struever and Vickery 1973) of native plants was cultivated in view of the pollen data

from the site (Appendix V). *Chenopodium* sp. (Wilson 1980) and *Polygonum* sp., for instance, have been identified as possible prehistoric cultigens (Struever and Vickery 1973:1207). Focusing on the potential of the site for agriculture, it is possible to say that certain soils in the immediate vicinity of the site offer decided advantages to agriculturists.

What were these advantages? We assume that one of the major difficulties facing prehistoric agriculturalists was the problem of breaking the ground with simple implements such as the digging stick or hoe. The friable structure of the sandy loams, however, offers less resistance than that of stiff clayey soils. Once crops were established, there was also the problem of sustaining plant growth under dry-farming (non-irrigated) conditions. The sandy loam soils on the terraces are superior in this respect, too, in that their permeability and superposition over less permeable clays causes them to hold moisture well even during periods of scant precipitation (Dallas County Soils Book 1922:1240).

Sandy loam soils at and near the Cobb-Poole site (Silawa Silstid-Bastisil Association; General Soil Map of Dallas County, Texas 1978) comprise 6% or less of the soils in Dallas County. Within the Project area, the only appreciable amounts of these soils are located on the terraces at the northern boundary of the Project. If sandy loam soils were sought out by prehistoric agriculturalists, the distribution of these soils may have been an important variable influencing these peoples' settlement patterns. Of course, the correlation between settlement and soil types may not be as direct as this presentation might suggest. It may be, for instance, that certain soil types, in conjunction with other critical resources such as water, will help to predict settlement locations. In this way, settlement location may have been influenced by resource procurement areas, or "catchments" (Vita-Finzi and Higgs 1970; Flannery 1976) made up of a mosaic of resources around sites.

It is important to emphasize that soils data are important beyond their implications for agriculture and settlement-subsistence. Another benefit of the sandy loam soils around the Cobb-Poole site is the vegetation that these soils supported. Part of the climax vegetation of the terrace "uplands" of the Trinity River and its tributaries is described by Mahler (1972:52) as the westernmost extension of the Eastern Deciduous Forest. One of the most complete descriptions of this vegetation community is by Dyksterhuis (1948) in reference to the Western Cross Timbers, a geographically restricted environmental zone where trees are able to maintain themselves against competition from prairie grasses (Lynott 1977:26-30). This phenomenon is crucially dependent upon light, sandy soils. Ordinarily, grasses represent the climax vegetation of the prairie, but a "post-climax" Oak-Hickory forest can maintain itself on sandy loam deposits because these soils contain sufficient moisture to sustain tree growth (Dyksterhuis 1948:328; McBryde 1933). The net effect of this situation is to create a forest overstory in conjunction with an understory climax of grasses. In this manner the Eastern Hardwood Forest (along with its plant and animal resources) is extended into habitats of the prairie, i.e., river terraces with their light, "luvial" soils. It is worth noting that the sandy terrace soils are an optimal habitat for oak and hickory

species, these species tending to attain their densest stands and largest size in these soils (McBryde 1933). Since the acorn production of oaks is proportional to tree size (as measured in increments of tree trunk diameter; Goodrum, Reid and Boyd 1971), it may be anticipated that the terrace habitat was likely an excellent locality for gathering acorns.

We draw particular attention to the food potential of the tree species. The good potential of the nuts produced by oaks and hickories for both human and animal populations is highly significant. Several investigators (Keller 1974:146; House and Wogaman 1976 24-26; Asch et al. 1972; Hilliard 1979) point to the high quality nutrition afforded prehistoric peoples by nut foods and the degree of ease with which nuts can be obtained and stored. Smith (1975:17-21, 76-80) details the significance of nut production to the exploitation strategies of prehistoric peoples in hunting major prey species such as deer and turkey of the Eastern Deciduous Forest.

Note should be taken also of the fact that (Eastern Red) Cedar (*Juniperus sp.*) stands are also located within the Lakeview Project, particularly as associated with the calcareous substratum of the Whiterock Escarpment. If these cedar breaks were present prehistorically, they would have contributed to the ecological variability of the region, perhaps affording specific plant and animal resources. It is not known, however, whether these stands were present prehistorically. It seems clear that cedar have been invading farm fields and grazing lands in historic times. Also, the pollen frequencies in Table 1 of Appendix V suggests that cedar may, along with mesquite, represent species that have invaded the area in historic times due to land-use practices. Both cedar and mesquite appear to be restricted to modern sediments in the Cobb-Poole site.

Clearly, the terraces are not the only habitat in the Project area that supported trees or produced arboreal resources. Richner and Lee (1977:6-16), for instance, present a good summary of the resources to be found in the bottomland forests of North Central Texas. The present discussion is a recognition of the potential importance of the oak-hickory forest characteristic of the terraces and the place of those forests in the ecology of the terrace habitat. It is also worth reiterating that the terrace habitat has resource potentials in addition to soils favorable to agriculture. To the extent that the nut resources, and the animal communities supported by these resources, were a factor in prehistoric settlement on the terraces, the terrace habitat may have attracted specialized-activity settlements for millennia. Such a possibility should not be excluded from future studies.

A Composite Picture. What kind of picture can we reconstruct for the terrace habitat? We can suggest that the terraces in the Lakeview Project area may have represented an important "package" of resources to the prehistoric inhabitants. Water is of course a major factor in that emphasizes the interconnected nature of the terrace habitat. Water is of course a major factor in the reconstruction. The soil profile at the site indicates that sand and gravel are present in a shallow aquifer that is recharged by water that appears from these terraces. The terrace habitat is

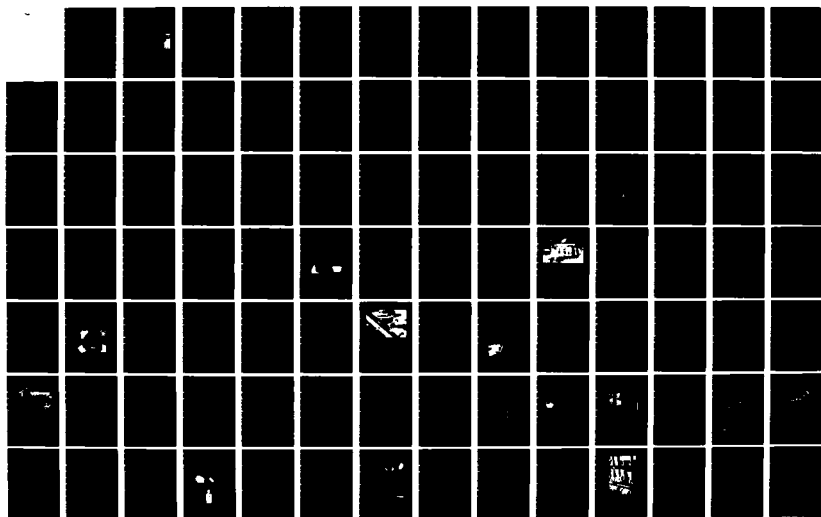
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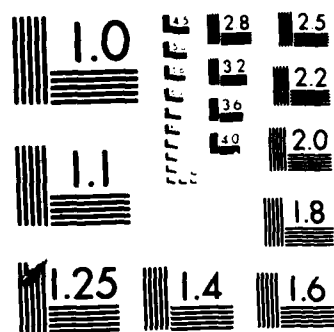
ARCHAEOLOGICAL INVESTIGATIONS AT LAKEVIEW LAKE: 1979
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MICROCOPY RESOLUTION TEST CHART
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terrace below the Cobb-Poole site.

Pollen from the lower level of Feature 2 of the Cobb-Poole site (a suspected prehistoric house structure) is notable for high counts of grains from hydrophytic plants such as bulrushes (*Scirpus* sp.) and cattails (*Typha* sp.) (Appendix V). Pollen of this kind may indicate not only use of hydrophytic species but clearly suggests that a pond or marshy habitat was present in the site's resource area. Conceivably, plants of this kind were collected from Mountain or Walnut Creeks, within a few hundred meters of the site. It is also possible, however, that a marshy area was formed on the T-1 terrace immediately below the site, if a seep spring was active at that location. Further work at the site should test this reconstruction by collecting sediments for pollen extraction from the area where the suspected paleoaquifer contacts the T-1 terrace. Additionally, the presence of small gastropods (snails) that are ecologically restricted to such a wet environment should be sought in the same sediments.

Turning to edaphic factors, we should recognize that the large water-holding capacity of the sandy loam soils, particularly with the native vegetation intact, could serve as a source of recharge for shallow aquifers. The same soils, as we saw above, might also support primitive agriculture. At the same time, the enhanced growth of nutbearing trees in the sandy loams of the terraces could provide an important food resource to both hunters and gatherers, and agriculturalists.

The physiographic setting of the terraces should not be ignored in its implications for settlement. Flood data (e.g., U.S. Army Engineers District, Fort Worth 1972:II-7 and 8) indicate that the bottomlands of the Project area are subject to frequent, significant flooding because of the limited channel capacity of the streams. The location of the terraces well above the floodplains and the well-drained nature of the soils on the terraces present a dry, secure locus for settlement. The terraces also provide a place where farming can be carried out without fear of losing crops to sudden flooding.

As Chapter 3 indicates, a considerable quantity of information is also available on the Neo-American Occupation of Lakeview from the Baggett Branch site (41DL149). Chronologically, the one available radiocarbon date (Chapter 3) of A.D. 1200 $\pm$ 200 years places the Baggett Branch site at the end of the estimated time frame in which the Cobb-Poole site was occupied (A.D. 800-1200), based on ceramics at Cobb-Poole (41DL148; Raab, Bruseth, and McIntyre 1980:46). Moreover, these same ceramic types are found at Baggett Branch.

More interesting perhaps is the place of the Baggett Branch site in the Neo-American settlement pattern. This site contrasts sharply with Cobb-Poole in its environmental setting and site content. The foregoing discussion of the Cobb-Poole site suggests that it was a permanent occupation containing a possible pithouse, and certainly containing midden deposits and other features.

By way of contrast, the Baggett Branch site, which may well have been contemporaneous with Cobb-Poole judging from the artifact content of both sites, is located on a floodplain about 2.5 m above Baggett Branch. Appendix III shows that this site has faunal remains clearly linked to a stream-side setting including fish (genus, spp. undetermined) mussels (spp. undetermined)



Figure 7-2. Cross-timbers environments of north-central Texas.

and turtles (*Chrysemys* spp.). But in addition, this site also contained abundant remains of white-tailed deer (*Odocoileus virginianus*), a second phalanx of *Bison bison*, and numerous elements of the eastern cottontail rabbit (*Sylvilagus floridanus*). Numerous snakes and small mammals are also reported in Appendix III from the Baggett Branch site.

From these data we may reasonably hypothesize that the Baggett Branch site was located in order to take advantage of stream-side resources, as well as a number of other plant and animal foods with a larger spatial distribution. It is interesting to note that examination of floral remains recovered from flotation from Baggett Branch produced numerous fragments of black

walnut (*Juglans nigra*) shell but little else (Cathy Crane, personal communication and lab notes on file) indicating use of plant foods.

The limited testing of the site to date does not indicate whether or not features are present beyond the pit described in Chapter 3. The excellent quality of bone and floral material preservation, as well as the apparently undisturbed nature of the site's matrix, does suggest that a great deal of information is contained in the site. In the context of the settlement-subsistence questions raised by the Cobb-Poole site, a number of important research questions could be answered by future work at Baggett Branch and Cobb-Poole.

Important questions about environmental influences on settlement are posed here as well. As we noted briefly above, pollen records from the Cobb-Poole site indicate the strong possibility of increased effective moisture at the time the site was occupied. It is not clear from these records whether this effect is widespread (climatic, say) or the result of localized sources of water such as springs. The exploitation of aquatic resources at Baggett Branch opens the possibility that streams in the Project area, now intermittent, once carried more water, suggesting possible general increases in moisture about A.D. 1200 in the Project area and regionally. Or perhaps sufficient active springs in the past could have fed streams more permanently than at present. These problems call for careful comparison of data between Cobb-Poole and Baggett Branch in an effort to isolate the possible effect of moisture on settlement patterns. The data from both Cobb-Poole and Baggett Branch suggest both the importance and feasibility of pursuing this line of investigation. Analysis of prehistoric pollen from Baggett Branch and Cobb-Poole can be expected to play a significant, if not pivotal, role in environmental reconstruction.

There are limited but provocative data that suggest a kind of prehistoric Caddoan cultural frontier. Krieger, in his seminal *Culture Complexes and Chronology in Northern Texas* (1946), was one of the first to suggest such an effect. In discussing the development of the Gibson Aspect (i.e., the early prehistoric phase of Caddo culture, ca. A.D. 800-1200) he notes that the Sanders components of the Gibson Aspect

...are found in a narrow north-south belt on the western frontier of Southeastern "Mississippian" culture, at the edge of the eastern forests and facing the rolling plains (Krieger 1946:213).

The importance of this observation is that Caddo or Caddo-influenced groups, marked principally by the presence of Caddo ceramic types, appear to have settled the fringes of the eastern forests, as these grade into the plains environment. For Mississippian-stage populations adapted to the wild food resources of the eastern Oak-Hickory Forest and the riparian habitats that allowed prehistoric agricultural practices, this kind of settlement pattern must mark the extreme geographic extension of this kind of socioeconomic adaptation, or some derivation of the latter.

We should note, however, that this effect is also related to the Alto focus of the Gibson Aspect, the type component of the well-known George C. Davis site in Cherokee County, Texas. Krieger, for instance, makes passing mention of the Chupek site (sometimes rendered Chupik site; e.g., Lynott 1977:109) in McLennan County, Texas, near Waco. This reference was presented as a footnote, no doubt because the site was (as of 1946) poorly known (Krieger 1946:213). Nevertheless, Krieger

noted that Watt (1935, 1941) had collected several hundred Alto focus sherds from the site. Although tested in 1972 (Locke; see Lynott 1977:109), the site remains unreported.

This site has interested Texas archaeologists for over forty years, for it appears as an anomalous outlier from Caddoan developments to the east. It also invites certain comparisons with the Cobb-Poole and Baggett Branch sites. If Lynott's (1977:109) brief description of ceramics collected from the Chupek site are correct, these are some of the same types found at Cobb-Poole and Baggett Branch. All of these sites, because of their relatively substantial composition and Caddoan artifacts, suggest villages or relatively permanent hamlets. And by the scarcity of other sites of the same type in archaeological reports, they seem few and far between.

Is there an hypothesis lurking here? There may be. Recent work by McMillan and Klippel (1981) points out a continental scale ecotone between prairie environments in eastern North America and the prairie biome to the west. They show that the location of this ecotone has been quite mobile during Holocene environmental changes, and this mobility has greatly influenced the settlement patterns of prehistoric peoples in this ecotone. It seems worthwhile to keep in mind that there may have been "frontier" type settlements in prairie areas or in forested habitats extending into the prairies (see the discussion of the Cross Timbers in the following section on the Archaic Stage) by peoples whose optimal settlement-subsistence systems require a wooded environment. The hypothesis presented earlier that a more effective moisture regime may have been present during the occupation of the Cobb-Poole site is directly relevant to this possibility. It may be that only a comparatively few sites of the type found at Cobb-Poole, Baggett Branch, and Chupek will ever be found because they represent a kind of settlement pattern that never did "take" in the prairie areas. As cases of settlement dynamics related to environmental factors, however, these sites are important far beyond their numbers.

Certainly this idea should only be regarded as an hypothesis rather than as a conclusion. And a larger regional view of this kind should be borne in mind during any further investigations in the Lakeview area. At that time, it may be rewarding to collect some information on Chupek and similar sites, if this information can be obtained from reports and museums. Synthesis of the information for comparative purposes might then allow a far more comprehensive set of conclusions to be drawn on the basis of the Cobb-Poole and Baggett Branch sites.

ARCHAIC STAGE SETTLEMENT

During Phase II of the Lakeview Project, relatively little information came to light concerning the Archaic-Stage occupation. In the Phase II report, discussion did focus on general theoretical and methodological problems that are plaguing reconstruction of prehistoric settlement-subsistence patterns in Texas and elsewhere (Raab, Bruseth, and McIntyre 1980:132-140) including the Archaic Stage. Owing to the paucity of Archaic materials and components discovered during the Phase II work, however, few specific comments were warranted (Raab, Bruseth, and McIntyre 1980:21-30, 120).

During Phase III of the Lakeview Project, significant buried

Archaic components were discovered at sites 41DL189 and 41DL199. Data from these sites, while limited, provide a useful view of several variables related to settlement-subsistence practices. Perhaps the best way to view the potential information value of these variables is within settlement-subsistence models for the Archaic of north and east Texas.

The research implication of the Archaic Stage data are much less clear than those on the Baggett Branch and Cobb-Poole sites. At the same time, however, generalized models of Archaic settlement-subsistence, albeit with a heavy speculative element, do exist for the larger north and east Texas areas. It may be useful to review some of these models in connection with the Lakeview data at hand.

MODELS OF ARCHAIC SETTLEMENT-SUBSISTENCE IN NORTH CENTRAL TEXAS

Are there scientific models that would allow us to assess the significance of the Archaic sites at Lakeview and frame a useful research design for future investigations? The answer to this question is a qualified "yes." If we expand our frame of reference to north and east Texas, we can identify several "models" of Archaic settlement-subsistence dynamics. These schemes offer some insights into the problem of Archaic settlement-subsistence, but none of them affords a complete basis for designing future work or assessing the importance of specific archaeological resources. In fairness to these models, they were never offered as complete, comprehensive statements, and it would be unfair to evaluate them from such a perspective.

Restricted- and Central-Based Wandering Models

The most ambitious attempts to model Archaic (and other stages of prehistoric) sociocultural development in north Texas have been connected with the scheme first proposed by Beardsley et al. (1956:129-157). Briefly, that scheme consists of a series of descriptive settlement types ranging from a presumed state of "free wandering," in which the subsistence behaviors of the social unit were not organized on a temporal or spatial basis, to a highly structured condition marked by sedentary village life based on food production. In Texas it has been the intermediate stages of this developmental scheme that have been applied to Archaic studies. Skinner et al. (1978:15-24; 1979:18-21), and Skinner and Connors (1980) have described Archaic settlement patterns as "restricted-wandering," "central-based wandering," and "circulating" in nature. A seasonal round of diverse economic activities is thought to be expressed in a variety of site types such as base camps, specialized-use sites, and artifact content of sites. The general picture here is one of hunters and gatherers (HGs) moving seasonally to and from major (base) camps to specialized-use camps, or from base camp to base camp in a circulating round of seasonal events.

We have argued elsewhere (Raab, Bruseth, and McIntyre

1980:131-140) that models of this kind have little utility in overcoming the problems plaguing reconstruction of HG settlement-subsistence systems. Namely, we have shown that these models are not based on adequate consideration of the past effective environment; they assume an unrealistically stable and consistent set of subsistence behaviors reflected in recurring tool "kits"; they do not account for the complex processes by which archaeological sites are formed by HGs; and they do not accommodate the fact that much of HG behavior results in archaeological records that are at or below the threshold of archaeological visibility.

All of these problems stem from the fundamental weakness of the Beardsley-derived models as explanatory vehicles. The Beardsley scheme is similar to a number of other developmental models in archaeology and anthropology that rely upon a succession on descriptive cultural stages (e.g., Willey and Phillips 1958; Fried 1967; Service 1972) arranged on an ordinal time axis. The emphasis of these models of description of a few criteria that define a stage provides little help in building theories that explain the dynamic interaction of environment, technology, settlement pattern, social organization, subsistence strategies, and other variables that are the avowed objectives of many HG studies. The latter task, or course, requires efforts that consciously attempt to relate a series of pertinent variables in a systemic fashion.

THE CROSS TIMBERS AS AN AVENUE OF MIGRATION

The location of the project on the eastern fringe of the Eastern Cross Timbers (Figure 7-2) raises questions about whether this environmental zone could have influenced the character of prehistoric settlement patterns.

McCormick (1976) offers a model, actually a brief conjecture, that prehistoric inhabitants of North Central Texas utilized the Cross Timbers as an avenue of seasonal migration through the region. That notion is rooted in the unique character of the Cross Timbers environment. The Cross Timbers are two north-south-trending bands of forest in north Texas (Figure 7-2). The ecological importance of these environments is that they represent the western-most extension of the plant and animal communities of the Eastern Oak-Hickory Forest into the Southern Plains. In the Cross Timbers strips of forest varying in width from about 3 to 50 mi. (5 to 80 km) dissect the prairie environment (Lynott 1977:26-30). The trees of the Cross Timbers are able to survive on the prairie in competition with grasses because bands of sandy loam soils along stream terraces provide greater moisture than the clayey prairie soils (Dyksterhuis 1978). Beyond the trees themselves, the Cross Timbers environment is significant in relation to human occupation because it affords access to many of the plant and animal species found in the eastern forests.

For this reason McCormick suggests that the Cross Timbers might have served as an avenue of movement for prehistoric people through the area. He offers the observation that the Cross

Timbers would have been a useful corridor for the movement of hunters following bison in southward movement from the Southern Plains in the fall and then back to the north in the spring (McCormick 1976:44-45). The Prairies/Cross Timbers ecotone is seen as a valuable base of subsistence security in this seasonal round.

It is difficult to evaluate whether those emphases are warranted because of the cursory fashion in which the model is presented. Nevertheless, this model should certainly be evaluated against a broader range of considerations. The implication that bison hunting was the focal point of prehistoric economy in North Central Texas should be qualified on two counts.

First, as Lynott points out (1979:98), it is by no means clear that bison were always present on the Southern Plains during prehistory. Lynott (1979) concludes from previous studies of bison distribution on the Southern Plains and from the context of bison skeletal elements in archaeological contexts that bison were not common in North Central Texas until after about A.D. 1400. That conclusion rests on an apparent increase in the frequency of bison food-bone elements in late Neo-American sites in the region. It is suggested that the increase in bison in the area after A.D. 1400 resulted from drying conditions that favored short grasses at the expense of tall grass prairies, the former being the preferred habitat of the bison. Acceptance of Lynott's interpretation certainly awaits further data, but his comments do warrant caution against a general assumption that bison were an important food resource during the Archaic stage in North Central Texas.

A second caveat against the view that bison were the focal point of Archaic economy arises from the generalized character of the subsistence base as it is currently understood. Lynott (1979:94-95) summarizes evidence from sites representing a long temporal range, including the Late Archaic Stage, showing that even when bison food bones are present, they are far outnumbered by the bones of deer and many other animals. Closer to home, if we look at our best faunal evidence, regardless of culture stage, sites 41DL199 and 41DL149 (Appendix III), which we have assigned respectively to the Archaic stage based on projectile point morphology and to the Neo-American Stage of the basis of a C-14 date (Chapter 3), reflects a similar pattern.

Although the evidence is admittedly limited, the range of faunal remains from these two sites suggest a diversified faunal exploitation in keeping with Lynott's observations. A single skeletal element (second phalanx, Appendix III) of *Bison bison* was identified at Baggett Branch, but this element presents a sharp contrast with the diversity of other kinds of faunal remains at the site including turtle, (*Chrysemys* spp.), numerous elements of white-tailed deer (*Odocoileus virginianus*), cottontail rabbit (*Sylvilagus floridanus*), indeterminate teleost fishes, mussels (species undetermined), rabnids (frogs, species indeterminate), water moccasin (*Agkistrodon piscivorous*), black water snake (*Natrix* spp.), and black racer (*Coluber constrictor*). As contrasted with a specialized emphasis on bison, this faunal assemblage suggests instead considerable emphasis of aquatic resources, befitting the site's stream-side location.

Examination of the most limited faunal remains from 41 DL199, an Archaic stage site, indicates a pattern of exploitation oriented in large measure to stream-side resources, other

cosmopolitan forms, but no bison. The list of exploited species at this site includes turtles (*Trionyx spinifer* and *Chrysemys* spp.), mussels (species undetermined), cottontail rabbit (*Sylvilagus floridanus*), white-tailed deer (*Odocoileus virginianus*), and catfish (*Ictalurus punctatus* or *furcatus*) (Appendix III). The latter forms, represented by a vertebra, suggest an animal of 30-40 lbs. or more (Murray, personal communication).

From a subsistence viewpoint, models of Archaic settlement must at least recognize the possibility that diffuse hunting and gathering economies geared to the plant and animal resources of Cross Timbers environment were in fact the predominant mode of adaptation. Moreover, given an economy geared to these resources, the possibility of a stable resident population of HGs if the Lakeview Project is likewise a possibility. The notion that areas such as Lakeview hosted only transitory populations who entered the area incidental to their pursuit of bison is one hypothesis to be weighed against others. One logical possibility in fact is that a broad range of resources located in the Lakeview area was the primary objective of HGs, and that bison hunting was, at least until late in the prehistoric area, a comparatively minor aspect of subsistence practice.

THE PRAIRIE AS A SPECIALIZED ECOSYSTEM

Attempts to account for prehistoric settlement patterns in North Central Texas invariably rely, at least implicitly, on the contrast between the prairie environment and geographically restricted habitats within or at the margins of the prairie (e.g., Lynott 1977, 1979 Skinner and Connors 1979:6-8; Shaw 1978:23-40). This contrast draws attention to the relatively low subsistence potential of the prairie itself as compared with wooded and better watered habitats within the prairie biome. Within the prairie and at the prairie margins, one finds hill country supporting forests (e.g., the Edwards Plateau) and stream courses through the prairie that offer riparian habitats and forested stream terraces (the Cross Timbers).

Shafer, Dering, and Baxter (1975:13) offer an insightful ecological contrast between prairie and non-prairie environments that implicates a number of useful considerations in building settlement models. Their discussion elevates a number of ecological issues implicit in the work of other investigators to an explicit level more amenable to theory building. Here, the notion of specialized ecosystems and their consequences for socioeconomic adaptation are of interest:

The Blackland Prairie can be defined as a marginally specialized ecosystem. A specialized ecosystem is one with a relatively small number of species, each of which is represented by a relatively large number of individuals (Geertz 1969). The diversity index for a specialized ecosystem is low due to the large populations of the individual species such as the grasses and herds of herbivores that are (or were) native to the Blackland Prairie. By contrast a generalized ecosystem is one which is represented by a great variety of species each of which is represented by a relatively small number of individuals. The energy produced by a generalized system is distributed among a relatively large number of different species (ibid)...

Prehistoric adaptations to specialized ecosystems tied also to be specialized because the subsistence alternatives are not numerous

(for example, the Arctic adaptations and the early big game hunting traditions). Specialized adaptations to the Blackland Prairie in prehistoric times is, however, doubted for several reasons. First, the prairie itself may be a product of changes in the Postglacial climatic conditions. Bryant (1969:130) has shown a gradual but continual loss of most tree pollen from Full-Glacial to Postglacial periods. This suggests the mixed deciduous woodlands of the Full-Glacial period were first reduced to savanna vegetation during the Postglacial period. Secondly, the large herds of bison reported in this area in early historic times may not have continuously ranged this far south (Dillehay 1974). Prehistoric specialized adaptations are, therefore, viewed as being unlikely.

Generalized ecosystems, on the other hand, are more optimal habitats for prehistoric hunters and gatherers because they provide numerous alternatives for exploitation and are usually conducive to seasonal scheduling of harvesting activities (Shafer, Dering, and Baxter 1975:5-13).

The distinction being made by the above authors is between the relatively specialized ecosystem of the prairie margin ecotone with the less specialized ecosystem of the prairie margin ecotone and the Cross Timbers. As they suggest, the microhabitats of generalized ecosystems present more optimal habitats for HGs than specialized ecosystems in that the former provide for a wider range of subsistence strategies. Doubt is also expressed in the statement above that we can expect specialized adaptations to the prairie in North Central and North Eastern Texas owing to a long-term shift from a forested environment to grasslands and the probable unavailability of large herbivores such as bison for much of the prehistoric era. Again, Lynott's recent (1979) review of bison remains in archaeological sites in North Texas suggests that hunting economies were aimed at a wide range of resources and that there is no widespread evidence for a specialization in bison hunting.

A number of important questions can be drawn from the ecosystem specialization concept as it applies to the Project area. First, if the microhabitats found in the Cross Timbers offered relatively great utility to HGs, was this utility sufficiently great to attract stable resident populations of HGs? Unlike the models advanced by Skinner and Connors (1979) and McCormick (1976), the characterization by Shafer, Dering, and Baxter suggests, at least to us, that the Cross Timbers may have been a target ecosystem sought by HGs, at least at certain times and for specific purposes.

This perspective recognizes the possibility that the Cross Timbers was a significant environment to prehistoric HGs.

Second, to what degree did the resources of the Cross Timbers represent a "pull" to HGs? Certainly there is a diachronic dimension to this question. We might well wonder whether or not long-term environmental change, such as increases or decreases in effective moisture or replacement of forests by grasslands, is correlated with intensity of occupation. We might ask, for example, what kinds of environmental conditions might be related to the seemingly less intense and more transitory Archaic occupations represented at sites like 41DL189 and 41DL199 (Chapter 3) as compared with Neo-American sites such as 41DL148 and 41DL149.

Third, subsistence practice and technology reflect adaptive processes. This question is obviously pertinent to more than Archaic sites, but recent studies (e.g., Gould 1978, 1980;

Binford 1979, 1980; and Goodyear 1980) have attempted to show that resource selection and scheduling combined with flexible, highly portable tool technologies are a major expression of HG attempts to attain subsistence security in the face of fluctuating resource availability.

TOWARD A MODEL OF ARCHAIC STAGE SETTLEMENT

Is it both possible and desirable to consider development of a model of Archaic settlement on the strength of current information? Our answer on both points is "yes." We do not claim that one can produce a fully articulated model. Nevertheless, it should be possible to identify major components of a model that would be useful in structuring future research. The discussion that follows is aimed at that objective. The desirability of beginning work on such a model is apparent at several levels. There is of course the immediate need to provide guidance to land-use planners and archaeologists during future stages of the Lakeview Project. Models not only provide a basis for management decisions but are also subject to modification and improvement through successive phases of implementation. At another level, model development should serve as a focal point of discussion and debate among communities of scientists.

What do we know? A useful first step toward developing a settlement model of the Archaic stage might be to take stock of factors that we can expect to have influenced settlement. Two major categories are worth consideration. These are environmental resources and sources of settlement pattern variability.

Environmental Resources

All of the approaches to settlement studies that we have reviewed here, as well as our own perspective (Raab, Bruseth, and McIntyre 1980:102-106), assume that biophysical environmental characteristics affected the settlement patterns of HGs. The question, however, is what characteristics should be taken into account. There is considerable difference of opinion, if not to say confusion, on this point. For our purposes, we might focus on vegetation and water resources. As we saw in the earlier discussions of settlement models, these resources play a prominent role in environmental reconstructions, or at least assumptions about the past environment.

Reconstruction of Past Floras in the Project area is hampered by a lack of "hard" data. Furthermore, interpretations regarding the climax vegetation communities in North Central Texas based on modern ecological surveys differ to an appreciable degree. Also, archaeological estimations of the effects of the various reconstructions show considerable disagreement. This array of interpretations has not encouraged a coherent position on the effects of vegetation on past settlement systems.

There are two interpretations of the floristic environment that deserve closer scrutiny. The first of these is a characterization of large areas of North Texas as predominantly a prairie environ-

ment with low potential usefulness to human hunters and gatherers. From a biogeographic perspective, there is no doubt that much of this prairie environment, with certain exceptions (e.g., specialized hunting of herbivores), offered a lower subsistence potential than forested environments, owing to the former's composition of grass dominants and the ecological consequences of that circumstance (cf. Shafer, Dering, and Baxter 1975).

There is reason to question whether this reconstruction is appropriate to HGs, insofar as predicting their behavior is concerned. A fundamental question here is the selectivity of HG behavior, i.e., what resources constituted the *effective environment*? Humans clearly have the capability to exploit their environment selectively. Accordingly, broad environmental characterizations may lead to highly misleading assumptions about behavior and subsistence potential. The characterization of the Project area as essentially a prairie environment broken by stream-bottom vegetation is a case in point. Shaw (1978:23), for instance, suggests that:

few plant species probably had economic potential for prehistoric populations within Cross Timbers upland areas. These regions would have been dominated by grasses of little nutritional value. Although oaks were present, they would have been much more abundant throughout the bottomlands. Thus it is likely that most aboriginal plant exploitation activities in this province were concentrated in the bottomland forests. Here, not only acorns and pecans would have been relatively dense but a number of wild fruits such as haws and plums would also have been available.

In the same publication, however, Shaw (1978:21) cites studies that classify the Cross Timbers as a true woodland, representing an extension of the East Texas Austroriparian Forest. In addition to a variety of plant and animal species found in the bottomlands, the savanna-like vegetation of the stream terraces provided access to fuel, building materials, nut crops, and animals that feed on the acorn meat (e.g., deer and turkey). The arboreal resources on the terraces should not be discounted. As we point out in an earlier Lakeview report (Raab, Bruseth, and McIntyre 1980:116), McBryde's (1933) study of the relationship between tree growth and sandy loam soils in Texas suggests that oaks (*Quercus* spp.) and hickories (*Carya* spp.) reach their maximum development in such soils. The potential of sandy loam soils in the terraces of Walnut and Mountain Creeks in the Project area to support such vegetation is noted in the earlier report (ibid.)

Again, pollen from a prehistoric feature in the Lakeview Project (Woosley and Raab 1980) also shows that oak (*Quercus* spp.), hickory (*Carya* spp.), and walnut (*Juglans* spp.) are well represented in the Cobb-Poole site for the time interval of about A.D. 800 to A.D. 1200. Although these data are limited to a single site and a relatively narrow time interval, they suggest that a variety of arboreal resources were available to the inhabitants of the Project area for at least part of the prehistoric period. This evidence cautions against the interpretation that aboriginal plant exploitation in the Cross Timbers was necessarily centered in the bottomlands.

A larger issue, however, is how we conceptualize the Cross Timbers as a zone of prehistoric human exploitation. From an

adaptive standpoint, should the Cross Timbers be regarded as a prairie? How one answers this question has implications that go beyond mere environmental classification. Earlier investigators have conceived the area as a prairie, following broad-scale biogeographical classifications (Shelford 1963; Küchler 1964; Mahler 1972) and then derived a series of similarly broad archaeological expectations. What has not been questioned perhaps is the level of applicability of these classifications. The need of a biogeographer to describe and classify large regions imposes a level of generality of environmental reconstructions that may tell little about the capability of hunters to exploit selectively microzones or habitats. The assumption that significant perhistoric exploitation of the Cross Timbers was centered in the bottomlands follows from the view that a prairie environment offers few plant resources, and that if the prairie is bisected by contrasting environments along stream courses, it is the latter environments that can be expected to produce evidence of settlements. The danger with this view is that it may become a self-fulfilling prophecy whereby serious attempts to find sites are centered on lower stream terraces. It may also down-play the importance of sites located on the higher terraces away from the streams instead of causing the archaeologist to ask what kinds of sites are located away from streams and what the function of such sites might be.

Water resources present similar problems. As we indicated earlier in this chapter, there is evidence (Raab, Bruseth, and McIntyre 1980) that springs located in terraces may have been significant water sources for prehistoric populations. Over emphasis of the ephemeral water sources present today in the major streams of the Project area may result in a distorted view of settlement possibilities in the past. The hypothesis of major ecotone shifts, as discussed by McMillan and Klippel (1981), are pertinent here.

Sources of settlement variability present another area of concern. A far wider range of the causes of settlement pattern variability needs to be explored. A key problem in connection with the Archaic sites is explaining the "thin" sites in the Project area. The known sites (Skinner and Connors 1979; Raab, Bruseth, and McIntyre 1980) are characterized by low density lithic scatters or low counts of artifacts per unit of site matrix with few features (e.g., pits, hearths). Occasionally, sites are seen to contain animal bones, floral remains such as charred nut fragments, mussel shell fragments, and larger lithic artifacts such as grinding stones, hammerstones, and cores (such as sites described in Chapter 3). In general, however, one is impressed with a paucity of artifacts and a lack of definable midden deposits. The overall impression is of relatively low-intensity occupations repeated only a few times at any one location.

How are such records to be explained? Thus far, explanations have relied upon the idea that prehistoric human populations in the Project area have been "intrusive," i.e., the Project area was host to populations that were passing through the area in search of migratory bison (McCormick 1976) or entered the area briefly on expeditions from permanent territories on the Trinity or Brazos Rivers. In the latter case (Skinner and Connors 1979:53), it is suggested that lack of reliable water sources in the Project area may have discouraged permanent settlement. The dynamic held to be responsible for site formation is simple: brief

occupations result in few remains.

Unfortunately, however, this kind of explanation is of little utility. On the one hand, it begs the question of the causes of settlement patterning. Even if one assumes that the area was only briefly inhabited and that scarcity of water may have played a major role in limited settlement, a long list of unanswered questions remains. For instance, what factors influenced site location? Are there definable tool kits (see Chapter 3) or technological strategies that are favored in such an environment? Are there seasonal patterns in resource procurement scheduling?

On the other hand, the intrusion hypothesis ignores an important alternative possibility, i.e., that the Project area contained a stable, resident population of HGs for millennia, albeit at relatively low levels of settlement intensity. It is only in recent years that archaeologists have begun serious attempts to explain variability in the form of archaeological sites as a result of systems of behavior and site formation processes. This perspective involves a shift away from primary concern with the form and content of sites *per se* to an interest in the systems of behavior that, in concert with non-cultural site formation processes, are responsible for creation of the archaeological record.

The relationship between the adaptive strategies of HGs and the kinds of sites that are produced by these strategies is an interesting focus of concern in these studies. One important implication that is emerging from these studies is that the "density" of archaeological sites—the quantity of artifacts deposited in a site, the rates at which refuse deposits accumulate, and the number of features that are constructed—bears no necessary connection to the behavioral stability or complexity of a hunting and gathering adaptation, a point we stressed in Chapter 5. We know from the archaeological and ethnographic record that there have been HG adaptations reflecting considerable complexity and stability of behavior that have not produced abundant archaeological remains.

Archaic sites in the Lakeview Project do contain important scientific information. The discussion above suggests three directions that future studies might pursue:

Environmental information is contained in faunal remains and quite possibly also in the form of pollen. The discovery of pollen during the Phase II investigations (Woosely and Raab

1980) suggests that, counter to the trend of past investigations, it is possible to obtain pollen from sediments in the Lakeview area. Combined with the environmental inferences that may be drawn from the faunal records, significant advances may be made in understanding the paleoenvironment.

Subsistence strategies of the Archaic stage inhabitants may be reconstructed to an appreciable degree. Although testing during Phase III indicated that preservation of faunal materials is not ideal, a considerable amount of faunal information is available, as witnessed in Murray's analysis presented in Appendix I. This potential contrasts sharply with estimates of the region's potential for faunal studies, based on the numerous deflated sites containing only lithic scatters. Testing showed that some Archaic sites do contain buried faunal remains of sufficiently good preservation to yield environmental and dietary information.

Macrofloral remains from the Archaic sites are less encouraging, as no floral material beyond flecks of charcoal has been produced by testing. Still, in view of the small amounts of site matrix recovered, floral material from pits or hearths remains a potential discovery with more excavation.

Settlement-subsistence pattern recognition for the Archaic sites is a distinct possibility through animal bone recovery and floral remains, though to a relatively limited degree. Gould's concept of material culture "signature" (1980) is a worthwhile objective. The idea is to identify the kinds of material remains produced by hunting-and-gathering adaptations regardless of the number of artifacts involved. Gould has shown that distinctive patterning of prehistoric remains can be both identified at the site level and shown to vary in systematic fashion across environmental settings even when these remains are the meager "outputs" of highly mobile groups of HGs employing simple technologies. An effort is made to combine all of the available information, including data on lithics, organic remains, and paleoenvironment, into a definable signature. Chapter 5 on lithics analysis suggests that such a signature might well be developed around a core of data derived from lithic remains.

What should actually be done if data recovery is required at the significant Lakeview sites? More pertinently perhaps is what specific, initial direction should such studies take? To answer these questions, we must turn to Chapter 8.

8

Prehistoric Site Significance: Project Impacts on Cultural Resources and Study Recommendations

Determination of significance, legally mandatory within all federally-supported assessments of archaeological resources, is a process guided by explicit definitions, procedures, and objectives. In a real sense the process is also the pivotal point of the whole cultural resource management process. Resources determined to be significant must be afforded protection (of several possible kinds) from possible adverse effects of federally-supported projects. Resources that are not found to be significant have no statutory claim to protection. Archaeologists must give careful consideration to their recommendations regarding archaeological significance.

The plethora of federal statutes, regulations, and guidelines pertaining to cultural resources are of course a fundamental set of criteria to be used in assessing significance (King et al. 1977; McGimsey and Davis 1977; and continually updated Codes of Federal Regulations, or CFRs). Perhaps the most fundamental guidelines for establishing significance, however, are the four criteria of 36 CFR 800.10 (Procedures for the Protection of Historic and Cultural Properties; also 36 CFR 60.6). Although any of these criteria may be used to establish archaeological significance, it is probably Criterion 4 that is invoked most frequently in connection with prehistoric archaeological re-

mains: Resources that "...have yielded, or may be likely to yield, information important in prehistory or history," may be determined significant.

While statutory criteria are obligatory in significance determinations, they are not sufficient basis in their own right for meaningfully carrying out the intent of the law (see Federal Register, Vol.45, No. 230, 78808-78811). One of us has argued elsewhere (Raab and Klinger 1977; Goodyear, Raab and Klinger 1978) that archaeologists have a professional obligation to bring detailed scientific criteria to the purposefully general guidelines of 36 CFR 800.10. Archaeological judgments, combined with the legal criteria of significance, can produce legally and scientifically useful determinations. Significance determinations should follow in a coherent, logical fashion from the laws and scientific issues at hand. Moreover, the better developed the scientific arguments, the more useful these will be in determining significance. The concern with scientific problems and research design in the earlier chapters (2, 5, 6 and 7) of the report are intended to establish the foundation for significance assessment as well as advance archaeological knowledge.

SIGNIFICANCE RECOMMENDATIONS

Of the 18 prehistoric sites scheduled for testing during Phases II and III of the Lakeview Archaeological Project, five sites are significant according to Criterion 4 of 36 CFR 800.10. These sites are 41DL148, 41DL149, 41DL184, 41DL189, and 41DL199. Chapters 2, 5, 6 and 7 indicated a series of scientific questions relating to our understanding of prehistory that can be resolved to a meaningful degree with data contained in the named sites, following Criterion 4, 36 CFR 800.10. These questions are incorporated into a series of specific hypotheses presented later in this chapter in recommendations for possible future work at significant prehistoric sites.

NEGATIVE DETERMINATIONS OF SIGNIFICANCE AND CONSTRAINING FACTORS ON SIGNIFICANCE DETERMINATIONS

Before presenting our reasoning for affirmative declaration of significance of the five sites named above, it may be useful to indicate the reasons for a negative finding of significance for some of the remainder of the prehistoric sites, and the reasons that determinations could not be made in other cases. Chapter 3 presents the data that stand behind these conclusions, but it may be helpful to summarize in tabular form the criteria for not finding some sites to be significant. Table 8-1 presents these criteria, providing a point of reference for discussion.

Whatever the scientific criteria employed to make significance determinations, one inevitably finds that some archaeological resources are more valuable than others. When potential to answer important questions about history or prehistory is the key criterion of value, as it is here, significance is judged in relation to information potential. Two questions are unavoidable: (a) To what extent does a particular archaeological site have potential to answer the stated questions, and (b) Would it be cost effective to attempt to preserve the resource for that purpose? These questions are of course complex. More importantly, it should be appreciated that attainment of both scientific and resource management goals requires us to recognize a tradeoff inherent in these two questions.

It is nearly always possible on purely scientific grounds to identify gains in knowledge that could be extracted from an archaeological site, however modest the latter might be. But it also has to be asked whether it would be cost effective at this time to preserve that information. One must consider the "opportunity cost" of a given preservation strategy under current archaeological technology. It may be possible, for instance, to make small incremental gains in a certain kind of information (data recovered or sites preserved in place), but at exponentially increasing cost. It may be that investment of preservation funds elsewhere would yield more return. With cost effectiveness in mind, we recommend that sites in Category A of Table 8-1 are

not significant; i.e., they evidence poor prospect of cost-effectively preserving important scientific information. Many of sites in this category were essentially "surface" sites, with low yields of artifacts per unit volume of site matrix, and no indication of internal structural differentiation (e.g., features, "living floors," or spatial clustering of artifacts). "Surface" in this instance means that artifacts were often found with greatest frequency on the surface, but in no case more than 30 cm below the surface. In view of the fact that most, if not all, of these sites were subject to plowing, one cannot rule out the possibility that materials found to a depth of 30 cm were deposited there by plowing and/or the widespread erosion that has affected the project area as a result of agriculture.

This circumstance makes the possibility of stratigraphic integrity in these sites a distant one. Even assuming some stratigraphic integrity, however, the low frequency of artifacts likely to be recovered from these sites is not likely to result in cost-effective gains of information.

While it is conceivable that some scientifically useful information could be extracted from these sites, the cost-effectiveness of doing so is unlikely to be acceptable in comparison with certain other sites in the project. Specifically, we direct attention to the greater information potential of sites 41DL184, 41DL189 and 41DL199; sites likely to yield comparable types of scientific information, but in a more cost-effective manner. These three sites have been found to be significant, and are discussed below.

One site in Table 8-1, 41EL29, Category B, produced artifacts from the ground surface only. Four stone flakes were found on the surface of 41EL29, and no artifacts were recovered from test excavations. The same comments about poor cost-effectiveness presented above clearly apply here.

At 41DL147, Category C of Table 8-1, only a limited number of artifacts were recovered during testing. Although the site contained bone, bone was found within 10 cm of the surface, while other fragments were found to a depth of 40 cm. This presents a somewhat ambiguous picture of possible occupation levels and contamination from the surface. It is clear, however, that the site contains a quite low frequency of artifacts (see Chapter 3). Once again, it is unlikely that much information could be recovered in a cost-effective manner by additional work.

We are mindful of the increasing sensitivity that archaeologists have toward the scientific potential of small lithic sites. We argued earlier (Chapters 2 and 5) that these sites should be studied where feasible because they are the material remains of behavioral systems to no less a degree than large, artifact "rich" sites. Nevertheless, we suggest that the best prospect of understanding the behavioral significance of such sites resides in contexts where at least a modicum of scientific control can be exercised over the context of cultural components, where there are adequate artifact sample sizes and other kinds of information, such as faunal and floral remains. For sites containing primarily lithic artifacts, sites 41DL184, 41DL189 and 41DL199 again offer the best prospects of building interpretive models that may eventually allow smaller sites to be brought into a coherent settlement-subsistence model.

Summary of Non-Significant Sites in the
Lakeview Project with Criteria of Rationale of Findings

SITE	RATIONALE
	A: Low Cost-Effectiveness owing to lack of stratigraphic integrity and low artifact counts.
41TR58	12 lithic flakes, 6 retouched flakes, 1 dart point, 1 piece of shell, 2 bone fragments
41TR59	11 lithic flakes, 3 retouched flakes, 1 biface, 1 scraper, 1 dart point, 1 fragment of groundstone, 1 core, and 2 hammerstones
41TR60	31 lithic flakes, 2 retouched flakes, 1 biface, 1 core, 1 dart point, 1 piece of shell, and 1 piece of bone
41TR61 (TSN3)	97 lithic flakes, 13 retouched flakes, 2 bifaces, 2 scrapers, 2 notched flakes, 3 dart points, 1 arrow point, 2 projectile point fragments, 1 axe (hoe?), 3 hammerstones, and 3 pieces of bone
41DL186	12 lithic flakes, 3 retouched flakes, and 3 pieces of bone
41DL198	88 lithic flakes, 10 retouched flakes, 1 pitted stone, 1 core, 1 hammerstone, 1 piece of shell, and 3 pieces of bone
	B: Site produced surface material only.
41EL29	4 lithic flakes, 1 biface, 1 retouched flake, and 1 piece of faunal material
	C: Doubtful stratigraphic context, low artifact frequency.
41DL147	26 lithic flakes, 3 bifaces, 1 arrow point, and 6 fragments of mussel shell
	D: Site could not be relocated.
41DL150	
41DL188	
	E: Site destroyed by landowner.
41TR1	2 lithic flakes, 1 biface, 2 pieces of shell, and 34 pieces of bone

Category D of Table 8-1 shows that two sites, 41DL150 and 41DL188, could not be reliably relocated despite intensive efforts to do so, including testing (Chapter 3). As one might suspect from the nature of sites in Category A of Table 8-1, it may be nearly impossible in some cases to relocate sites with only a handful of artifacts.

One site, 41TR1 in Category E, was apparently destroyed years ago during construction of a cattle watering pond. No evidence of this site could be found, despite surface testing (Chapter 3).

SITES OF INDETERMINATE STATUS

Two sites scheduled for investigation during Phase III could not be evaluated due to landowner refusal to allow archaeological testing. These sites, 41TR36 and 41TR37, therefore cannot be evaluated in relation to significance criteria on the basis of current information. Plans should be made to evaluate the significance of these properties at the earliest possible time. As we noted in Chapter 3, one of these sites, 41TR37, is potentially significant because of discoveries of prehistoric stone tools made by the landowner.

SIGNIFICANT PREHISTORIC SITES

Five prehistoric sites have been found significant during Phases II and III at Lakeview. These sites, divided into two groups, are categorized by prehistoric cultural stages:

Archaic Stage (5,500 B.C. to A.D. 800): 41DL184 (Skinner and Connors 1979:43; Chapter 3 above), 41DL189 (Skinner and Connors 1979:45; Chapter 3 above), and 41DL199 (Skinner and Connors 1979:46; Chapter 3 above).

Neo-American Stage (A.D. 800 to A.D. 1500): 41DL148-Cobb-Poole (Skinner and Connors 1979:37-43; Chapter 3 above) and 41DL149-Baggett Branch (Skinner and Connors 1979:37 and 43; Chapter 3 above).

Testing has shown that these sites contain two significant categories of scientific information related to prehistoric settlement systems. These categories are: (a) Information on past environment and economy as reflected in floral and faunal remains, and (b) Inter- and intrasite variability in settlement form, as seen in site features and layout, and evidence of inter- and intrasite variability in function reflected usefully, though not exclusively, in lithic (stone tool manufacturing and use) remains.

It is important to emphasize again, however, that these resources take on significance in relation to reasonably precise scientific questions that the former might be used to answer. Significance must be clearly defined in this way in order to identify a range of resource management options that actually address the value of the resources. With that objective in mind, we now turn to a detailed discussion of the scientific potential of the significant sites. This discussion, in addition to presenting the scientific basis for a determination of significance, should, if

necessary, form the basis for designing mitigation alternatives aimed at preservation of resources in place or recovery of important scientific data.

SCIENTIFIC POTENTIAL OF SIGNIFICANT PREHISTORIC SITES

The scientific potential of the significant prehistoric sites is couched here as a research design. The research design format allows an economy of presentation while indicating the specific types of information that warrant protection. In the event that mitigation of adverse impact through data recovery is determined to be the most appropriate resource management option, the research design can serve as a blueprint for such efforts.

ARCHAIC-STAGE SITES

41DL184

Research Summary. Tested during the Phase II work at Lakeview (Chapter 3) the site's scientific value lies primarily in its lithics (tools, tool fragments and debitage). These artifacts achieve importance in a comparative framework including other Archaic-Stage sites in the project: 41DL189 and 41DL199. This comparison can be made on the basis of the specific hypotheses that follow this summary.

Testing showed that lithics occurred in low frequencies at the site. Four 1m² test pits were excavated (Chapter 3). Tabulation of lithics by test pit and levels within pits indicates that artifacts are found to a maximum depth of 80 cm, in Unit 1 (Appendix IV). Relatively high counts of lithics appear in Units 1 and 2, and range in frequency from 1 to 37 artifacts, mostly broken flakes from bifacial tool manufacture. The greatest frequency of artifacts is from Levels 1 through 4 in Unit 2 (Appendix IV). Units 1 and 2 would be good starting points for expanding excavations during any data recovery program.

Recovery of the lithics should be done at least in part with 1/8 in. screen in order to recover an adequate sample of even the smallest recoverable debitage. Recovery of this debitage is necessary to carry out the bivariate graphic analysis suggested in Chapter 5. Indeed, it is necessary to recover small debitage flakes in a similar manner from all of the sites slated for mitigation studies in order to have comparability of data.

Analysis of soils from the site (Chapter 6) suggested that the site was heavily alluviated in the course of its natural development on the floodplain of Mountain Creek (60 meters from creek channel). Soil elements, for example Phosphorus, appears to be leached out by recurrent flooding. Like most other sites in the project, the high content of clays in the soil contribute to a high potential for shrink-swell cycles, resulting in soil cracks reaching a maximum depth of about 80 cm. This fact should caution in interpreting pollen and artifact-distribution data. Also, compare this observation with Feature 2 at the Cobb-Poole site where this cracking is well exemplified.

Sixty-one pieces of bone were recovered from the site; 10% identifiable (Appendix II). Unit 2 produced burned fragments of deer bone from Levels 2 and 4. It does not appear that recovery of faunal bone is a major prospect at the site, but should be borne in mind in data recovery. It seems possible to at least investigate the proportions of deer-size animals in the faunal assemblage, as contrasted with smaller forms.

A total of 517 artifacts were recovered, of that total 13.7% were recovered from the surface. Four dart points were recovered, three from the surface (Pamillas, Gary and Carrollton types), and one unidentifiable (Ensor type) point from Level 4 of Unit 1. Estimated chronology and cultural span is middle to late Archaic, 2000 B.C. to A.D. 800.

Data Recovery Objectives. Earlier, we indicated some of the problems involved in reconstruction of hunter-gatherer (HG) settlement-subsistence systems (Chapter 5). We stressed the idea that certain notions about the settlement patterns have been raised to the status of interpretive principles through sheer repetition in the literature, rather than being advanced as testable (much less confirmed) hypotheses. Analyses of lithic tools, because they are one of the most promising avenues of investigation, provide some of the most serious examples of the problem.

The Lakeview Project affords an opportunity to draw back and consider possible approaches to the archaeology of HGs in North Central Texas. In large measure that task involves formulating models of stone tool manufacture and use. The central role of lithics in the analysis of HG sites and settlement patterns follows naturally from the fact that these artifacts represent a common denominator between sites in disparate time periods, environmental locations, and preservation environments. It also seems reasonable to expect that stone tools were of such fundamental technological importance that their remains can reflect significant behavioral variability.

No one is suggesting that lithics alone are adequate in reconstructing settlement patterns, but they are shown to be a useful baseline of information for initial development of settlement models. The many sites in the project area and in North Central Texas generally that have artifact inventories restricted to stone tools and lithic debris can be dealt with by means of such a framework. The approaches that we suggest can also help to alleviate the persistent problem of finding many of the region's sites disturbed by soil erosion. Dealing with lithics as functional assemblages relaxes the need to recover individual artifacts in undisturbed spatial contexts (though, needless to say, the latter is always desirable). Information from soils, pollen, floral and faunal remains, and other data sources can be efficiently synthesized within settlement models built upon the study of lithics as a unifying analytical dimension.

One fundamental research question posed here is whether one can justifiably posit a dichotomous functional differentiation of sites within HG settlement patterns along the lines of base settlements and specialized activity sites, and whether such phenomena can be detected in lithic remains. Earlier reports

(Skinner et al. 1978; Skinner et al. 1979) conclude that this interpretation is possible on both counts. The results offered in support of such interpretations are presented within the framework of the central-based wandering community proposed by Beardsley et al. (1956), and specialized activity sites are assigned the functions of quarrying raw materials, creek-side hunting and gathering, upland hunting and gathering camps, and river mussel gathering sites. The validity of such interpretations is in question, however, as reflected in the comments of Gallagher (1978) and Mallouf (1978) and in Chapter 5.

In reality, several problems have been by-passed in pursuit of useful settlement pattern models. We outlined some of those problems earlier in the chapter: overly simplistic ideas about the stability of HG behavior, the need to account for site formation processes, and problems of archaeological visibility in reconstructing whole settlement patterns. It seems appropriate, therefore, to aim future work at determining whether those problems can be overcome with theory and method that we currently possess or, alternatively, if more adequate tools can be developed. In a sense this effort can be described as "back to basics" in nature, in that a variety of basic theoretical and methodological problems are retrieved from the status of implicit assumptions or tautological hypotheses and test implications in order to be subjected to critical evaluation.

In that task we propose the following hypotheses:

H1: The attributes of lithic assemblages produced by bifacial flaking can be analyzed by site or component to yield effective indicators of the extent to which bifacial manufacturing has occurred.

H1: Bivariate graphs of prehistoric debitage dimensions will reflect the placement of the site/component in the manufacturing "trajectory" and the similarity of such a trajectory to replicated debitage, based upon relationship to experimental and empirically derived models (Raab, Cande, and Stahle 1979; see Chapter 5 above).

This hypothesis attempts to get at the underlying idea that variability in stone tool manufacture can be a useful indicator of variability in site function. There is a widely accepted notion that manufacture of bifacial tools might be a characteristic of relatively permanent camps, while tool maintenance (e.g., resharpening, reworking broken tools) may tend to occur at greater rates at extraction sites. A serious difficulty with this concept, however, is that we have little basis for predicting the "scale" of such an effect. If one considers that such an effect occurred along a scale or continuum of behavior composed of many recurrent but highly variable behavioral episodes, the expectation that an easily defined site "type," will manifest itself to the archaeologist is rather remote. Instead, it will be necessary to characterize the functional character of sites in relation to the magnitude of measurement scales (ratios, measures of variance, graphs, for example), because these offer the possibility of assessing variability more effectively than simple categorization of data. Hypothesis 1 directs attention to that kind of effort. But a complementary proposition to Hypothesis 1 can be proposed as well in Hypothesis 2:

H2: Classes of use-related artifacts can be shown to have significant differences in frequency of occurrence between sites.

I1: Number of artifacts per unit volume of site matrix will show more variability from site to site than within sites. This test implication can be measured by the number of artifacts per m³ of site matrix, and the number of artifact classes (e.g., groundstone, hammerstones, drills, projectile points) found at a particular site divided by the total number of artifact classes recorded for all comparable sites (Fish, Fish, and Jeffries 1978:44-45 describe this diversity index).

I2: The number of stone flakes with edge damage resulting from use and/or retouch will vary in direct proportion to total quantity (weight, count) of chipped stone artifacts in samples of artifacts from all sites.

I3: The quantity (weight, count) of "exotic" (imported) lithic raw material will vary in direct proportion to total quantity (weight, count) of chipped stone artifacts in samples of artifacts from all sites.

This hypothesis provides a complementary perspective to Hypothesis 1. Whereas Hypothesis 1 is concerned with bifacial manufacturing as an indicator of the "extraction" vs. "maintenance" dichotomy of site function (Chapter 5), Hypothesis 2 takes up the role of tools in the systems of behavior carried out with tool kits.

The first test implication of Hypothesis 2 attempts, in part, to control for the problem of site size resulting from site re-occupation. It does no good to argue that size per se is an indication of the functional character of sites, since size reflects only the quantity of behavior at a site and not necessarily the functional character of that behavior. But test Implication 1 of Hypothesis 2 also seeks to determine if a "standard" set of tools tends to be found at sites regardless of size. The discovery of such a pattern would suggest that sites may tend to be far more like base camps than extraction sites (Chapter 5), regardless of size.

The second test implication takes up a complementary perspective. Use-damaged flakes and small flake tools were identified in the collections at Lakeview (Chapter 5). These artifacts should be a good indicator of economic activities being carried out at the sites. If sites tend to be relatively undifferentiated in relation to the economic activities performed at them, we might expect the numbers of these flakes to increase in direct proportion to total output of chipped stone. We would expect that a greater amount of behavior involving a "basic tool kit" would produce more such flakes in more or less constant proportion to increases in the output of stone artifacts generally. Interestingly, though, if one could determine that the opposite were true (number of used flakes and number of all stone artifacts are inversely related), it would suggest that flakes tend to accumulate at greater rates on some kinds of sites, suggesting that Hypothesis 2 ought to be rejected.

Test Implication 3 is derived from a model proposed by Gould (1974), in which he suggests that imported stone materials will tend to be restricted to use in base camp settings because of their value, while "non-quarried" or poor grade local materials will be used at extraction sites. One study (Fish, Fish, and Jeffries 1978:62) on Archaic period sites in Georgia indicates that imported lithic materials do not vary in relative frequencies between sites of different sizes. At the same time,

House and Wogaman (1978) indicate the need to consider the form of the exotic materials and the processes that produced them at different kinds of sites. We might, for instance, find that debitage indicative of manufacture of tools will be concentrated in certain sites, if sites tend to be functionally differentiated. The evidence for the role of imported lithic materials in settlement systems is ambiguous but worth looking at.

Attempts to deal with the systemic variability induced by such stone tool use will put us in a stronger position to account for the confounding influences of site formation processes (such as controlling for the effects of site reoccupation). It should also make possible inferences about phenomena that fall below the threshold of direct archaeological visibility. We may never be able to bring an entire settlement pattern under archaeological observation, but if we can understand something of the dynamics between variables of the environment and lithic tool use, we may be able to infer processes that we cannot directly observe, such as extremely short-term events that produce few detectable archaeological traces.

41DL189

Research Summary. The nature of this site (Chapter 3) offers an opportunity for dating environmental events. This site presents a number of hearths washing from the banks of Mountain Creek at differing stratigraphic levels, two of which were dated during Phase II by the radiocarbon method (Chapter 3). The fact that this site failed to produce many artifacts or features other than the hearths themselves should not suggest that the site is without value. The hearths exposed at the site present an opportunity to calibrate chronologically any biophysical environmental changes that may have occurred during the Archaic stage. The prospect of dating comparatively long-term environmental change is good.

We recommend that further excavation take place at 41DL189, with a view toward obtaining datable material from hearths that can be associated with soil samples suitable for soils analysis (e.g., particle size: sand, silt, and clay fractions; pH; organic content; calcium carbonate content) and extraction of pollen.

Pollen analysis is of particular interest here. Although pollen studies in North Central Texas have not generally been successful in recovering meaningful number of pollen grains, work at the Cobb-Poole site (Raab and Woosley 1982) and in the Richland Project near Corsicana, Texas (Raab, Bruseth, and McGregor 1981) strongly indicate that this pattern of failure is the result of pollen extraction techniques employed in the past, rather than the nature of pollen preservation in the sites. This should be given careful consideration by future investigators.

In Chapter 3 we presented a discussion of site 41DL189, including the results of two radiocarbon assays from two prehistoric hearths excavated from strata in the site. As we noted there, the .77 m of sediments deposited in the site between 2430 ± 80 radiocarbon years ago (Area H) and 2140 ± 250 radiocarbon years ago (Trench 4) suggests substantial deposition on the floodplains in the project area during prehistoric

times. This deposition is significant, in relation to opportunity for chronological calibration through the C-14 method, because it offers a vital base of information that can be correlated with recent advances in paleoenvironmental reconstruction in North Central Texas.

All lithics were recovered in conjunction with exposing the hearths, burned clay lenses, mussel shell lenses, and concentrations of fire-cracked rock. A total of 16 lithic flakes were recovered from all of these features (Appendix IV). Four dart points were recovered from the banks of Mountain Creek: 1 Carrollton, 1 Gary, 1 Edgewood, and 1 unidentifiable type. The radiocarbon dates are consistent with a late Archaic occupation.

A total of 136 faunal elements were recovered. Of this number 19 are identifiable (Appendix III). Fifteen of the 19 identifiable pieces are white-tailed deer, distributed rather uniformly over the site's proveniences. Despite its creek-bank setting, only one aquatic element (other than mussel shell) was present, a single turtle scute. Features in Areas B and F (Chapter 3) were mussel shell lenses.

Data Recovery Objectives. Recent work by Southern Methodist University in the Richland Creek Reservoir near Corsicana has demonstrated evidence of extensive environmental changes in North Central Texas during the last five millennia, including the possibility of major drought and major changes in the region's plant and animal communities. Changes of this kind would have had a major influence on prehistoric adaptations to the region, including the Lakeview Project area. The evidence for these changes was derived from extensive work with deposition on the floodplain of Richland and Chambers Creeks, analysis of pollen from depositional strata in the floodplains, and radiocarbon dating of depositional events (Raab 1981; Pheasant 1982). At Richland, radiocarbon dates span a range of 2380 B.C. $\pm$ 160 and A.D. 420 $\pm$ 150 (Raab 1981:575-576). Since the Lakview dates from 41DL189 fall into this range, site offers the potential of complementary data on past environments.

Rather than entertaining a lengthy digression on the Richland work, we suggest that data from 41DL189 be compared with the following summary of the Richland investigations (Raab 1981: 577-578):

(1) Three depositional units are represented in the banks of Richland and Chambers Creeks, with three paleosols. Depositional Unit 2 is the most distinctive, being composed of transported Blackland Prairie (Trinity Clay) soils. Only Depositional Unit 3 is of historic age.

(2) Pollen preservation, generally quite good throughout the 32 samples of Trench 1 at 41NV139, is poor within the lowest paleosol located at the interface between Depositional Units 1 and 2. The pollen grains preserved, all grasses, show high degrees of weathering. This fact, combined with the deposition of the Trinity Clays in Unit 2 above the paleosol, suggests an episode of severe drought. This drought, currently of unknown age and duration, was apparently of sufficient magnitude to cause massive erosion of upland (prairie) areas affected prehistoric settlement.

(3) The ages of the various depositional palynological events are not known in detail from current data. Sites from different

proveniences within Unit 1 produced dates spanning the 2380 B.C. $\pm$ 160 to A.D. 420 $\pm$ 150 range. The paleosol interface between Units 1 and 2 developed sometime after A.D. 420. Based on artifacts associated with Unit 2, it appears that the postulated drought and deposition of Unit 2 occurred no earlier than A.D. 1000 and probably later.

(4) Although the pollen spectra from Trench 1 show the influence of sampling from a floodplain habitat, frequencies of arboreal and grass pollen suggest a continuous warming and drying trend, punctuated with at least one major environmental fluctuation (postulated drought). Across time, frequencies of pine pollen suggest that the East Texas forests may have been closer to the project than at present. This effect is most apparent in the oldest depositional unit, Unit 1. Based on current dates, this effect would have been synchronous with the late Archaic stage (ca. 5000 B.C. to A.D. 800).

The fundamental objective would be to find points of similarity or departure from the Richland results. This objective can be expressed as hypotheses:

H3: Similar to the Richland Creek findings (Raab 1982), a rapid cycle of deposition occurred sometime in the interval of A.D. 1000 and A.D. 1300, accompanied by poor preservation of pollen and decline of arboreal pollen in relation to non-arboreal types, principally grasses.

H1: Defined depositional strata will evidence poor pollen preservation at inception of erosional cycle owing to stasis of deposition on floodplains during draught. Die-off of vegetation and resumption of moisture results in rapid erosion and deposition of sediments over strata of poor pollen preservation (weakly developed paleosols, perhaps).

H2: Material datable by the radiocarbon method or archaeological material whose age can be estimated on typological grounds will allow assignment of strata to an interval of A.D. 1000 to A.D. 1300.

H4: Sediments deposited in the time range of about 2000 B.C. to A.D. 400 will evidence greater effective moisture.

H1: Relatively large proportion of arboreal pollen in sediments from this time range.

This work would require great attention to geological and palynological data. A geologist would need to be consulted, and a depositional history of Mountain Creek in the vicinity of the site worked out. With this information in hand, pollen sampling should be carried out within the defined depositional strata. Concurrently, archaeological excavation should seek to determine the age of these strata by means of C-14 dating, preferably, and by typological analysis of artifacts. Should faunal remains be found in these sites, these, too, should be looked at with a view toward their information potential about past environments. Microfauna such as voles and other rodents may be particularly helpful here (see Appendix III by Murray). Also, fired clay around hearths should be assessed for possible archaeomagnetic dating, if feasible.

Again, the data from the Richland Project offer a useful point of comparison for these studies. The value of such comparative work is that through these kinds of investigations an effective model of the past environments of North Central Texas may be achieved. This model would not only benefit archaeologists but

also many other scientific fields such as paleoclimatology, biological ecology and biogeography.

It should also be stressed that potential for testing Hypotheses 1 and 2 also exists at 41DL189, and data recovery at this site should be planned to integrate such needs with paleoenvironmental objectives.

41DL199

Research Summary. Also an Archaic stage site, 41DL199 was tested during Phase III (Chapter 3). Testing shows that this site contains reasonably well-preserved faunal bone, relatively abundant lithics and a possible pit feature. Data collection should attempt to recover as much data as possible that offers insight into Archaic stage economy. Like site 41DL184, an effort should be made here to maximize recovery of lithic materials, including the smallest debitage flakes. Again, the latter should be useful in constructing bivariate graphs of bifacial tool manufacture (Chapter 5). Recovery of material datable by the radiocarbon method should be a high priority in order to relate the site in time to other sites and chronology of environmental data as might be obtained from 41DL189.

Eight test pits and two backhoe trenches were sunk at this site. Units 1 and 7 had the largest number of artifacts, and these were primarily lithics. In Unit 1 most of the material was recovered in the upper three 10 cm levels. In Unit 7 the material was clustered in comparatively high proportions down through Level 6 (Appendix IV). These units, 2 m apart, are a "hot spot" in density of buried material. For this reason, soils studies at the site were also centered in these two units.

The tendency of lithics to segregate into an upper stratum in Unit 1 and an upper and lower stratum in Unit 7 suggested the possibility of different occupation levels, although this could not be seen in the stratigraphy of the test pits. The soils analysis indicated that the Phosphorus (P) levels were high down to the level 6 artifact cluster in Unit 7, as compared with just the upper deposit in Unit 1. This finding tends to reinforce the idea of occupation level separation (Chapter 6). The greater P values suggest the presence of anthropic soils in the site. This is a valuable interpretive device because of the lack of visible stratigraphy. Also soils evidence (Chapter 6) is presented for the inference of a pit feature, not visible in the soil profiles as seen in the field, located at about the 30 cm level in Unit 7.

Other features were visible, however. There was a possible postmold in the west wall of Unit 1 (Chapter 2) and a mussel shell accumulation in Unit 7 at 30-40 cm depth. These suggest a focal point for future excavations at the site, searching for more detailed information on possible features.

The site contained a significant amount of faunal material. A total of 764 faunal elements were recovered, of which only 19 were identifiable (Appendix III). Aquatic fauna are represented in this site, including a Catfish (*Ictalurus* sp.) vertebra from the 60-70 cm level in Unit 4. Turtle scutes and white-tailed deer elements were also found with this element. Fourteen of the 19 identifiable elements were white-tailed deer (Appendix III).

Seven diagnostic dart points were recovered from

41DL199. Of these, three were from the surface (2 Edgewoods, 1 Ensor), one came from Unit 2, Level 2 (a Yarbrough), one came from Unit 7, Level 6 (a Yarbrough), and two came from Unit 7, Level 7 (both Wells). Estimated cultural chronology spans the middle Archaic into the Neo-American Stage.

DATA RECOVERY OBJECTIVES. Hypotheses 1 and 2 presented under the discussion of site 41DL184 apply here as well. Along with 41DL184 and 41DL189, this site affords an opportunity to look at functional variability in Archaic-Stage sites, particularly in relation to stone-tool manufacture and use. Any future work at this site should attempt to evaluate Hypotheses 1 and 2. Also, to the extent that faunal and floral remains can be recovered from this site, Hypotheses 3 and 4 should be evaluated if possible.

NEO-AMERICAN STAGE SITES

41DL148 (Cobb-Poole Site)

Research Summary. Investigated during Phase II (Chapter 3), this is perhaps the most complex site encountered to date in the Lakeview Project. The site was extensively probed with backhoe trenches and test pits. First brought to the attention of ARP by the late R.K. Harris of Dallas, Texas, the site produced many ceramic and lithic artifacts for local artifact collectors over the years.

Testing revealed three features. Feature 1 is a small cluster of mussel shell at about the 30 cm level in Test Trench F. Feature 2 was the most complex structure at the site. In Chapter 3 arguments are presented in support of the idea that this may have been a prehistoric pit house occupied between A.D. 800-1200, based on the Caddoan ceramic types found within it.

Feature 2 was also the locus of pollen sampling and analysis. This analysis, combined with geological evidence, was used to construct a model of a terrace-edge habitat, where seep springs may have been available to the site's prehistoric inhabitants (Appendix V and Chapter 7).

Feature 3 was a cluster of three posthole outlines in excavation Units 10 and 15. One of these contained leg bones of a white-tailed deer. This Feature may be an activity area associated with Feature 2. This Feature was also probably associated with Feature 1.

The site contains considerable quantities of bone, including one deer ulna awl from the fill of Feature 2. Preservation of this material is, however, only fair to poor in quality. Four hundred and sixty-six bone fragments were recovered in total. Three hundred and forty-eight were unidentifiable. A large quantity of the faunal material came from Level 9 of excavation Unit 1 (which was later designated as the Feature 2 "pit house" as excavation continued). This looks as if it might represent food materials inside the structure. Interestingly, this material contains rodents, white-tailed deer, beaver, an ulna awl, and bird long-bone fragments thought to compare favorably with turkey (Appendix II). Turtle and fish elements were also recovered (Unit 1, Level 4).

Soils analysis was done in the pit feature (Feature 2). This showed peaks of chemical elements attributable to human

deposition of organic matter. The soils data corresponds well with stratigraphy and artifact counts to define possible occupation or deposition levels in Feature 2.

No radiocarbon dates were run for lack of suitable quantities of datable materials from a "tight" provenience. However, the Caddoan sherds in the site offer a range of A.D. 800-1200. This span agrees well with similar ceramics in site 41DL149 where a radiocarbon date of A.D. 1200 $\pm$ 200 years.

Any future excavations should proceed carefully from re-exposure of the Features discussed above. Feature 2 was lined with plastic sheeting prior to back-filling for this eventuality.

A total of 378 pieces of lithic material were recovered. Most of these were from excavation Unit 1, dispersed in low-frequencies through the eleven levels of this unit. There are some distinctive features to the lithics at this site. Perhaps the most notable feature is a "micro-tool" assemblage. This consists of pieces produced by bipolar percussion and numerous use-damaged flakes. Some of the flakes also have been carefully retouched about their margins to form elegant, small flake tools. This suggests the presence of a possible small-tool tradition oriented to conservation of high-quality chert, which is rare in the project area in pieces of appreciable size (most found in Uvalde gravels; Chapter 5). A diverse assemblage of lithics from the site were presented by Skinner and Connors (1979:40-41) from R.K. Harris' surface collection of the site. This includes dart points, drills, and numerous Neo-American arrowpoint styles. Four arrowpoints, one alba, and three unidentifiable forms were recovered during testing (Chapter 5).

Data Recovery Objectives. Several hypotheses at different levels of inclusiveness might be considered in any future work. Starting at the most general level, we would propose the following hypotheses and their test implications:

H5: Increases in effective moisture (available to plants and animals) as reflected in pollen data will be accompanied by greater frequency of settlement in the project area.

H1: Increase/decrease in the pollen Families/Genera/Species indicative of general moisture conditions. Particularly important here are trends in the reciprocal frequencies of the grass and arboreal pollens and the Compositae and Chenopodiaceae (e.g., Bryant and Shafer 1977). Greater effective moisture would be indicated by increases of grasses at the expense of arboreal forms and increases in Chenopodiaceae at the expense of Compositae.

H2: The number, size and density of archaeological sites increase with improved effective moisture conditions.

This hypothesis attempts to evaluate the model proposed by Skinner and Connors (1979:53) in relation to their suggestion that occupation of the project area was essentially controlled by availability of water. Hypothesis 5 implies that a more reliable water supply in the project area might allow a more intensive occupation (i.e., a larger number of people in the area and/or greater frequency of duration of occupation of the area). More intensive occupation should presumably be reflected in site size, artifact density, and perhaps number of sites. One assumes here that more intensive occupation will result in reoccupation of some sites, leading to greater site size (unless reoccupations precisely overlap one another, a most unlikely possibility) and density of debris accumulation and occupation of a larger

number of new sites. All of these variables relate to intensity of occupation, the major effect that would be expected to follow increased moisture conditions. While Hypothesis 5 directs needed attention to broad patterns of variation, a more refined hypothesis is required as well:

H6: Through time, "micro-habitats," that offered greater access to water, supported relatively intensive occupations despite fluctuations in general environmental moisture conditions.

H1: Trends in intensity of occupation show little correlation with trends in general effective moisture levels.

H2: Specific habitats or resource "zones," e.g., springs and riparian zones, will correlate with settlement, rather than fluctuations in conditions of the general environment.

This proposition, in contrast to Hypothesis 5, draws attention to two points. First, humans do not adapt to their "general" environment but rather to the specific temporal-spatial conditions of critical resources. Second, if this notion is valid, it may be that reliance on specific kinds of resources tends to buffer the effects of the general environment on a population. For instance, significant shifts in the general effective moisture levels may have little impact on a prehistoric settlement pattern if the settlement pattern is supported by a relatively stable micro-habitat such as permanent or semi-permanent springs or streams. Of course, at some point trends in effective moisture will affect the whole structure of the environment, but frequently the job of the archaeologist is to account for human behavior under circumstances that lie in between extreme environmental trends.

The important point here, however, is the interplay between alternative hypotheses. Future work should seek to determine not only broad patterns of change in environment and settlement but also the relationship between the "fine-grain" aspects of the effective environment. If data are collected to evaluate both hypotheses, it should be entirely possible to build up a series of more refined models during any future phases of investigation. The result would be a continually refined set of study objectives leading to an increasingly sophisticated understanding of past settlement behavior through time.

41DL149 (Baggett Branch Site)

Research Summary. In many important respects this site can be considered the "sister site" of 41DL148 (Cobb-Poole). Tested during Phase III, this site (next in importance to Cobb-Poole) is the most complex and artifact-rich site tested in the reservoir.

There were five 1 m² test units and one backhoe trench excavated (Chapter 3). Another unit, Unit 4a, was dug to the south of Unit 4 to probe a dense subsurface midden in Unit 4 at 10 to 30 cm below surface. These two units evidence a strikingly high concentration of artifacts, including ceramics, bone, and lithics. A pit, originating at about 30 cm and extending to a depth of 90 cm, was located in Unit 2. This feature, Feature 1, contained fire-cracked rock, mussel shell, charcoal and animal bone. A C-14 sample from this pit yielded a date of A.D. 1200 $\pm$ 200 years. In all, the site contains dense midden deposits lying at about 10 to 30 cm below surface and are confined to the wooded

southern portion of the site along a line of Units 1, 2, 4, and 5.

Soil samples from the pit, Feature 1, were analyzed for elements indicative of the breakdown of organic matter in the pit. This analysis failed to show any such difference as compared to control samples. It was suspected that the pit fill was composed of washed-in sediments of post-abandonment occurrence, thus yielding the comparatively low readings of Phosphorous and other chemical elements.

A relatively large quantity of faunal bone was recovered. One thousand nine hundred and fifty-nine faunal elements were recovered, of which 81 were identifiable. These remains reflect the broadest spectrum of species of any site tested. These include: *Bison bison*, a phalanx and long-bone fragments, white-tailed deer in every provenience unit, lizards, snakes, rabbits, squirrels, woodrats, pine voles, turtles, frogs, and fish. The latter are represented by tooth plates and vertebrae. Most of this material came from Units 4, 4a, and 5. This is evidence of a broad-based exploitation pattern with a significant aquatic component. Data recovery should aim at extensive analysis of this material. Of the total faunal elements (1959), 1780 came from the three units named above. This pattern suggests a concentrated deposit of materials in this part of the site.

Notably, the lithics at Baggett Branch included one Alba type, three Perdiz and two unidentifiable arrowpoints. Over 550 flakes were recovered from the same proveniences as the faunal material.

No pollen work was attempted at this site, owing to the comparatively shallow nature of the deposits. Given the soil cracking and bioturbation common to sites in the area (discussed under 41DL184), it was doubtful that pollen analysis would supply any culturally interpretable information, even if pollen were present in the samples. However, future work should seek to recover pollen from buried contexts where some protection from intrusives could be expected. These contexts might, for instance, be found under large fragments of groundstone, other artifacts, or under sealed lenses of clay lined pits, or on occupation surfaces.

Sixty-three sherds were found within the single backhoe trench at the site, apparently from a single vessel. Grit and bone-tempered sherds, some with shallow engraving and with brushing on the surface, were recovered. These are Sanders Phase (?) Caddoan sherds of the type also found at 41DL148.

Data Recovery Objectives. Hypotheses 5 and 6, addressed in the discussion of the Cobb-Poole site, apply in an important way here, too. At the Cobb-Poole site, these hypotheses seek to establish whether favorable moisture conditions, as measured by pollen data, allowed the kind of relatively permanent or "dense" settlement seen there. The second test implication of Hypothesis 5 directs attention to the question of whether or not the "number, size, and density" of sites might be associated with such an effect. The difficulty of evaluating such a test implication is evident of the basis of a single site that might provide relevant data. Fortunately, the Baggett Branch site offers another set of data for evaluation of this test implication. Certainly, we could want more cases, but we can at least contrast 41DL148 and 41DL149 in this instance. Actually, the importance of this comparison should not be down-played for the following reasons:

(a) As we have seen, there is good evidence that the two sites are part of the same cultural stage, based on the ceramics found in them. The exciting possibility must also be entertained that the two may even have been contemporaneous; possibly part of the same settlement pattern of a single group. Finding of these two sites in contrasting micro-environmental settings (Cobb-Poole on a stream terrace and Baggett Branch on a stream floodplain) provides a contrasting data set on the availability of resources in the sites' effective environment.

(b) There may not be many of these kind of sites to be found. Comparisons of sites may always be on the basis of only a few cases because the prehistoric occupation of the area during the Neo-American Stage of the order of sedentarism evidently reflected in these two sites may have been sparse. If, as is suggested in Hypothesis 6, settlement of this nature was made possible by an interval of relatively favorable environmental conditions, such settlement may represent extreme westward penetration of Caddoan-like populations into prairie environments. That kind of settlement may have involved only a comparatively small population and persisted for only a short period of time.

For these reasons, any further work at Baggett Branch should attempt to address Hypotheses 5 and 6. This should be done, as we suggest at the outset of this section, within a comparative framework with Cobb-Poole. *If both sites are the object of data recovery, such data recovery should be standardized between them in order to facilitate comparisons of data.*

At the same time, the scientific data potentials of Baggett Branch should be exploited. The potential for seasonality studies of the faunal materials at this site should be investigated, e.g., growth rings in mussel (if well enough preserved) and the growth rings in fish otoliths (if they can be recovered; none found during testing) and white-tailed deer teeth. These data might help to establish if the site was a seasonally occupied camp.

Specific Data Collection Needs

Testing Hypotheses 1 through 6 is clearly an involved process. It may be helpful in designing any future data recovery to indicate key kinds of information that must be collected to allow adequate evaluation of the hypotheses. Preparation of research designs for data recovery should include attention to:

Statistically determined samples of artifacts, combined with judgmental sampling of course, should be used during data recovery, particularly where it is anticipated that analysis will involve statistical techniques. In the event that large samples of material, for example debitage, is recovered (Hypotheses 1 and 2), statistical methods afford the most efficient method of analysis. At the same time, where a dispersed sample of the site matrix (e.g., Hypotheses 1 and 2; possibly 3, 4, 5, and 6) is desired, a statistically determined sampling plan would form a useful basis for these efforts. Statistically-based sampling would also provide a base for use of computer graphics techniques if the latter proved helpful in displaying information about site structure.

Sediments containing pollen should be collected for ex-

traction from all sites investigated during future work (Hypotheses 3, 4, 5, and 6). All definable stratigraphic levels should be used in deposits devoid of detectable natural stratigraphy. In addition to samples selected for evaluation of long-term environmental effects, pollen samples extracted from suspected occupation surfaces and other features may be helpful in defining the economic significance of plant species in sites.

Faunal materials constitute an important source of information not only about past economies but also about past environments (Hypotheses 3, 4, 5, and 6). Careful attention should be given to recovery and analysis of the faunal materials. Of particular importance in connection with Hypotheses 3, 4, 5, and 6 are studies of microfauna and gastropods. These classes of organisms often have rather specific habitat requirements; requirements that can be more informative about past environments than information from larger forms that are more cosmopolitan in their habitat requirements. Of course, information of this kind should be thoroughly integrated with pollen and geological data for maximum analytical value.

Geomorphology and pedology require careful recording as to their setting and characteristics. Testing demonstrated, for instance, the utility of chemical analysis of soils in interpreting Feature 2 of the Cobb-Poole site (41DL148). The same work also emphasizes the importance of determining the depositional histories of the strata within sites, particularly the floodplain sites (Hypotheses 3 and 4). The natural formation processes of the sites must be correlated with the pollen evidence to yield an intelligible record of environmental change and site occupation (Hypotheses 5 and 6).

Site characteristics are important. All of the hypotheses clearly require certain information about site structure. Data need to be produced on indications of extent of site reoccupation, density of artifacts and features per unit volume of site matrix, and chronology of site occupation (particularly Hypotheses 1 and 2). Information about site functions, as reflected in features, is important particularly in relation to subsistence practices.

TIMING AND ORGANIZATION OF DATA RECOVERY

Data recovery aimed at the five sites named above should strive for a two-way frame of analysis, insofar as is possible. Even if we cannot assume that sites within the Archaic and Neo-American Cultural Stages were contemporaneous, it is worthwhile to determine if sites within stages reflect similar settlement strategies (including economy, technology, site structure, and response to environmental variables). This kind of comparative analysis seeks to find patterns of settlement at a synchronic level. On the other hand, however, it is equally important to question whether or not settlement patterns were changing through time, particularly in response to environmental stimuli. Were Archaic-stage peoples, for instance, reacting to different kinds of effective environments than Neo-American populations? This kind of analysis looks for diachronic patterns of change. As we noted in Chapter 6, this kind of analytical framework required a two-way

frame of comparative analysis at synchronic and diachronic levels. The time and organization of mitigation studies should be adjusted to this framework.

Specifically, excavation and analysis of all sites should be organized so that there is constant feedback between sites regarding the progress of the investigations, if all sites are to be investigated at the same time. If it is true, for example, that the Cobb-Poole (41DL148) and Baggett Branch (41DL149) sites represent different functional elements of a Neo-American settlement pattern (whether these sites are contemporaneous or not), it is important that findings at one site be contrasted with data from the other site. If these two sites were to be excavated in a vacuum, an opportunity to make critical comparisons of data based on comparable sampling and excavation strategies might well be lost. Similarly, feedback between sites should allow a unified response to new and unanticipated kinds of data and analytical possibilities. The same condition applies to excavation of the Archaic stage sites, 41DL184, 41DL189, and 41DL199. In both categories of sites, investigators need to be sensitive to possible intersite functional variability.

PROJECTED IMPACTS ON RESOURCES AND RECOMMENDED PRESERVATION ALTERNATIVES

All of the sites discussed above are, in our estimation, likely to suffer adverse impacts as a result of the construction project. The bottomland sites, 41DL149, 41DL184, 41DL189, and 41DL199, will eventually be buried under sediments laid down by water impounded behind Lakeview Dam. While it is unknown whether inundation per se is destructive to sites, the fact that the sites will be buried under substantial amounts of alluvium will almost certainly make any future access to the scientific information contained in them extremely expensive to obtain. Moreover, sites located in or on the bank of streams in the project—this includes 41DL149, 41DL189, and 41DL199—may be subjected to erosion by wave action as the dam fills.

As we noted in Chapter 3, the Cobb-Poole site (41DL148) is located within the dam structure. This site was fenced at the initiative of COE during Phase II work (Robert Burton) and designated a protected area to construction personnel. Long-term effects of flooding and wave action may pose significant threats to the site's integrity. Changes in ground water levels incident to creation of the dam's floodpool may also affect preservation of organic materials in the site. Also, future construction of access roads or lake maintenance facilities on the dam may endanger the site.

In view of these potential dangers, we recommend the following sequence of resource protection alternatives be considered on a site-by-site basis:

Alternative One: If feasible, the project should be redesigned or modified in order to avoid impact on the sites. First consideration should be given to preserving the sites in as pristine a condition as possible.

Alternative Two: Failing the feasibility of Alternative One,

consideration should be given to enhancement of preservation by preserving the sites in place. This may include construction of dams to avoid flooding or treating sites with anti-erosion measures, for instance.

Alternative Three: If the first two measures are not feasible, it will be necessary to give consideration to mitigation of site destruction through excavation of important objects and scienti-

fic information.

In the eventuality that Alternative Three, i.e., resource preservation through mitigative excavation and analysis, is determined to be the only feasible management alternative, we have prepared a recommended mitigation plan in the last chapter of this report.

Part Two: Historical Archaeology

Contributors:

C. Reid Ferring
Nancy G. Reese

9

Introduction to Historical Archaeology at Lakeview Lake

This section presents the results of initial studies of the historical archaeology of sites within the Lakeview Reservoir area (Figure 9-1). This work has been conducted by the Institute of Applied Sciences, North Texas State University, under subcontract with Southern Methodist University. Included in this section are the background to the current research, descriptions, evaluations of the sites, recommendations for future research at the four sites and a research design for mitigation of these cultural resources.

This work was divided over two separate phases of work. In 1979 four sites (41DL181, 182, 191, 196) were investigated. The remaining sites were studied in 1980. Separate reports on these two phases of work were originally prepared. This section of the final report on site investigations represents the merging of the two seasons' research. A marked reduction in funding levels for the second season imposed constraints on the nature of some investigations during the second season.

During the first season, Dr. Kathleen Gilmore acted as Principal Investigator and Dr. Reid Ferring served as Project Manager. During subsequent work, Ferring was Principal Investigator. Advice and assistance from Dr. Terry Jordan, Department of Geography, North Texas State University is gratefully acknowledged. In addition to the authors, the field crews included

Leonard Allen, Gerald Blow, Phyllis Wolf, Kim Koberly, and Cristine Ramaekers.

RESEARCH OBJECTIVES

The primary objectives of this research were concerned with the definition of the nature and historical/archaeological significance of the sites described here. Determination of significance is the necessary prelude to decision-making with respect to eligibility for nomination to the National Register as well as potential mitigation of adverse impacts associated with land-use activities.

The second major objective of this research was the generation of research hypotheses which could be tested during later investigations. These should, in terms of work, lead to statements of "historical, anthropological and archaeological significance."

PREVIOUS INVESTIGATIONS

The status of archaeological research in a project area is an

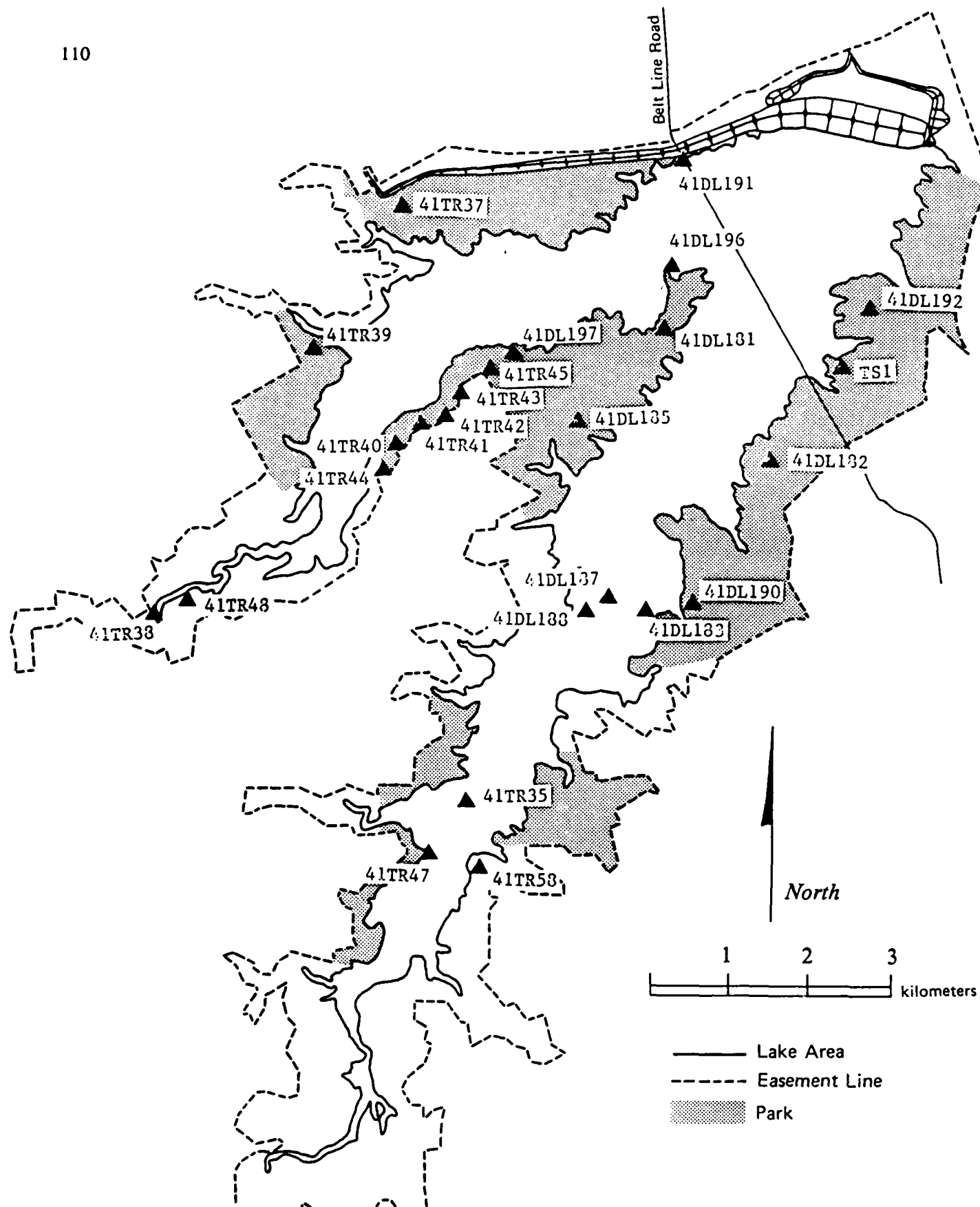


Figure 9-1. Lakeview Project area map showing historical sites.

integral factor in the establishment of levels of site significance (Scovill, Douglas, and Anderson, 1970). The historical background for this study illustrates low status of historical archaeology in the North Texas region. This low status is mainly the result of an absence of research rather than poor quality research.

Within a context of cultural resources management, historical sites have been treated only recently with the same intensity as prehistoric sites in most regions; North Texas is no exception to this general pattern. Few archaeologists in this region have had formal training in historical archaeology. At the same time, few agencies required in-depth treatment of historical sites over the last two decades. As a result, most major cultural resource efforts in this region have contributed little to archaeological knowledge of the historical periods.

Quite distinct shifts in emphasis have emerged as a response to broader concerns for historical resources and more specific demands from contracting agencies. Regional manifestations are best seen in reports concerning the Trinity River Basin (Richner and Bagot, 1978) and Tennessee Colony Lake (Richner and Lee, 1977). These reports dealt with the historical periods explicitly, recovered primary data on historical archaeological sites and standing structures, and provided certain interpretive backgrounds. To date, however, no substantive undertakings in historical archaeology have been published in this region, except at certain military sites.

Historical investigations at Lakeview were initiated during the survey phase (Skinner and Connors, 1979). In the course of the survey, some 25 historical sites were recorded. Each of these consisted of a standing structure or structures and in some places associated features such as cellars, windmills, etc. None was strictly an archaeological occurrence.

Documentation of these sites by the SMU survey team consisted of field observations and occasional photographs. No architectural plans or elevations were made and no surface collections or test excavations were undertaken. Some knowledge of the sites' histories was gained through conversations with local residents, although no oral histories were conducted. The record of these sites was expectedly scant following the survey phase.

METHODOLOGY

Historical archaeologists have only recently become intensively involved in large-scale cultural resources management projects. This heightened involvement, and the relatively new 50 year old significance threshold employed by most agencies, have led to some disparities between traditional objectives and available methodologies in historical archaeology. In many cases the historical archaeologist is faced with recent time periods and standing structures which fall within the 50 year age limit. Both of these demand skills which probably have not been emphasized during the archaeologist's training. Many architectural historians and ethnologists would be more comfortable with some of the situations encountered, yet the scope of the cultural resources management setting is usually such that both archaeological and ethnological approaches are demanded.

During work on the Lakeview historical project, a methodological response was made to the stated and perceived problems at hand. This response is viewed as a fluid one with respect to subsequent stages of work or to future projects of a similar nature. Approaches to Late Victorian archaeology and history must by necessity evolve and mature by trial. Historical archaeology has provided a theoretical basis for the analysis and interpretation of variation in material things which may easily be applied to the Late Victorian setting. Late Victorian archaeology will achieve its potentials, not simply by the application of established approaches to the study, but rather by the successful integration of multiple approaches to the study of Late Victorian lifeways. This testing phase is but a brief introduction to the scope of problems and approaches which the Lakeview historical project should generate.

ON-SITE INVESTIGATIONS

During the first season each primary structure was architecturally documented. With flagged pins as location keys, mapping crews prepared detailed, measured plans of all interior and exterior features of the structure. This included room size, wall dimensions, modifications, etc. Detailed elevations of each facade of each major structure or representative elevations of minor structures were also prepared. Precise measurements of all observable features were taken in the field and were carefully collated in the lab. The plans and elevations presented in this report, therefore, are accurate, measured plans which constitute a permanent record of the structures. Notes were taken on the structural elements, materials, finishing hardware, paint, wallpaper, fixtures such as heating or wiring elements, and visible evidence of architectural change and modification. These notes were dictated in the field according to a rough outline and served to amplify the drawings made earlier.

For the second season only a few buildings were initially documented owing to funding limitations. Essentially similar techniques were implemented as during the first season, yet less detail was recorded.

In the first season test excavations at each site were limited to backhoe trench digging. At the time these were deemed adequate approaches to the apparently minimal extent of buried archaeological deposits. In retrospect, controlled excavations seem to have been warranted and would be recommended in the future when surface conditions suggest their potential is high for revealing *in situ* materials.

During the second season limited test excavations were conducted at a number of sites. These were all controlled hand excavations, with arbitrary or natural levels used within test units. All matrix was screened through 5 mm mesh.

ORAL HISTORIES

Four oral histories were undertaken. Summaries of each are presented in the site descriptions. Permanent copies of these will be placed in the libraries of North Texas State University and Southern Methodist University and will be supplied to the

contracting agency separately.

The oral histories were arranged with Mr. Gwen Hintze, Miss Ruby Pool, Mr. James Cain, and Mrs. Robert Loyd. The interviews were taped and transcribed. After editing for general form of speech (usually entailing the removal of habitual speech crutches such as "ugh" or "okay"), the typed transcript was returned to the interviewee for comment and clarification where needed. Another edition, with some asides or impertinent comments deleted, was prepared and sent to the interviewee for final approval. Permission to use the transcription was acquired formally.

TRACT REGISTER SEARCHES

Tract register, or deed searches, were undertaken to establish the pattern of land ownership and transfer for the sites to be tested and for the borrow areas specified by the Scope of Work. These were productive with respect to the goal of determining ownership patterns, but not with respect to location of actual structures on these tracts. Virtually the entire project area, exclusive of Ellis County (where no sites were tested) was researched in the Dallas and Tarrant County courthouse records. Copies of these searches are on file with the original manuscripts at North Texas State University and Southern Methodist University.

10

Historical Background

At the Trinity River near what is now Eagle Ford is the beginning of a chain of rugged crags, covered with the evergreen of the cedar. At the beginning of these crags the hills are small and almost bare, then they gradually get larger and higher and the cedars thicker.

They run in a southerly direction, a little to the west for 14 or 15 miles, then turn due west for two or three miles, when they bend back south, and begin to grow smaller and disappear in Ellis County... On the west side of these crags, a creek winds its way to the Trinity River... To the early settlers these crags, from a distance, looked like mountains, so they called them "The Cedar Mountains" — and called the creek, "Mountain Creek." (Vinyard n.d.: 32)

Settlement in the Mountain Creek area was actually initiated in the early 1840 s when the government of the new Republic of Texas began searching for a way to alleviate the financial strain brought on by their fight for independence. They believed a partial solution to this problem would be found with an increase in population. They became eager for the benefits to be gained by an influx of immigrants. Up to this time, however, a permanent land policy had not been established. The Congress had been divided on which policy to adopt. While most citizens of the Republic had arrived under the Mexican "Empresario" system, many seemed inclined to favor the United States policy in which

a fixed price was charged per acre. The latter, while easing their finances, would also put them in competition with other western states. Many felt this would not provide the impetus they required to encourage immigration.

A variety of temporary measures was quickly initiated to reassure those settlers, who had arrived before, during, and immediately after the revolution, of their land claims. Then, on February 4 of 1841, the Fifth Congress of the Republic of Texas adopted a law entitled "An Act Granting Land to Emigrants." This law was based on a petition signed by twenty men interested in colonizing unoccupied portions of the Republic. This law provided the means for the settlement of the north-central region of Texas, including the Mountain Creek area.

The twenty men responsible for proposing the scheme maintain a rather infamous place in Texas history as the founders of the Peters Colony. While chiefly motivated by financial reasons, they were also directly responsible for promoting much of the immigration into the area. Four separate contracts were negotiated with the Texas Government by various agents of the Texas Emigration and Land Company, as they would come to call themselves. The first contract did not include the Lakeview Project area, but the remaining three did (Figure 10-1). The second contract signed on November 9, 1841, extended the colony lands westward, encompassing the

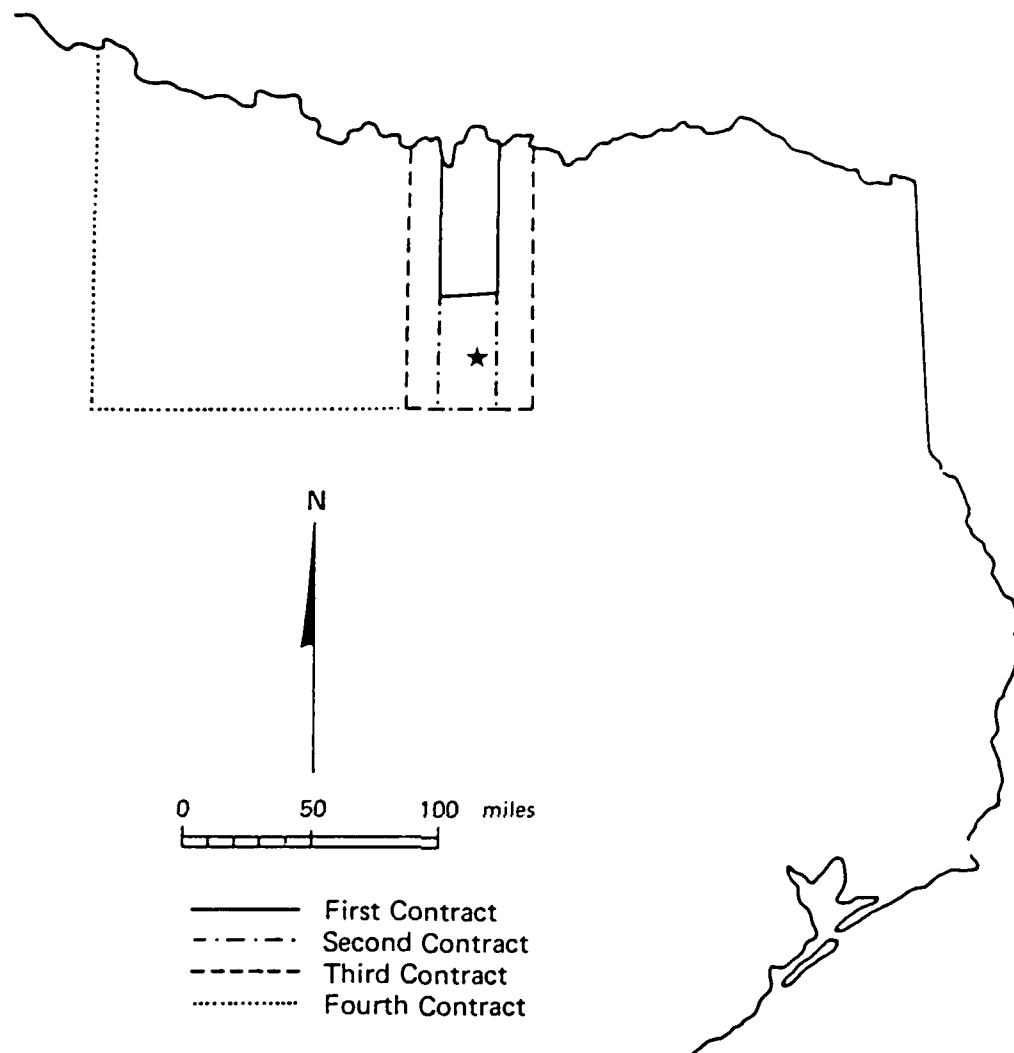


Figure 10-1. Map showing extent of lands in Peters Colony contracts.

three forks of the Trinity and the third, of July 26, 1842, pushed it still further.

Peters Company, approximately twenty men who comprised the Texas Emigration and Land Company, was not working in the best interest of the settlers. This can perhaps be more clearly seen when examining their fourth contract with the Republic of Texas (Connors 1959). The fourth contract was signed on January 16, 1843. In it the Texas Emigration and Land Company gained over 10 million acres of land to colonize for which they were required to do very little. They were responsible for surveying the properties and providing assistance in house construction. In return for this, they could retain up to one half of a settler's land for their fee. Also included was an incredible clause stating that land titles were to be issued to company agents rather than the settlers themselves. All this, not surprisingly, was to lead to much hostility between the Company and the settlers.

At this point we begin to relate directly to the Mountain Creek area. Small settlements had begun to cluster around rivers and creeks throughout Dallas County; Farmers Branch, Eagle Fork, Trinity Mills, Lancaster, and Cedar Hill are a few which have survived in some fashion from that period. Many others did not withstand the test of time.

Martin Gaudin, who traveled the region in 1845, recorded the following in his journal:

...this morning we started on our Journey traveled a bout four miles when we got into Peters Colliny this part of the Country is the delightfulest country my eyes ever beheld there is a plenty of timber for to suport all the praries the praries is the richest looking soil i ever saw tis black this Country has plenty of water and many priviledges we past the Ceder springs and dallas these places are mereley settlements of emigrants many of hoom (whom) are living in Camps this is on the river Trinity... (McElhaney 1979:163)

By 1845 when Texas had joined the United States, it

rudiments of businesses had begun to emerge in the region around Mountain Creek. Grist mills were established on Farmers Branch and the headwaters of Joe's Branch. These were followed by more mills, on 5 Mile Creek and Coombes Creek. The County of Dallas was taking shape, both economically and politically.

The Mountain Creek area had begun to attract residents also. The chain of "rugged crags covered with the evergreen of the cedar" (Vinyard n.d.:32) attracted settlers, who took them from a distance to be mountains, from which derived "Mountain" Creek. The combination to be found here of lumber, water, and farmable land was a strong enticement to incoming families. Gauldin must certainly have passed close to the area, recording the following: "...we then came to where the prairie was first rate and many large groves of Cedar the settler here make fence and houses of Cedar...(McElhaney 1979:163).

The cabins of James Horton and Timothy Carpenter were quickly joined by those of Crawford Trees and Samuel Ramsey. Settlement followed the creeks, then spread to accommodate the growing influx of immigrants (Figure 10-2).

One of the first settlers to come to the Mountain Creek area, when it was still Peters Colony in 1845, was Crawford Trees. While not actually residing within the Lakeview project area, he owned several tracks of property there. Although he came to the region as a single man from Illinois, his license to marry Anna Kimmel was the first recorded after Dallas County was created in 1846 (Vinyard, n.d.:14). Like others he was attracted to the rich farmlands in combination with the abundant supplies of wood and water.

All was not calm, however, as a growth is generally accompanied by some growing pains. Disharmony in this case was brought on by Peters and his associates, who would, no doubt, claim to have suffered the most. Sherman Converse, an English gentleman who had negotiated the fourth contract for Peters Company, had agreed that they would settle "not more than 10,000 families" (Connors 1959:54) on the colony lands, an ambitious undertaking at the very least. This seems ambitious and expensive especially for the group of inexperienced "Empresarios," who were neither organized nor available. Early settlers began to question the status of their claims, and this undercurrent of dissatisfaction began to penetrate the confines of the colony. Groups of settlers coming to the colony began to pass those leaving it. Peters and Associates tried to compensate by publishing announcements in newspapers embellishing the attractiveness and emphasizing the stability of the colony. The following is an example from the Northern Standard of June 24, 1844.

Immigration — We have received information several times, within the last few weeks, that great numbers of immigrants are coming into the District; crossing above here, and making their way to the South Sulphur, and the Trinity. The stream is continual and they come, not singly, but in bodies. (Connors 1959:69)

This tactic may have stimulated immigration to the colony, but it did nothing to alleviate the hostilities building there. Settlers who had been there three years and improved the property, per the contract agreement, began to demand title to their lands, which the Company was slow in producing. In

addition, the services that the Company was charged with providing, surveying and assistance in construction, proved to be a reality on paper only. Settlement continued, but so did resentment.

The breaking point came with what has since been called the "Hedgecoxe War." Oddly enough this was initiated by interest outside the colonists or the Company. Independent land speculators had come to resent the restrictions the colony boundaries presented. Recognizing the ineffective nature of the Company's agents and relishing the unallocated lands held in reserve by them for supposed "services rendered," speculators began to trespass on colony properties. Utilizing the animosity that already existed between the Company and the settlers, they began to organize committees and present formal complaints before the state government. Inadvertently, they provided the nucleus for self-government by giving the colonists a common cause to fight against.

The protests of the colonists were finally answered in 1850, when on January 21, Thomas William Ward was appointed to study the controversy and issue certificates verifying the property due each colonist. This temporarily abated the hostilities, but by 1852 they were to be reinstated with increased fervor.

The final outcome was precipitated by the Company's current agent, Henry O. Hedgecoxe. In retrospect, Hedgecoxe appears to have had some redeeming qualities, but these were totally outweighed by the abrasive, autocratic nature he continually displayed to the colonists. Settlers eager to receive official title to their lands began to project all their dissatisfaction with the Company on this one man. In 1852 pent-up resentment finally erupted in the aforementioned war. While hardly a war, angry colonists agitated into action by land speculators, broke into Hedgecoxe's office, threatened him and absconded with Company records, placing them in the new Dallas County Courthouse. Peters and Associates, tired of dealing with what had turned into a continual headache, relinquished their responsibility for the colony by fulfilling their contract agreements, i.e., surveying properties and assisting in road and house construction. They managed to retain, however, sizable tracts of land for their "trouble."

The part of the speculator in the foregoing is graphically demonstrated by the transactions occurring on one property included in the Lakeview Reservoir, James Hughes survey A-1492 (of two-thirds league on Mountain Creek) (Figure 10-3). Granted to James Hughes by the State of Texas in 1846, this property was to become the home of the Penn family, whose house still remains. From James Hughes the property passed to his brother Moses in 1847 (Deed Records, Vol. B, p. 563). He in turn appointed James E. Patton as his agent in surveying and marketing the land. James Patton, a land speculator, was charged with trespassing by the Texas Emigration and Land Company in the same year and ordered to keep off Company property. He is also listed among those representing Ellis County in voicing their complaint against the Company's practices. The effectiveness of the injunction restraining him from Company lands appears to be slight. Deed records reveal that he is responsible for negotiating over 46 transactions on the Hughes survey between 1847 and 1852 (Figure 10-3).

The deed records also show the true nature of James Patton's

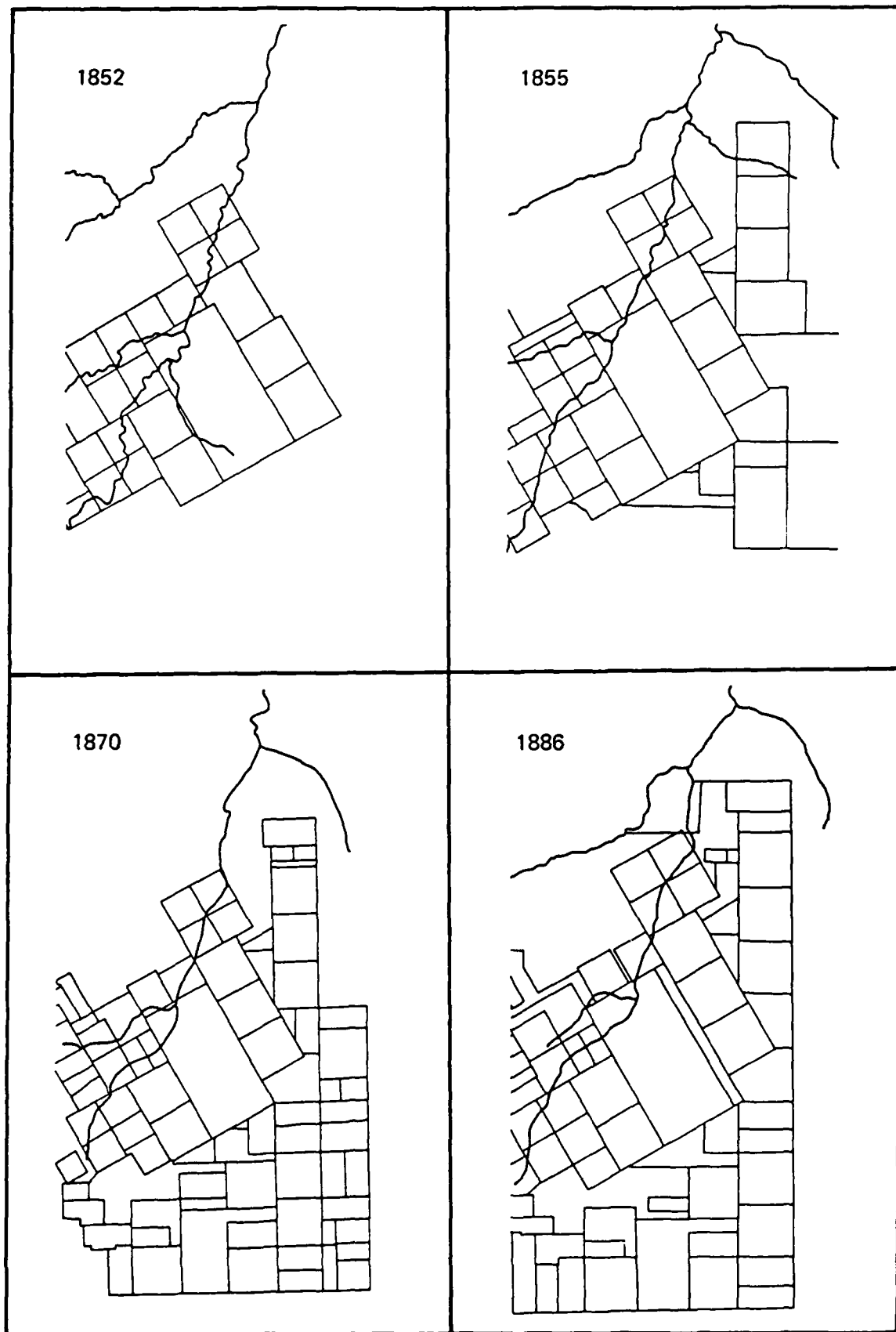


Figure 10-2. Map showing surveyed lands around Mountain Creek. Taken from land ownership maps courtesy of the Dallas County Heritage Society.

State of Texas to James Hughes 2952 acres

1850

? 1472 Weatherford 1134 acres

1851

? 1328 1134

1852

? 1266 1134

1861

? 1266 Penn 1134 acres

1878

? 1092 Trousdale 174 acres 1134

1888

? 992 1308 Smith 100 acres

1892

? 941 1359 100

1894

? 868 1359 173

1905

? 1945 273

Figure 10-3. Land transactions on the James Hughes Survey.

interest. Aside from the fact that he had no legal right to negotiate transactions on what was at the time colony property, he was charging a much higher price than can be considered reasonable. The customary price was around \$2.00 an acre, but Patton was asking \$5.00 to \$10.00 on the tracts he transferred. There is also some evidence to indicate that he sold more property than actually existed.

While the motives of Patton and others like him were questionable, their impact is self-evident. New families brought new stimulus and increased prosperity to the area. Throughout the 1840's the closest markets to the three-county region had been Houston and Shreveport, both long trips by ox-wagon. Increased wheat production, coupled with accessibility to grist mills, gave the area a valuable commodity to trade. By 1852 flour was being exchanged for pine logs from east Texas (Stark, 1935:66). Improved roads and ferry crossings offered encouragement to prospective businessmen, such as Alexander Cockrell. Utilizing the available resources, he established a brick factory at Dallas in 1853. This same man was also responsible for the construction of the first bridge spanning the Trinity in 1854 (Cochran 1928).

1849 saw the establishment of Tarrant and Ellis Counties. Camp Worth changed to Ft. Worth, where the rudiments of a city were forming. Dallas County added two cotton gins to its growing commerce. In 1850 transportation networks began to substantially improve; ferries were established at numerous points on the Trinity, joining east and west Dallas County. The Ft. Worth-to-Yuma, Arizona stageline began operation. All these combined to form the texture of the emerging region. By 1850 the population of Dallas County alone was 2,743 (Table 10-1). The census also reveals that while most of the individuals with jobs were farmers, many with specialized occupations were attracted to the developing region (Table 10:2).

Ft. Worth, after suffering an initial setback in 1853 when abandoned as a military establishment, soon recovered and began to grow at a sporadic rate. The barracks and other structures vacated by the soldiers, provided "ready-built" stores for incoming merchants. By 1856, she too could boast of mills and gins.

The Mountain Creek area benefited from the growth of both these emerging cities. Located in between, the advantages of both could be enjoyed. Cedar Hill, Little Bethel, Grand Prairie, and Florence Hill became points of congregation. The 1850's show the arrival of families who would make Mountain Creek their home for the next 100 years. Even the devastating Cedar Hill tornado of 1856 was only a momentary setback. The families of Penn, Loyd, Nance, Rapes, and others brought stability to the area.

Major Penn and his family came from Illinois, establishing a residence on the east side of the "mountain" by 1856 (41DL192). He became a large landowner, whose primary interest was stock raising.

In 1859, one of Major Penn's daughters, Mary Jane, married Napoleon Bonaparte Anderson. These two became the founders of another prominent family, building their home "southwest of Penn Hill in the valley and on the bench by the mountain" (Vinyard n.d.: 69). Their first cabin stood near a spring, west of

the two-story house built later to accommodate a growing family (41DL19U).

Marion Loyd brought his family to Dallas County in 1856. By 1859, he had settled a tract on the Robert Crawford survey in southeastern Tarrant County. They built a four-room dog trot here the same year, in which descendants of his family still reside (41TR39).

Communities in the surrounding region also began to emerge. Mansfield, established in the 1840's, had a steam powered mill for processing flour, meal, and lumber by 1850 (Webb, 1952: 137). By 1856, Cedar Hill had stores, blacksmith shops, and a post office. Little Bethel provided other services with its school and church organized in 1855. Located on land donated by Crawford Trees, a description of this building still exists.

The house was made of logs and faced the west. A fireplace was in the east end, another door was in the north side, the teacher's desk or table was in front of the fireplace, and across the south side was one long log seat made by splitting a big log open and putting legs that crossed in the middle at each end. Another seat like this, only shorter, was west of the door on the north side; to the east side of the door was piled the wood to be used for warming the room (Vinyard n.d.: 52).

In 1850 the population of Dallas County was 2,743. By 1860, with the Civil War on the verge of erupting, census reports list Dallas County with a population of 8,665 (Table 10-1). Tarrant and Ellis Counties also show substantial gain.

Dallas supplied flour, clothing, and men to the Confederate cause. Wool carding machines established on Ten Mile Creek and in Lancaster provided the raw materials for local women to weave into garments. When one reviews the origins of the settlers (Table 10-3), their sympathies with the South are understandable. The largest percentages of people were from Alabama, Tennessee, Mississippi, Arkansas, and Louisiana.

At the close of the war, the main emphasis was again turned towards local interests. The three-county region continued to thrive commercially. This growing commercial prosperity attracted a large diversity of individuals to the region (Tables 10-4 and 10-5).

Another family to take up residence in the Mountain Creek area during this period was that of Andrew T. Lowe. Mr. Lowe came to Tarrant County in 1865, settling on a farm east of Mansfield (41TR40). Originally from Illinois Mr. Lowe had been in Texas since 1848. Mr. Lowe farmed this property until 1892 when he retired to Mansfield (Lewis 1895: 493).

The 1870's brought more European immigrants into the region. Germans and French began to arrive during this period in greater numbers. The Reitz's, a German family, came to the Mountain Creek area during the 1870's, settling on their land (41TR45) by 1879.

The great cattle drives reached their peak during the 1870's. The Chisolm Trail, a popular route from Central Texas to the Kansas markets, ran through the region. Ft. Worth was an outfitting stop along this trail. Drovers often galloped through the Mountain Creek area purchasing cattle from local residents to increase the size of their herds. Yet these great drives were destined to be short lived. Barbed wire, invented in 1873, began appearing on Texas farms in the last year of the decade.

TABLE 10-1
Population Statistics for Dallas, Tarrant, and Ellis Counties, Texas

<u>YEAR</u>	<u>DALLAS</u>	<u>ELLIS</u>	<u>TARRANT</u>	<u>TOTAL</u>
1850	2,743	989	664	4,396
1860	8,665	5,246	6,020	19,931
1870	13,314	7,514	5,788	26,616
1880	33,488	21,294	24,671	79,453
1890	67,042	31,774	41,142	139,958
1900	82,726	50,059	52,376	185,161
1910	135,748	53,629	108,572	297,949
1920	210,551	55,700	152,800	419,051
1930	325,691	53,936	197,553	577,180
1940	398,564	47,733	225,521	671,818
1950	614,799	45,645	361,253	1,021,697
1960	951,527	43,395	538,956	1,533,878

Compiled from Texas Almanac

The ending of one era is the beginning of the next, and the Houston and Texas Railroad was finally completed through Dallas in 1872. The Texas and Pacific Railroad was finished by 1873. The year of 1872 also saw the construction of the first bridge to span the Trinity River. This allowed those living west of the Trinity easy access to Dallas for supplies and offered them a market in which to sell their produce. This, coupled with the coming of the railroad, turned Dallas from a small country town into a fast growing commercial center.

The 1880 s brought a new prosperity to the region. Its growing commerce and abundant farmland combined to make it even more attractive to incoming settlers.

Railroad lines tripled in the ten years between 1870 and 1880 (Figure 10-4). These new modes of transportation finalized the stability of the area. New waves of immigrants brought their talents and energy. Ernest and Fred Hintze are characteristic of this period, hard workers whose reward was the land they bought and the security it provided.

The year of 1882 marked the arrival of two more families into the project area, the Holvecks and the Ballwegs. John Baptist Holveck was born in France during the early 1800 s. He brought his family to the United States in 1872, settling first at Waxahachie. In 1882, they moved to a farm close to Cedar Hills, (41DL183), which they worked until it was purchased by the Corps of Engineers in 1973.

Martin M. Ballweg, originally from Germany, brought his family to the Mountain Creek area from Wisconsin in 1882. They settled on a farm close to the Holvecks on which they quickly built a two story house "which at that time was the showplace of the community" (Sims n.d.).

The majority of the residents in the Mountain Creek area were farmers. This occupation was fairly lucrative during the 1880 s. The primary cash crop was cotton, with corn and wheat as secondary crops. Surrounding communities grew in response to the needs of farmers. The town of Gertie, of which nothing remains today, was probably the closest market to the Mountain

TABLE 10-2
Occupation of Inhabitants for Dallas County According to 1850 Census

FARMERS	437	TRADERS	2
LABORERS	18	CHAIRMAKERS	2
BLACKSMITHS	13	PRINTERS	2
CARPENTERS	9	GUNSMITH	1
LAWYERS	7	COOPER	1
SCHOOL TEACHERS	6	TAILOR	1
CLERKS	6	PLANTER	1
PHYSICIANS	5	HUNTER	1
WAGON MAKERS	4	WHEELWRIGHT	1
MERCHANTS	4	CARRIAGEMAKER	1
MILL WRIGHTS	3	CABINET MAKER	1
SHOEMAKERS	3	COFFEESMITH	1
MINISTERS	3	INNKEEPER	1
SURVEYORS	2	FERRYMAN	1
SADDLEMAKERS	2	DENTIST	1
PLASTERERS	2	EDITOR AND LAWYER	1
STONEMASONS	2	UNEMPLOYED	2

Compiled by E. B. Comstock

Creek area. As described by a local resident:

On a road too Mansfield there was a little place called Gertie, gin, blacksmith shop, general store, etc. Like so many places then in farming country, that were a great benefit too farmers. As that is where we got the mail, in a little post office in one corner of grocery store. Our dad made frequent trips there, too store, blacksmith shop, and had some cotton ginned at gin....On rainy days, Dad and Uncle Comer would often walk too the little village to get some needed items and visit with farmers. (Sims n.d.) (sic).

During the 1880 s another type of farmer began to enter the

area, the tenant farmer. Many of the houses scattered throughout the Mountain Creek area were once inhabited by renters and their families (41DL185, 41TR35). Almost 40% of all farmers in Texas were tenants during the 1880's (Green 1977: 135). Individuals would often purchase property as an investment or receive it as inheritance. Many of these people, not interested in farming the land themselves, would rent the property for a share of the profits. One third of the grain and one fourth of the cotton were the customary "rent" most absentee landowners received. Ideally this allowed the tenant to save enough money to purchase his own land, although it was not often the way things worked

TABLE 10-3
Birth Places of Inhabitants of Dallas County (United States Census Data)

	1850	1860	1870
ALABAMA	23	77	353
ARKANSAS	10	55	136
CONNECTICUT	4	4	2
DELAWARE	0	4	2
DISTRICT OF COLUMBIA	1	0	0
FLORIDA	0	0	50
GEORGIA	15	52	190
ILLINOIS	71	324	402
IOWA	30	119	218
KENTUCKY	84	648	800
LOUISIANA	5	7	37
MAINE	0	0	4
MARYLAND	4	16	0
MASSACHUSETTS	2	9	1
MICHIGAN	0	0	4
MISSISSIPPI	1	53	172
MISSOURI	33	156	451
NEW HAMPSHIRE	1	3	1
NEW JERSEY	3	11	8
NEW YORK	12	52	37
NORTH CAROLINA	67	140	186
OHIO	54	110	118
PENNSYLVANIA	21	39	31
SOUTH CAROLINA	28	66	142
TENNESSEE	178	535	910
TEXAS	0	0	251
VERMONT	2	9	7
VIRGINIA	98	226	278
IRELAND	2	17	12
ENGLAND	6	17	13
NORWAY	3	1	0
GERMANY	2	10	6
MEXICO	1	0	0
SCOTLAND	0	1	1
CANADA	0	7	2
FRANCE	0	85	45
FINLAND	0	4	0
PRUSSIA	0	7	3
BELGIUM	0	6	8
SWITZERLAND	0	12	4
HUNGARY	0	1	0
NOVA SCOTIA	0	1	0
POLAND	0	2	0
SWEDEN, ICELAND, DENMARK	0	2	46

TABLE 10-4
Occupation of Inhabitants of Dallas County According to 1860 Census

FARMERS	1134	MILLINERS	2
FARM LABORERS	197	TAILORS	2
CARPENTERS	61	COOPERS	2
LABORERS	40	RAILROAD CONTRACTORS	2
CLERKS	30	FARMERS AND SADDLERS	1
BLACKSMITHS	28	FARMERS AND BLACKSMITHS	1
SCHOOL TEACHERS	21	FARMERS AND LAWYERS	1
PHYSICIANS	21	FARMERS AND CARRIAGEMAKERS	1
MERCHANTS	16	MILL WRIGHT	1
WAGGONERS	15	HOTEL KEEPER	1
MILLERS	15	DEPUTY POSTMASTER	1
SHOEMAKERS	11	FARMER AND JUSTICE OF THE PEACE	1
WAGONWRIGHTS	10	WATCH	1
PHYSICIANS AND FARMERS	9	PLASTERER	1
LAWYERS	9	STONE MASON	1
BRICKMASONS	8	LITHOGRAPHER	1
GROCERS	5	WELL DIGGER	1
TEAMSTERS	5	SILVERSMITH	1
TRADERS	5	AMBROTYPEPIST	1
MACHINISTS	4	TURNER	1
STAGE DRIVERS	4	CHIEF JUSTICE	1
STOCKRAISERS	4	JUSTICE OF THE PEACE	1
HOSTLERS	3	DISTRICT JUDGE	1
SADDLERS	3	COUNTY SURVEYOR	1
CABINETMAKERS	3	CONSTABLE	1
ENGINEERS	3	CLERK DISTRICT COURT	1
FARMERS AND MILLERS	3	CLERK COUNTY COURT	1
FARMERS AND MERCHANTS	3	DEPUTY CLERK	1
MINISTERS	3	SHERIFF	1
PRINTERS	3	POLITICIAN	1
RETIRED FARMERS AND CARPENTERS	3	BRICK MAKER	1
MILL WRIGHTS	2	PAINTER	1
TINNERS	2	BOOKKEEPER	1
WOOL CARDERS	2	GARDNER	1
OVERSEERS	2	LIVERY STABLE	1
CARRIAGE MAKERS	2	MATTRESS MAKER	1
HERDSMEN	2	BAKER	1

out.

During the 1890 s this situation was amplified by a depression. Many small farm owners, unable to make their payments, lost their property and were forced into tenancy. Yet this situation began to resolve itself towards the end of the century.

The turn of the century brought about a return to prosperity. In the Mountain Creek area, this is reflected in many of the houses that date from this period. The Bowman (41TR42) and Foster (41LD188) homes are among these. Sam Street's map of Dallas County in 1900 (Figure 10-5) shows the County crisscrossed by wagon roads, leading to innumerable points of commerce and congregation.

The turn of the century also brought about an increase in absentee landownership in the Mountain Creek area. Many of

the homes here were occupied by renters or tenants. By 1910, over 50% of all the farmers in Texas were tenants (Green 1977: 135), another situation difficult to overcome. Rising land values had caused many absentee owners to feel that the customary rents of thirds and fourths was not adequate, and they began to demand additional cash payments. This, coupled with exorbitant interest rates sometimes up to 35% per annum, made it almost impossible for the average renter to better his situation.

This plight would, of course, worsen during the Great Depression. During this time a great number of absentee owners returned to their land, displacing the renters. There seems to be some architectural evidence in the Mountain Creek area that reflects this "return to the land" during the Depression.

TABLE 10-5
Occupation of Inhabitants of Dallas County According to 1870 Census

FARMERS	1367	STOCKRAISERS	3	GINNER	1
HOUSEKEEPERS	185	HOTEL KEEPERS	3	HOTEL CLERK	1
DAY LABORERS	86	DENTISTS	3	FOUNDRY WORKER	1
MERCHANTS	66	SEAMSTRESSES	3	LAND AGENT	1
CARPENTERS	66	MUSIC TEACHERS	3	THEATRICAL MAN	1
PHYSICIANS	40	U S DEPUTY MARSHALLS	3	WATCH MAKER	1
CLERKS	30	COUNTY SURVEYORS	2	PEDDLER	1
BLACKSMITHS	23	POSTMASTERS	2	TAILOR	1
LAWYERS	23	MUSICIANS	2	CONFECTIONER	1
MILL MAKERS	20	BARBERS	2	BANKER	1
TEAMSTERS	20	SHERIFFS	2	SAILOR	1
STONEMASONS	17	HORSE DEALERS	2	COUP MAKER	1
SADDLERS	13	HORTICULTURALISTS	2	STAGE DRIVER	1
PAINTERS	8	TRADERS	2	COOPER	1
MINISTERS	7	JUSTICES OF PEACE	2	COTTON BROKER	1
CABINET MAKERS	7	FERRYMAN	2	SHINGLE MAKER	1
GROCERS	7	BREWERS	2	HUNTER	1
WAGON MAKERS	6	RETIRED DOCTORS	2	HUCKSTER	1
SERVANTS	6	BANK CLERK	2	BAKER	1
SHOE MAKERS	5	MAIL CARRIERS	2	ARTIST	1
CATTLEBROKERS	5	LIFE INSURANCE AGENT	1	DAIRYMAN	1
CATTLEDRIVERS	5	PLOW SHOPKEEPER	1	BROOM MAKER	1
WHEELWRIGHTS	5	POLICE JUDGE	1	LAUNDRESS	1
BUTCHERS	5	SCULPTOR	1	DRUGGIST	1
ENGINEERS	5	TINSMITH	1	STABLE KEEPER	1
MACHINISTS	4	REPRESENTATIVE	1	AUCTIONEER	1
PRINTERS	4	TOBACCONIST	1	PLANTER	1
GUNSMITHS	4	RETIRED FARMER	1	TEACHER OF RIGHTEOUSNESS	1
PERFORMERS	4	TANNER	1	BLIND	1
PHOTOGRAPHERS	4	NOTARY PUBLIC	1	INSANE	1

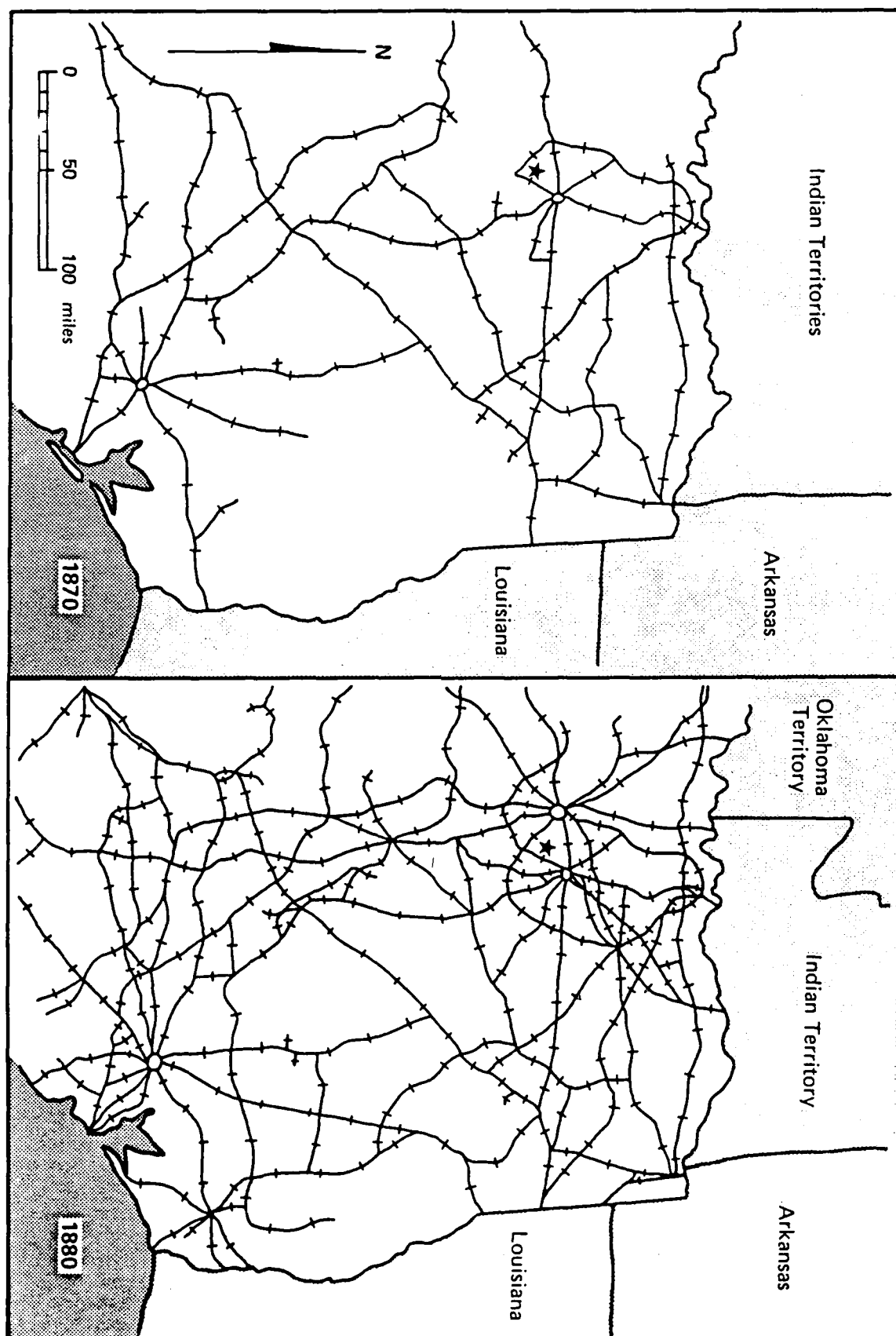
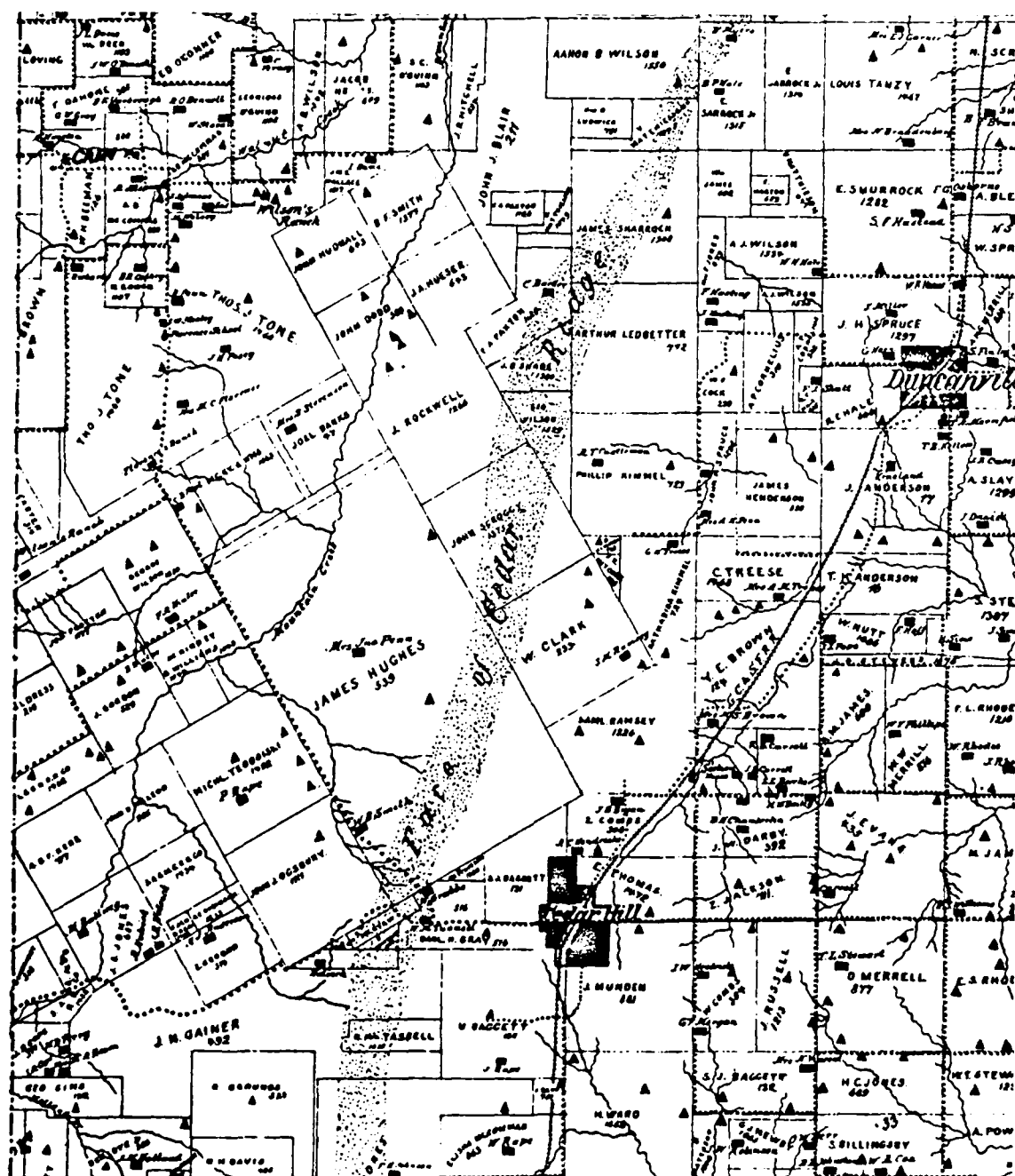


Figure 10-4. Map showing the development of the railroads in East Texas.



■ Land owners house

▲ Tenant house

..... Wagon roads

+ + + + Railroads

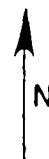


Figure 10-5. Section of Sam Streets Map of Dallas County for 1900.

11

Site Descriptions

INTRODUCTION

This chapter provides the descriptive information on the sites investigated in both the 1979 and 1980 seasons. As indicated in the introduction to this section, differing levels of treatment are evident for the various sites. When applicable, data from test excavations are provided, as are summaries of oral histories related to the specific site. Full transcriptions of the oral histories are available from the Institute of Applied Sciences, North Texas State University. The estimated date of initial settlement is provided in brackets after the site name and number heading.

41FT35 THE LITTLE HOUSE SITE (CA. 1930?)

This site consists of one structure, a well casing and a few piles of modern trash in gullies to the southwest of the house. This appears to be a tenant house, but no details of its construction or occupants could be acquired from local residents.

The house is a minor variation on the theme of frame type tenant houses. It has three rooms, with the two smaller rooms

arranged symmetrically around the central one (Figure 11-1). The smaller rooms appear to have been added somewhat later to the central room.

Braced frame construction is used for each room. The foundation consists of cedar piers, with conventional sills and floor joists, all made of milled lumber and wire nails. The interior walls are made of mixed plank lumber, and all appear to have been wallpapered. Trim on windows and doors is accomplished with simple 1 × 4 pieces. There are exterior doors on the north and south walls of the central room and one on the north wall of the east room. The original structure had No. 105 exterior siding and a pitched shake roof. The additions have shi lap siding and pitched roofs. All soffits are enclosed. A ceiling braced chimney is present in the eastern end of the central room; the bricks are unmarked modern forms. The entire house is wired, but it is not clear as to whether the wiring was added later or not.

The framing technique, as well as the materials used in construction, suggests that this house was probably constructed sometime around 1925-1930. It is probably a tenant house for one of the surrounding farms, or possibly a depression house reoccupied and enlarged as was common in the 1930s. Little potential for additional work at the site is evident.



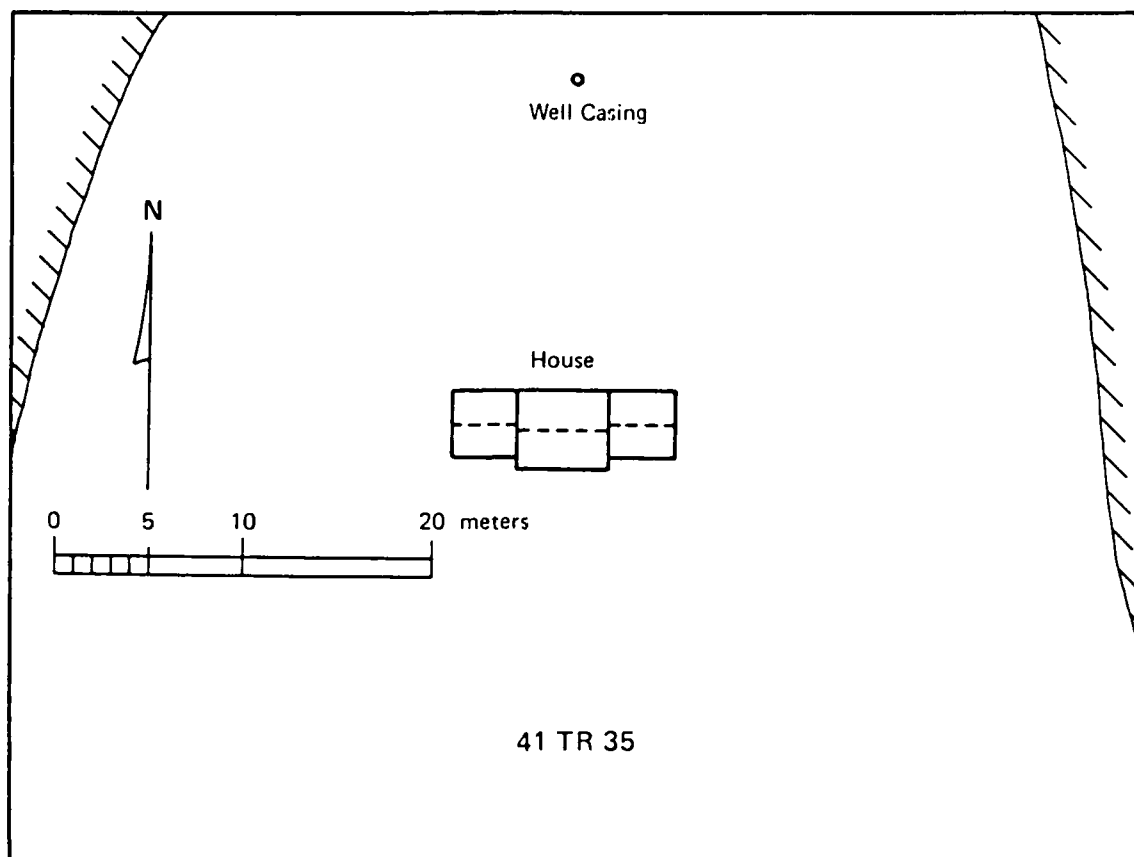


Figure 11-1. Map of site 41TR35.

41TR38 THE BRIDGE SITE

Located on Walnut Creek near the western limits of the Project area, this Pony Type truss bridge appears to have been relocated to its present position and substantially modified through its inclusion in a more modern total span (Figure 11-2). The plate noting its manufacturer and possible date of construction has been stolen. Although the Warren variety of truss construction, of which this is an example, has been made since the nineteenth century (Comp and Jackson 1977), the fact that this bridge appears to have been relocated makes its potential eligibility for inclusion in the National Register of Historic Places questionable. No local informants could remember exactly when the bridge was repaired to its present condition or whether it had in fact been relocated. A suggested use for the old part of the bridge would be to be used as a pedestrian walk-way for access to some portion of a park facility.

41TR39 THE LOYD SITE (1859)

The Loyd site is one of the largest continually occupied homesteads in Tarrant County. Today a number of descendants

of Francis Marion Loyd occupy the premises, notably Mrs. Robert Loyd, his daughter-in-law, who lives in the modified dog run house built by Francis Marion Loyd in 1859. An historic marker commemorates the site.

An interview with Mrs. Robert Loyd, and her son, Marion Loyd, provided considerable information concerning the family history, the structure of the site (including feature locations) and various aspects of daily life throughout the last 100 years in the area. While numerous visits were made to the Loyd homes, only initial inspection of the site was possible, and no test excavations or surface collections were made. All available information suggests that the site is of considerable historic interest, and has the potential to contribute to a number of problem areas outlined in the research design. Test excavations would be necessary to fully evaluate site potential however, and these must await further negotiations with the site owners. A number of potential areas of investigation will be briefly discussed.

The original structure at the site was a four room dog run style log house. While it has been reported that lumber from the house was milled near Dallas and hauled to the construction site, an old photograph of the house suggests that the logs were hand hewn (Figure 11-3). It is possible that the framing pieces for the roof or floors were milled or that the photograph is simply deceptive.

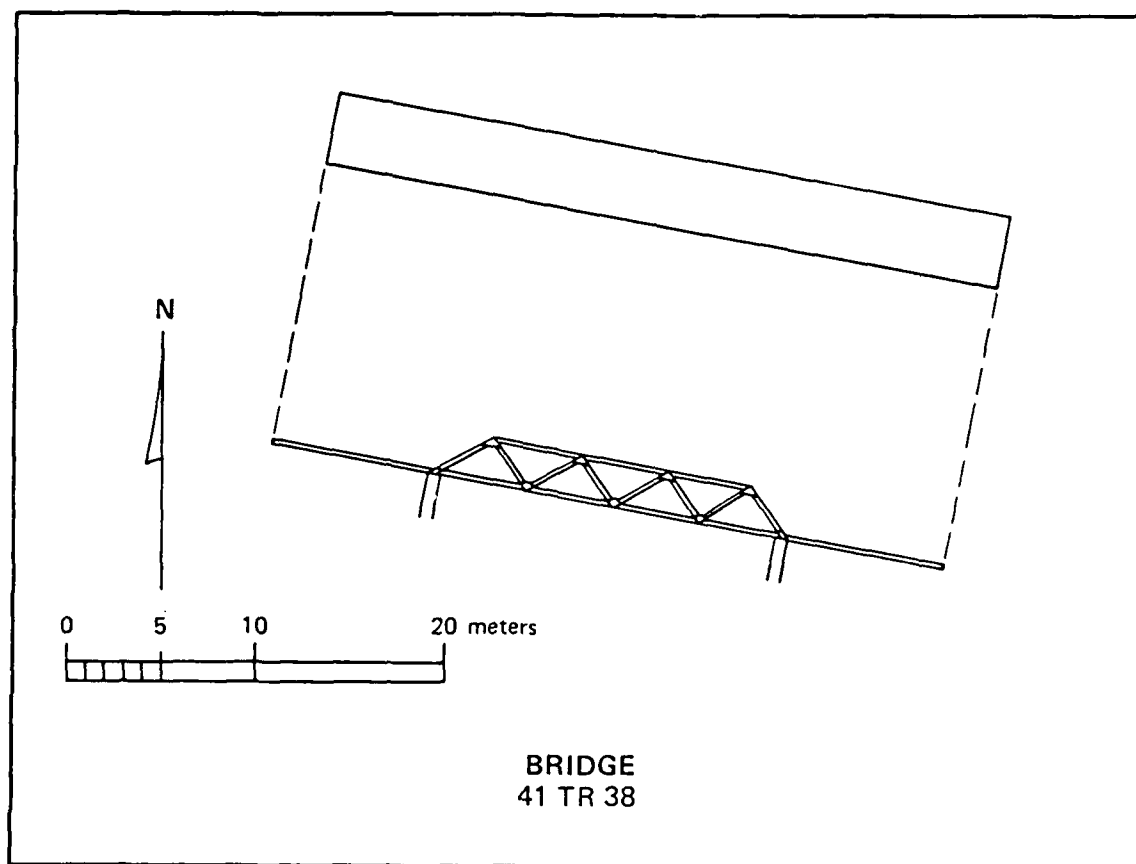


Figure 11-2. Lateral and plan view of the bridge (41TR38).

Some family members feel that some of the original structural elements are preserved within the walls or under the new foundation. This issue should be relatively easy to resolve by examining critical areas of the house. Restoration of the structure to its original appearance seems unfeasible owing to the substantial modifications over the years.

Mr. Loyd pointed out the locations and probable locations of a number of exterior features (Figure 11-4). These include two wells, both hand dug, just north of the main house, a smoke-house/cellar adjoining the northern part of the house, and slave quarters about 30-40 m east of the house. Surface evidence of one of the wells is present, while precise location of the other features would entail test excavations. Numerous artifacts occur on the surface near the house, and test excavations would probably reveal substantial deposits just subsurface.

LOYD INTERVIEW

While at work gathering information for the second phase of the Lakeview Project, we had the opportunity to interview Mr. Marion Loyd and his mother Cordie Sprinkle Loyd. Mrs. Loyd resided at 41TR42 (the Bowman site) until she married Robert Loyd in 1924. She and her son were able to provide a great deal of valuable information on the Loyd Homestead (41TR39) and

the immediate area.

Francis Marion Loyd came to Texas with his family in 1856. Originally from Illinois, they had settled for some years in Arkansas before moving to Texas. Stopping first close to Dallas, they did not come to purchase the property on which 41TR39 is located until 1859. At that time F. M. Loyd began to build the house "a four room, dog run, with a sleeping loft" made of logs. The house was built with logs hewn at the Eagle Ford saw mill on the Trinity River and hauled to the site by oxen.

In 1862, F. M. Loyd married Friendsina Cheshier of Dallas, who had four children before she died an early death in 1870. Nine years later he married his brother Tom's widow, Ann Haney, with whom he had three more children, Mrs. Cordie Loyd's husband, Robert, being the youngest of these.

Francis Marion Loyd was a farmer whose primary crops were cotton and corn. He also raised horses and cattle. His grandson, Marion (of this interview) raises Longhorns like his father and grandfather did before him.

The Loyd homestead was at the junction of two wagon roads and as the well there was open to all, there was always much activity. "All the old-timers always talked about coming to Uncle Marion's.... They called him Uncle Marion. He could read the legal papers and things that they'd get and Grandma wrote the ladies letters." (Loyd interview). F. M. Loyd's interest in education lead him to establish the Loyd school, shortly after

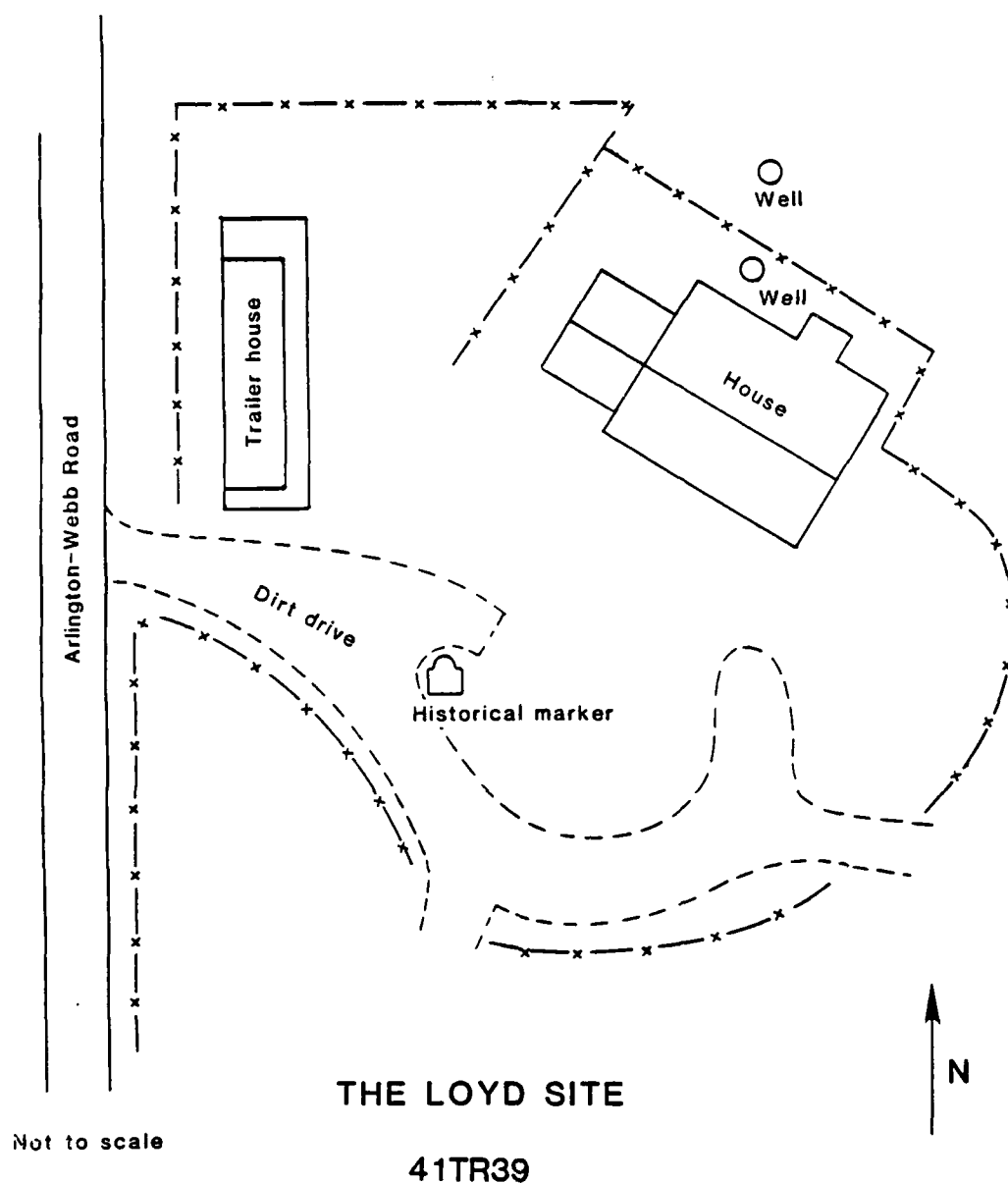


Figure 11-3. Sketch map of the Loyd site (41TR39).

the Civil War, for the benefit of local children and adults. The Loyd school was in existence until 1905, at which time it was combined with the Webb school and moved to that community.

Mrs. Loyd moved to the Bowman house (41TR42) in 1910 with her family. According to Mrs. Loyd, there was a board on the back side of the house over a window with the date the house was constructed on it, 1907. "It had four rooms with the kitchen...that back porch and the front porch come all the way around it." There was a dug well just behind the house and another well with a windmill on it further back. To get soft water "we'd have a barrel and a slide and hauled it from Reitz." (Loyd) Cotton was their chief crop "and we'd have a good garden and canned stuff out of that" (Loyd interview).

When Cordie Sprinkle married Robert Loyd and came to live in the Loyd homestead the appearance of the place was different than it is today. Still extant at that time were a carriage house, brick lined cellar, cowbarn and corral. The barn was eventually torn down because it was built at the bottom of a hill:

if it come any kind of shower, you couldn't get down that hill. Grandpa built it; and my dad used it. But everything was horse and wagon, you could do anything you wanted to anytime. But you couldn't back a pickup down there or a flatbed trailer and get anything out. (Loyd interview)

Mrs. Loyd and her son Marion were able to provide much valuable information about the Lakeview area. As well as helping us associate families with some of our sites they were

THE LOWE SITE
41TR40

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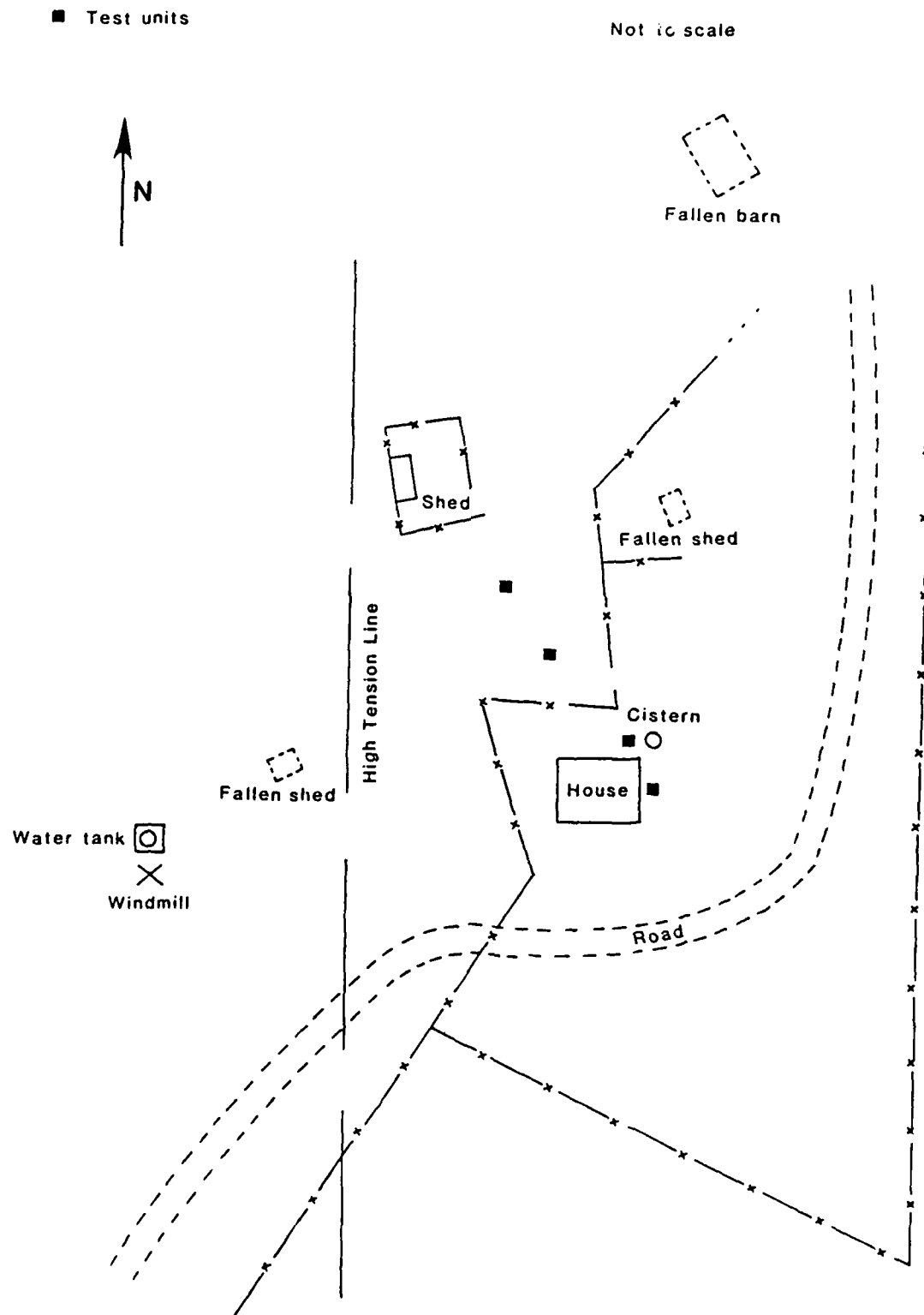


Figure 11-4. Sketch map of site 41TR40.

able to give us a picture of what life was like in the area during earlier times. Mr. Loyd told of riding jitneys into Dallas, of buying groceries from peddling wagons and of the rural postman, "Old man Kerr," who rode a horse when it was bad and drove a hack when the weather was pretty. Both the Loyds were able to add greatly to our knowledge of the Lakeview Project area and the people who lived there.

41TR40 THE LOWE SITE (CA. 1860?)

This site is located on the bluff overlooking Walnut Creek near its confluence with Bowman Branch, and just northeast of Estes Cemetery. The site complex has been bisected by construction of a high power line, and all of the structures at the site are in very poor condition.

This site, according to Mrs. Loyd, may be the original homestead of Andrew T. Lowe, who settled in Tarrant County as a farmer in 1865. Between 1848 and 1865 he lived in Dallas and Jack Counties. Tract records do not support this notion, however, but suggest that the property was acquired by the Bowmans (see site 41TR42) in 1855. In 1887, Andrew J. Lowe, a son of Andrew T. Lowe, purchased about 280 acres of the original Bowman tract from an intermediate owner. The principal structure at the site could date to the 1860s, as is suggested by the architecture. If the tract records are correct, the house could be attributed to the Bowmans.

The site consists of a main house located at the southern end of the complex, a loose cluster of outbuildings to the north, and a windmill and tank west of the house (Figure 11-4). A cistern or well is located at the northeast corner of the main house. Each of the shed type outbuildings appears to be of recent construction and ambiguous function. No main barn or cribs could be identified. Several trash accumulations were identified; one of these contains numerous handmade bricks, but no structural associations for these could be established.

ARCHITECTURAL DESCRIPTIONS

Only brief architectural observations were made at the site before access was encumbered by tenants. The structure of primary interest is the main house, which unfortunately is largely deteriorated. The older portion of the house is built on sandstone piers and is framed with roughly hewn cedar poles, morticed and tenoned into large sills. These are toed with cut nails, which are used almost exclusively throughout the rest of this part of the structure. This construction technique is best matched in the Lakeview area by the original structure appears to have been 1854.

The floorplan of the original structure appears to have been oriented around a very tall central ridgeline on an east-west axis. The central portion of the house was two-story, with overlapping flanks on the roof providing single story rooms on the north and south sections of the house. This design is actually reminiscent of barns more than houses, yet this is clearly a house, with a fallen stone chimney on the eastern end of the structure. The lower floor had three rectangular rooms, measuring approxi-

mately 9.4 x 4.8 m, the side rooms being slightly smaller than the central one. A later frame addition to the west end of the house more than doubled the ground floor area. A huge pile of fallen timbers and planks needed to be slightly dissected to determine the nature of the addition.

The secondary structures to the north and west of the house are all of pole/plank or pole/metal construction and appear to be quite young.

TEST EXCAVATIONS

Four one square meter test pits were excavated at the site before access was restricted. No features were defined in the excavated areas, yet in situ artifact occurrences were encountered in each pit. Two pits were placed near the northeast corner of the house. These were excavated to between 10 and 20 cm below the surface. Both encountered artifacts of apparently mixed ages; the base of the cultural deposits needs to be reached before the context of these materials can be fully evaluated. The pits excavated in a trash concentration north of the house also encountered artifacts of apparent mixed periods, yet a number of artifacts dating to the late nineteenth century were recovered. These suggest that additional excavations as well as full documentation of the main structure and mapping of the entire site are necessary. This site appears to be one of the few in the area which may date to the middle nineteenth century and certainly contains important architectural information. Additional test excavations are important since undisturbed concentrations of late nineteenth century artifacts may be present.

ARTIFACT DESCRIPTIONS

Kitchen. One of the largest groups of kitchen related artifacts is that of food storage containers (Table 11-1). The largest percentage of these containers are tin cans. Of all the identifiable fragments, 53% are a crimped seam construction; a process developed in the early twentieth century. Of the 35 glass food storage containers or fruit jars, for home utilization, 26 seal on beads of glass applied under the threads, also a twentieth century development. One of these is a "Ball" jar (Toulouse 1977) but it is too incomplete to date. The remainder are unidentifiable.

The ceramic storage containers include several crock fragments, one salt glazed, three with albany glazed interior and exterior, and one with a bristol glazed interior and exterior (Table 11-2). Four sherds from a milk bowl were also recovered, these have a blue glaze on the exterior. The ceramic serving containers are primarily undecorated ironstone whiteware sherds. Thirty-six fragments of green underglaze transferware were also recovered. These were all from the same plate with a "winter scene" decorative motif. One base sherd with a partial mark stamped in black was recovered (Figure 11-5).

Architecture. The majority of architectural elements recovered are fragments of window pane glass. The fragments range in thickness between 2.0 mm and 4.0 mm, the greatest percentage being 2.5 mm thick. The second largest group of architectural related artifacts recovered are nails. Other archi-

TABLE 11-1
Artifacts from the Lowe site (41TR40)

Artifact Class	Provenience				Total	%
	Sq. 1	Sq. 2	Sq. 3	Sq. 4		
Unidentifiable	17	75	173	321	586	39.78
Kitchen	21	59	148	242	470	31.91
Architecture	59	60	85	54	258	17.51
Furniture	13	9	1	5	28	1.83
Ordinance	4	6			10	.67
Clothing	3	2	2	3	10	.67
Personal	10	2	29	10	51	3.46
Activities						
General	1		2		3	.20
Blacksmithing				2	2	.13
Auto-Related	1				1	.06
Fencing	9	9	15	22	55	3.73

tectural artifacts recovered include brick (both an older hand-made variety and a standard machine molded type), masonite, and composition roofing.

Furniture. Seven of the items related to furniture are fragments of plate glass, of the type used in cabinets. One fragment of an oil lamp chimney was recovered. It is the decorative top edge of the chimney, and has been sun-colored to amethyst (Figure 11-5). Fourteen light yellow glass vase fragments as well as one fragment of clear "Lacy" glass from a candy dish are also represented.

Ordinance. Three cartridges were collected at 41TR40: one .32 caliber Smith and Wesson short and two .22 caliber U.N.C. shorts. All are of recent manufacture.

Clothing. Items related to clothing include three buckles, the type used in suspenders or overalls, and two snaps. Also included in this group are a straight pin and a clotheshanger fragment.

Personal. Four fragments of snuff bottle glass were recovered. These are all clear and appear to be a variety produced in the mid-twentieth century.

Toys. Two fragments of an undecorated porcelain toy tea cup and one metal fragment of a bicycle were recovered.

Cosmetic. Five milk glass fragments representing three short ointment or cosmetic containers were recovered. One pressed glass fragment in a "Lacy" pattern was also collected. It is a cosmetic container that has been sun-colored to amethyst.

Medicine. Fifteen fragments representing five containers for medicine were recovered. These include two panel bottles, one customary cobalt blue bottle and one bottle that has been sun-colored to amethyst. In addition one neck fragment (Figure 11-5) was recovered that has an applied mouth of a type produced between 1860-1889 (Newman 1970).

Activities. The largest group of artifacts related to activities is under fencing. Fifty-one pieces of various gauge wire were collected as well as four fencing staples.

41TR41 THE GREEN HOUSE SITE (CA. 1925?)

This site is located on the bluff overlooking Walnut Creek about 200 m east of the Lowe site. The main house faces the

TABLE 11-2
Ceramics from the Lowe site (41TR40)

	Plate	Soup Plate	Vegetable Dish	Cup	Saucer	Crock	Flower Pot	Milk Bowl	Unidentifiable
EARTHENWARE									
IRONSTONE/WHITEWARE									
Plain	3	2		2					83
Repousse	33		3		9				
Transferware									
Green	36								
Unglazed							1		
PORCELAIN									
Repousse									4
Gilt				2					
STONEWARE									
						5		4	

fields to the south, while a burned barn and several smaller outbuildings lie to the west (Figure 11-6).

The original house appears to have been a possible tenant house of plank construction, but the structure has been considerably modified over the years. The main floor area measures approximately 11 × 8 m, and is divided into a main front room and several smaller rooms on the east and north sides. A large overhanging porch on the front has been added, and the old horizontal siding has been covered with green shingles. Details of the modifications could not be documented owing to restricted access.

The main barn burned between the time of the SMU survey and this reconnaissance. The concrete foundation indicates a structure approximately 18 meters square, with corrals on three sides. Smaller feeding shelters and a small workshop/pen of recent construction are situated to the west of the barn.

This site was apparently occupied at the time of the SMU survey, and the area is littered with recent trash. Other than further inspection of the main house to determine the nature of the primary structure, little potential for additional work is indicated by the apparent late age.

41TR42 THE BOWMAN SITE (1907)

Dominated by a large Late Victorian house, this site is the most imposing of several located on the bluff overlooking Walnut Creek Valley. It is situated about 1 km east of Estes Cemetery, and consists of the main house and several outbuildings of various ages. Although some test excavations and architectural work were completed at the site, increasingly difficult access was imposed by the tenants, and full excavations

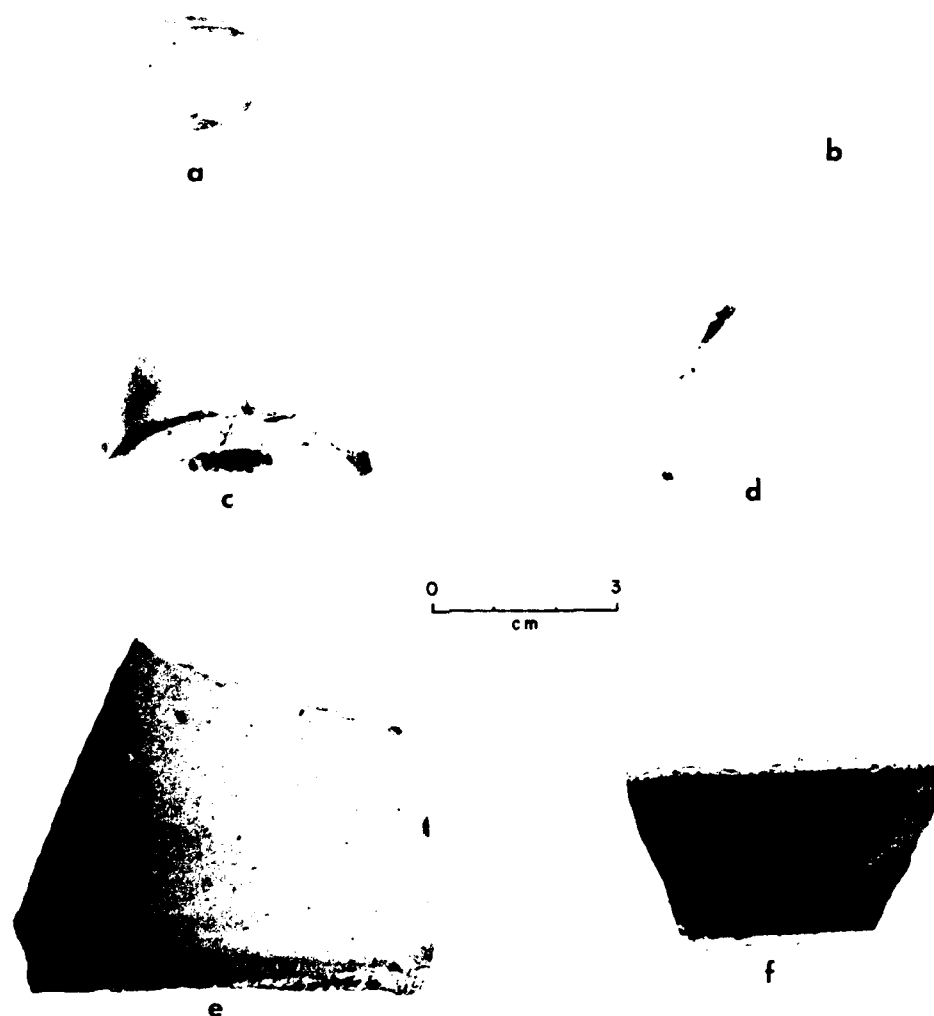


Figure 11-5. Artifacts from the Lowe site (41TR40). a - bottle neck with applied mouth; b - decorative edge of glass lamp chimney; c - ceramic bottle fragment; d - whiteware sherd decorated with green glaze and repoussé; e - stoneware crock base; f - rim sherd from stoneware milk bowl.

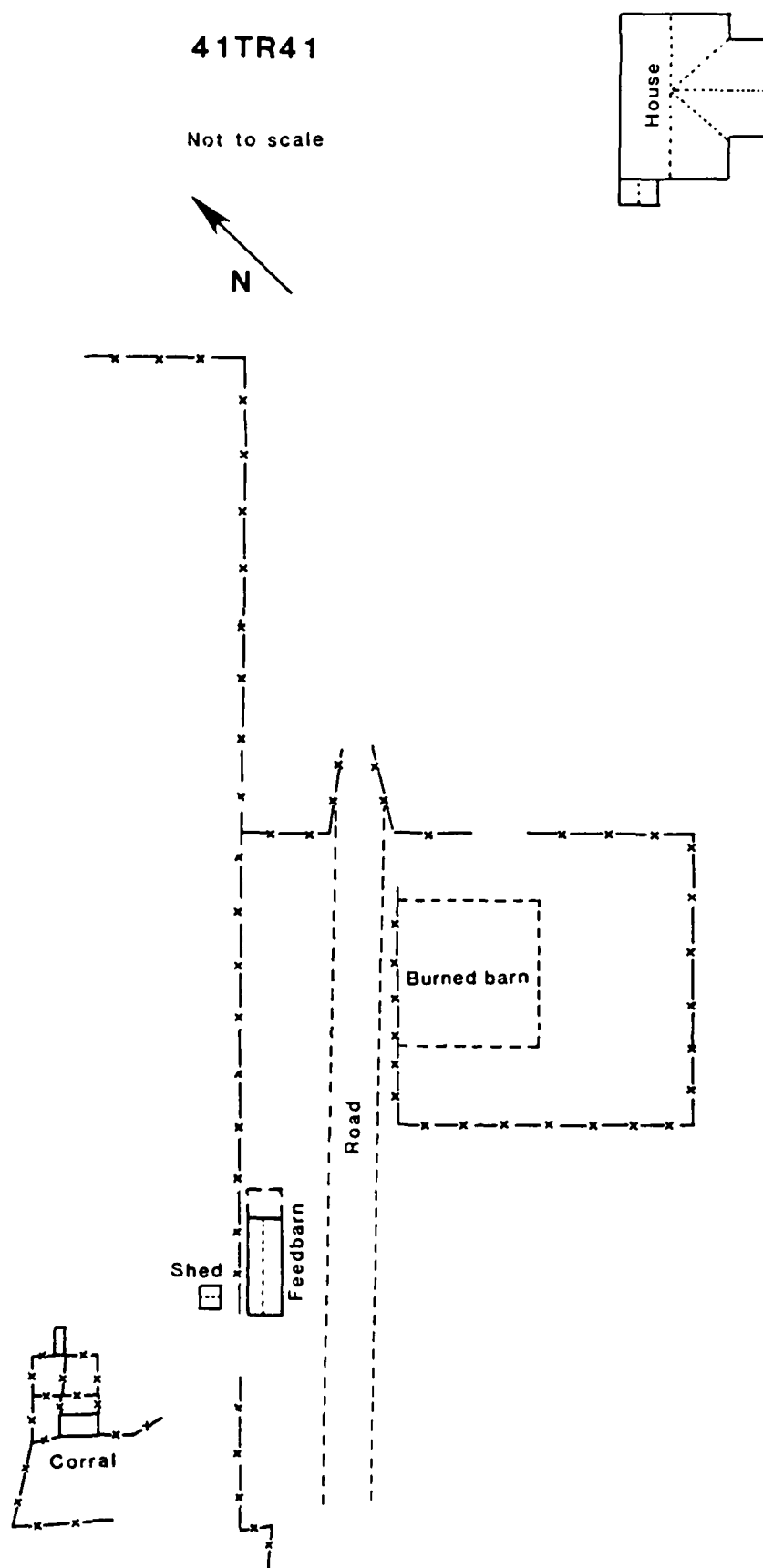


Figure 11-6. Sketch map of site 41TR41.

could not be completed.

As with most of the sites along this bluff, the residence was originally the southern-most building and faced south (Figure 11-7). A metal shed/barn southeast of the house has been added in recent times. The bulk of the outbuildings string to the north of the house on either side of an old wagon road which passed behind the main house. Although many outbuildings are deteriorated or renovated, none can be called a "main barn;" rather, there are a number of smaller structures which appear to have had differing functions. This cluster of small buildings appears to have characterized the site as early as about 1910, when Mrs. Loyd (then Miss Cordie Sprinkle) lived there with her family as tenants. A photograph of the house taken in the mid-teens shows little change in the area other than a tremendous increase in the number of trees along the bluff (Figure 11-8).

The site structure is typical in that the house is peripheral to the working buildings. The house area originally was swept clean and was fenced from the surrounding pastures and work areas, as shown in the early photograph. The water supply for the house was probably the well at first; this was later supplemented by the wind driven well behind the house which apparently fed tanks for the house as well as stock (Figure 11-7). Ms. Loyd noted in her interview that soft water was collected off the roof and/or carried from the Reitz site (41TR45).

The location of a cellar some distance from the main house is quite usual, and may relate to an earlier period of occupation. There are few sites in the Lakeview area which do not have cellars immediately behind or alongside the main house presumably located close by both for ease of access to food and for shelter from storms.

One of the barns, probably structure number "7" was used as sleeping quarters for the young men in the Sprinkle family according to Mrs. Loyd. This situation should apply to many sites from the late Victorian period, particularly those with quite small houses. Apparently all other family activities were conducted in the main house however, and this "dormitory" pattern of building use is not likely to be reflected archaeologically.

ARCHITECTURAL DESCRIPTIONS

The unusual character of the main-house in the Lakeview context led to emphasis on the documentation of this structure. Unfortunately access to the site prohibited full documentation and only limited observations were made on the other structures.

The main house at this site was constructed by the Bowmans, whose family had owned the land since 1855. Mrs. Loyd indicated that the house had been built in 1907. The number of reused structural elements and the long previous ownership suggest that this may not be the first residence built at the site. In any event the house is perhaps the only classical Late Victorian structure in the Lakeview area which still stands.

The best statement as to the character of the house is made through the photograph of the Sprinkle family, taken about 1915 (Figure 11-8). The tall profile, polygonal front room and "gingerbread" trim are familiar hallmarks of the period's nicer homes. These characteristics appear to be manifestations that

much of the house is made of second hand materials, the remainder being supplemented by readily available commercial trim. For all of its apparent size, the house has only four rooms (Figure 11-9). The symmetrical floorplan includes a kitchen on the west, the parlor on the south and living/bedrooms on the north and east. A spacious porch covers the front (Figures 11-10a and 11-10b), while a back porch off the kitchen provided easy access to the well.

The foundation consists of mortared limestone piers, with large (ca. 5" x 8") sills with lap joints, and 3" x 12" floor joists lap jointed to these. Many of these have been reused, with numerous old mortices evident.

The west end has slightly smaller elements in similar positions. The porches are supported by split cedar piers, and cedar struts supported a skirt around the foundation. The studs are tenoned into the sills, and some of these have been had hewn. They are toed with large wire and/or cut spikes. The outside is finished with shiplap, attached with wire nails. The roof is shake.

Salvaged planks were used to finish the interior walls, all of which appear to have been wallpapered. Catalogue type moldings, door trims and mopboards are used throughout the interior, and even the mantle for the fireplace appears to have been storebought. The fireplace sits on a mortared limestone foundation and is made of GLOBE bricks. Electricity, water, and gas were all retrofitted.

The exterior was probably painted brightly; blue trim is still evident on the porch ceilings, door, and window trims. The eastern front door to the parlor had a plate glass top, and a paneled base with rosette appliques. The gable trims are shown in the photograph, noting that the herringbone woodwork on the front has been mimicked on the side gables with paint over the shiplap.

Building number seven on the sketch map is a small, heavily modified barn/storage shed. Its last functions appear to have included housing of tack and possibly shelter of animals, as well as storage of feed. Numerous reused timbers, many of them hand hewn, suggest the presence of an earlier structure. The earlier structure may possibly be seen in the Sprinkle photograph, as the buildings in the left background are not the same as those present today. Building eight, a fallen barn, also has hand hewn timbers, but is constructed with wire nails. The remainder of the small structures at the site are pole/plank constructions with metal roofs. None appear to be very old or functionally discrete.

TEST EXCAVATIONS

Four one square meter test pits were excavated around the main house (Figure 11-7). Although no features were defined by the excavations, they clearly demonstrate the presence of considerable artifactual material in the house area. Most of the artifacts appear to date from the early decades of this century, but late nineteenth century dates for many cannot be precluded. Most of the materials recovered are either domestic or architecture related (Table 11-3).

A single test pit was excavated in a deep trash accumulation in a gully just west of the house. This pit continued to reveal artifacts to a depth of 40 cm below the surface, but even at that

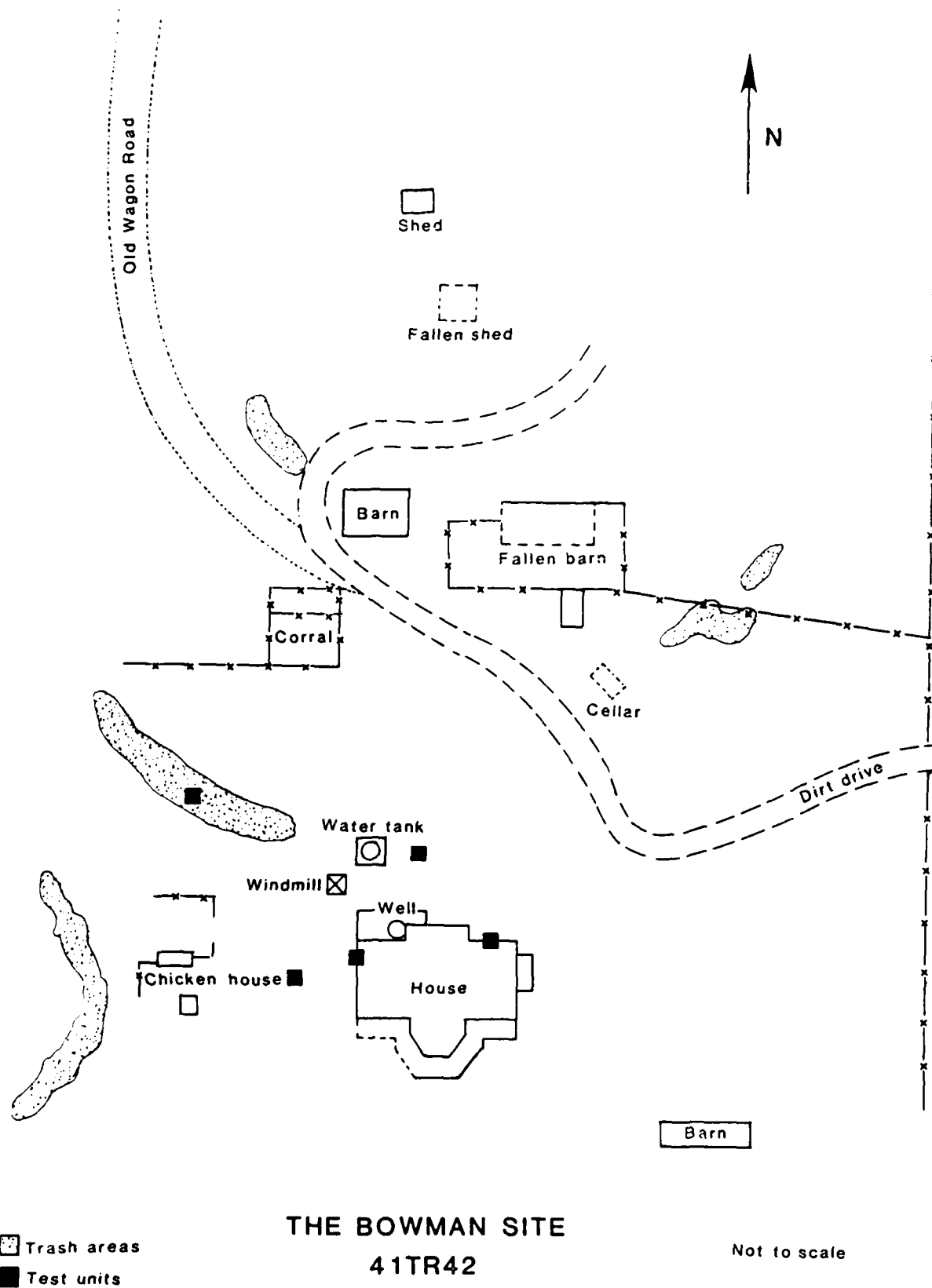


Figure 11-7. Sketch map of the Bowman site (41TR42).



Figure 11.8. Photograph of the Sprinkle Family, Circa 1915. View to the north at the Bowman house (41TR42), built circa 1907. Notice Reitz house (41TR45) in distant right background. Photo courtesy Marion Loyd.

depth the artifacts were modern in appearance. These gully trash accumulations undoubtedly may have complicated depositional histories, and clear stratigraphic records may be difficult to define without extensive excavations.

Kitchen. The largest group of kitchen related items is tin cans. The greatest percentage of the identifiable fragments have crimped seams, but one fragment with soldered seams is present.

Fifty fruit jar fragments representing twenty-one containers were recovered. Twenty of these are "seal on a bead applied under the threads" type. The other jar has a shoulder sealing type. Two of the beaded seal jars are also "Ball" jars and date to ca. 1915 (Toulouse 1977).

The ceramic storage containers are represented by twelve stoneware sherds from five crocks, two jugs and one milk bowl (Table 11-4).

The ceramic serving containers are primarily plain ironstone whiteware sherds, with plates, cups, and saucers being the recognizable body forms (Table 11-4). Occasional decorated vessels represented and all are late nineteenth century or later forms.

Architecture. By far the greatest percentage of architectural material recovered is plate glass, with 1257 fragments ranging in thickness from 1.5 mm to 4 mm, 73% of which are 2.0 mm thick.

The second largest group of architectural materials is nails. About 90% of the nails from the test squares around the house are wire, while all of them from the test of the trash area in the gully are wire. In addition two fragments of window hardware, one plumbing fixture fragment, and three porcelain door knob fragments were recovered. Also collected were one new type machine molded brick fragment, wood fragments, composition roofing and masonite.

Furniture. The largest group of artifacts collected under the furniture heading are 22 oil lamp chimney fragments. Also recovered were three fragments of peach tinted glass from a vase, four fragments of clear glass with a painted floral design in yellow from a vase and one clear specimen with thumbprint decoration. Eight red unglazed flower pot sherds were also collected.

Ordinance. Three modern .22 caliber long cartridges were collected at 41TR42. One has a "U" headstamp and the others are unstamped.

Clothing. Artifacts classified under clothing include one clothing stud, five gromets and one snap. A number of buttons were also recovered: one metal "Hawk Brand", one made of glass, two of plastic and three of shell. Nineteen pieces of shoe leather and one boot heel were collected. Also included under

THE "FAT CAT" SITE
41 TR 42
Main House
Floor Plan

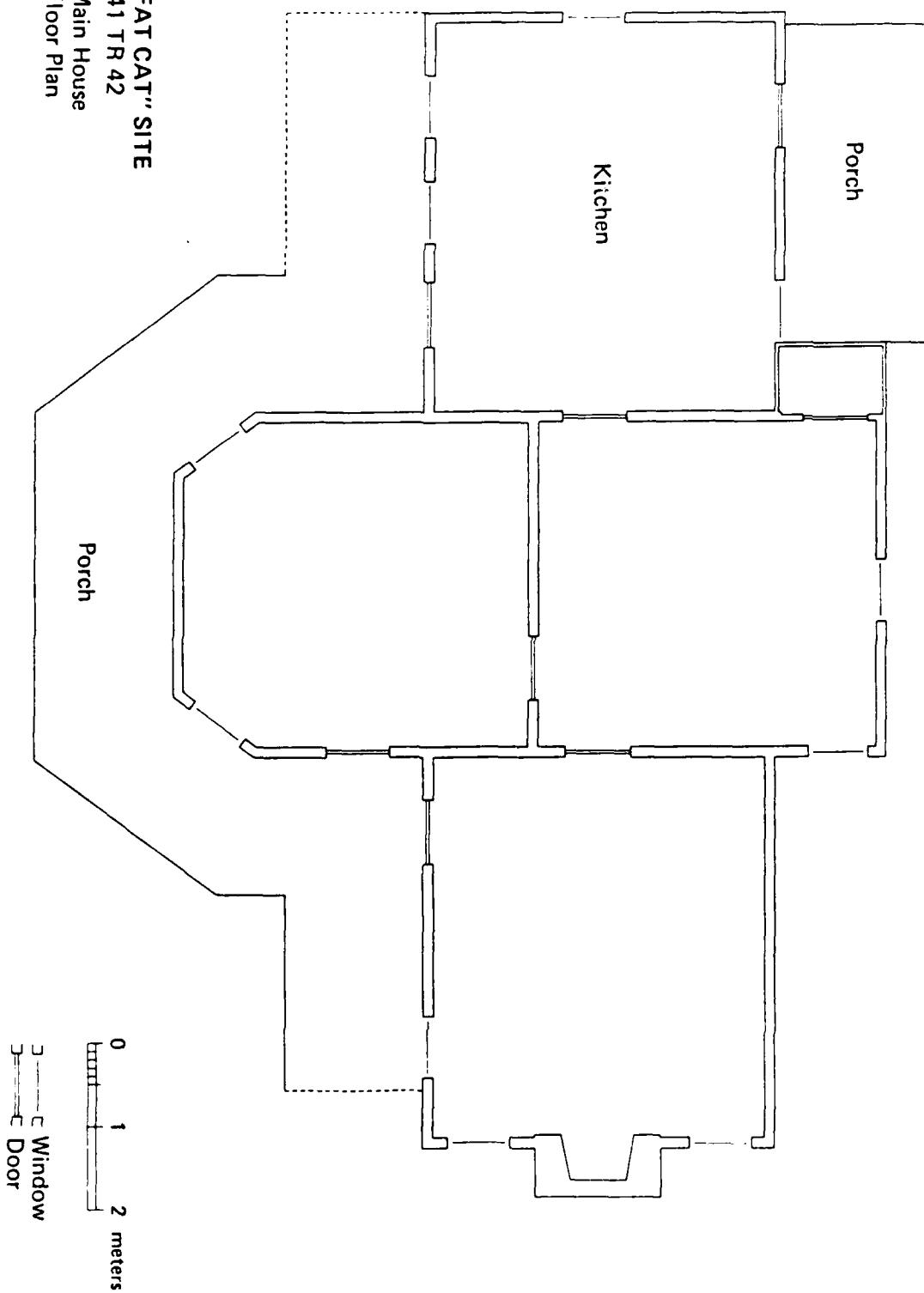


Figure 11-9. Floorplan of Main house (41 TR 42).

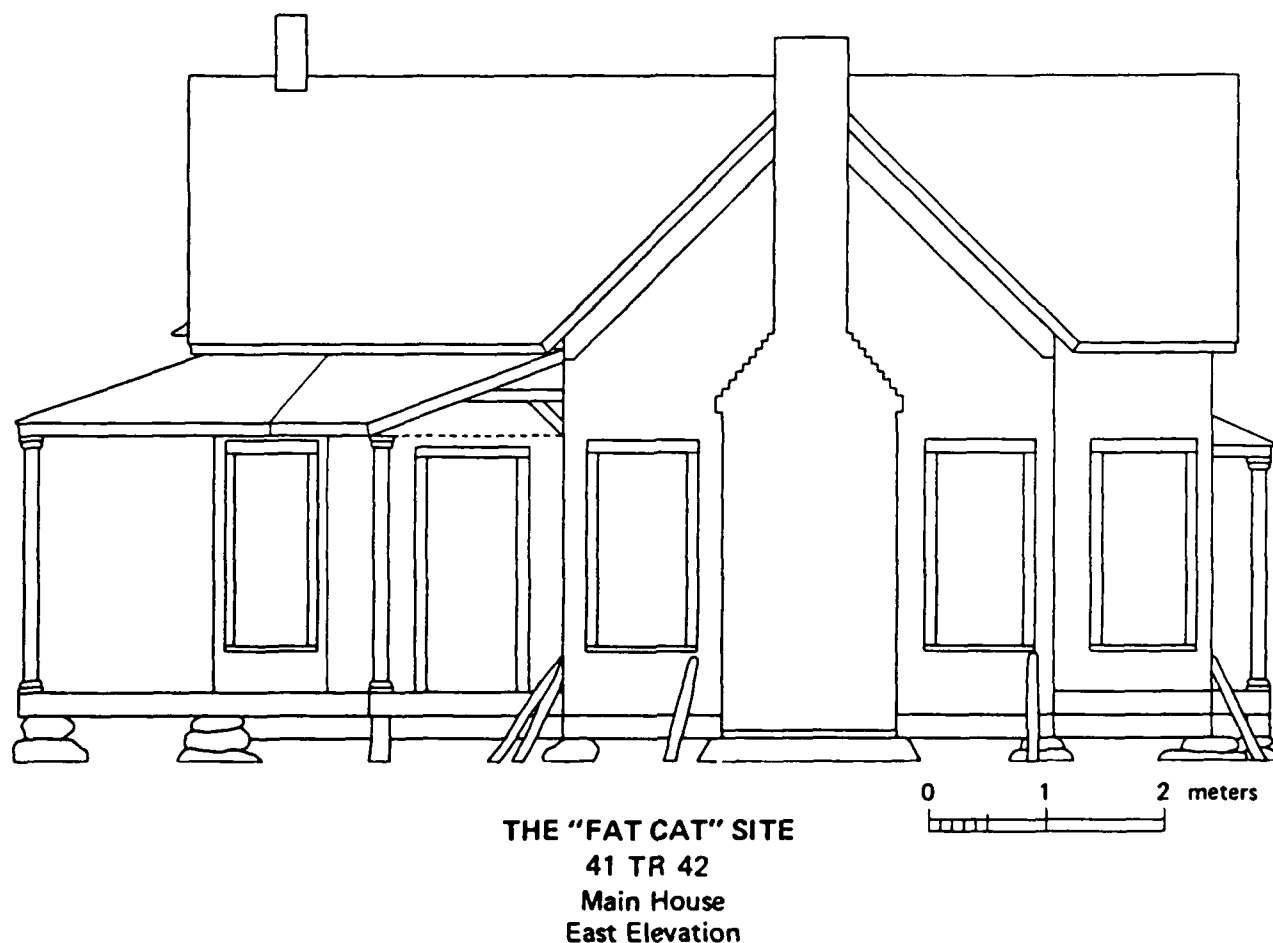


Figure 11-10a. East elevation, Main house (41TR42).

this heading are two clothespin springs and a safety pin.

Personal. The squared base of a brown snuff bottle bears the three raised dots characteristic of bottles produced during the twentieth century. Four of the toys recovered are glass marbles. Also collected were two white porcelain fragments with black paint on the exterior surface, that appear to be from a doll's head. Another interesting item under this heading is a molded red paste ceramic figurine of a small animal (Figure 11-11). This appears to be a whistle, but as this piece is broken its true function can only be conjecture. Other personal group artifacts include: an 1897 Indian Head penny, a "Prince Albert" can lid, two fragments of modern ballpoint pens, eight 78 RPM record fragments, one plastic pearl, four bobby pin fragments and three fragments of a plastic comb. Also recovered was the top of a cologne bottle and two clear glass perfume bottles. Two decorative metal bands in a floral motif appear to have at one time encircled a cosmetic container. Numerous medicine containers were recovered. These include: one peach tinted panel bottle, one blue tinted panel bottle, four clear panel bottles and one eye dropper fragment. Also collected were numerous

fragments of the dark cobalt blue glass customarily associated with medicine bottles.

Activities. Several items fall under the general activities heading. These include: hex nuts, cap nuts, square nuts, and screws. The only agricultural related materials recovered are seven fragments of bailing wire. One artifact relating to blacksmithing activities was recovered. This is a fragment of slag, or the debris from smelting. The materials relating to fencing are fragments of wire and fence staples.

DISCUSSION

The Bowman family bought the land surrounding this site in 1855 from Robert Crawford, who had been granted the land from the State of Texas the previous year. It is not known if and where the Bowmans resided on the property, but County records indicate that early as 1890 there was a 45×32 foot residence on the tract. If Mrs. Loyd's recollection that the present house was built in 1907 is correct, then this structure may represent an in situ rebuilding of the older structure.

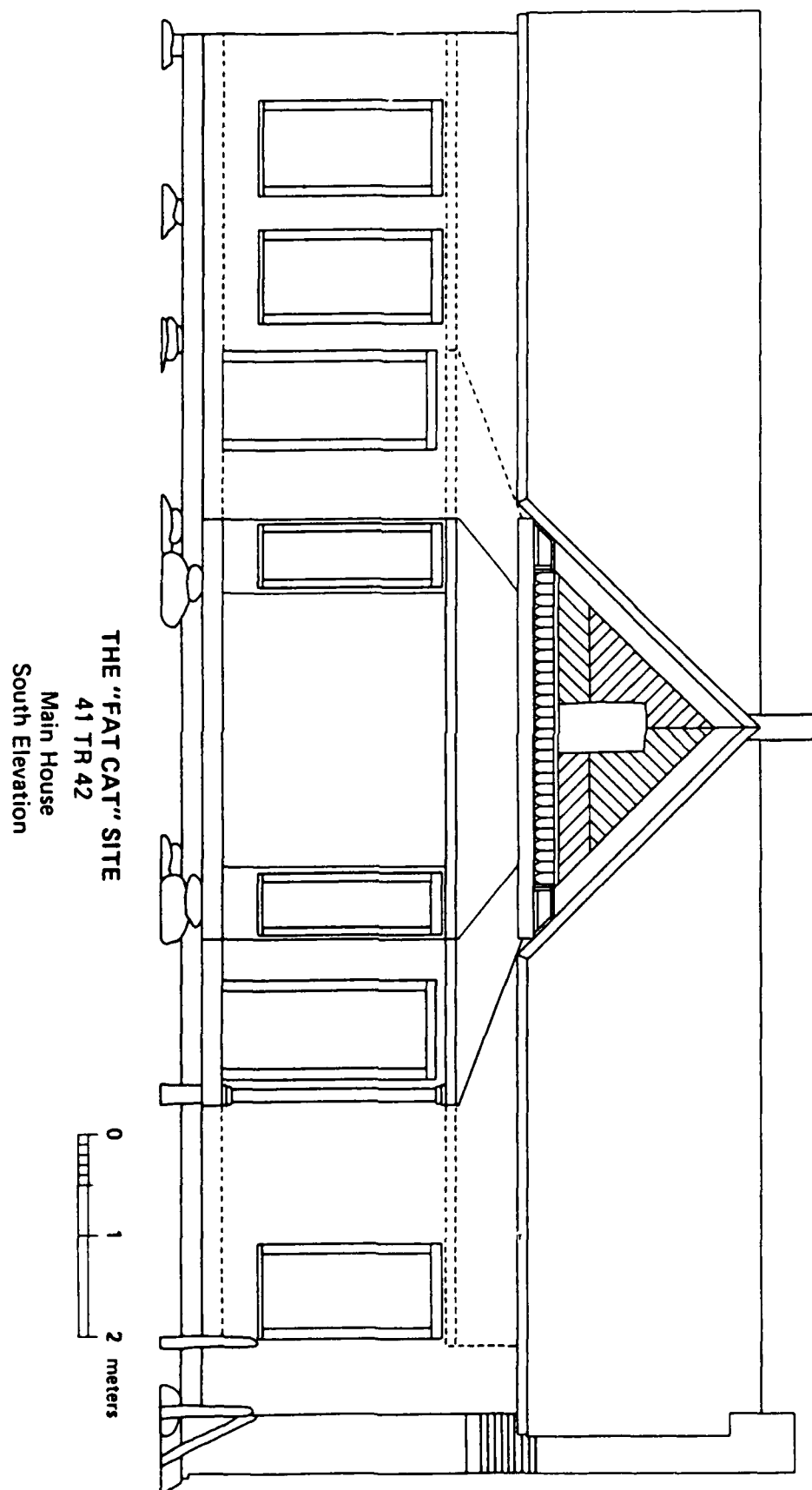


Figure 11-10b. South elevation, Main house, 41TR42.

TABLE 11-3
Artifacts from Site 41TR42

Artifact Class	Provenience					Total	%
	General Surface	Sq. 1	Sq. 2	Sq. 3	Sq. 4	Sq. 5	
Unidentifiable		25	76	158	29	514	802 26.84
Kitchen		24	46	99	10	273	452 15.79
Construction		113	69	1091	24	167	1464 48.96
Furniture		1	1	29		10	41 1.33
Ordinance				2	2	1	5 .16
Clothing			2	6	3	27	38 1.27
Personal	2	8	2	27	2	34	75 2.61
Activities							
General			38	6	2	9	55 1.84
Agriculture				5		2	7 .23
Blacksmithing			1				1 .003
Farm Machinery						1	1 .003
Auto-related				1		2	3 .01
Fencing		1	10	3		9	23 .76

Architecturally the site is probably unique in the Lakeview area, since it is the only standing rural home with classical Late Victorian attributes. The fact that the house was rented most of the time after 1910 poses some problems with what was originally expected to be the site of a continuous land owning family pattern of occupation. Nonetheless, the site offers good potential to provide information on turn of the century lifeways, and may contain information pertaining to the latter half of the nineteenth century as well.

41TR43 THE HASWELL SITE (CA. 1935)

This small site covering an area of approximately one acre is situated in a clearing on the ridge overlooking Walnut Creek Valley. The site was first occupied in the 1930s when the Haswell family built the primary structure at the site. The Yother family rented this home from the Haswells, apparently for

several decades. At some unknown time, the Stewarts purchased the property from the Haswells and in the late 1950s the Wilshire family bought the property from the Stewarts. The site has not been occupied for at least fifteen years. The site complex is dominated by a plank house (Figure 11-12). To the west of the site is a privy. To the east of the house are a fallen cellar, a well, a small barn, and just to the southeast of the house, a small pole and plank garage. An extensive accumulation of trash is located in a ravine just to the northeast of the house (not shown on map), yet all of the trash appears to be of post-1930s date. There is no evidence of occupations prior to the 1930s and no evidence of any in situ materials other than in the fallen-in cellar which was not tested.

ARCHITECTURAL DESCRIPTIONS

The main house was originally a two pen box and strip type structure. The pens are oriented on an east-west axis; they are

TABLE 11-4
Ceramics from Site 41TR42

	Plate	Vegetable Dish	Cup	Saucer	Handle	Unidentifiable	Crock	Jug	Milk Bowl
EARTHENWARE									
IRONSTONE/WHITEWARE									
Plain	4	1	2	1	1	20			
Repousse only	1		1	1					
Transferware									
Blue			1	1		2			
Underglaze Painted						1			
Decalomania	4								
Stamped	1								
PORCELAIN									
Plain			2			2			
Underglaze Painted						1			
Stamped				6					
STONEWARE									
Albany Glaze							5	1	1
Bristol Glaze							1	1	
Albany/Bristol Glaze							1		
Slip - Gray							1		
Other							1		

symmetrical, yet there is only an entryway to the western room of the house. A porch is also confined to the eastern room of the house and faces in a southerly direction. At some later time, a "T" addition was made to this structure on its northern side. Apparently at the same time, a porch was added on the east side of the "T" addition.

The construction of this house is similar to those which have been studied elsewhere dating to the earlier part of this century. Sawn cedar piers serve as the foundation. The walls were formed of vertical 1 x 12 planks and the superstructure is composed of 2 x 4 joist rafters covered by a shake roof. Wire nails were used throughout the construction. The interior walls of the east room

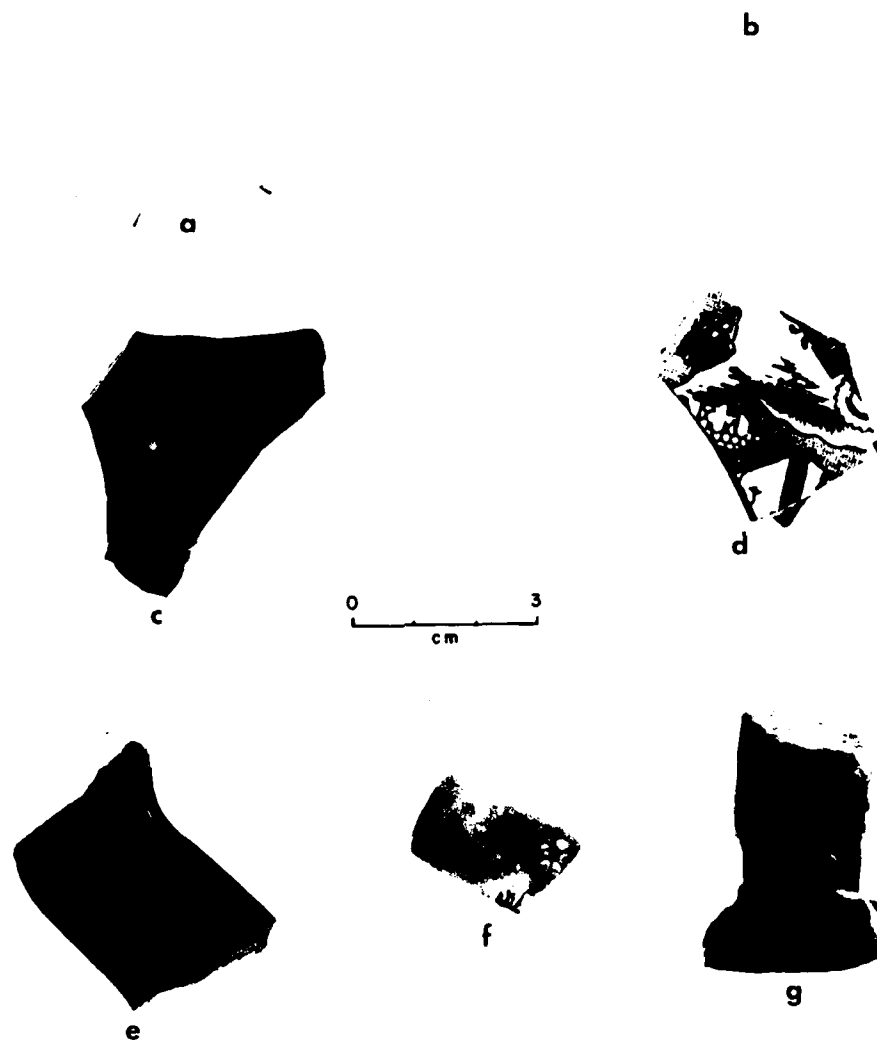
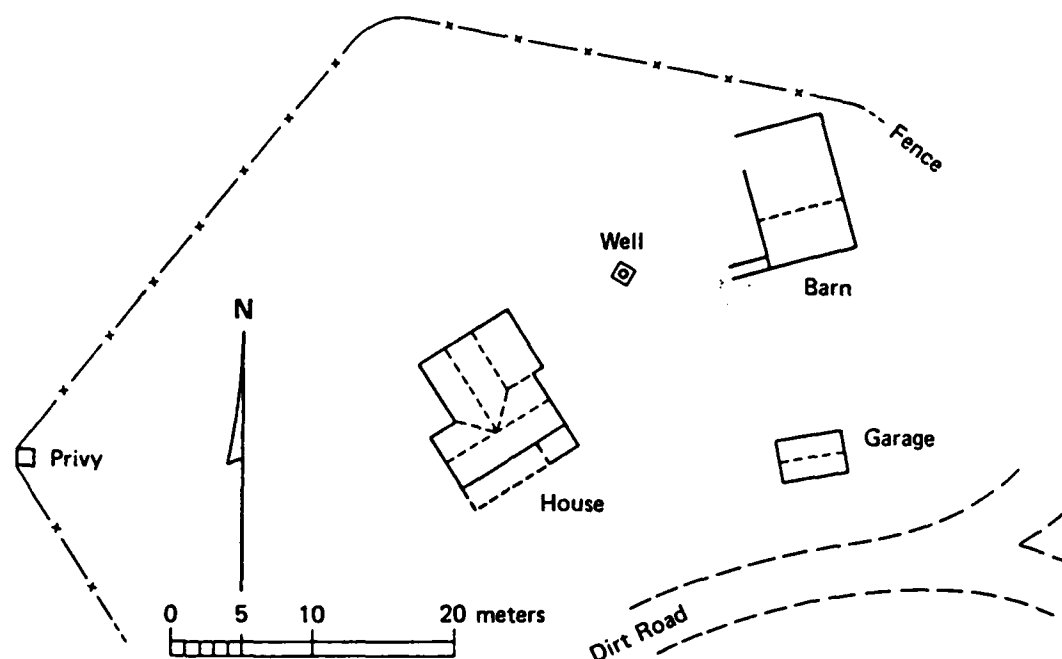


Figure 11-11. Artifacts from the Bowman site (41TR42). a - liquor bottle neck; b - medicine bottle base; c - snuff bottle base; d - base sherd with underglaze blue transfer decoration; e - stoneware jug handle with Albany type glaze; f - toy porcelain tea cup; g - ceramic whistle.

of the original two pen covered with beaded siding. A single chimney is situated in the western pen of the original structure. The "T" addition is similar to the western pen of the original house in construction. Other than a small closet added on the one corner of this "T" addition, there are no plumbing features or chimneys suggestive of function in this room. The interior walls

apparently were white, the ceiling was painted blue and only simple moldings were added around the windows.

The main outbuilding at the site is the small barn just to the east of the house. This structure has pole cornerposts with 2×8 studs and horizontal plank interior walls. The central portion of the barn is a single crib. There is a shed room on the northern side



THE HASWELL SITE
41 TR 43

Figure 11-12. Map of the Haswell site, 41TR43.

of the structure and a cattle working pen and chute on the southern portion of the structure. The roof of the entire structure is of the witch's hat type formed of 2×4 rafters and sheetmetal covering. The garage located near the southern edge of the site is of simple pole and plank construction. The well is a handpump type and is situated on a concrete slab. Adjacent to this is a fallen-in cellar apparently of earth and log construction. The other two outbuildings consist of simple pole and plank structures north of the main house. The first appears to be a storage shed of some type which is largely fallen at this time. Near this is a standing privy.

The only other feature at the site is the extensive accumulation of trash in the ravine just to the northeast of the house. While this trash accumulation was not systematically tested, the lowermost portions of this deposit were investigated in a cursory fashion in the field and it was determined that all of the trash dates to the 1930s or later.

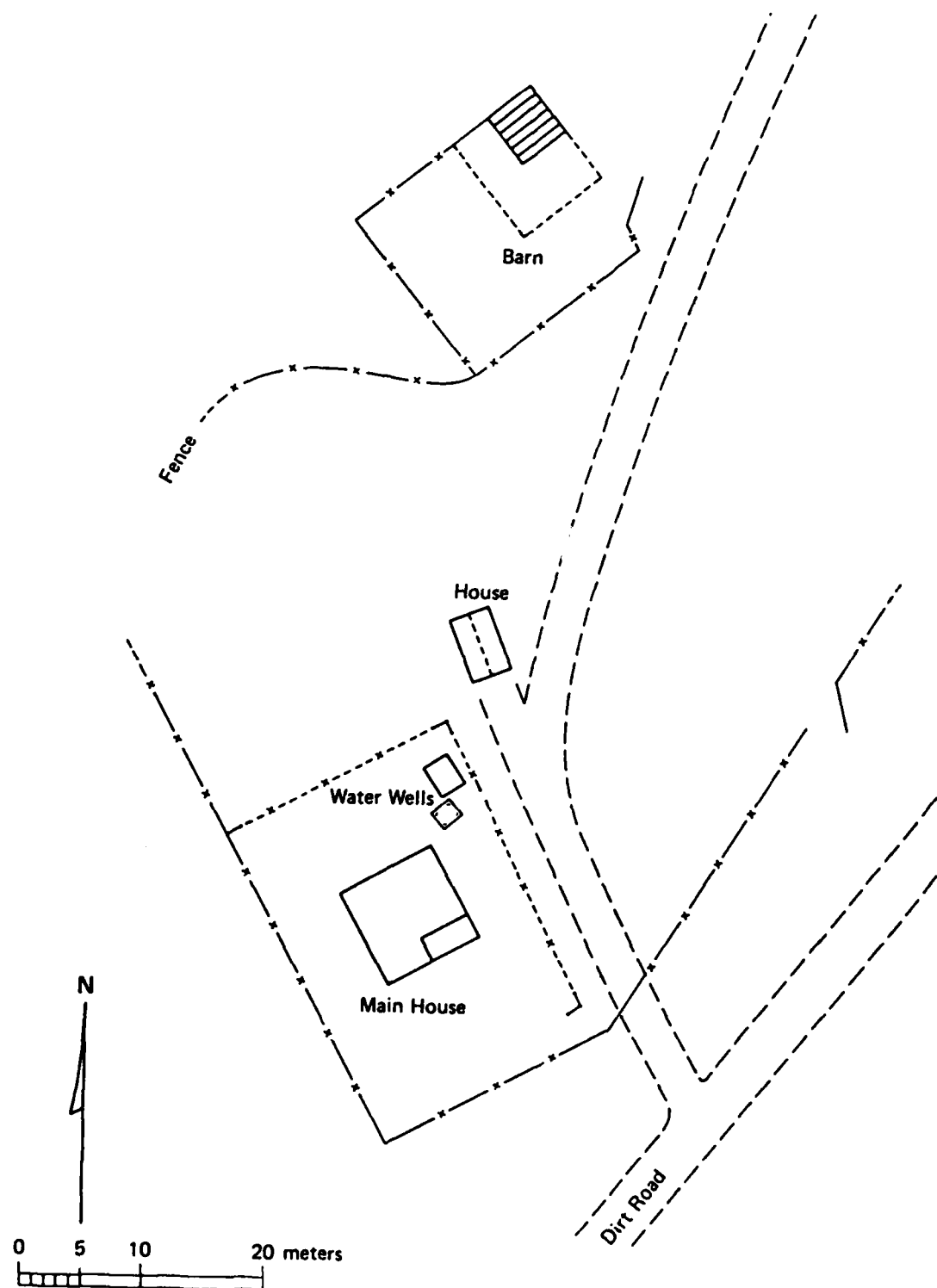
If the date of construction of the main house is in fact the 1930s, this site offers good evidence for the persistence of the simple two pen house design well into this century. There is no formal evidence for this date of construction, however, and further archival work could well demonstrate that the original two pen structure dates to some earlier period. Overall, however,

the construction type, floor plan and site arrangement appear to be very typical of the earlier to middle part of this century. This aspect of the site, as well as the absence of obvious archaeological features, reduces the potential of the site for further investigations.

41TR44 THE CUT FENCE SITE (1930+)

This site is located just west of Estes Cemetery, alongside Mansfield Road. Of the three structures noted by the SMU survey only one remained intact in 1980. The main house had been largely burned, and the barn had been almost completely salvaged. The small box and strip structure was intact (Figure 11-13).

The main house faces south and the two other structures are to the northeast. Two water wells are situated near the back of the house. The main house is built on saw piers and has a simple open floorplan which is modern in character. The small board and batten structure is also built on piers and is made entirely with wire nails. It last functioned as a hay storage shed. The barn was built on sawn piers, and was surrounded by a corral. Considerable recent trash surrounds the site, but no evidence of



41 TR 44

Figure 11-13. Map of the Cut Fence Site, 41TR44.

early components could be detected. This site appears to have little potential for further work, owing to the poor preservation of architecture and its apparent late date.

41TR45 THE REITZ SITE (1876)

This site is located at the edge of the bluff overlooking Walnut Creek Valley, approximately 1 mile east of Mansfield Road. The areas south of the site are in cultivation, while recent woods cover the gullies and bluff slopes in the site area. All of the structures are on level ground, but the structure concentrations are partially separated by a deep gully.

SITE PLAN

The site consists of two loose clusters of structures located along the edge of the bluff (Figure 11-14). The western cluster consists of the main house (removed), a garage, cellar, barn, smokehouse, and several small outbuildings and cattle working pens. The eastern cluster consists of a probable barn foundation and several outbuildings including the blacksmith shop. The eastern cluster may represent an earlier component of the site. All of the structures are linked by dirt roads or footpaths.

While temporal adjustments may be indicated by the two clusters (this cannot be documented at this time), the site layout seems to reflect use of marginal land near the bluff, leaving the agricultural land to the south unobstructed. Location of the cellar to the rear of the house and the position of the water pump between the house and the barn are typical settings. The smokehouse is also located close to the residence, a pattern observed at several other sites.

Most of the outbuildings appear to be of late construction with the exception of the barn to the south of the main house and the fallen structure in the eastern cluster. While the former may be a pirated building, the presence of some earlier structures is not unlikely, since the site has been continuously occupied by the Reitz family since 1876, and possibly earlier.

ARCHITECTURAL DESCRIPTIONS

The main house had been removed from the site since it was described by the SMU survey crew (Skinner and Connors 1979:34). The Reitz family indicated the house had been sold, but it could not be located for study. Ruins of the porch and foundation are evident, and test excavations were undertaken in the area formerly under the house.

The original structure appears to have been a two pen plank house, which was modified into a three room house. Still later renovations are noted by the SMU survey crew as having been effected about 1974; these included new siding and other modernizations. The present remains include a large concrete porch on the southern front of the house, presumably permitting entrance through both front doors. Piers (cedar, cottonwood, and brick) as well as plumbing fixtures and artifact accumu-

lations help delineate the former structure in the unvegetated area north of the porch. A stone walk leads to the edge of a presumed porch at the northeast corner of the original house. A fallen chimney and plumbing fixtures indicate that the kitchen was probably located in the southern room. Another chimney is noted by the SMU survey notes in the middle of the two front rooms; since no foundation for the latter chimney is evident, it is likely that it was pedestaled at the ceiling as are most stove chimneys in plank houses in the Lakeview area.

The cellar is constructed of poured concrete. It has I-beam supports for the roof, with 1 × 12 planks left in place as a form for the roof. Poured concrete steps lead to the cellar and the roof is heaped with earth. The interior walls have all been plastered.

The garage to the east of the house is 14.7 by 6.3 m in overall dimension and is constructed of cedar poles with upright 1 × 12 siding and a metal roof. It is loosely partitioned into two areas, both of which have vehicle bays and storage areas.

The smokehouse (5.5 × 3.1 m) is constructed of cedar poles with upright 1 × 12 plank sides. The roof frame has no ridgepole, and the original shake roof is in smaller door occurs in the west wall. Two small sliding windows on the south wall may be ventilators. The firebox is situated in the east central portion of the floor. It is constructed of GLOBE bricks and consists of a massive foundation with double course walls for the firebox proper (compare to the similar but older feature at the Anderson site). The walls and rafters have numerous nails, presumably for hanging meat, and the roof is heavily smoke stained.

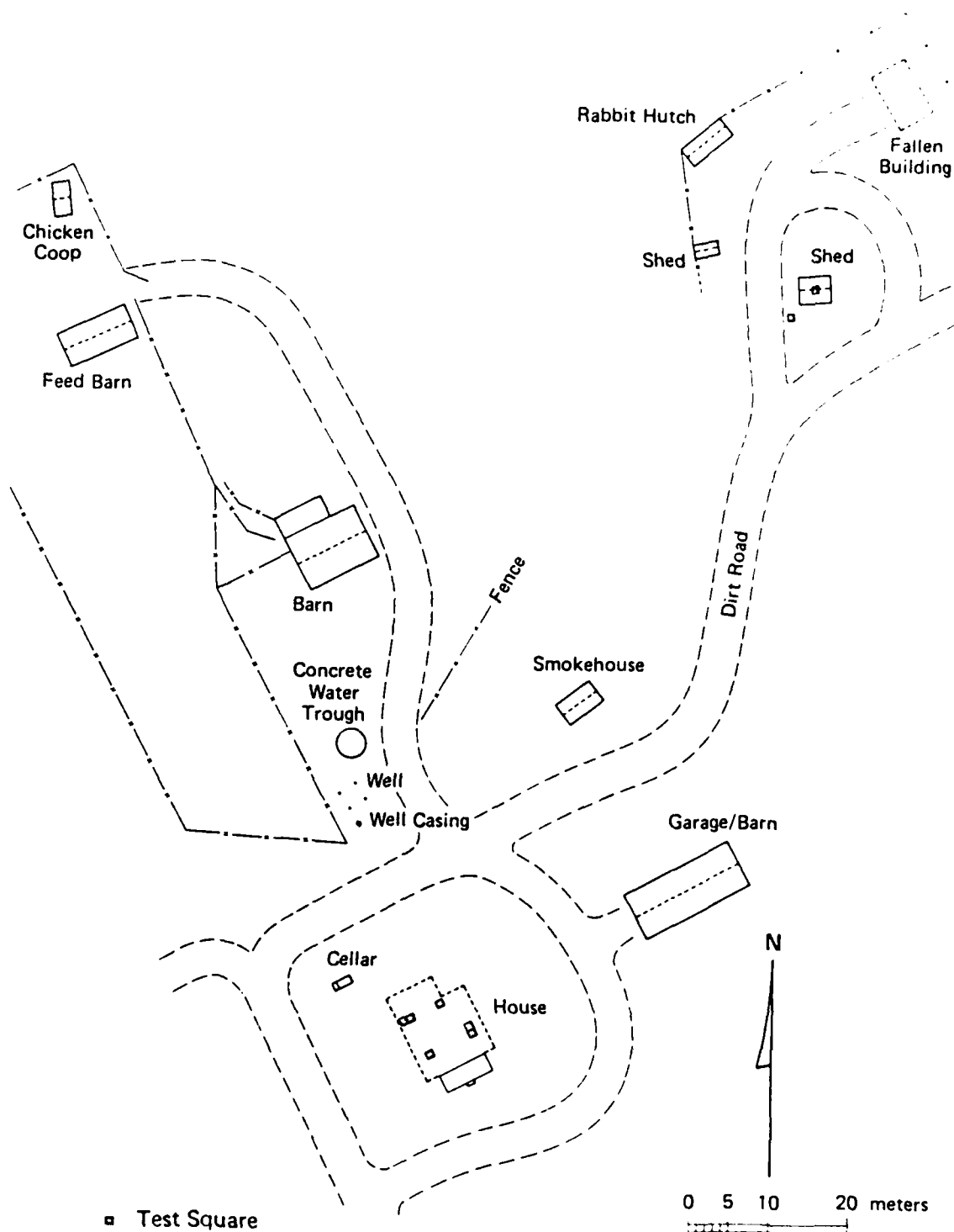
The main barn to the north of the house appears to have an early core structure which may have been moved from another location. It is approximately 10 by 4 m in overall dimension. The foundation consists of massive lapped sills resting on log piers. Oversized joists and oversized studs are joined with cut nails. The braced frame construction was once covered with clapboards, which were removed to convert the structure into a crib. Sheds were added to the north and south, but these have been largely salvaged. Modern plank and cinderblock structures (the chicken coop and feedbarn respectively) are situated farther north of the barn and cattle working pens.

The eastern complex is dominated by the fallen building, which may have been a barn or residence. The foundation consists of massive sills which have pegged lap joints supplemented by large cut spikes and metal straps (Figure 11-15). Most of the fallen timbers associated with this structure have cut nails, and the lumber forms suggest plank walls and a simple shake roof. A shed may have been added to the south side. The original building was approximately 7.1 m square.

The other structures in this cluster include a small pole/plank "rabbit hutch" or chicken coop, a small pole/plank shed with board/batten construction, and a similarly built larger shed. Both of the sheds are made with wire nails and have shake roofs. The larger structure was used as a blacksmith-workshop.

LANDSCAPE ARCHITECTURE

The Reitz site exhibited a diverse array of landscaping which relates primarily to its latest phase of occupation. Elm and pecan trees were planted around the front of the main house, with wax



THE REITZ SITE
41 TR 45

Figure 11-14. Map of the Reitz site (41TR45).

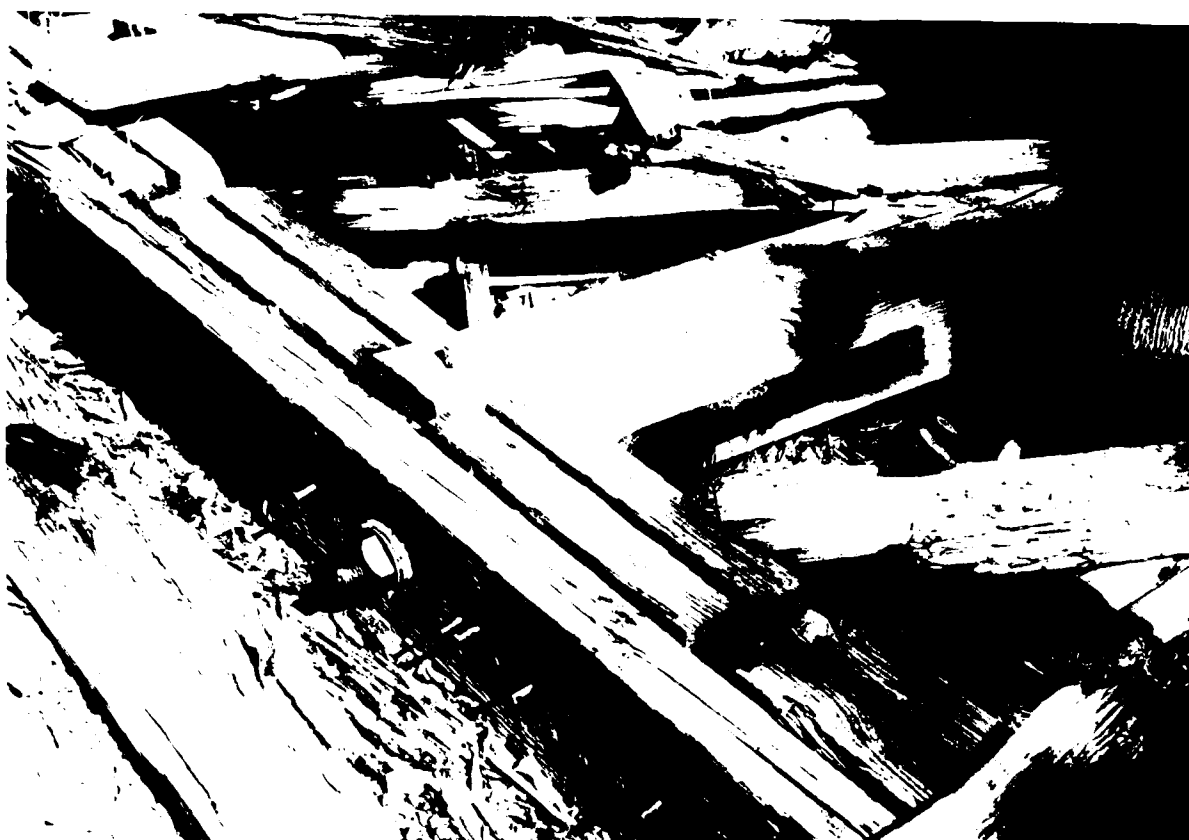


Figure 11.15. Construction detail of barn foundation at the Reitz site (41TR45). Note lap joint, pegging, metal strap and large cut spikes.

leaf shrubs near the house and large iris beds just across the drive from the porch. The rear of the main house yard has fruit (apple¹), mulberry, ash, and mimosa trees. Just across the back drive is an extensive bed of roses, yuccas, and iris. Behind these separating the house from the barn area is a row of redbuds, a peach, and chinaberry trees. Near the garage are peach, pear, fig, and cypress. Yucca have been planted along the drive between the garage and the smokehouse. Many of the beds have exotic local and non-local rocks and foliage.

TEST EXCAVATIONS

Test excavations were conducted in two areas of the site (Figure 11.14). Six 1 × 1 sq m test pits were dug at the location of the main house. One pit was dug within the blacksmith shop shed and one just outside this structure. Each of the test pits in the house area yielded artifacts, with a maximum depth of ca. 20 cm. Some temporal stratification of these deposits is suggested by the nail data presented later, and the house area is regarded as a good locus for further archaeological investigations. Cultural debris was found to a depth of ca. 30 cm in the blacksmith shop area. This material is on good context and can yield information

on the blacksmithing activities carried out there.

ARTIFACT DESCRIPTIONS

Kitchen. The largest group of items related to use in the kitchen are tin cans (Table 11.5). Of the 118 fragments located, 37 are the common crimped seam variety, two are evaporated milk cans with soldered seams and six are beer cans. The second largest group of kitchen-related items is glass containers. The majority of these are soda bottles with crown top necks (Table 11.6). One glass fragment from a wine bottle and one beer bottle fragment were also recovered. Fifteen fragments representing ten tin cans were recovered. Of these, six are flat, thin, and brown to ashy in color. One of the brown ones had a partial mark identifying it as a Perfect Malted product, not before 1900 or 1905 (Ludwig 1977).

Shard fragments include two gray whiteware sherds, one underglaze-painted sherd, and one brown porcelain sherd. Bone recovered is discussed in Appendix II.

Architecture. Numerous artifacts relating to architecture were recovered. These include brick, wood, composition roofing, ceramic sewer pipe, metal sewer pipe, and mortar fragments. Of the 41 fragments of brick all but one are of the standard

TABLE 11-5
Artifacts from the Reitz Site (41TR45)

Artifact Class	Main House				Blacksmith Shop Area		Total	%
	Sq. 1	Sq. 2	Sq. 3	Sq. 4	Sq. 5	Sq. 6		
Unidentifiable	5	2	12	30	19	3	150	8.13
Kitchen	67	19	44	46	68	12	280	17.39
Architecture	41	29	46	75	142	38	450	25.31
Furniture	3		3	11	6		31	1.68
Ordinance			3	10		28	43	2.33
Clothing	1	1	1	1	1		14	.75
Personal		7	4	5	1		26	1.40
Activities								
General		1	2			3	317	17.18
Construction				1			1	.05
Agriculture			2				25	1.35
Blacksmithing						17	337	18.26
Wagon-related						307	30	1.62
Farming Machinery						13	38	2.05
Auto-related					1		11	.59
Water System						5	2	.10
Fencing			3				32	1.73

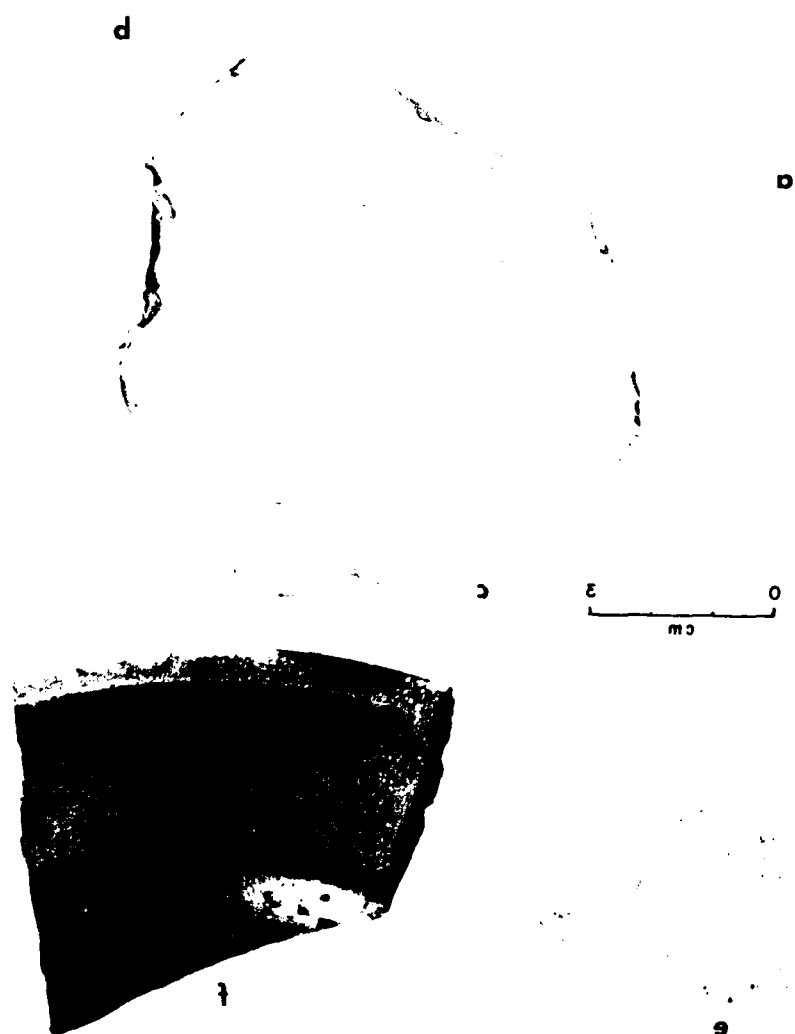


Figure 11-16. Artifacts from Reitz site (41TR45). a - soda bottle neck; b - medicine bottle neck; c - fruit jar base; d - fragment of pressed "Lacy" glass compote with "Grapevine" decorations; e - rim sherd from plain whiteware vegetable bowl.

molded type, and the remaining piece appears to be handmade. Nails recovered from the test pits in the main house area appear to document the late nineteenth century date for the house, and the integrity of the shallow buried deposits. The percentage of cut nails from these squares is as follows: Surface, 10% ($n = 10$), 0-10 cm, 66% ($n = 68$), 10-20 cm, 100% ($n = 5$).

Furniture. The largest percentage of material recovered relating to furniture is oil lamp chimney fragments. Twenty clear pieces were recovered representing five individual chimneys. An oil lamp burner is also present. One wooden chair slat was recovered. In addition, several decorative items were included in this category. These include: one milk glass footed dish, one milk glass vase, one brown dish with pressed decorations, and one clear dish with a pressed design that appears to be an animal head.

Ordinance. One .22 short cartridge and one .22 short bullet were collected. Also included in this grouping are 40 fragments of yellow and black clay trap pigeons.

Clothing. Two buttons were recovered from 41TR45, one of metal and one made of shell, that appear to be handmade. Four pieces of shoe leather were collected as well as two boot heel fragments made of hard rubber. One safety pin, one clothespin, and a piece of fabric were also recovered.

Personal. The largest percentage of material to fall under the heading of personal is medicine bottle fragments. Other items include two pieces of newsprint and one fragment of a 78 RPM phonograph record. Numerous cosmetic and medicine containers include six panel bottles, three clear, one aqua, one green, and one amethyst or sun-colored, dating from ca. 1880-1900. In addition to these, one amethyst colored medicine vial, with a partial raised mark, one specimen in cobalt blue and the neck of a bottle with a flattened crown top were recovered (Figure 11-16). One cosmetic or toiletry container base with a pressed sunburst design and ridges running vertically up its sides was also recovered.

Activities. Many activities are represented in the artifacts collected at 41TR45. Agricultural activities are indicated by the 17 mower teeth and one planter tooth recovered as well as the 20 fragments of bailing wire and four bail ties.

Blacksmithing activities are by far the most well represented, with all materials deriving from test excavations in the shed in the northeast building cluster. A list of these materials includes 22 iron plates, 31 rod stocks, 14 bar stocks, 1 angle iron, 111 pieces of scrap iron, 6 iron straps, 2 pieces of lead, 1 piece of tin, 60 clinkers, and 17 pieces of slag. Also recovered were: 2 round files, 1 triangular file, 3 flat tires, 1 chisel, and 1 punch.

Wagon-related artifacts include 13 pieces of leather harness strap, two hame rings and one buckle, as well as one "U" shank and a shackle plate. Auto-related artifacts recovered include five pieces of rubber that appear to be from a tire and six piston rings. Seventeen fragments of fencing wire, three fencing staples, one piece of barbed wire and one piece of wire mesh were collected.

DISCUSSION

Initial investigations at this site indicate that it is an important location of settlement within the Lakeview area, with continuous

family use from at least 1876 to recent times. The structure of the site includes several activity areas, such as the residence, smokehouse, blacksmith shop, etc. These serve as activities vis a vis archaeological investigations and subsequent analyses of cultural material. The possibility of pre-1876 components is suggested by discussions with the Reitz family. Additional architectural documentation is needed for the barn north of the house, the smokehouse, and the buildings in the eastern cluster at the site. Archaeological excavations near these structures, and expansion of the excavations in the main house and blacksmith shop areas are needed. Together these investigations can contribute significantly to knowledge of transitional lifeways over the last century at a site which is well documented in terms of its inhabitants.

41TR47 THE SEETON SITE (CA. 1925)

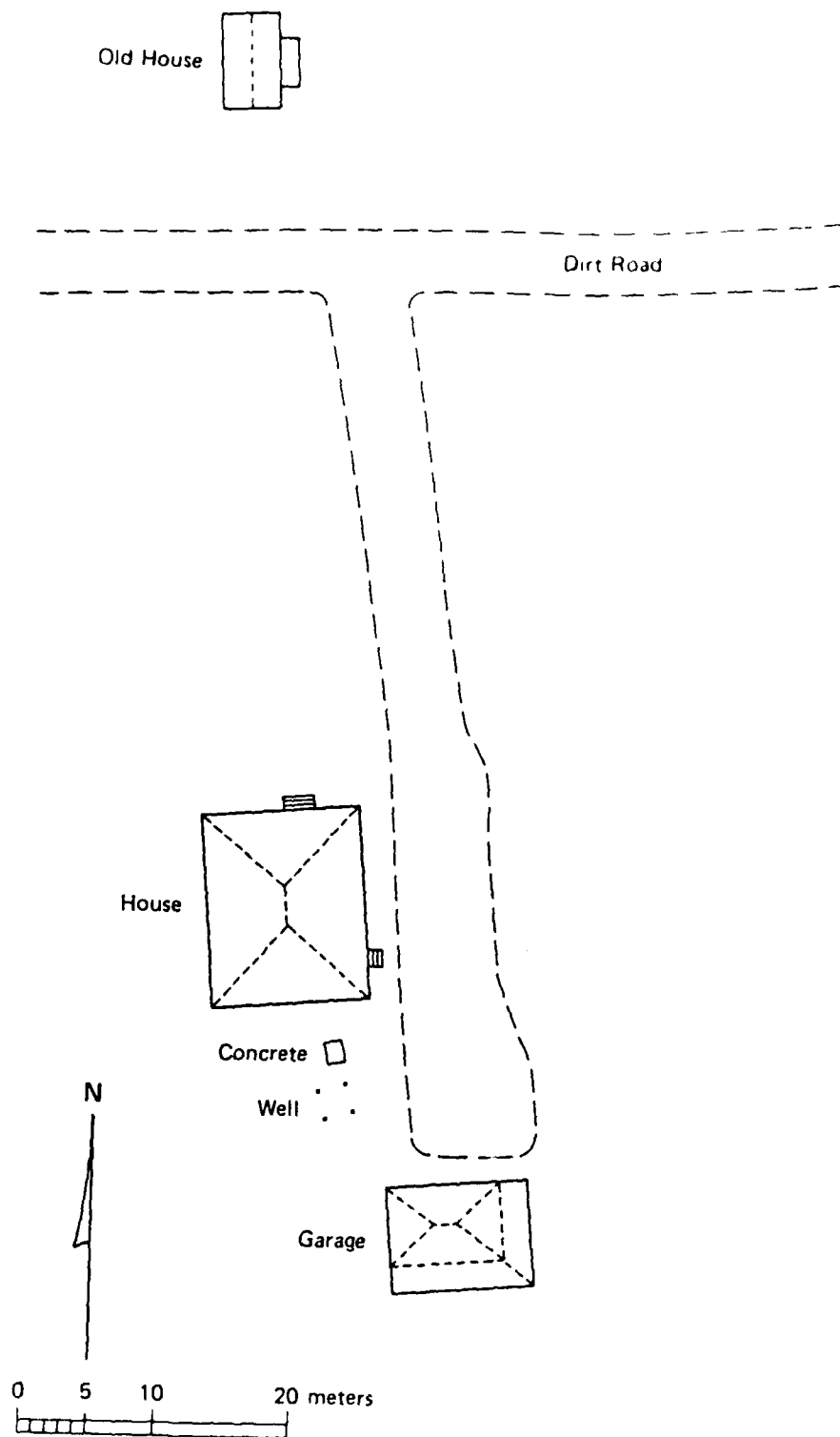
This site is located on the west side of Mountain Creek along Seeton Road. It consists of a main house, garage, and a smaller two-room house on the north side of the road (Figure 11-17). Conversations with the present occupants indicate that the main house was built in the 1920s, while the small house is older and has been relocated to its present position from nearer the creek. The main house is roughly of the prairie style, with a fully hipped roof, and a broad porch which faces the entire north and east sides. It was not possible to closely examine the interior, but it is almost certainly a frame structure, with contiguous rooms (i.e., no halls) typical of the period. The exterior is finished in shiplap painted white, with black trim. Both front (northern) rooms have doors to the porch and the kitchen on the east also has a door to the porch. The garage is pole and board/batten construction, and also has a fully hipped roof. The small house to the north is board and batten in construction, resting on wooden piers. It is divided into two small rooms, but has been remodelled in relatively recent times.

The main house at this site is of interest since it represents one of the latest styles of rural architecture in the area prior to the depression. The family intends to move the structure upslope out of the floodpool, so it will likely be preserved.

41TR48 THE MARRS SITE (CA. 1859)

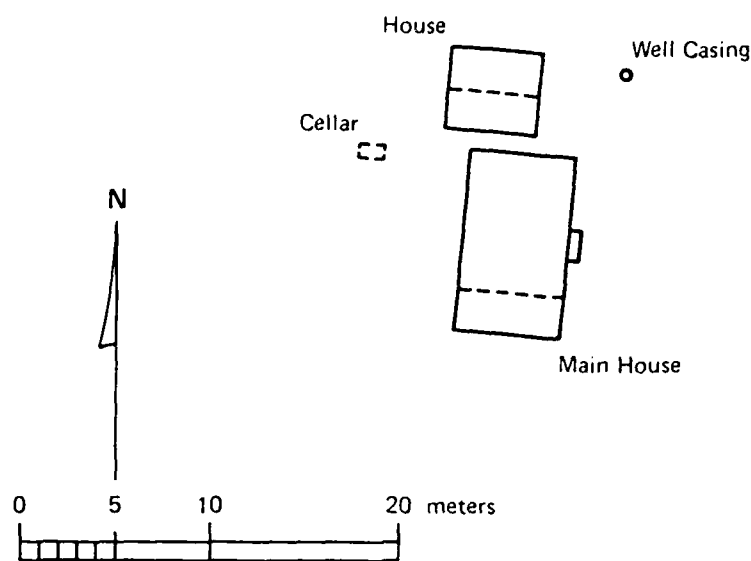
This site is located on Walnut Creek near the upper end of the proposed floodpool. It consists of a main house, a secondary structure immediately behind it, a fallen cellar, a well and several scatters of trash (Figure 11-18). The Marrs family has owned land in the area since at least 1859, and Mrs. Robert Loyd indicated that the family lived in this house during the early part of this century. The date of construction is not known, however.

Architecturally the main house is unique in the Lakeview area. It is two story, balloon frame with mortice and tenon joints used for the major structural elements. Cut nails are used predominantly. Resting on stone piers, the house measures roughly 7.4×5.6 m, with the roof ridge transverse to the long axis of the house. The ground floor is dominated by a large front



THE SEETON SITE
41 TR 47

Figure 11-17. Map of the Seeton site (41TR47)



41 TR 48

Figure 11-18. Map of the Marrs site (41TR48).

room with a fireplace. A small back room includes the turned stairway to the single large second story room. The back (north) wall has been modified without any apparent change in the total floor area, but the exact nature of the modification could not be determined without removing interior planks. A large porch extends across the front of the house; the overhang of the porch is decorated with a curvilinear skirt, suggestive of late nineteenth century styles. The exterior is finished in clapboard and simple 1 × 4 window-door moldings.

The house to the rear is unusually close to the main structure and may serve as a kitchen. It is a plank house with shiplap siding and a single ceiling supported chimney. It rests on a wooden pier foundation, with conventional milled lumber sills and floor joints; wire nails are used throughout. It appears to be considerably later than the main house.

A cellar just west of the two structures had log supports and a log roof, which has long ago collapsed. A well just northeast of the main house is ringed with stone slabs and appears to be joined to the house by a stone walk.

Little is known of the Marrs family according to the sources contacted during investigations. The present tenant on the property had no idea who lived in the house or when it was occupied. Mrs. Loyd seems to be familiar with the family, but does not recall many details about the period of nature of the occupations. Architecturally the main house is of considerable interest. It perhaps represents a very early balloon frame structure in the area, or possibly a late nineteenth century

manifestation. In either case full documentation is important, as are more extensive searches for information on the Marrs family. Test excavations near the house and in at least one of the trash concentrations to the east of the house should be undertaken to establish the nature of the artifact assemblages associated with the structures. Some time depth in these assemblages should be anticipated, but artifactual analyses may be needed to assist in dating the site.

41TR57 THE WEST GRAVE SITE (1872)

This burial site, marked by a granite tombstone of recent age and surrounded by an older metal fence, is located near the crossing of Wagner Road over Lynn Creek. During the course of this phase of research the marker was stolen and recovered by Park Rangers, and the fence has been stolen and not recovered. The burials are reported to include not only Ophelia E. West, buried in 1872, but also one and possibly two infants. It has recently been determined that the burials will not be relocated, but will be preserved in situ.

Restoration to original appearance may only promote additional vandalism at this site, which has become notable in the area. Replacement of the marker in a concrete foundation seems necessary; the foundation could be landscaped or buried to retain some aesthetic character of the original setting, while more substantial fencing seems necessary to provide adequate protection to the graves.

41TR58 THE SNAKE SITE (CA. 1930?)

This site is located just west of Walnut Creek, opposite the Seeton Site. The Seetons indicated it was a tenant house which burned at least a decade ago, but they could not provide an age for the structure.

The only remains of the house are a few burned piers and some fallen bricks. A very thin scatter of late historic trash is exposed in the plowed field to the immediate south of the structure. Shovel testing in the vicinity of the house revealed a very thin, shallow scatter of recent trash. All of the observed artifacts appear to be ca. 1930 and later. Since little if any significant architectural data may be gained from the site, and since the artifacts are either scarce or in very disturbed contexts, no additional work at this site seems warranted.

41DL181 THE HINTZE SITE (1898)

SITE SETTING

The Hintze site is located just south of Ballweg Road and about 750 m west of Belt Line Road (Figure 11-19). It is situated near the edge of a low, broad hill overlooking the southern edge of the Walnut Creek floodplain. The main site area is surrounded by fields on three sides and by a stand of mesquite to the north. At the time the original house was built, it faced a road to the west. When Ballweg Road was constructed, the latter road was apparently abandoned. Springs were located near the site until recent times. A pump near the stock tank just northwest of the site marks the location of an artesian spring which provided water for the Hintze family for years. Backhoe trenching revealed no evidence of recent alluviation at this site, as might be expected because of its topographic setting.

SITE APPEARANCE

At present the Hintze site consists of a main house, a barn and two outbuildings (Figure 11-19). Other features at the site include a water pump and tank (now pirated), a small grain silo (now pirated), and fencing. The main house was in relatively good condition when photographed by the SMU survey crew (Figure 11-20). At the time the structures were documented, considerable damage had been done to the house by scavengers. Most salvageable materials from the site had been taken by the time this documentation began. Some loss of information on the main house architecture was lost; photographs from SMU as well as documentation of remaining features minimized much of this potential loss. The outbuildings are basically intact, but are not of particular architectural merit.

ARCHITECTURAL HISTORY

The main house has undergone two major phases of construction followed by some minor additions and modifications.

The original house was built in 1898. The house faced west and had two main rooms at the front with a porch and a third room at the rear (Figures 11-21, 11-22). The porch and third room were original features of the house. The barn was apparently built some time prior to the construction of the house. This is probably because the Hintze family had been living in the vicinity of the site for some years prior to construction of the main house.

In 1915 the floorplan was changed by the addition of a "T" to the western end of the house. As was common with "T" additions, the new rooms consisted of a dining room in the middle and the kitchen at the end of the "T." The old porch area between the two house units was enclosed and served as passageway and small additional room. After 1915 the house was a fairly symmetrical "T" with a porch following the northern portions of both house phases (Figure 11-23).

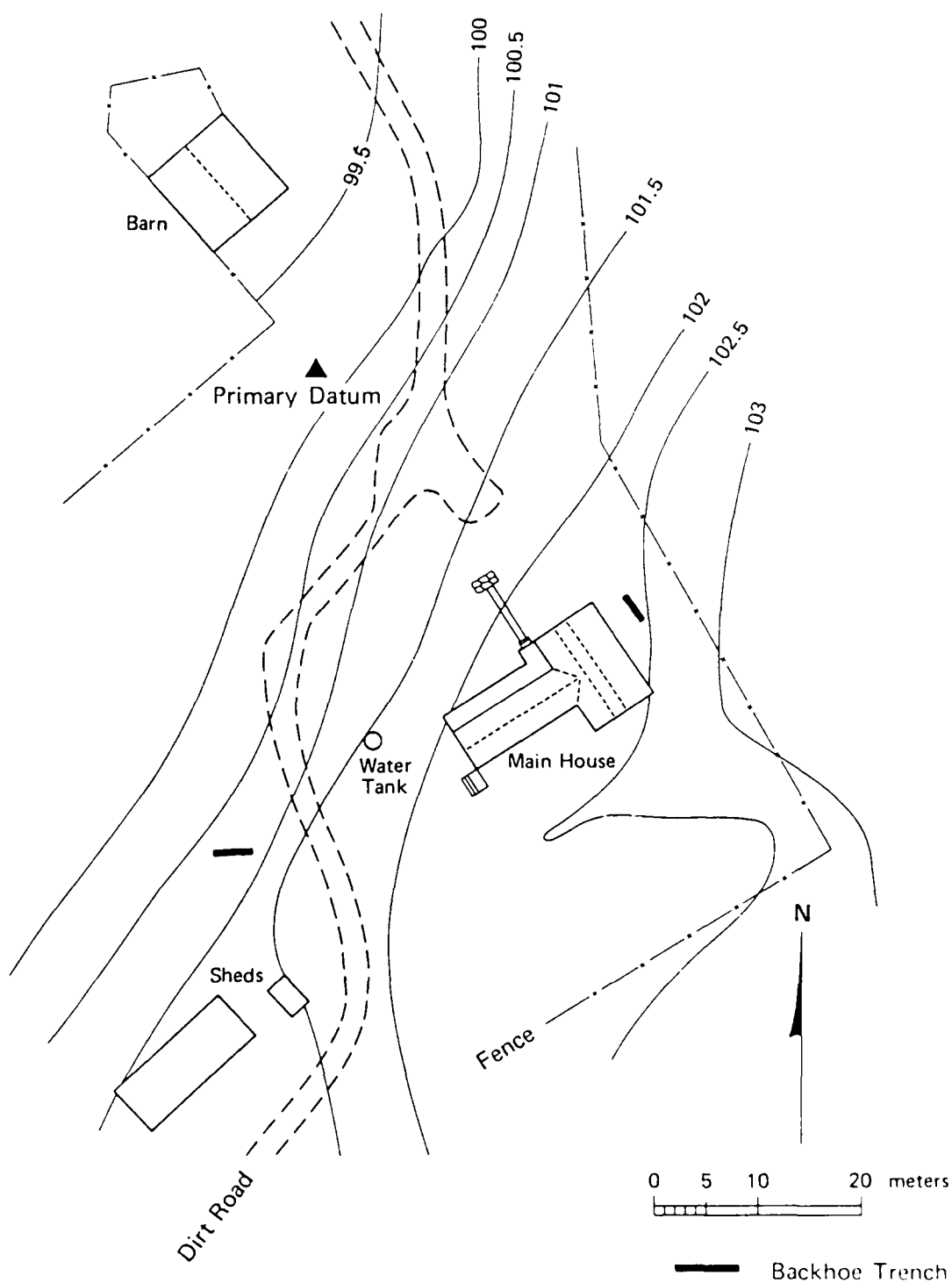
At some later time another addition was made to the southern portion of the 1915 portion of the house. A rear porch was added off the kitchen door. Between this porch and the 1898 portion of the house, a bathroom and another room were added (Figure 11-23). At this time the southern windows to the dining room were closed off and a door was cut through a probable window location between the 1898 house and the new room. Still later, the back porch was closed in and apparently converted to a laundry room.

Prior to recent vandalism, the modern appearance of the house was that of one which had been frequently modified. The original simplicity and charm of the house had given way to a growing family and a successful way of life (Figures 11-24, 11-25).

The floorplan of the original house was typical of homes farther to the east or farther up the economic scale than most plank-type houses. It is similar to some of the larger log structures in Texas and exhibits a typical offset porch roof (Jordan 1978:87). As mentioned above, the transformation of the house to a "T" floorplan was also accomplished in a way typical of the modification patterns of log structures in Texas. This includes placement of the kitchen at the base of the "T" which seems to be common for "T" and "L" modifications (Jordan 1978).

The construction techniques for the two main phases (1898 and 1915) are very similar. Foundations for the old house consist of bois d'arc piers, some of which may have been placed on limestone slabs. These were either hewn or sawn to level and provided a base for the floor sleepers and peripheral stringers. Roughly milled 1 x 12" boards without joints were used for the upright members. These were capped with stringers and joined with ceiling joists. The superstructure consists of roughly milled 2 x 4" or 3 x 4" rafters, 1 x 4" lathing and wooden shingles. (The shingles were made on the site by a shingle maker.) The original porch floor has been replaced, but it was probably made of the same tongue and groove planks that the ceiling is made of. Cut nails are present throughout the original construction.

The window and door frames were all made on the site from standard 1 x 4" boards. Window frames involved some inletting and the final product was undoubtedly pleasing from the outside. Since the walls consisted of only the upright 1 x 12"s and clapboard siding, these window frames necessarily project into the rooms. The door frames are equally simple, but they did not



THE HINTZE SITE
41 DL 181

Figure 11-19. Map of the Hintze site (41DL181).



Figure 11-20. Photograph of the Hintze house (41DL181) facing south.

originally extend into the rooms. The exterior of the house was entirely covered with clapboard. The soffits were all neatly enclosed and the exterior seems to have been painted green.

The interior of the house has been greatly modified and the original features are difficult to discern. The original ceiling was painted dark green. There were twin chimneys in symmetrical positions near the ends of the two main rooms. The flooring appears to have been tongue and groove boards.

The 1915 addition is essentially similar to the original house. Wire nails were used throughout the new section and shiplap siding was used instead of clapboard. Basically the same structural plan was employed, with upright 1 x 12's serving as the major members. Evidence of chimneys had been removed at the time the site was visited.

The entire house has remodeled from time to time. Modern linoleum floors or carpeting are present throughout. Linoleum wainscoting is present in the kitchen and several of the interior walls have been sheetrocked. Several built-in cupboards were added to the kitchen, all painted white, and the southern portion of the old house was covered with inexpensive siding. As previously mentioned, the house was eventually equipped with indoor plumbing. The house was last heated by space heaters and was quite fully wired for electrical appliances.

The barn is a transverse crib type, typical of the period (Jordan 1978). It is constructed of cedar poles which define the sides and central passageway. Although no poles reach the ridge of the roof, each of them is quite tall. Milled crossmembers and rafters are nailed to the cedar poles with wire nails. The hayloft flooring has been replaced with plywood. The walls of the barn are made of unjointed upright 1 x 12" pine boards. The roof is made of wooden shingles. The floor is dirt and the barn has been cut into progressively smaller cribs.

The additional outbuildings are recent pole and sheet metal or scrap lumber constructions. They served most recently as tractor barns/shops, stock shelters and storage buildings.

ARCHAEOLOGICAL INVESTIGATIONS

Two test trenches were excavated with a backhoe at the site. The first was placed just east of the house near the back porch (Figure 11-19). It revealed a modern soil and no subsurface features or artifacts. The second was placed in an area of dense trash accumulation west of the house. It, too, indicated an absence of in situ material.

An intensive surface collection was made in an area of trash

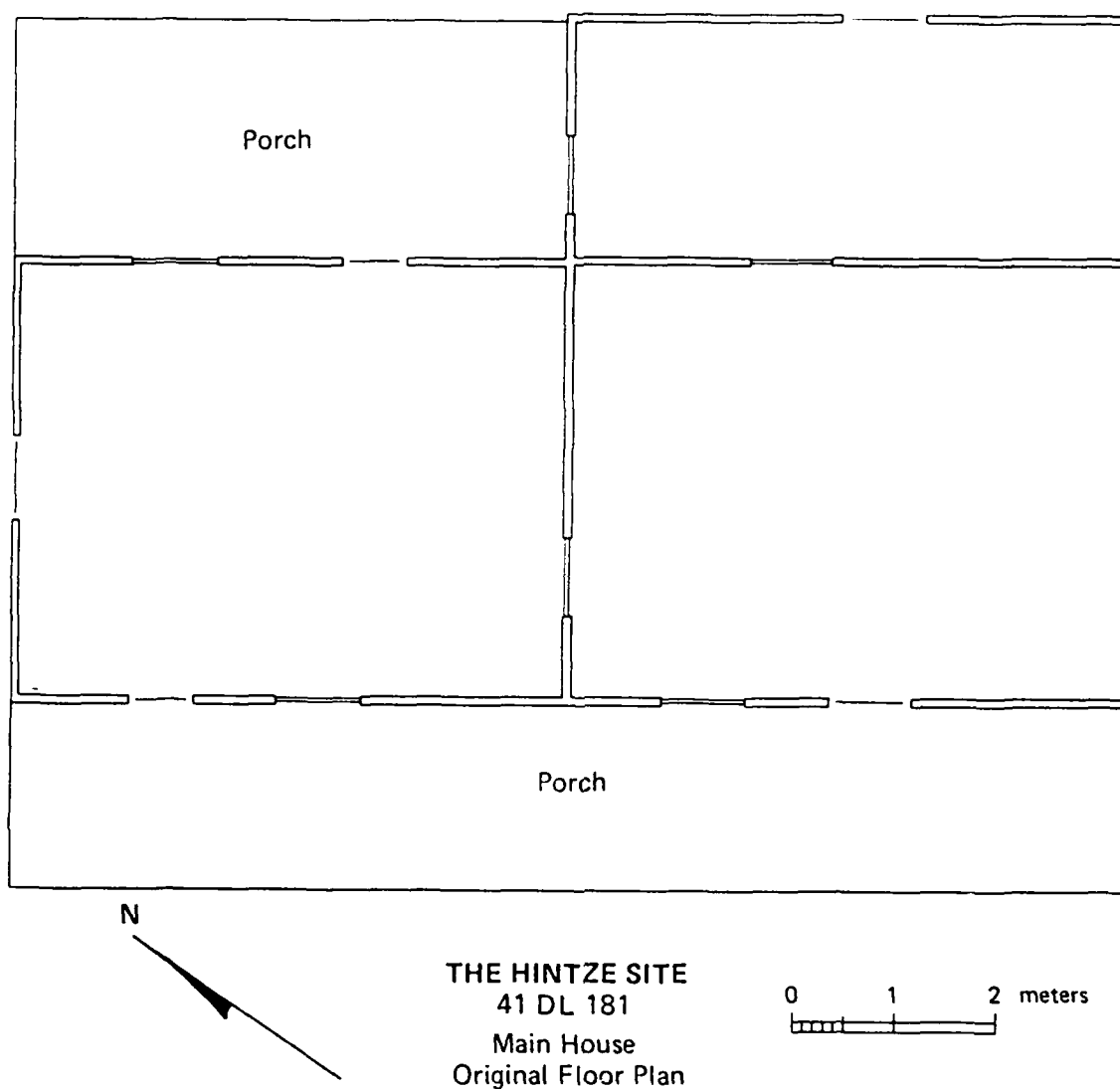


Figure 11-21. Original floor plan of the main house at the Hintze site (41DL181).

accumulation to the east of the house. This position would have been behind the original house, where earlier trash would be expected. The area has been plowed recently and no evidence of outbuildings could be seen. The material recovered from this area of the site is reported in the following artifact description and analysis.

ARTIFACT DESCRIPTIONS

Domestic Utensils

Glass Containers

Glass container fragments constitute 38% of the artifacts recovered from 41DL181. These were classified by their former

content and/or function into several groups (Table 11-7). Three of the four containers are fruit jars; two are clear and one is aqua. Of these, one has a beaded seal (Figure 11-26c), a type produced after 1915 (Toulouse 1977:106). One aqua jar has a partial "BALL" mark but is not complete enough for specific temporal identification. The fourth is a product of the twentieth century and probably contained syrup.

The largest group of glass containers are medicine bottles. Four of these are panel bottles (two are clear, one is aqua, and one is amethyst). One of the clear panel bottles has a partial mark "...S.A..."; although this bottle probably contained bitters, it is not complete enough to identify. Of the fourteen remaining containers, one has an applied mouth, formed with a lipping tool (Figure 11-26e), two have flared crown tops and one screw top; the latter three are all molded through the lip (Figure 11-26).

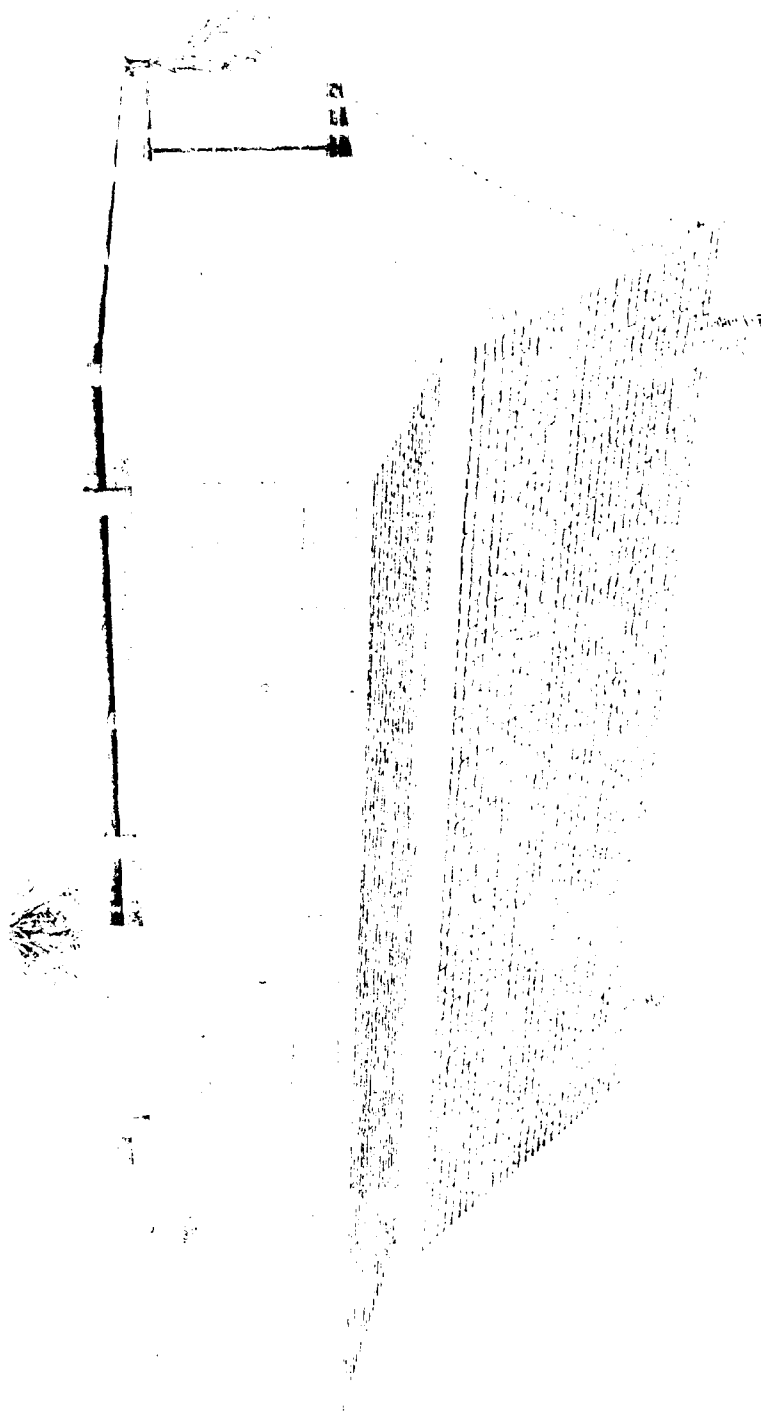


Figure 11-22. Reconstructive drawing of the original Hintze house (41DL181).

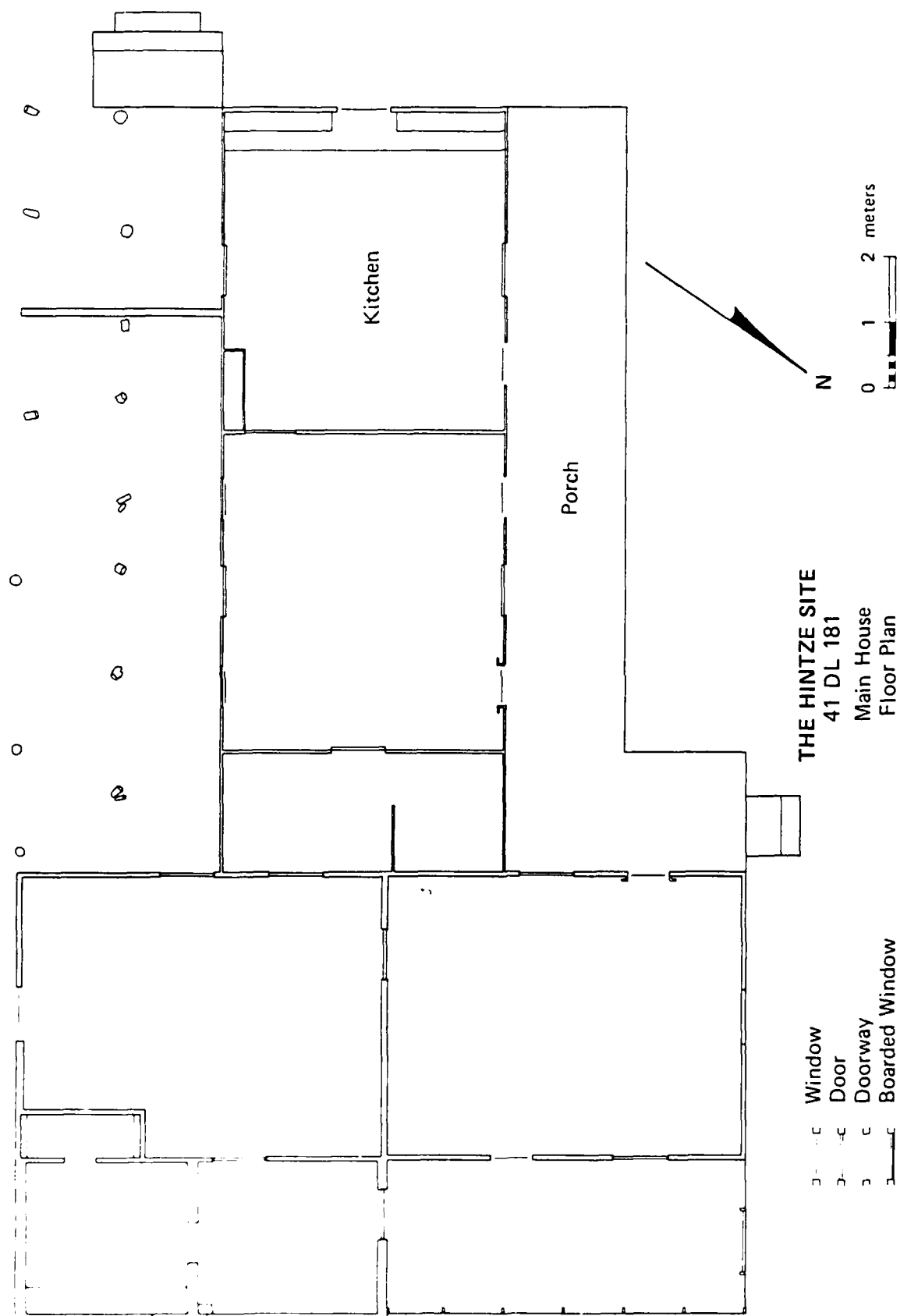
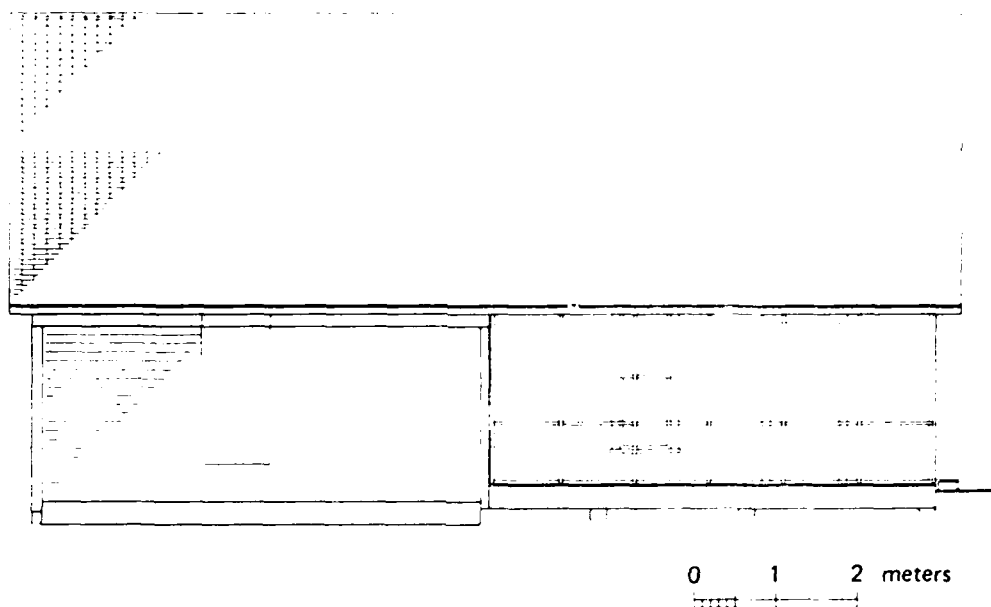


Figure 11-23. Floorplan of the Main house at the Hintze site (41DL181).



THE HINTZE SITE
41 DL 181
Main House
Northeast Elevation

Figure 11-24. Northeast elevation of the main house at the Hintze site (41DL181).

Two containers (one clear and one amber) have partial raised side marks, but neither is complete enough for identification.

Two (both clear glass) have base marks identifying the manufacturers. One of these is an Owens-Illinois mark, of a type produced between 1929-1954 (Toulouse 1972:403) and one is a Hazel-Atlas, manufactured from 1920-1964 (Toulouse 1972:239).

Two of the soda bottles have applied necks, one with a crown top and one with a wide collar and underrring. Both of these forms were produced between 1880-1913 (Newman 1970:70). One clear bottle, molded through the lip, has a crown top with a bulb neck. One aqua base shows the characteristic ring left by "Owen's" machine, patented in 1903.

Five amber beer bottle fragments representing two containers were collected. One base has an "Owen's Ring," produced after 1903. The only liquor bottled recovered is an amethyst bottle neck which has an applied, wide-collar type mouth. It was produced between 1880 and 1913.

Three jar tops were collected from the surface east of the house. Two of these are milk glass cap liners used for sealing fruit jars. One clear glass lid of the type held in place with a spring-wire clip was also retrieved.

The serving group includes one clear glass plate and three examples of bowls and compotes. One amber compote has "Lacy" decorations, but the design is not complete enough to

distinguish. One of the two remaining fragments is amethyst, the other is peach in color.

Ceramics

A total of 95 earthenware sherds were collected from 41DL181. Of these, 84 are undecorated whitewares. Recognizable vessel forms include cups, bowls, plates, and one large serving platter.

Two of the earthenware sherds are decorated with underglaze transfer prints. One plate with a brown floral print has also been hand tinted in blue and red (Figure 11-27a). One fragment from a bowl has a blue floral design. One cup fragment was recovered that has a blue transfer line overglaze around the rim. Two sherds of what appears to be a vegetable serving bowl were collected (Figure 11-27d,e) both with stencil painted blue and aqua underglaze flowers. Five sherds with various molded designs were also recovered; these represent the following forms: two bowls, two plates, and a tureen.

Three earthenware sherds with partial marks were recovered from 41DL181. One has an unidentifiable mark printed in green underglaze. Two marked sherds were collected from the general surface. One, printed underglaze in blue-black, shows the British Royal Coat-of-Arms in a rampant pose and has "WAR..."

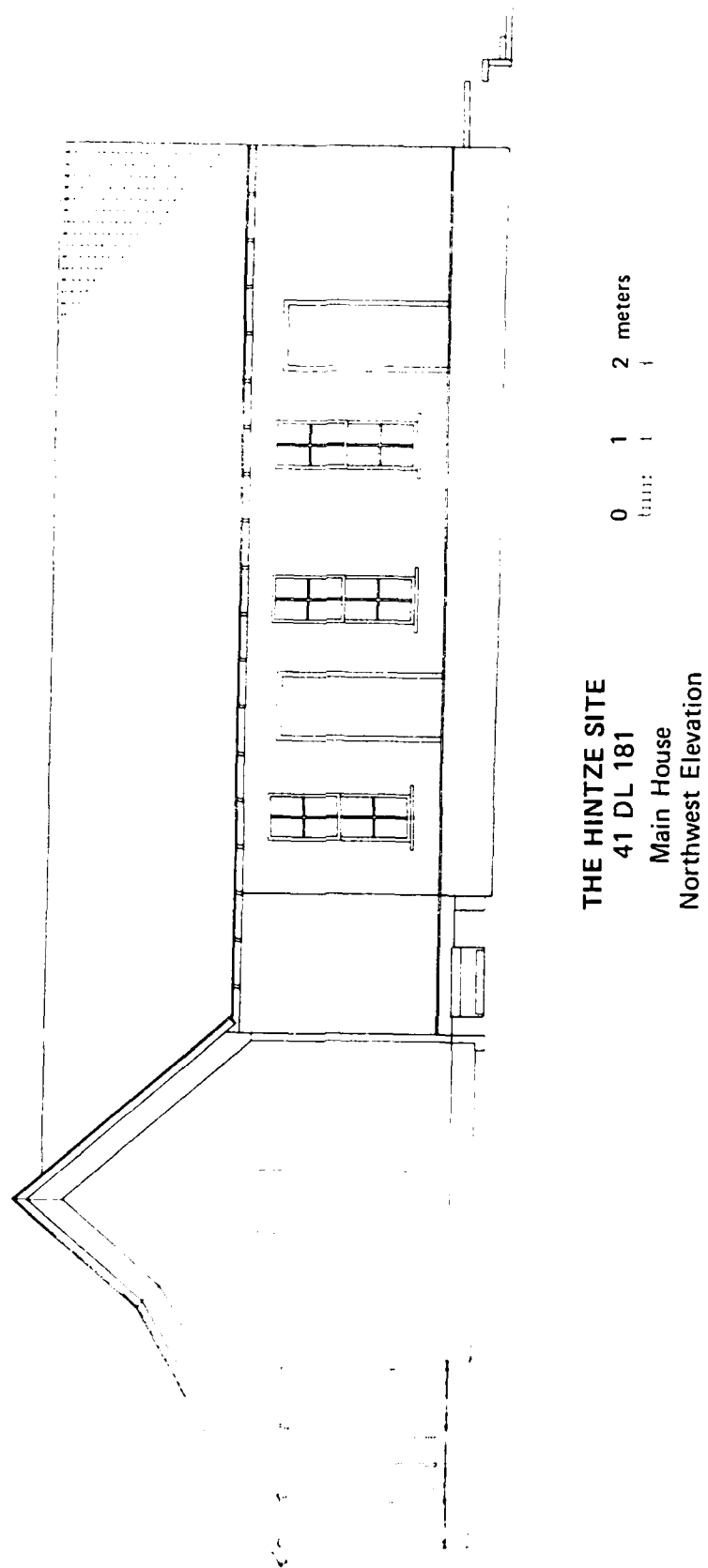


Figure 11-25. Northwest elevation of the main house at the Hintze site (41DL181).

TABLE 11-6
Artifact Assemblage from 41DL181

Artifact Group	General Surface	Surface East	Trench	Total	%
Domestic utensils	4	282	2	287	82.99
Domestic furnishings		5		5	1.44
Personal possessions		9		9	2.59
Tools and implements		3		3	.86
Horse and Wagon		2		2	.57
Building hardware		2		2	.57
Constructure materials		34		34	9.79
Miscellaneous metal		2		2	.57
Miscellaneous non-metal			1	1	.28
Faunal		1		1	.28
Total	4	340	3	347	

underneath, probably "warranted" (Figure 11-27c). Because of the common use of the Coat-of-Arms in the last part of the nineteenth century, a specific marker could not be located. It seems probable, however, that this is an American or British product from the last quarter of the nineteenth century. The remaining sherd is also printed in black underglaze with "ENGL..." being the only distinguishable portion. This piece was probably produced after 1891, at which time all imported ceramics were required to bear the name of their place of origin.

Thirteen "semiporcelain" sherds were collected. Twelve of these are undecorated; the following vessel forms can be distinguished: three cups, two saucers, two bowls, and a vegetable bowl. The one decorated sherd is a cup saucer with a molded "sunburst" pattern, radiating out from the center of the piece. Ten undecorated porcelain sherds were recovered. These include parts of one saucer or dessert plate, one bowl, and one cup.

Thirty fragments of stoneware were recovered, representing a minimum of 16 containers. Of these, all but two are thrown pieces. Four of the vessels are salt-glazed and one also has cobalt blue painted decorations on the exterior. Four have interior and exterior brown Albany type slips. Five have beige Bristol type slip-glazes interior and exterior. One has Bristol

glaze on the exterior and Albany slip on the interior. The last container has an alkaline glaze. Of the above, ten are large storage crocks, four of which were lidded, two are milk bowls, and one is a small jug (Figure 11-27f-i).

Domestic Furnishings

Five fragments of glass from oil or kerosene lamp chimneys were collected. Three of these are clear, one is aqua and one milk glass.

Personal Possessions

These include two short, milk glass jars of the variety that usually contain cosmetics or cold cream. One amethyst container has pressed "Pillar" moldings. The remaining item is a rim fragment from a small dish. This container has a pressed "leaf" design on the interior; it is made of amethyst glass around the lip (Figure 11-26d).

Four snuff bottle fragments were recovered, representing one container, amber in color. This bottle is typical of those

TABLE 11-7
Glass Containers from Site 41DL181

Types	No. of Fragments	Minimal No. of Containers	Percentage of Identifiable Containers
Food storage/fruit jars	9	4	13
Medicine	19	14	47
Soda	5	5	17
Beer	5	2	7
Liquor	1	1	3
Serving	4	4	13
Unidentifiable	88		
Total	131	30	

produced during the twentieth century.

One sherd of procelain with molded decoration and aqua glaze was collected. While this probably belonged to a figurative piece, it was too incomplete to discern a specific form (Figure 11-27b).

Tools and Implements

Three items that can be related to blacksmithing activities were collected from 41DL181. Two are sections of bar stock (Figure 11-28a). The remaining is a hand forged "blank," the unfinished blade of a knife or gouge (Figure 11-28b). This is 9 cm long and 3 cm wide; the butt end was squared and the working end was tapered to a point and beveled. These offer scant evidence that at some time small scale smithing operations were performed here.

Horse and Wagon

This group is represented by one fragment of trace chain and one carriage bolt (Figure 11-28c).

Building Hardware

A white porcelain door knob and a portion of an iron "butt"

hinge were recovered.

Construction Materials

Twenty-six fragments of plate glass were recovered at 41DL181. These include clear, aqua, and green specimens, which range in thickness from 1.8 mm to 3.6 mm. All appear to be window pane fragments.

One square head bolt, probably handmade, and one copper washer were recovered. Four wire nails were collected, falling under the following types: one 6d finishing nail, one 8d common nail and two fragments. Two cut nails were also recovered; both are common 10d siding nails (Figure 11-28d,e).

Miscellaneous

Of the two metal specimens collected, one appears to be a short cast iron brace. The other is a thin iron sheet with numerous holes; this is possibly a handmade patch. The single glass item recovered is a clear glass top of an electrical insulator. One unidentifiable bone fragment was collected.

HINTZE INTERVIEW

During the course of gathering oral histories for the Lakeview Project, we interviewed Mr. Gwen Hintze. Mr. Hintze is the grandson of Ernest Ludwig Hintze who along with his brother Frederick August built both the house on 41DLL81 and the



Figure 11-26. Glass artifacts from the Hintze site (41DL181). a - applied, wide collar; b - molded, screw type; c - "beaded" fruit jar; d - "pressed" cosmetic container; e-g - applied bottle necks.

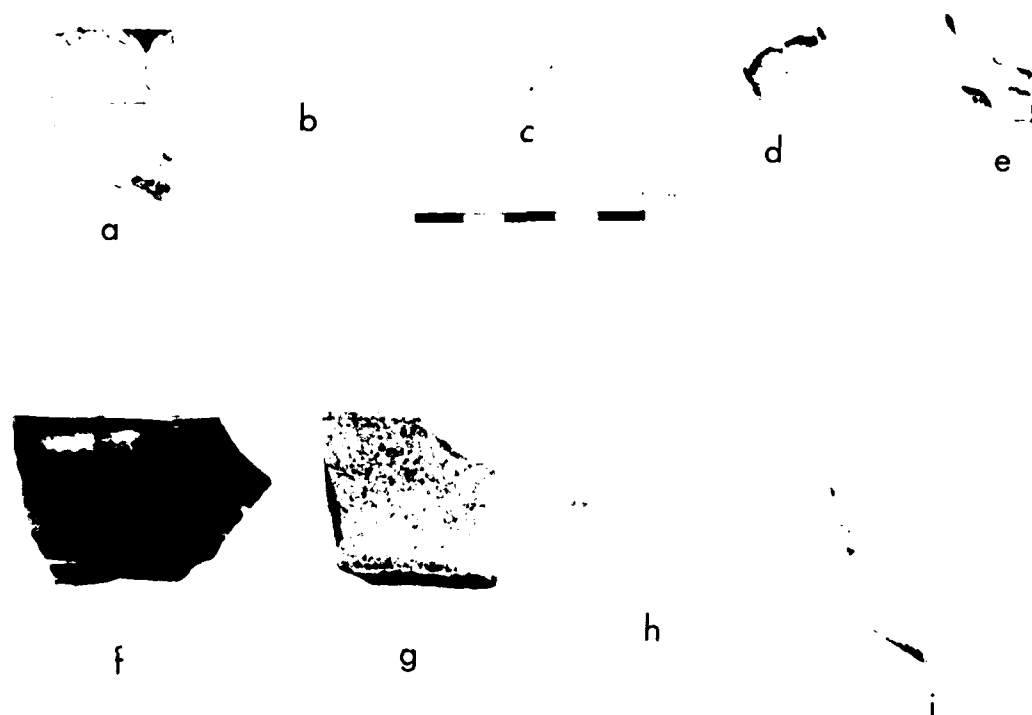


Figure 11-27. Ceramic artifacts from Hintze site (41DL181). a - transfer/hand painted plate; b - figurine; c - hallmark; d,e - "stamped" serving bowl; f-i - stoneware crocks.

"Hintze Tenant" house, 41DL196. Mr. Hintze was gracious enough to share his knowledge and family documents with us.

The two brothers Ernest and Fred A. were born in the village of Schoenlake in Prussia. Their father Julius was a dyer of cloth. In order to avoid impending political strife, Ernest and Fred migrated to America in 1872. They came in separate ships, but were reunited in New York City. After spending some years employed at a variety of jobs, which included work upon the Erie Canal, the brothers decided to move to Texas, "attracted by a depot sign advising young men to go to Texas," according to L. B. Hill (Hill 1909:96). Stopping in Tennessee for two years, they finally reached Texas around 1878. They began working in southwest Dallas County and after a time began farming some land on which they intended to settle.

As I understand it, they were working the land and share-cropping it and supposedly getting equity in it by that means. Unfortunately, they were both immigrants, didn't speak English, and the man took advantage of them. At the end, they didn't get the land. The story I always heard was that they were cheated out of it. (Hintze)

Although Ernest and Fred did not get that particular piece of property, in 1885 they had saved enough money to buy a 21-acre tract on the south side of Mountain Creek. By 1898 they had

added 80 more acres to their holdings, and built the house and barn at 41DL181. Both men appear to have been fairly successful at their adopted occupation of farming, for they continued to purchase land until they had acquired over 600 acres in the Mountain Creek area, including the tract that 41DL196 is located on.

As mentioned above, both the house and barn at 41DL181 were built in 1898. An interesting twist to this story is that the barn was built before the house; unfortunately, Mr. Hintze was not aware of the reason for this. One unusual feature at the Hintze site is the relative locations of the house and barn. When turning south off Ballweg Road onto the site, the barn sits north, or in front, of the house. As explained by Mr. Hintze,

The original house...faced west...if you go due west of the house, probably about 300 yards, there's a little draw down through there. And what caused that draw...as I understand, there was a road or trail running along through there...And the house faced the road and the barn was to the side. But now, since they built Ballweg Road, the barn is in front of the house. (Hintze)

In addition to building the house and barn at 41DL181, Ernest and Fred A. built the structure on the Hintze Tenant site (41DL196) and at least three other "tenant" houses which have subsequently been destroyed.



Figure 11-28. Metal artifacts from Hintze site (41DL181). a - barstock; b - knife "blank"; c - trace chain; d,e - cut nails; f - bar stock.

Due to the similarity between the Hintze house (41DL181) and the Hintze Tenant house (41DL196), we were curious to learn if any plans had been used in their construction. Mr. Hintze indicated that he was not aware of any.

I guess that was just the style that they built them in...I don't know if you noticed the way that old house was built. It's the box, the 1 x 12 boards that go up (to form the walls), and when they got to the roof, they just sawed them off at random. They're not straight across, those protrusions, if you go up in the attic you can see that. (Hintze)

While it appears they had no plans, they did have help at certain phases of construction. Relating a story about the building of the Hintze house (41DL181).

That house had originally, of course it has long since been repaired and replaced, but it originally had cypress shingles on it. And I can remember Dad telling the story; of course, he was just a small child when the house was built. He said they brought the blocks of cypress in from East Texas or Louisiana...They were sawed to the length, but they were in trunks of trees, and the guy came out there with a tool and split those off. He'd split off a few

and then he'd climb up there and nail them on and then he'd split off some more. But he made the shingles on the spot, was the thing that impressed me. (Hintze)

Mr. Hintze indicated that the structures were not built to be "tenant" houses, as such, but rather were intended to house family members outside the nuclear groups of Fred and Ernest. This being the case, no formal "sharecrop" situation existed; all worked in common "for a place to live and a share of the food." (Hintze)

In addition to farming, blacksmithing activities were common at 41DL181. Mr. Hintze indicated that Ernest had this skill as well as his maternal grandfather, Pierce, who was a blacksmith by trade. Mr. Pierce was not from the Mountain Creek area. "...he was kind of an itinerate; he moved around...all over the State of Texas..." (Hintze) He would set up shop where there was work to do and stay as long as the jobs lasted.

Members of the Hintze family retained possession of the Hintze Tenant property until 1953. 41DL181 was occupied by Fred Hintze, Jr. until 1973, when it was purchased by the Corps of Engineers.

41DL182 THE TEODVISKI SITE (CA. 1890?)

SITE SETTING

This site is located near the southern edge of the Project area well above the floodplain but below the nearby break to the uplands. Just south of the structure is a stock tank which appears to be quite old and heavily silted. A backhoe trench near the contact of the dam and the house area did not reveal any insight as to the relative ages of the house and dam (Figure 11-29). No evidence of a well could be found and no permanent surface water other than the tank is available. The site is located about 235 m west of Belt Line Road. An unnamed dirt road passes behind the site to the south. Another historical structure is situated to the south of the Teodviski site on that road. Structural similarities between the addition to the Teodviski site and the other house suggest possible temporal relations. Backhoe trenching confirmed the lack of alluviation of the site in historical times.

SITE APPEARANCE

The site consists of a single structure and associated surface trash. The house is in an extremely deteriorated condition. Its condition has worsened considerably since it was photographed by the SMU survey crew (Figure 11-30). The house has been abandoned for a considerable time, yet little evidence that it was subsequently used for hay storage or other nonhabitation purposes was not observed.

ARCHITECTURAL HISTORY

Two distinct phases of construction are represented by the site. The original structure was a basic two pen house with a northwest-southeast orientation (Figure 11-31). This house was later modified into an asymmetric "basic T" floorplan (Jordan 1978:126) for a triple pen house. Architectural details of both construction phases were documented. At present the site presents a "uniform" external appearance reflecting the last stage of construction. The exterior has doors on the porch doors typical of the early twentieth century (Figure 11-32).

The original floorplan was that of a basic double pen house. The doors and windows of this house are oddly asymmetric. This led to the suspicion that perhaps the house had originally been a single pen house, but this could not be discerned. Each of the two rooms had a door which faced the porch. These were retained in the later floorplan. Chimneys were placed symmetrically near the central end of each room; these were also retained in the later building plan. Windows were located at each gable wall and probably were the doors to the "T" room occur now. The original roof was a simple pitched roof connecting the gable ends of the house. The porch roof was offset from the main roof. The added "T" room was integrated into this plan by overlapping the pitched roof with the original one (Figures 11-30, 11-31). Doors connected each of the original rooms with the new one, and a chimney in the "T" room indicates that each had a separate

source of heat. It may only be suspected that the "T" room served as the kitchen, in the fashion common to such additions to log structures in Texas (Jordan 1978) and in the fashion of the Hintze site.

The original structure was a "box and strip" type house. Its foundation was hewn bois d'arc piers and log sections lying on their sides. Roughly milled 2×8 " and 2×12 " members were used for stringers and floor sleepers. Tongue and groove oak flooring was added to this foundation. Upright, lap-jointed 1×12 " boards were next nailed to the exterior of this floor foundation. These were joined at their tops by stringers and connected by 2×4 " ceiling joists. The roof was framed with 2×4 " rafters, covered 1×4 " lathing and finally shingled. The interior ceiling was finished with lap-jointed boards. The exterior walls were finished with partly rounded, narrow battens, as was the interior of the wall separating the two rooms. Cut nails were used consistently for all portions of this early structure.

The "T" room addition differs considerably from the early structure. The foundation consists of sawn mesquite logs on both end and side. The floor was built up with stringers and sleepers as it was in the original structure. A frame of upright 2×4 " studs was built up, with the studs' long dimension running with the wall instead of against it in modern fashion. Lap-jointed 1×12 " boards were placed vertically on the outside of the wall and horizontally on the interior of the wall. These were joined by stringers and ceiling joists at their tops. The roof was framed with 2×4 " rafters. Lap-jointed 1×4 " were used for both the ceiling and as lathing for the shingled roof. Cottonseed was used in between the 1×12 " boards for insulation. Finally the entire house exterior was covered with shiplap, following removal of the exterior battens from the old portion of the house. Wire nails were used exclusively during this phase of construction.

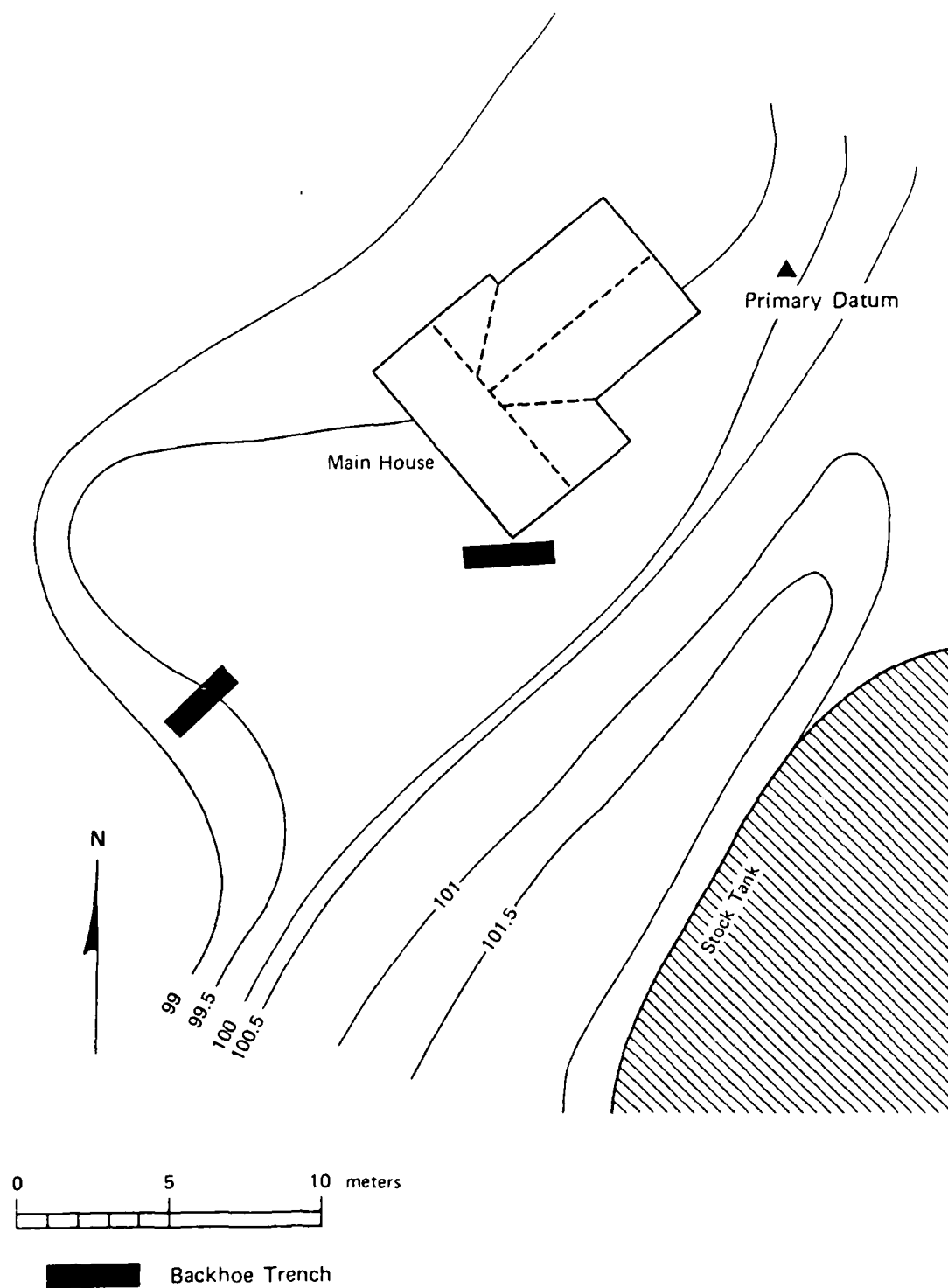
The window and door frames of the original and later house were simple and made from 1×4 " boards. The windows consisted of sashes with four rectangular panes each. The flashing was added over most of the doors and windows to provide weather protection. The soffits were all boxed in at least during the last phase of construction. Traces of paint indicate that the exterior was last painted bright red.

The interior of the house was simple. Geometric wallpaper covered the last occupant's walls. Heating and (presumably) cooking stoves were woodburning. A later addition of modern conveniences included wiring (apparently for lighting only) and bottled gas.

ARCHAEOLOGICAL INVESTIGATIONS

Two backhoe trenches were excavated at the site. The first was placed near the junction of the house with the slope of the dam as mentioned previously. This revealed no in situ materials of any kind. The second trench was excavated just west of the house in an area of substantial surface trash. This trench revealed no buried deposits are present in that area.

Controlled surface collections were made from two areas of surface trash accumulation. The first covered about 15 sq. m just west of the house. The second covered about 5 sq. m and was situated about 10 m north of the house.



THE TEODVISKI SITE
41 DL 182

Figure 11-29. Map of the Teodviski site (41DL182).



Figure 11-30. Photograph of the Teodviski house (41DI.182)

ARTIFACT DESCRIPTIONS

Domestic Utensils

Glass Containers

Glass container fragments constitute the largest group of artifacts (Table 11-8). This abundance can be attributed to both the fragile qualities and the highly disposable nature of most glass objects. The 131 fragments were sorted into groupings based on their former content and/or function.

As the majority of the identifiable fragments represent late nineteenth and twentieth century forms, additional comment will be confined to the more unusual items.

Of the 15 medicine bitters containers, four are panel bottles. Two of these bear marks complete enough for identification; one clear bottle has "KONJOLA" on the side insets, and "MOSBY MEDICINE CO. CINCINNATI" on the front while the second is an amber "DR. HARTER'S WILD CHERRY BITTERS" container, a product from St. Louis (Figure 11-33e). Four of the 15 have applied necks (Figure 11-33). Three have marks on their bases complete enough to determine the bottle manufacturers. Of these, one, an "N" in a square, is a

product of the Obeir, Nester Glass Company of St. Louis, made after 1915. One was made by the Illinois Glass Company between 1916 and 1929. The last was produced by Owens-Illinois Incorporated between 1929 and 1954 (Toulouse 1972: 264, 373, 403) (Figure 11-33).

Ten of the 15 food storage containers collected are "Mason" or fruit jars. It is noteworthy that the six jar rims collected illustrate different stages in the development of the fruit jar.

The critical quality of a fruit jar is its ability to seal tightly enough to prevent the passage of air between the lid and jar rim. The first stage of development, initiated by Mason's patent of November 30, 1858, sealed on a flared shoulder as he saw no practical way of sealing on the ground lip (Toulouse 1977:106). One example of the shoulder seal jar was recovered at 41DI.182.

The second major change involved modifying the lid to hold a glass inset that sealed on the lip. Various patents along these lines were made between 1865 and 1870 (Toulouse 1977:106). This collection includes two of the top sealing jars.

The advent of machine made jars eliminated the group lip, making it possible to seal on the top. After which, the shoulder seal was completely discontinued in favor of sealing on a circular bead directly below the threads. Of the beaded type, patented between 1910 and 1915 (Toulouse 1977:107), three examples

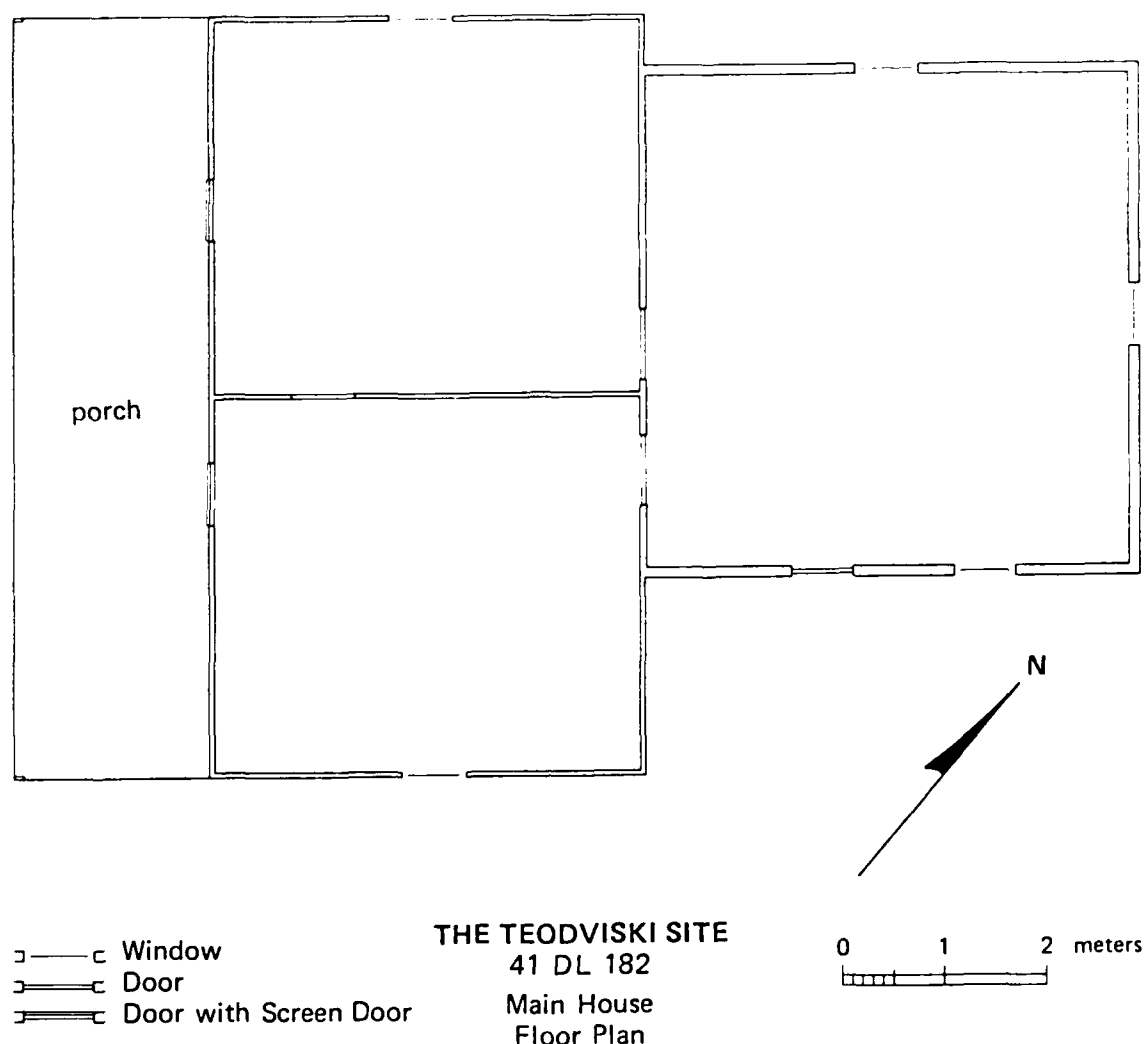


Figure 11-31. Floor plan of the main house at the Teodiviski site (41DL182).

were recovered. Only one of the fruit jars collected has a mark complete enough to identify. This is a "KERR SELF-SEALING MASON," patented in 1915 and produced until 1940 (Toulouse 1977:43).

Of the two soda bottles recovered, one has a partial mark on the side, "COCA BOTT..." with "TEXAS" underneath. While no further information was located to provide positive identification, it is typical of the short, round, "blob-top" bottles produced during the late nineteenth century (Sellari 1975).

One of the nine containers requires short comment as it is formed of "black" glass. Actually a very dark olive-green, this glass was popular in the mid-1800s because the contents were thought to keep better in this color.

Ceramics

Ceramics comprise the second largest unit under domestic

utensils; 96 fragments were recovered from the areas collected.

The majority of the earthenware ceramics are undecorated white earthenwares with three plates, one bowl, two cups and one saucer represented. Only six of the earthenware sherds are decorated. Of these, five are overglaze polychrome floral transfer prints and one is a saucer rim with molded scallops. Nine sherds of "semi-porcelain" were recovered, three of which have molded decoration. Porcelain makes up the smallest group with only four examples present. Two sherds have painted green line work overglaze, but the design is not complete enough to be identified.

Stonewares recovered constitute 67% of the ceramic material. But of the 65 sherds collected, 56 belong to one container, a salt-glazed crock with "2-1/4" stamped underglaze in cobalt blue (Figure 11-34). Of the remaining stonewares, four are salt-glazed, four have a Bristol type glaze both interior and exterior and one an Albany type slip-glaze (Figure 11-34c,d,g).

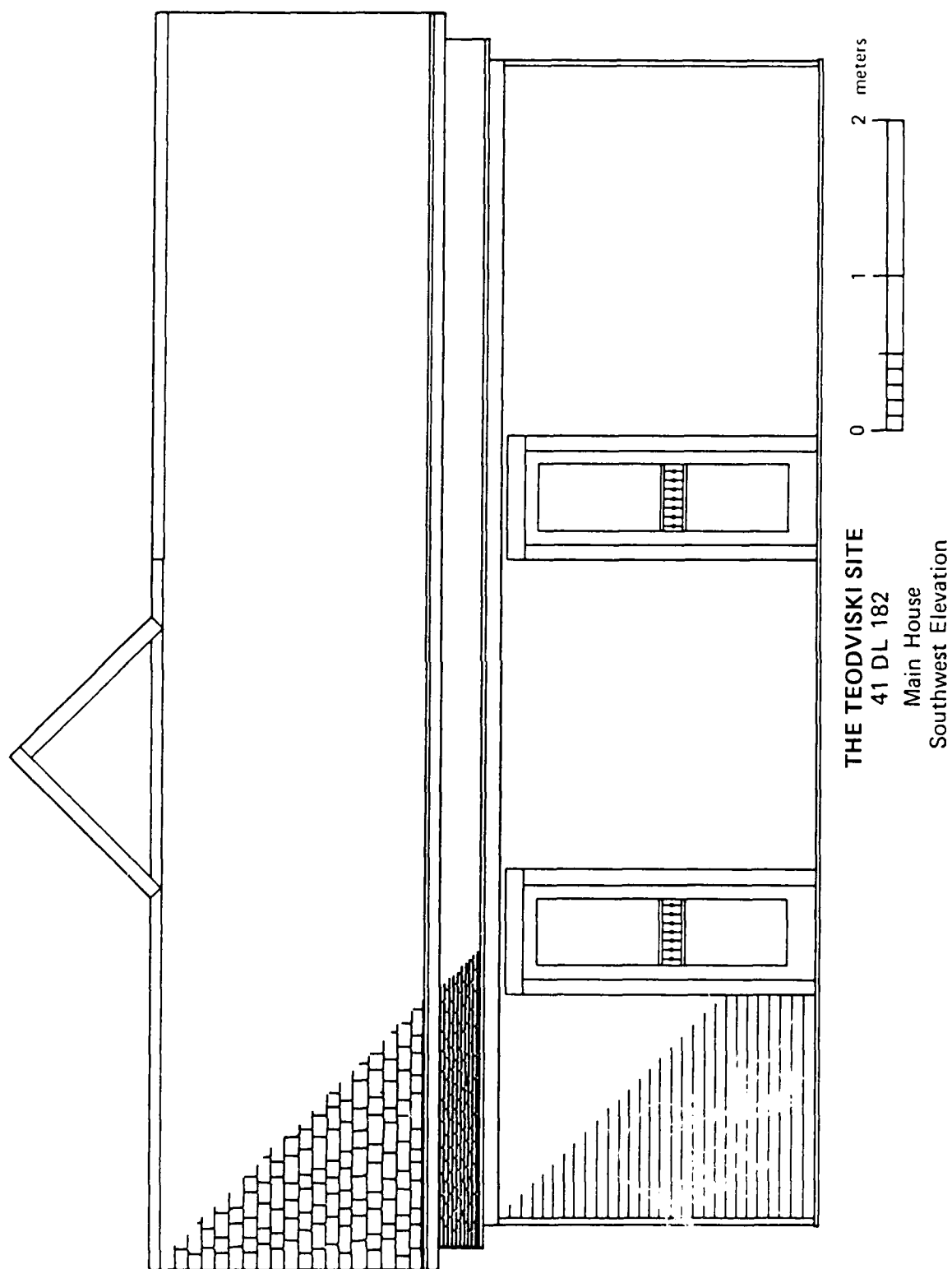


Figure 11-32. Southwest elevation of the main house at the Teodviski site (41DL182).

TABLE 11-8
Artifact Assemblage from the Teodviski site (41DL182)

Surface Collection Area					
Artifact Group	General	North	West	Total	%
Domestic utensils	8	81	144	233	75.89
Domestic furnishings		7		7	2.28
Personal possessions	2	4	13	19	6.18
Tools and implements			1	1	.32
Building hardware			2	2	.65
Construction materials	1	25	16	42	13.68
Miscellaneous metal			2	2	.65
Faunal			1	1	.32
Total	11	117	179	307	

Miscellaneous

Only one example of flatware was recovered, a silver-plated tablespoon with the "CARLTON" hallmark stamped on the underside (Figure 11-34). A case iron skillet fragment was also recovered.

Domestic Furnishings

Six fragments of clear glass from an oil or kerosene lamp chimney were collected from the area north of the house. A brass lamp burner marked on the bottom rim as "QUEEN ANNE NO. 2" was recovered from the southern room of the house, under the floorboards (Figure 11-34b).

Personal Possessions

Cosmetic and Toiletry Containers

Nine represent six small cosmetic or cold cream jars. While

all are pressed "Pattern" glass, they display a variety of styles. Three fragments (two amethyst and one clear) are examples of "Lacy" glass, in floral motifs. "Lacy" glass arose after the advent of pressed glass in the 1830s. Forms produced in this manner assumed the texture of the mold and were often dull in appearance. To alleviate this mat veneer, the background portions of the container were "stippled". As this often created a "lace"-like surface, the term "Lacy" was coined to describe pieces with a stippled background (McKearin 1948:336). Five specimens (four amethyst and one clear) have "Pillar" moldings (Figure 11-33). These along with the remaining fragment, a "Strawberry Diamond" variant in amethyst, represent a later phase in the development of pressed glass. Around 1835 a technique was developed in which the glass was reheated, after being pressed; this polished the surface and obliterated tool or mold marks. "Lacy" glass did not stand up well to "fire-polishing" and new designs, utilizing geometric motifs were developed. These patterns reminiscent of cut glass, polished to a high luster, became very popular in the 1840s and continued so throughout the nineteenth century (McKearin 1948:394).

In addition, three artifacts belonging to a perfume or toilet water bottle were recovered. The neck and mouth are fashioned from a pewter- or lead-like metal that was originally gold-plated.

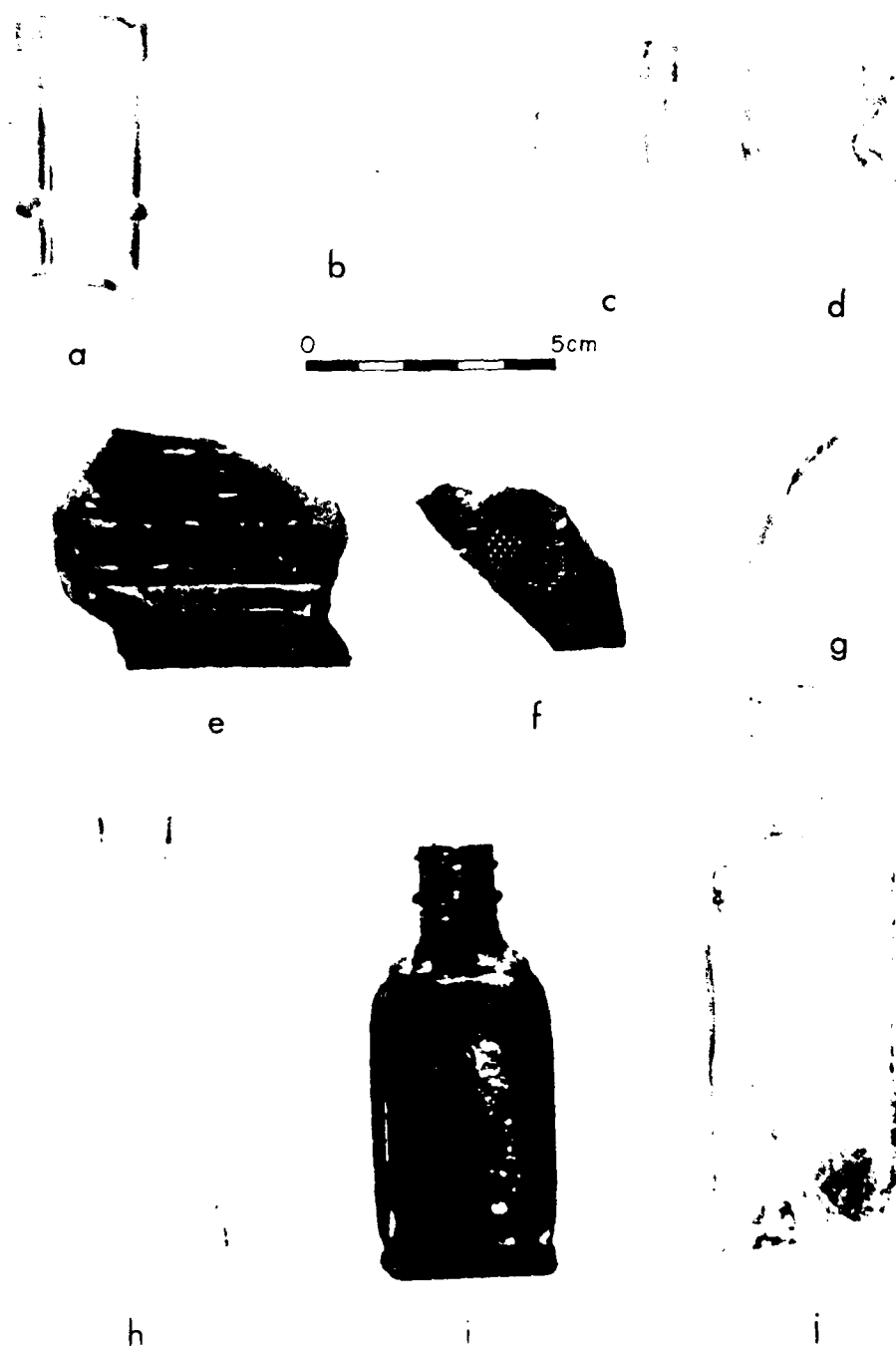


Figure 11-33 Glass artifacts from Teodyviski site (41DL182): a-d applied bottle necks; e panel bottle; f "pressed" cosmetic container; g "pressed" pillar moldings; h-i medicine bottles.

The threaded neck screws onto the amethyst glass, which flares immediately into the shoulder of the bottle. The mouth opening is also threaded internally to permit a screw-type closure. Two metal strips with scrollwork designs, also gold-plated at one time, probably served as decorative bands around the body of the container.

Two amber snuff bottles are represented by three fragments. One of these bottles, with mold lines running through the lip, has a square base with the customary raise protrusions observed in snuff bottles from the twentieth century. The other bottle represents an earlier type in which the lip is formed by an applied bead of glass (Newman 1970:73).

Miscellaneous

Included here are a fragment of a 78 RPM record, a child's polished white marble measuring 1.78 cm in diameter (Figure 11-34), and one figurine fragment of "semi-porcelain" with molded and blue underglaze painted decorations.

Tools and Implements

The single item to be recovered in this group is a metal mower tooth collected from the surface north of the structure.

Building Materials

The items under this heading consist of a white porcelain door knob (Figure 11-34a) and a large square head bolt with a shaft length of 21.5 cm.

Construction Materials

The plate glass recovered from 41DL182 includes clear (2), aqua (34), and green (3) specimens which range in thickness from 1.5 to 3.0 cm. All are probably window pane fragments.

Two additional specimens much greater in thickness were also collected. One fragment of green glass, 5.5 mm thick, has a beveled edge. It and a green fragment of 7.2 mm are suggestive of the panes used in china cabinets and display cases.

The single nail recovered was a 6d wire nail, with a unique head that is close in appearance to a "pan head," perhaps ornamental as well as functional.

Miscellaneous

One iron "strap" fragment is reminiscent of the braces used in construction. The remaining specimen, also iron, appears to be a fastener of some type. One bone fragment, which was too incomplete to be identified more specifically than as a large mammal, was recovered.

DISCUSSION

The Teodviski site offers an excellent example of architectural change associated with one of the simpler structural forms of the late nineteenth century. The major changes have not been well dated, but may relate to reoccupation or an intensification of use during the early part of this century or possibly the Depression. Unfortunately it is not known whether the house was a tenant house during any phase of its use. The rapid demise of this structure as well as the absence of significant artifact deposits in good context diminish the potential for further work at the site, but the recovered data should be of use to subsequent investigations in the Project area.

41DL183 THE HOLVECK SITE (1882)

This site is located on the bluff breaks overlooking Mountain Creek just west of the Anderson site. The original structure is segregated to the west of a more recent complex of structures, all of which have been built by the Holveck family since they were granted their initial land holding in 1882 (Figure 11-35).

The main site complex included a house which has been removed by the family prior to this Project. Other primary structures include a garage, several sheds near the house and the large barn at the base of the slope below the house. A few smaller sheds and a water trough surround the barn, and several large trash accumulations of apparently late date occur to the northeast of the barn.

ARCHITECTURAL DESCRIPTIONS

The initial structure at the site is the "box and strip" house located at the western end of the complex (Figures 11-36, 11-37). Built on stone and cedar piers, the house originally was a single pen structure with a fireplace offset on the north wall. Large, lap-jointed sills and smaller joists form the base for the upright 1 × 12 planks. Large cut spikes are used for the major framing, and cut nails dominate in other areas of the structure as well. Roughly cut lumber is used for the ceiling joists and rafters, suggesting an early date. The interior walls are almost all wallpapered.

A room and an east facing porch were added to the original structure, enclosing the plastered brick fireplace. This northern room is elevated considerably by cedar piers owing to the slope. In addition to quite advanced natural decay, this structure has become increasingly subject to vandalism.

The main barn at the site is an excellent example of a variation on the transverse crib barn type, although the nuclear structure is essentially a double crib granary with a high salt box roof. Certain parallels in construction can be drawn with the barn at the Anderson site. The foundation consists of huge wooden piers. For support, massive 8 × 8 sills and 4 × 6 floor joists are used, with lap joints at the corners and midsections. Large cut spikes are used for joining. Large corner posts are tenoned into

TABLE 11-9

Glass Containers from 41DL182

Types	No. of Fragments	Minimal No. of Containers	Percentage of Identifiable Containers
Medicine/Bitters	28	15	34
Food Storage/Fruit Jars	21	15	34
Soda	2	2	5
Whiskey	3	3	7
Wine	6	4	9
Beer	3	3	7
Serving	5	2	5
Unidentifiable	63		
Total	131	44	

the sills, and the long studs are bevel tenoned into the sills in the same fashion as those at the Anderson barn. Additional, perhaps later support was gained from iron rods bolted through both axes of the cribs (Figure 11-38).

Usually tall studs provide for a hay mow above the cribs, with a balloon type effect to the framing. Offloading platforms (to stand on when unloading wagons) fold down into the alleyway. This main structure is capped by a salt box roof, the short end facing north. The roof slopes past the crib on the south providing for spacious sheds. Additional sheds have been added to the other sides of the barn, some of them being partitioned into rooms of various storage functions. The alleyway is covered by dormers on each end.

The original siding of the barn is clapboard, while the shed additions have either vertical or horizontal planking. The roof is shake. The entire exterior has been well maintained and is painted red. Unfortunately the barn is being progressively destroyed by vandals who are after the valuable pine studs.

As indicated in the historic background, the most frequent foreign immigrant to Dallas County in the 1860s and 1870s was French. The Holvecks are the only known French family to have settled in the Lakeview area. It is likely that most of the French lived in town or perhaps were associated with La Reunion.

Continuously occupied since 1882 by the Holvecks, this site is exemplary of stability and growth in the Lakeview area. Architecturally this pattern is seen in the preservation of the original homestead, with modifications, as well as the addition of a new house and a substantial barn. Complete documentation of the barn at this site will contribute to knowledge of barn construction styles in the area and with additional historical documentation can be compared to the barn at the Anderson site. No test excavations or surface collections were carried out here. No trash concentrations could be found in the site area.

41DL185 THE TREES TENANT SITE (1900?)

This plank tenant house is located north of Mountain Creek on the southern portion of the flat land between that stream and Walnut Creek. The original structure was a typical two pen plank house with battens covering the butted uprights. The foundation consists of wooden sills and joins (no piers) and the ceilings and shake roof are framed with 2 × 4's. Symmetrical front doors with flanking windows are present. A "T" addition to the center of the rear was made, apparently for a kitchen. Interior walls were simply wallpapered, as was the ceiling. Ceiling

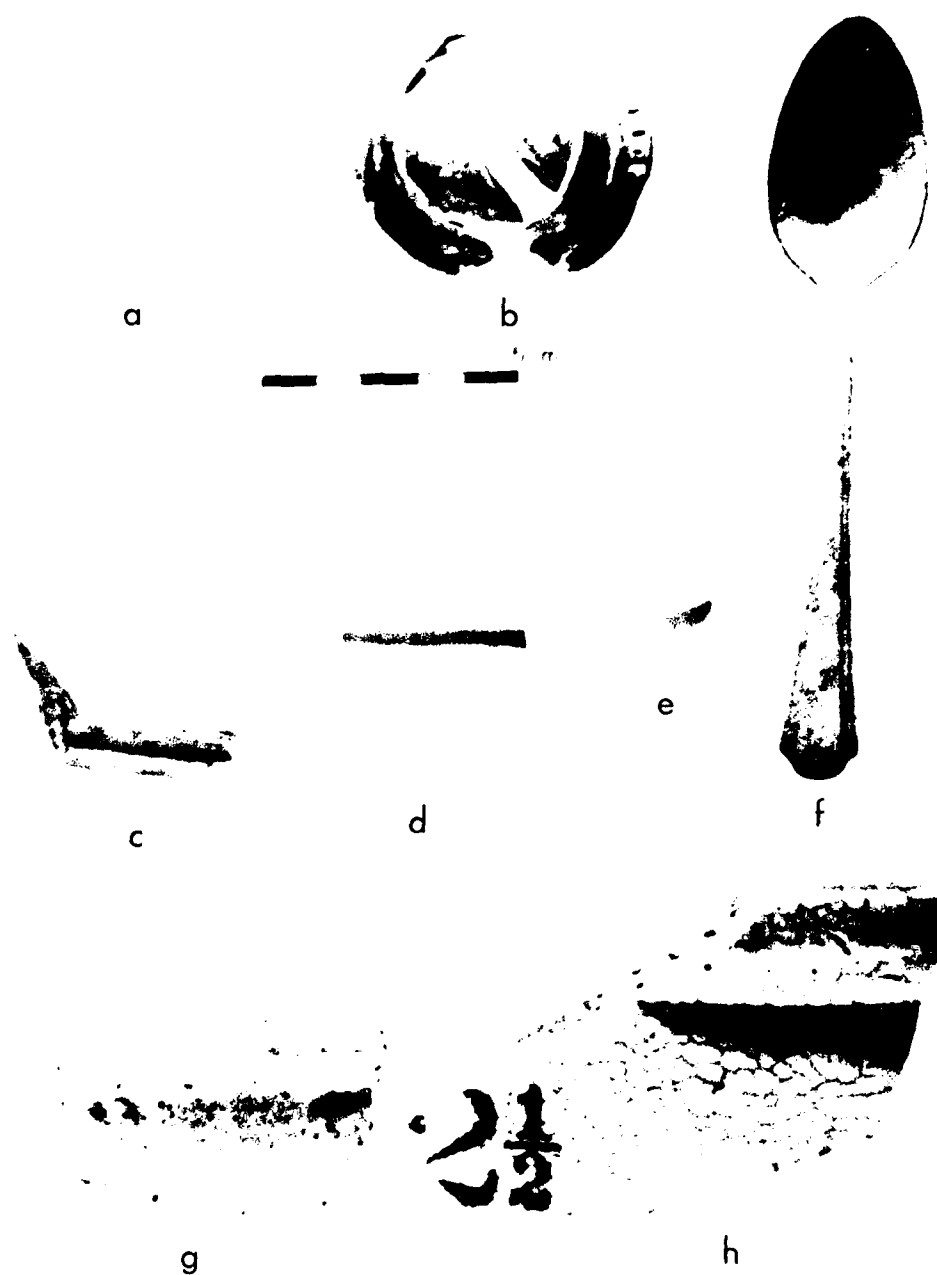


Figure 11-34. Artifacts from Teodiviski site (41DL182). a - porcelain door knob; b - brass lamp burner; c - salt glazed milk bowl; d - Bristol galzed crock; e - marble; f - spoon; g - salt glazed crock; h - salt glazed crock with stamped mark.

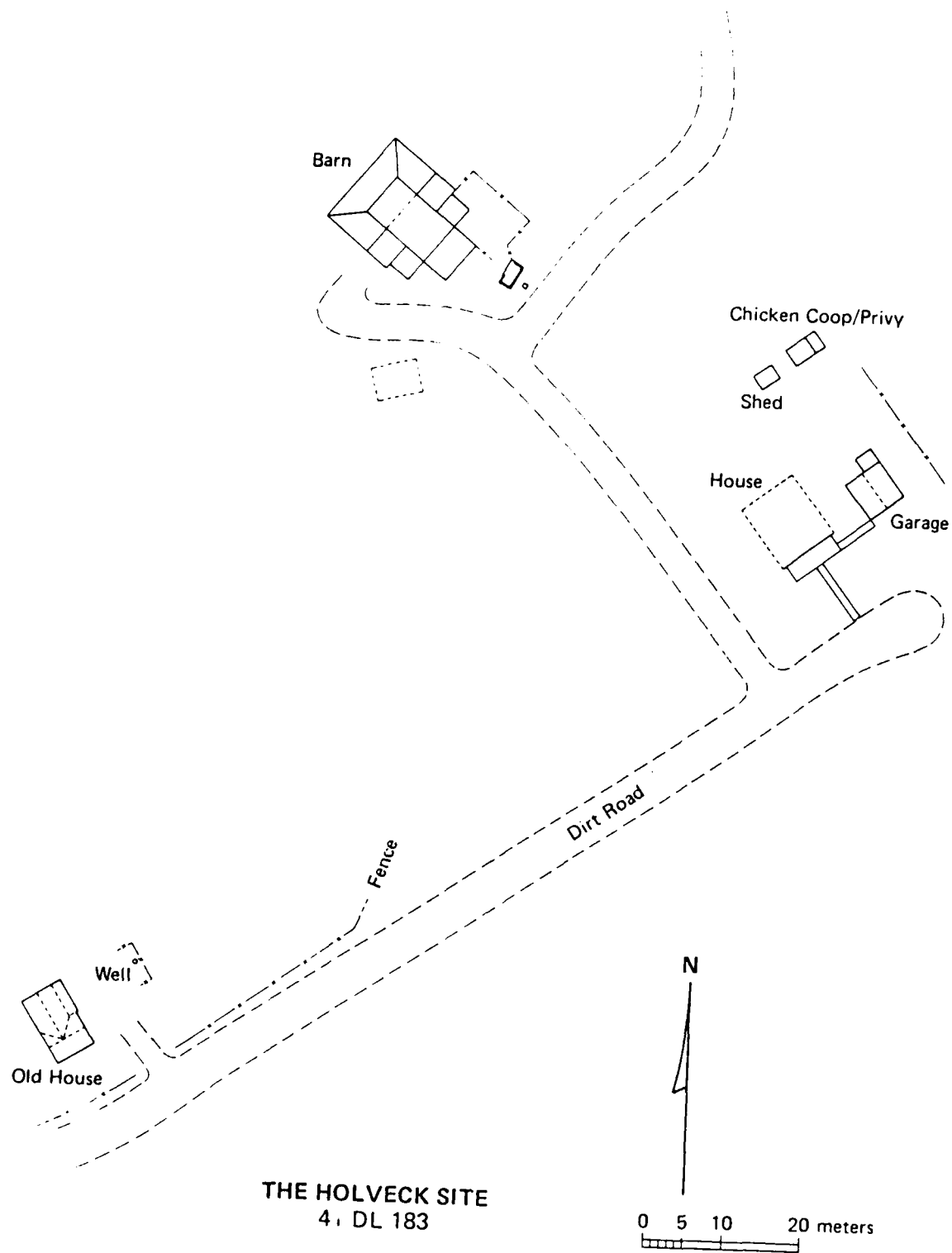


Figure 11-35. Map of the Holveck site (41DL183).

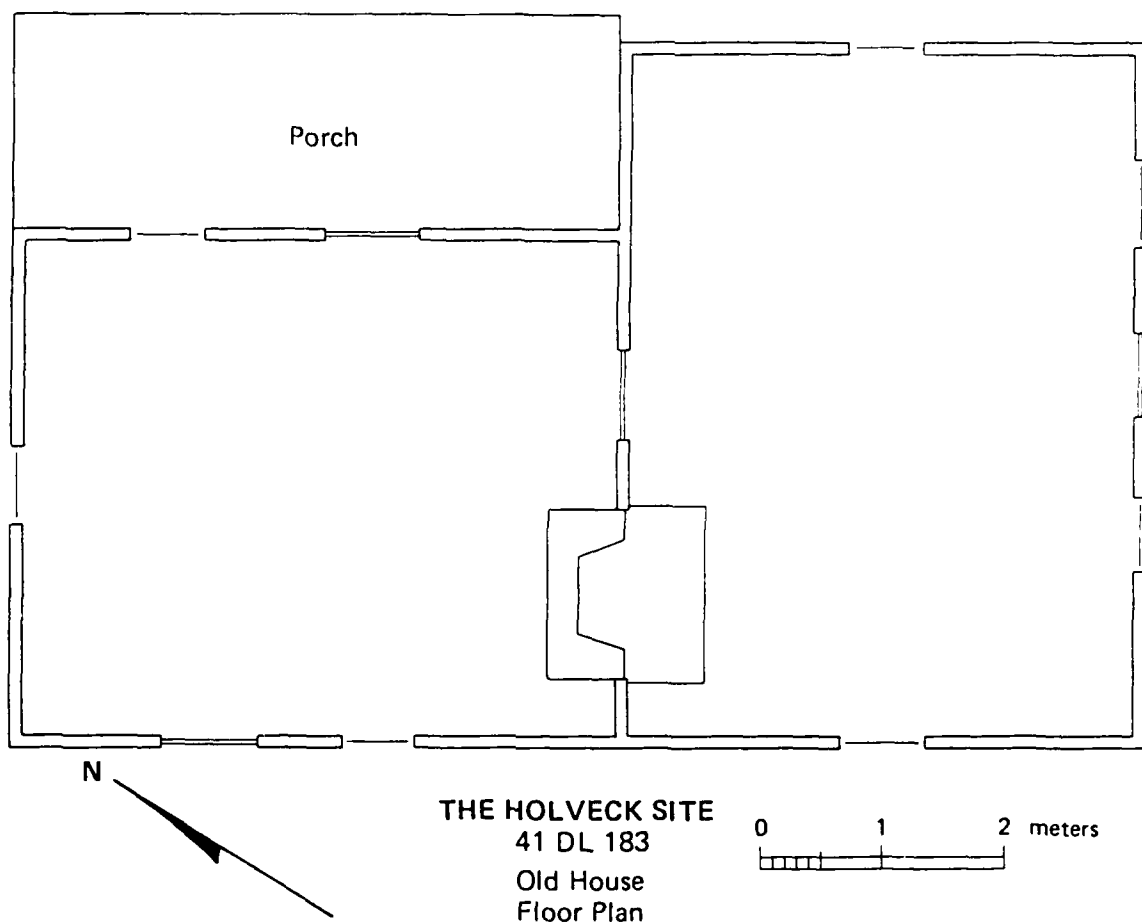


Figure 11-36. Floor plan of the old house at the Holveck site (41DL183).

supported chimneys for the stoves are present in each room; either unmarked or FERRIS bricks were used. A scatter of recent trash is present to the rear of the north facing house; all of this appears to be post-depression to modern in age.

Little potential for further work is apparent at this badly deteriorated site since better preserved examples occur in the Project area. It appears to be one of the several tenant houses associated with the Trees property in the Lakeview area. Three tenant houses in this immediate area are shown on the 1900 Street Map of Dallas County. It is presumed that this is one of those structures, although no independent evidence of that age as opposed to a younger one was observed. The Trees family became increasingly large landholders in this area during the late nineteenth century, with holdings in excess of 5,000 acres by 1889, the year of Crawford Trees' death (Vinyard nd).

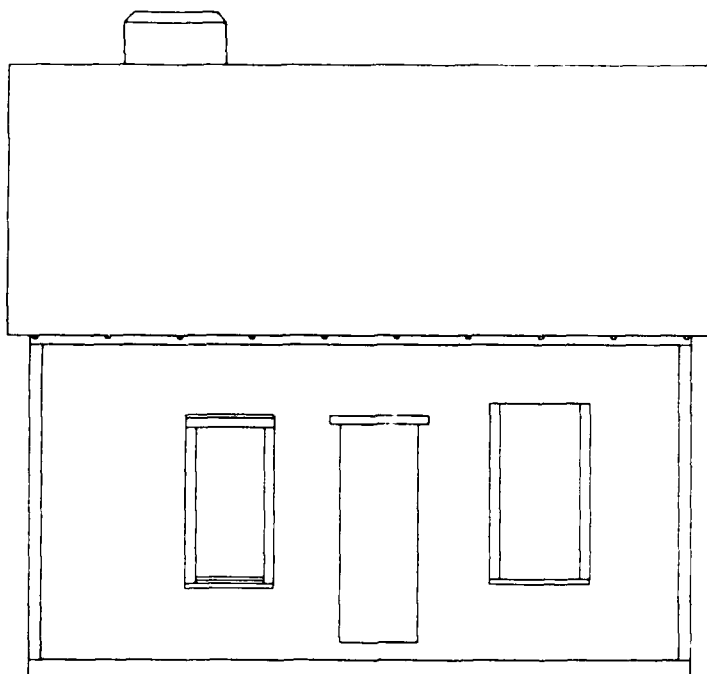
41DL187 THE BALLWEG SITE (1900)

This site is located about 500 m north of Mountain Creek, just

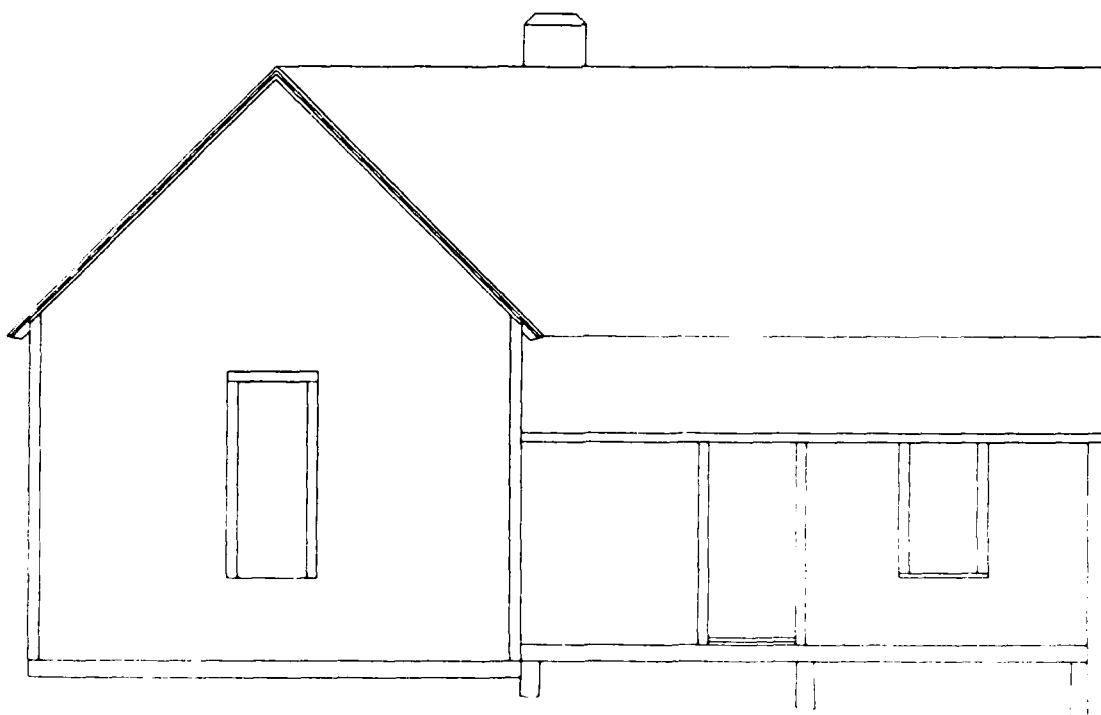
east of Ballweg Road. No standing structures remain at this site, yet many details of its changing appearance over the years were provided by Mr. James Cain, grandson of its primary resident, Martin Ballweg.

The main features at the site today are the foundations of the main house built in 1900 and the foundation of a garage-shop built sometime later (Figure 11-39). South of these features are the deteriorated remains of a horse stable and a fallen barn. No evidence could be found of the pier supported plank house which the Ballwegs moved into in 1883 when they originally settled here. Mr. Cain did not know the date of construction of this earlier structure, which stood just east of the 1900 house. It was probably dismantled entirely after the big house was completed. Other than the above mentioned remains south of the house, there is little evidence of the several outbuildings (bar, corn crib, granary, etc.) Mr. Cain mentions in his interview.

The house built in 1900 was a stylish two-story structure crafted by an English carpenter who completed several homes in the area at the turn of the century. It is pictured in Skinner and Connors (1979:27), although the photograph in that report is



South Elevation



THE HOLVECK SITE

41 DL 183

Old House

0 1 2 meters

Figure 11-37. South and east elevation of the old house at the Holveck site (41DL183).



Figure 11-38. Architectural detail of the Holveck barn (exterior). Note chute for removal of grains, bolted end of stress rod which passes through crib.

reversed. This house has been completely removed except for the brick wall and wooden pier foundation and some scrap; the materials from the house have been added in various ways to a residence in Cedar Hill.

The garage has a slab floor. The adjoining workshop is survived by a foundation of 6" x 6" lapped sills joined with cut nails. Much of an oak tongue and groove floor remains, and in the northeast corner is the foundation of a brick stove chimney.

To the north of the main house is the buried carbide generator mentioned by Mr. Cain, and a small hut-like structure.

At the rear of the main house a test pit was excavated in a

brick enclosure which appeared to be the entry to a cellar. Other than a number of handmade brick fragments, all of the material recovered from this pit is modern. The feature appears to have been a flower bed lined with bricks. The old bricks may relate to the earlier structure at the site, or could have been pirated from some other location.

In view of the poor condition of the structures at the site as well as the absence of well defined trash accumulations dating to the pre-1910 period, no further work at this site seems necessary.

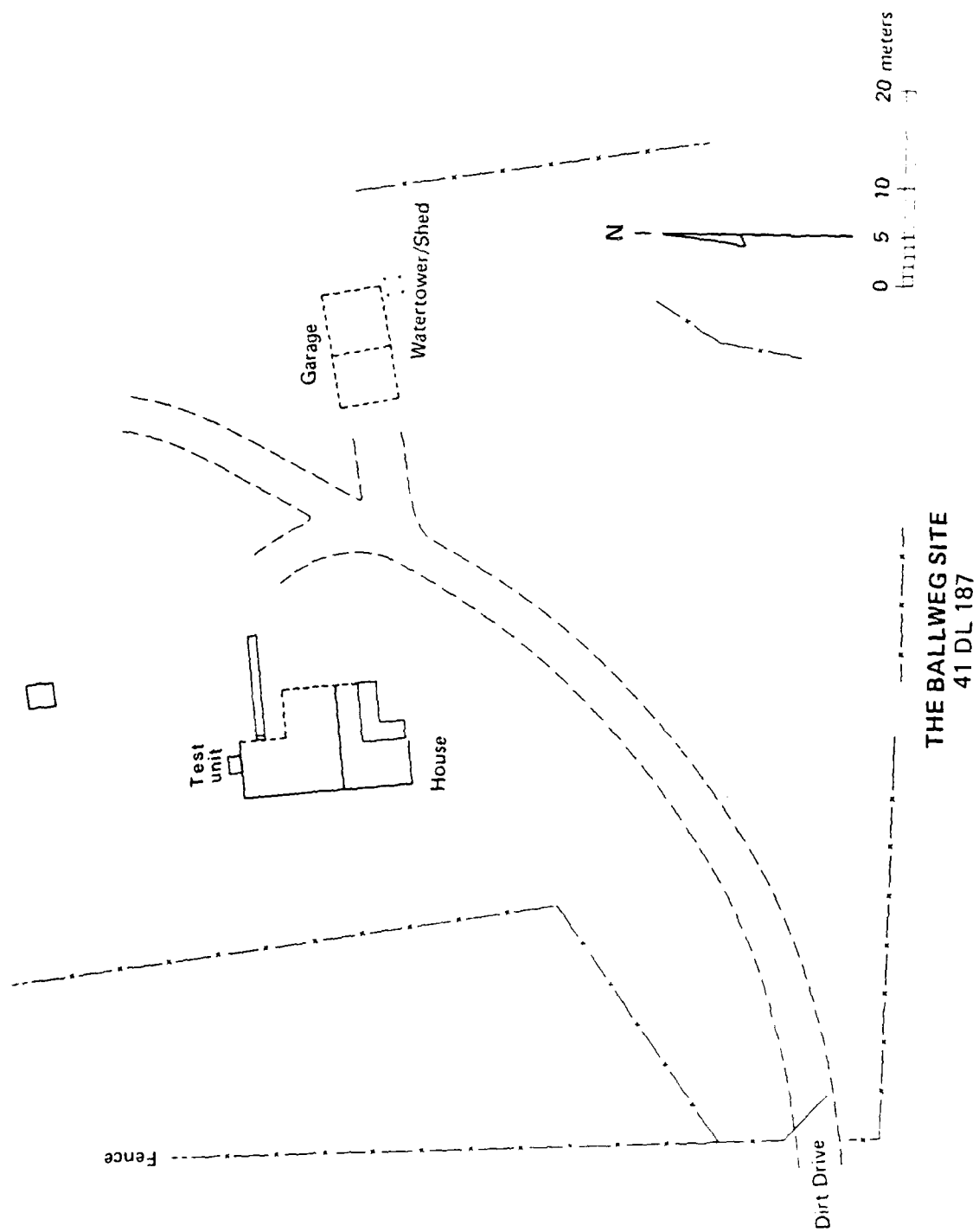


Figure 11-39. Map of the Ballweg site (41DL187).

ARTIFACT DESCRIPTIONS

Kitchen

The limited testing at 41DL187 produced 73 items related to kitchen activities (Table 11-10). Of these all but three are bone, which are discussed in Appendix VI. One crimped seam tin can was recovered. Only two ceramic sherds were collected. Both of these are whiteware saucer sherds with molded floral decorations around the rim.

Architecture. Nine fragments of brick were collected. Of these eight were the older handmade variety with very coarse paste that has many inclusions. The remaining brick fragment is a newer molded type. Also recovered were ten mortar fragments.

Included in the architectural group were ten pieces of pipe and pipe fittings, and specimens of wallpaper and tar paper.

Clothing. Five pieces of fabric were collected as well as the female portion of clothing snap.

Personal

Medicine. The single item collected that falls under this heading is a brown glass medicine bottle with a crew type neck. This bottle has the characteristic Owens-Illinois trademark on its base, indicating that it was made between 1929 and 1954 (Toulouse 1972).

Activities

Artifacts that fall under the general activities heading consist of metal sheet fragments, one iron slug, several pieces of electrical wire and a white porcelain insulator fragment. One air valve cap and one Texas license plate fragment were also recovered.

TABLE 11-10
Artifacts from 41DL187

Artifact Class	Provenience		Total	%
	General Surface	Test Square 1		
Unidentifiable		14	14	7.00
Kitchen	2	110	112	56.00
Architecture		57	57	28.50
Furniture		1	1	.50
Clothing		5	5	2.50
Personal		1	1	.50
Activities				
General		6	6	3.00
Construction		1	1	.50
Farming Machinery		1	1	.50
Auto-related		2	2	1.00
Fencing		1	1	.50

DISCUSSION

The lack of substantial architectural or artifactual remains at the site greatly diminish its potential for further research. The patterns of land acquisition as well as the family history known from the Cain interview make this site important as a comparative base for studies of the Project area.

CAIN INTERVIEW

During the course of collecting oral histories for the second phase of the Lakeview Project, we had the pleasure of interviewing Mr. James Cain of Cedar Hill. Mr. Cain, the son of Josephine Ballweg Cain, was raised in the house formerly located at 41DL187 and was able to give us a great deal of valuable information regarding the Ballweg family and the general area.

Martin F. Ballweg came from Germany with his family when he was nine years old, settling somewhere close to Luxemburg, Wisconsin. As a young man he was drafted into the Northern Army during the Civil War. It was through this experience that his first exposure to Texas came about. He came through the eastern part of Texas with the army and was discharged at Brownsville. He liked the mild climate and was determined to find a piece of property and move there. After he was discharged, an army friend who had settled in West Texas

wrote him and told him about a piece of property that was for sale out there. So, he caught a train and went out there. The day that he got into this town, why, they were having one of those awful sandstorms, like they used to have.... here you couldn't see your hand out in front of you.... So, he got out and went on in the depot and he ask the depot agent what all this stuff was blowing. "Well, do you have them all the time." "If it don't rain, we have them all the time." So, he just spent the night in that depot and the next morning he caught a train and went back to Wisconsin. (Cain)

Some years later another army friend, who lived in Mansfield, told him about a piece of property outside of Cedar Hill. After a trip down to look it over he moved his family there on December 31, 1883.

When the Ballweg family moved to the land on which 41DL187 is located a small pier and beam house were already there. Constructed by the previous owner this house stood to the east of the large two story one completed by Martin Ballweg in 1900.

Mr. Ballweg contracted an English builder named John Anderson to build his house. When completed it was thought of as one of the "showplaces of the community." The house stood facing south and was "L" shaped. The ground floor consisted of a parlor, living room, dining room, kitchen, and one bedroom. The upper story contained three bedrooms, a hallway and a loft over the kitchen. One of the unique features of the house was its high ceilings, 16 feet, in rooms that averaged 12 by 14 feet. The house was not originally built with indoor plumbing but a bathroom was added several years after the house was completed.

The only thing about this carpenter who built that house was that he built it without closets....in those days people didn't have a lot of clothes. You know what kind of clothes it had....there was a space about this far (between the studs)....he cut a door there and made a closet out of that. You hung about three pair of overalls and two jumpers in there and that was it. (Cain)

Mr. Cain was also able to give us a description of the other buildings at 41DL187. These included: a large barn, two corn cribs, a granary, a stable, a garage, and two sheds. When Mr. Ballweg brought his family to the Cedar Hill Farm in 1883 they got their water from two springs northwest of the house. They did not dig their first well until around 1910. They dug the well "with a mule pulling an auger....it was 250 feet deep....with good artesian water" (Cain).

Martin Ballweg was a farmer and with the help of his twelve children was apparently quite successful. By the time of his death in 1918 the 75 acres he had originally paid down on had swelled to over 700. According to Mr. Cain, their chief crops were cotton, corn, oats, and wheat. Mr. Ballweg farmed with horse or mule drawn equipment, it was not until around 1940 that the Ballweg family purchased a tractor.

For many years gypsies were frequent visitors at the Ballweg home. "They always came to his house because he said that if you gave the gypsies feed for their stock and water, they wouldn't steal from you. So, there were a lot of gypsies" (Cain).

The Ballweg family was close neighbors of the Andersons (41DL190) and Mr. Cain was able to tell us something of that family. Andy Anderson whose parents built the house was considered by some to be eccentric. He raised cattle, mules and horses, the horses being his primary interest. "He was into the paint horse business....he bred a lot of them" (Cain). As Mr. Anderson had around two thousand acres of land he always rented out sections. "He'd furnish mules and horses to people all over the country—just loaned them to them to work." (Cain) While Mr. Cain had only a general knowledge of the house and other buildings at 41DL190, he was able to give us some insight into life at the Anderson house and the entire Mountain Creek region.

41DL188 THE FOSTER SITE (1912)

This site is located just west of the Ballweg site, on the west side of Ballweg Road and north of Mountain Creek (Figure 11-40). The site was settled by the Fosters in 1912, when R. A. Foster purchased 103 acres from J. T. Clark. There is no indication that the site proper was occupied prior to this time. Most of this area west of the Ballweg house appears to have been farmed by various families, including the Andersons, up until the Fosters built there. As indicated in the Cain interview, the Foster's farmed the land themselves, using mule drawn equipment, for many years.

The main house, pictured on the cover of Skinner and Connors (1979), was almost certainly built by the Fosters. The date of construction is known, but sometime shortly after 1912 would seem likely. This large house, built on a west side lot, was burned to the ground before it could be inspected.

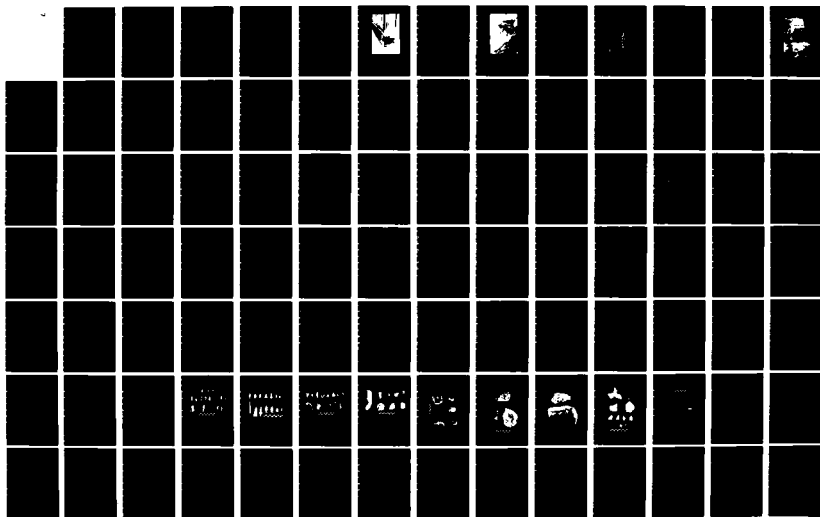
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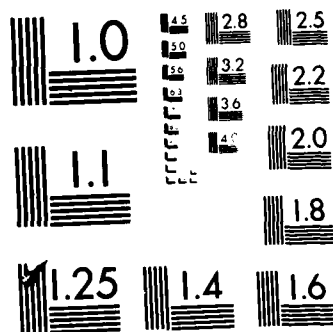
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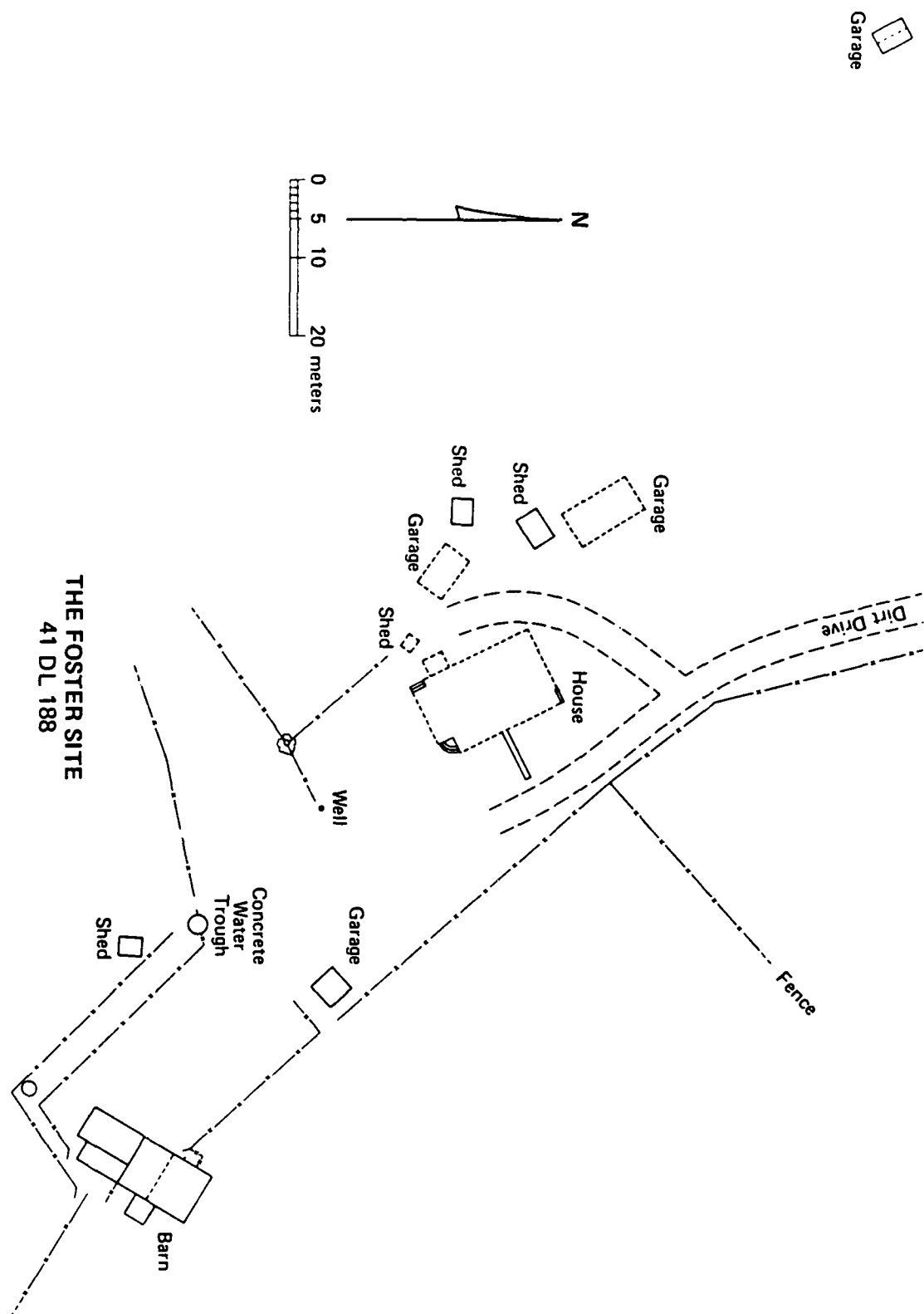


Figure 11-40. Map of the Foster site (41DL188).

a frame structure, as can be deduced from its size and massive upper portion which included a large attic and a large room with the gables on three sides. A porch extended along the east and south fronts of the house, with curved, poured concrete steps on the southeast corner. The interior had been renovated many times it seems, and was most recently finished with sheetrock in several rooms. The downstairs rooms were contiguous, with no central hall. Many of the plumbing and electrical fixtures appeared to have been retrofitted. There were no fireplaces, and the one brick stove chimney may have been removed to below the roofline in more recent times.

None of the many outbuildings are substantial, and most of them appear to be relatively recent. The garages and sheds near the house are all pole and plank structures, mostly with metal roofs, and all constructed with wire nails. Several of these were burned, but virtually all of them were filled with recent materials, which seems to have accumulated with little pattern. The larger "barn" at the southeast corner of the site is actually a motley collage of recent plywood and scrap additions to a small single crib structure resembling a granary, but lacking chutes. The small, rude shed northwest of the barn was a shelter for animals.

The absence of substantial outbuildings at this site is somewhat surprising, given the stature of the main house and the long occupation of the Foster family. On the other hand, many of the present outbuildings appear to be quite recent; there may have been earlier structures which could not be detected. In any event, little potential for further research at this site is suggested by its present condition. Ground exposures suggest no buried archaeological deposits are present.

41DL190 THE ANDERSON SITE (1859)

Originally settled by Napoleon Bonaparte Anderson in 1859, this site is among the oldest in the Lakeview area which have been found by recent surveys. It further represents one of the sites of long term occupation by the same family and is of considerable interest owing to the prominent role which the Andersons played in local ranching, farming, and horse raising.

The site is located on a large promontory overlooking Mountain Creek to the west. A large expanse of flat land extends to the geologic bench between Cedar Hill and the alluvial valley. The Anderson land extended well into the valley and at one time amounted to over 2,000 acres in the vicinity of the site. They had land holdings in other counties as well.

The site complex reflects the long period of occupation as well as the dominant horse ranching activities of the family. The original cabin, built in 1859, is no longer standing, although features possibly relating to it will be discussed later; it stood near the spring which was later enclosed with a vaulted springbox. The spring flows well even today and is located in a ravine just west of the old house site (Figure 11-41).

At some time after the cabin was built, a substantial house (locally referred to as a plantation) was erected near the spring. This burned in the 1940s, but remains of the structure were found during the test excavations. The springbox, a "smoke-house firebox" and an unusual vaulted cellar appear to relate to

the early period of construction at the site. All are constructed with the same handmade bricks which have been identified as those similar to slave-made bricks from this part of the state (Steinbonner, personal communication).

Later expansion of the site is indicated by standing structures. A probable turn-of-the-century granary/barn is located west of the spring, a later large barn-shop complex is located south of the house, and a garage probably dating to the 1920-1930 period stands just northeast of the house. A large metal water tower stood over the house area, a now dismantled pole barn was added in the northwest portion of the site. A later cinderblock house is located some distance to the north of the main site; this was informally documented but will not be considered in this report.

The location of in situ artifacts and features in the vicinity of the main house confirms the potential of this site for extensive archaeological investigations. Extensive documentation of the Anderson family is available, and there is good potential for oral history documentation for details of family history. This site must be considered one of the more important early settlements in Dallas County, and an important resource for archaeological and historical research.

ARCHITECTURAL DESCRIPTIONS

Standing structures at the site are discussed here. Other architectural features are considered in the text excavations section.

The oldest and most important standing structure at the site is the barn on the western edge of the complex (Figure 11-41). Originally a double crib granary, this the finest example of turn-of-the-century barn carpentry in the Lakeview area and is probably of regional significance. The granary had been modified into a storage barn and today is in poor condition.

The original structure was a double crib granary with a pitched roof on axis with the alleyway (Figure 11-42). The cribs originally had no doors, but only chutes for removal of grain along the interior of each crib. Later doors were added, and much of the crib walls have been salvaged.

The cribs rest on large limestone and cottonwood piers (Figure 11-43). The framing is of exceptionally stout construction, reflecting the structural support needed for a full store of grain. Massive 8×10 or 8×12 sills support each crib. Half dovetail joints are used at the corners and lap joints in the middle of each crib. This construction is supplemented by 8×12 longitudinal sills and 4×8 cross pieces. The superstructure is proportionately stout; the regular pattern of uprights of various dimensions is unusual. Corner posts (6×6) and major studs (6×6) on ca. six foot centers from the first order supports. Second order studs (4×6) on three front centers, as well as the larger ones are morticed into the sills. Third order studs (2×6) are spaced between the larger uprights; these are tenoned with bevelled cuts to counteract outwards stresses. All of the uprights have been toed with large wire nails. The floors are made of pine planks, while the interior walls are lap jointed 1×8 pine. The shake roof overhung the front (east) entry, and had a louvered

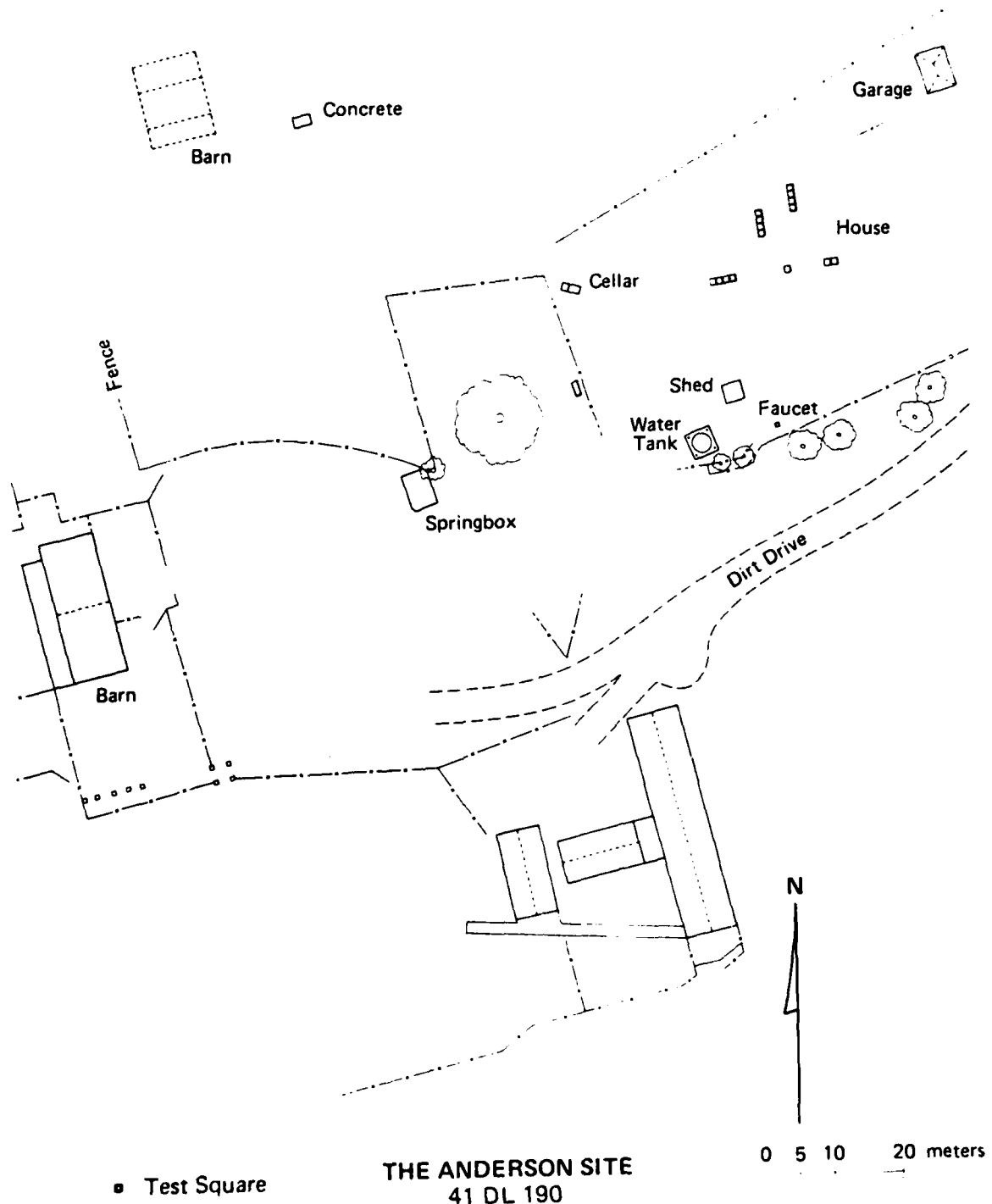


Figure 11-41. Map of the Anderson site (41DL190).

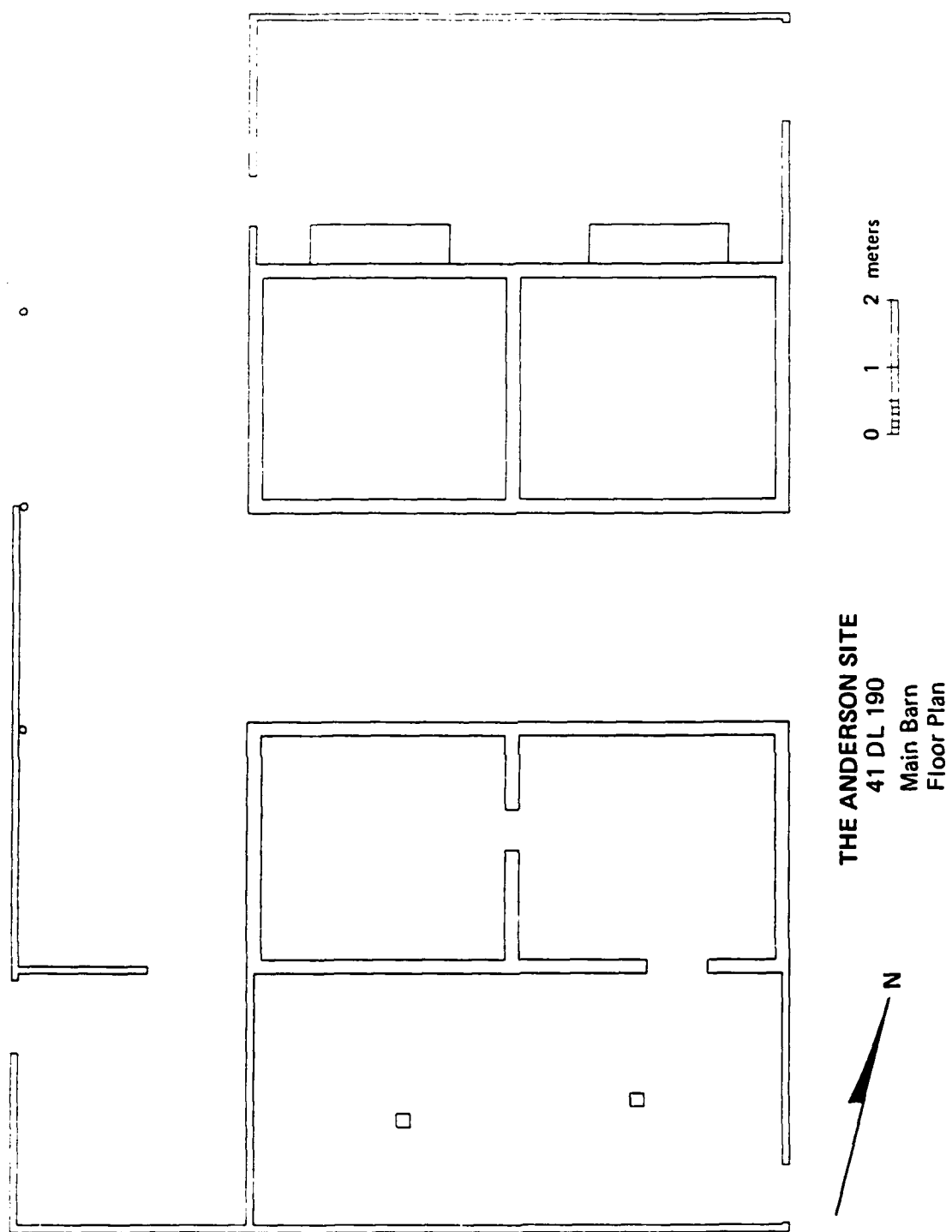


Figure 11-42. Floor plan of the main barn at the Anderson site.



Figure 11-43. Detail of barn construction at 41DL190.

ventilator near the peak. The exterior was clapboard.

Sheds with feeding stanchions were formed by extensions of the roofline below the tops of the cribs on the north and south ends of the structure. Later rude sheds have been added to the south and west ends of the building.

Several distinctive monograms (AJA) indicate that Andy Anderson frequented the barn, but the date of construction is not known nor is the identity of the builder.

The main barn-stable is a much younger complex. The long building on a north-south axis is dominated by a stable-feeding

area. The northern end of the building is divided into work, tack, and storage rooms, including what appears to be a cool room for meat. The entire structure is made of poured concrete and has a trussed metal roof. The annex to the west includes a cinderblock work-shop area also with a trussed metal roof. All of these structures have original electrical wiring and modern fittings. The barn appears to be the oldest, but probably does not date too much before WWII.

The garage located just northeast of the main house appears to have been built in the twenties or early thirties. It is on piers

which level the structure over the slope near the ravine along the north side of the site. The braced frame construction has heavier elements to support the cars, while both electricity and gas fixtures are present suggesting that the building served as a shop during or after it was used for a garage. The exterior is finished with shiplap siding and a shake roof. An unfloored shed addition to the east probably accommodated additional vehicles or perhaps some yard equipment.

The water tower and pump house were located just southwest of the house. The pump most likely tapped the aquifer flowing at the spring (a geologic contact is exposed in the gullies near the spring, suggesting that the aquifer would be about 20 or 30 feet below the surface near the well). The water tower rested on massive concrete piers, and was constructed of bolted iron members. The tank was wooden, with metal hoop braces. An elaborate manifold system provided for distribution of the water to buildings and also several outlets near the house. These suggest great care for the yard or possible gardens near the house.

EARLY COMPONENTS OF THE SITE

The earlier components of the site were investigated mainly by test excavations but observations on the springhouse and cellar will be presented here, since these both appear to relate to the older phases of construction.

The cellar is located behind the house towards the spring (Figure 11-44). Several burned piers as well as charcoal distributions (checked by shovel tests) suggest that the cellar was connected to the house at one time. The cellar is vaulted and is constructed of double courses of the same type bricks that are used in the "smokehouse" and springbox. The interior dimensions are 4.7×2.9 m, with a vault height of 3.1 m. The brick-lined entryway is approximately 5.2 m long, but collapse prohibits exact measurement at this time. The exterior and interior are completely plastered. A fireplace on the west wall is an original feature. The function of this is uncertain, but seems contradictory to normal cellar functions. Above the fireplace is a complete genealogy of the Andersons, beginning with the marriage of Napoleon Bonaparte to Mary Jane Penn in 1859. It was painted in 1898. This is badly deteriorated but still legible. Someone attempted to cut this from the wall but abandoned the effort. Prompt professional restoration and curation are needed to preserve this important record.

The springbox appears to have been constructed much like the cellar. It is completely fallen and pirated, but large blocks of vaulted and straight walls are present.

The "smokehouse" is situated above the spring, just southwest of the cellar. The unusual character of this feature, coupled with its early type brick construction, led to test excavations in and around the brick box (Figures 11-45, 11-46, 11-47). These tests indicated a long firebox set into a deep pit. The foundation of brick and some stone rubble is at the base of the pit. The firebox has a base of two brick courses; the walls are constructed of two courses of the handmade bricks used in the cellar and springhouse, but no evidence of brick reuse is evident. The box is

partitioned into two roughly equal areas by two courses of dry stacked bricks and a segment of iron railroad track. All interior surfaces are plastered. The interior fill consists of ash beds, gravelly fill and rubble from the collapse of the upper box walls. Occasional burned artifacts and burned pig bones occur in the ash fill. It is possible that the box was reused in relatively recent times as a roasting pit; but the lower fill may also relate to smoking activities. Overall, the position and character of this feature are consistent with a smokehouse associated with the middle nineteenth century construction period at the site, but other functional interpretations may ensue with further excavations. Surface scraping and one offset pit revealed a scatter of nails and one possible post mold, but definition of the superstructure will require additional excavations. It seems likely that the superstructure was framed with a pole foundation.

Test excavations in the area of the main house were limited, and were implemented to ascertain the presence and condition of architectural and artifactual materials. Earlier reports that the house area had been completely bulldozed (Skinner and Connors 1979) appeared inaccurate since two relatively intact fireplace foundations were visible at the surface. Trenches were placed in the areas of suspected walls using these foundations as guides (Figure 11-48). These confirmed the presence of good architectural features and dense accumulations of burned artifacts in the northern house area.

Three trenches (.5 m wide) and three 1 sq. m test pits were excavated after the northern part of the site had been roughly cleared of heavy vegetation. The trenches, informally named west, north, and east, were placed where walls were expected based on the pattern of hearths and burned piers (Figure 11-48). In each case wall floorings composed of brick and/or stone rubble were located. Both stone and wooden piers suggest that at least one phase of construction, and probably the entire main phase, had a pier and beam foundation. Dense, and in some cases, almost pure concentrations of charcoal attest to the fire which destroyed the building in the 1940s. The only areas with unburned artifacts (other than intrusive ones) are to the west of the house. Along the northern wall a low brick skirt for a flower bed is present about 1.5 m north of the house wall. Charcoal filled the bed up to the brick skirt, while sterile pebbly loam is present just on the other side (Figure 11-49). The northern wall was encountered in the northern end of the two larger test pits near the northern fireplace. This area of the site is also where a large stone feature was partially cleared. These mortared slabs of native rock appear to be at an odd angle to the other hearths, and possibly relate to an earlier structure. Another fallen chimney was partially cleared to the west of this feature. It appears to be a stove chimney. The dense kitchen-related artifacts in this part of the site suggests that this area of the house contained the kitchen, at least in the latest phases of occupation. A third isolated pit in the center of the house area revealed few artifacts, but a dense accumulation of charcoal.

Nail distributions strongly suggest at least two phases of construction at the site (Table 11-11). The high frequency of cut nails in the northern portion of the site contrasts with the dominance of wire nails in the east and west walls. The wire nails from the northern trench are smaller than the cut ones, possibly



Figure 11-44. Photograph of the Old Cellar at the Anderson site.

indicating repairs (to siding and/or roofing), or additions. This pattern, in addition to the stone feature in the northern portion of the house suggest that identification of multiple construction phases may be possible with additional excavations.

ARTIFACT DESCRIPTIONS

Due to the fact that the Anderson house was totally burned, 52% of all the artifacts recovered are unidentifiable (Most of

these are glass blobs). The following discussion will be limited to the identifiable material (Table 11-12).

Kitchen

Of the 51 tin can fragments recovered all appear to be constructed with a crimped seam. Twenty fragments of glass food storage containers or fruit jars were collected representing nine vessels. Of the ten identifiable necks all appear to seal on a

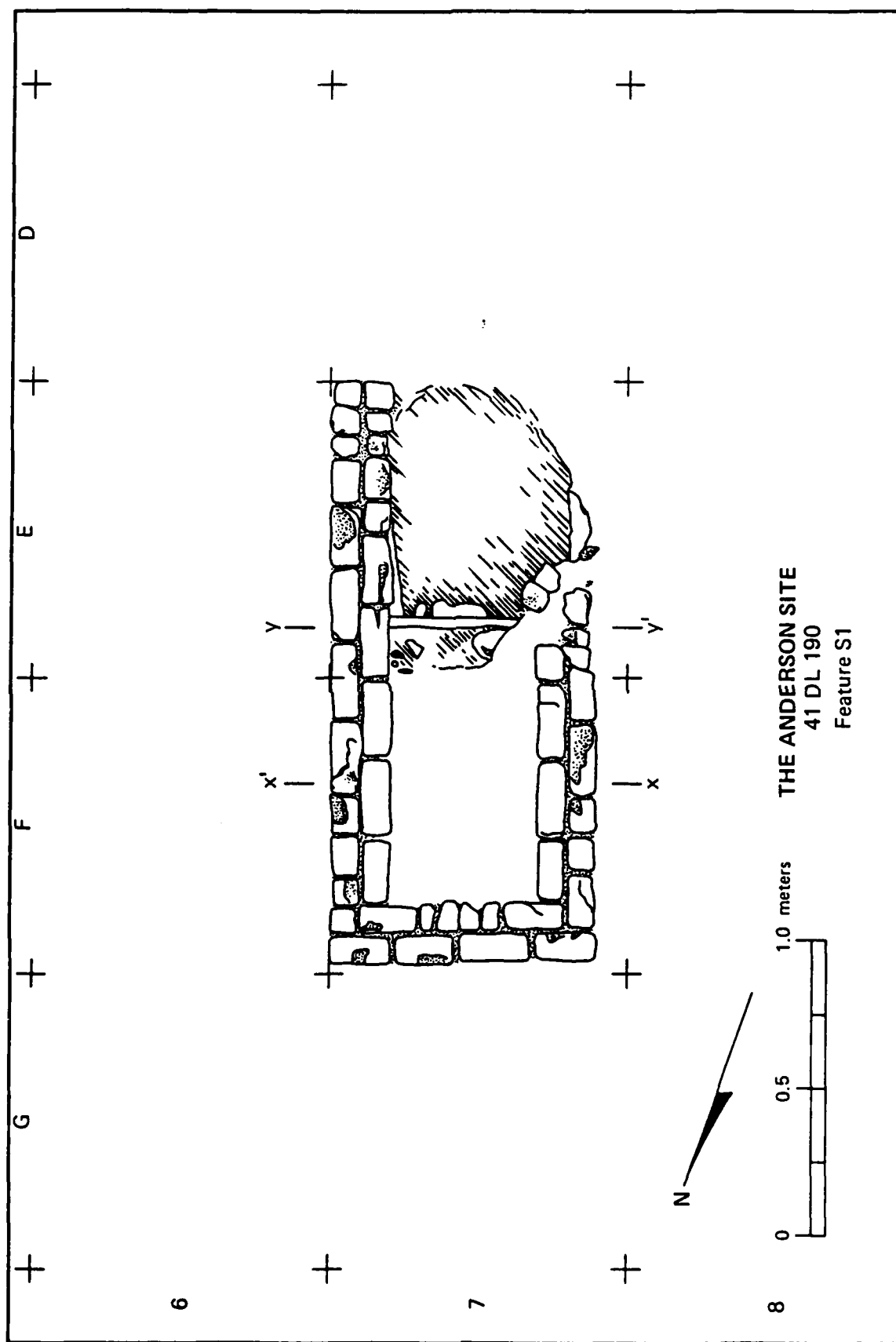


Figure 11-45. Plan of Feature S1, 41DL190. Shaded area on right was not excavated.

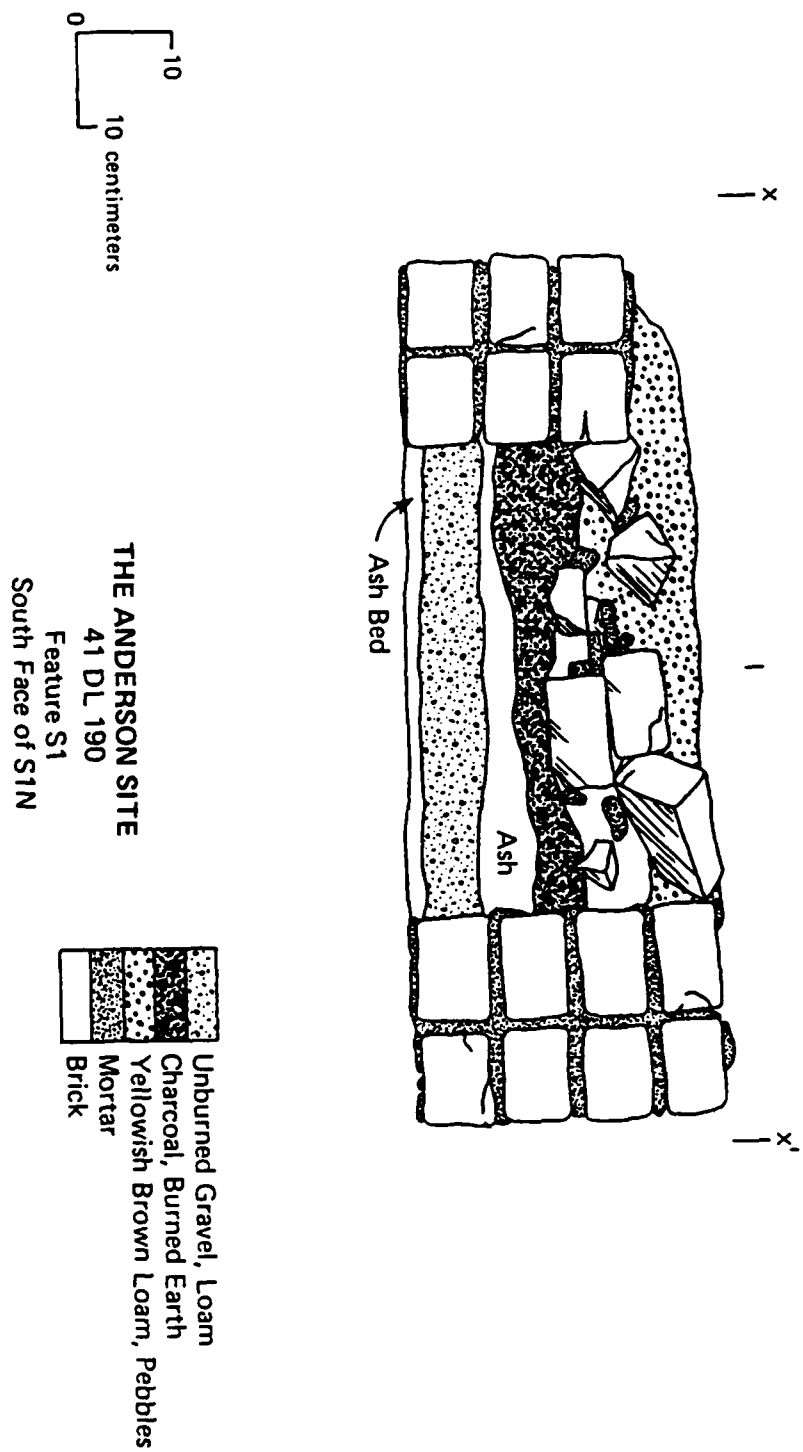


Figure 11-46. Cross-section of the south face of Feature S1, Anderson site (41DL190).

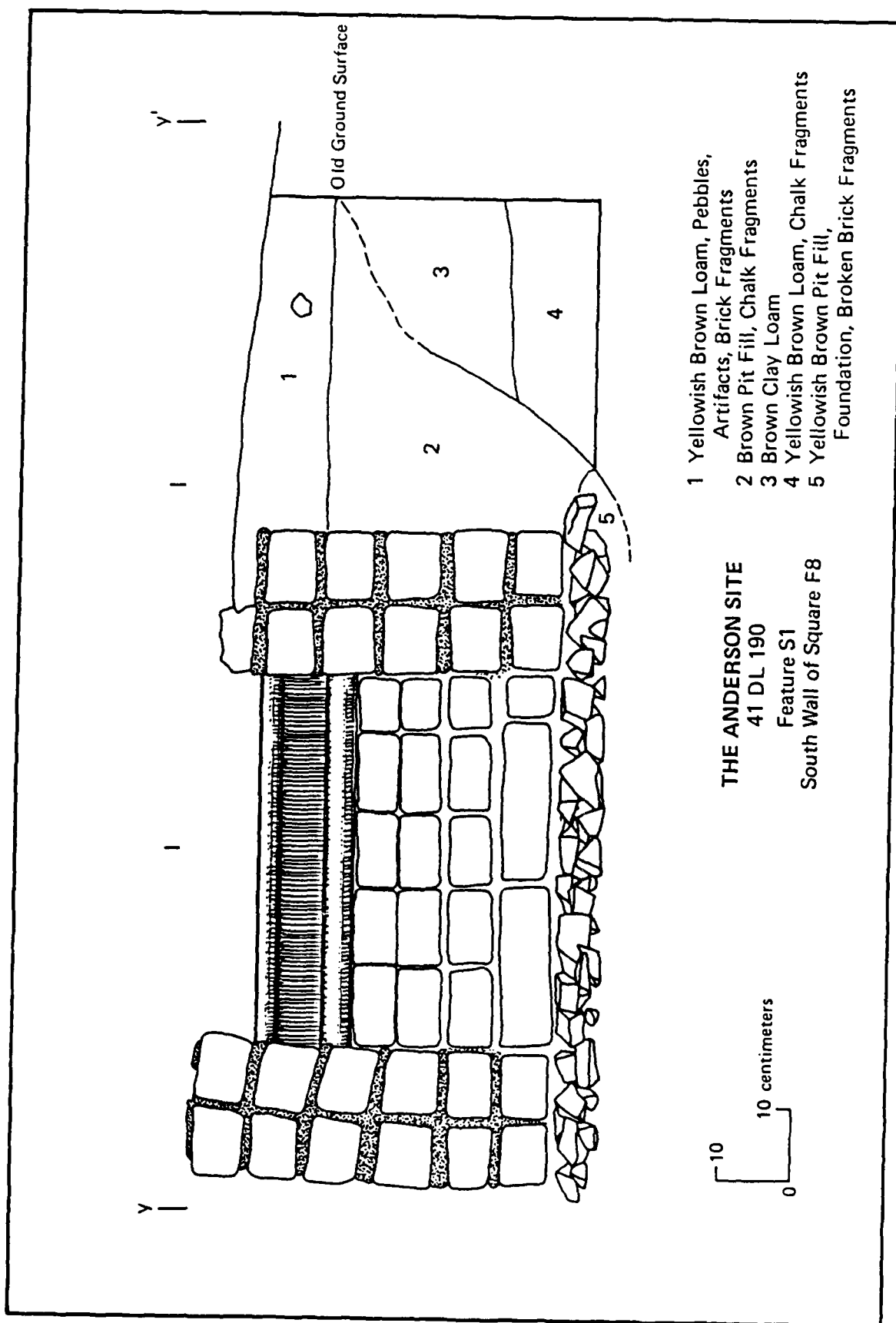


Figure 11-47. Cross-section of south wall, Feature S1, The Anderson site (41DL190).

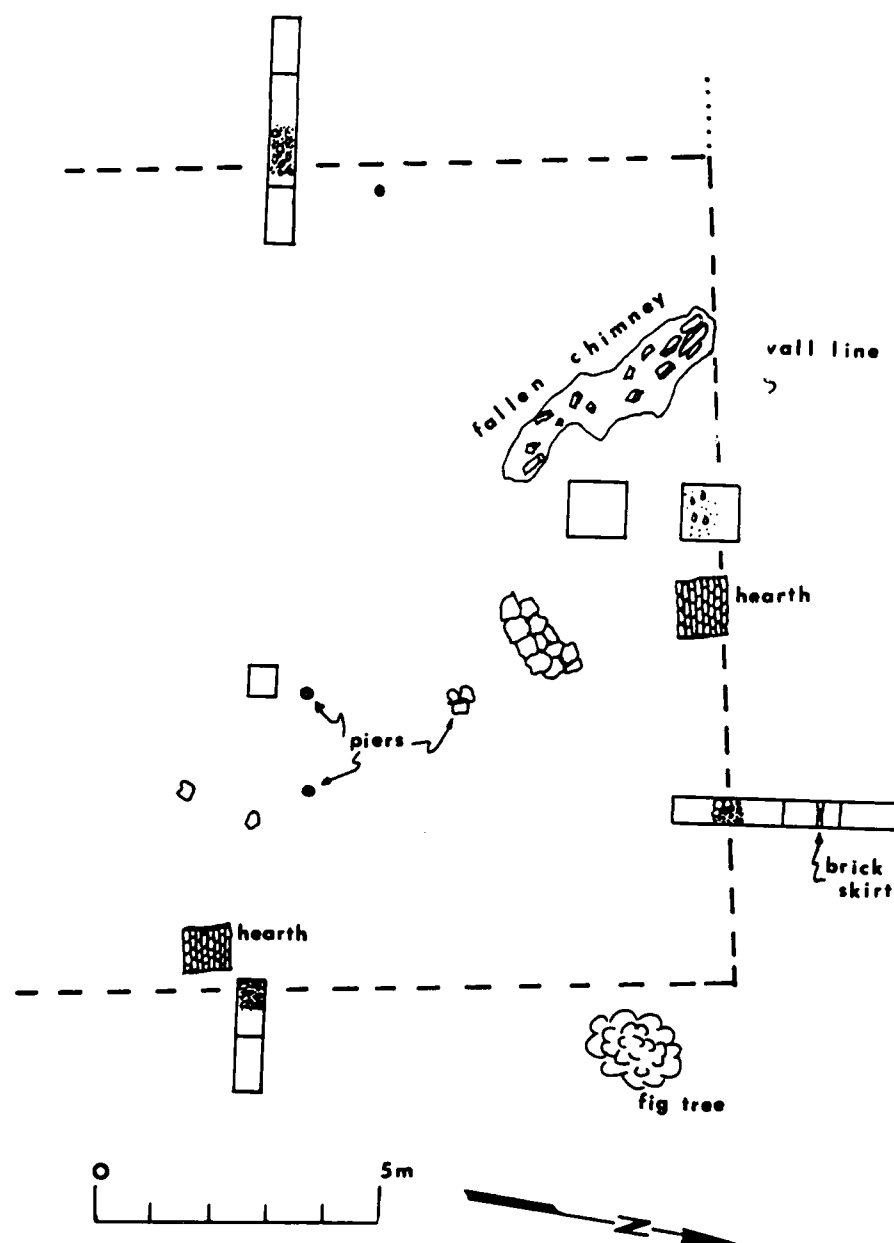


Figure 11-48. Plan of test excavations at the old house, Anderson site (41DL190).

bead of glass applied under the threads, a technique developed in the twentieth century and still in use today (Toulouse 1977). Also recovered was a fragment from a "Kerr Self Sealing Mason" jar produced between 1915-1919 (Toulouse 1977). Eighty-four fragments of soda bottles were collected representing 10 containers, all of these appear to be contemporary. All of the 32 fragments of brown glass from beer bottles also appear to be contemporary, deposited after the site was abandoned.

Ceramic serving and storage containers are presented in Table 11-13. The serving containers are primarily undecorated ironstone-whitewares. None of the pieces collected have makers marks on them. One piece of repousse in a floral motif and several sherds of decalomania were recovered. All the ceramics appear to be from the post-Civil War to modern periods.

Very few fragments of stoneware were recovered. Of these most are from crocks while two fragments of bowls were also collected.



Figure 11-49. Test Excavations at the Anderson site. (a) West trench showing wall footing; (b) North trench, looking south, showing concentration of charcoal on house side of brick skirt.

TABLE 11-11
Percentages of Nail Sizes and Types from Test Trenches at 41DL190

Size	North Trench		East Trench		West Trench	
	Wire	Cut	Wire	Cut	Wire	Cut
2d	25.0	1.4	2.4		.9	
3d	8.6	18.9	7.3	16.6	12.5	31.2
4d	1.2	4.9	2.4	16.6	6.3	
5d				16.6	37.5	
6d	37.0	3.5	26.8	50.0	1.8	6.3
7d	4.9	.7				
8d	12.3	53.1	51.2		28.6	62.5
9d		.7				
10d	2.5	15.4			1.8	
12d	1.2					
16d	7.4				8.9	
20d		1.4	4.9		1.8	
Spike			4.9			
n	81	143	41	6	112	16
N		224		47		128
Percent Cut Nails		64.0		12.8		16.0

TABLE 11-12
Artifacts from 41DL190

Artifact Class	Feature C	Feature D	Feature F	Feature G	Feature S-1	Sq C-7	Sq E-3	Sq E-4	Sq E-6	Sq E-8	Sq F-8	Sq G-6	Sq G-7	Sq G-8	Sq N-7	Sq N-8	Sq N-9	Sq N-10	Sq R-16	Sq W-1	Sq W-2	Sq W-10	Sq W-11	Sq W-12	Sq W-13	Total	z
Unidentifiable	56	22	39	21	1	129	239	1	131	50	67	1010	110	33	37	14	8	1973	52.49								
Kitchen	55	27	26	2	5	10	3	7	13	5	7	1	8	19	3	3	6	67	44	16	30	8	9	374	9.90		
Architecture	2	17	51	29	12	119	90	2	25	6	1	2	102	113	77	77	112	5	49	116	60	19	19	1105	29.32		
Furniture	22	6	4	1	1										14	3	1	4	1					56	1.49		
Ordinance					1		1								1		1	1	1				2	9	.23		
Clothing			1				1								1	1		3	1					8	.21		
Personal	2					2	1	1		1					4	7	1	1	1	5	2	1	3	30	.79		
Activities																											
General					66	1	1	11	11	17	8	5	22			1	1	1	1	1	1	1			150	3.99	
Construction					10																				10	.26	
Blacksmithing							3																		3	.07	
Auto-related																									1	1	.02
Fencing	1	1	1	3	4	5	2		5	2	1	2				1	8	2	3	1	1	2	1	1	44	1.17	

TABLE 11-13
Ceramics from 41DL190

	<u>Vessel Form</u>							
	Plate	Vegetable Dish	Bowl	Cup	Saucer	Tureen	Sugar/Creamer	Unidentifiable
EARTHENWARE								
IRONSTONE/WHITEWARE								
Plain	1	2	11	1	2			55
Repousse only		1						
Underglaze Painted								1
Decalomania			2	3		1		
Decalomania and Gilt							2	
Decalomania and Gilt and Paint							2	
UNGLAZED								
Flower Pots								24
PORCELAIN								
Plain			1					1
Gilt							2	
STONEWARE								
			2					9

One interesting item is a fork melted onto another mass of metal, bearing witness to the intense heat of the fire that destroyed the Anderson house.

Architecture

Architectural materials include 74 fragments of mortar and 44 pieces of the newer machine molded brick. Also recovered are four pieces of window hardware, one hinge and one plumbing fixture, and many nails (Table 11-11).

Furniture

Artifacts relating to the furniture group include 11 glass oil lamp chimney fragments, one light bulb and two electrical plug lugs. Nine upholstery buttons and 14 upholstery staples were also collected. One glass decorative furniture coaster with rounded flutes on the side was also recovered.

Ordinance

Six .22 caliber long cartridges, one .22 caliber short, one Remington, .300 S.A.U. cartridge and one firing pin are included in this group. All of the cartridges are modern.

Clothing

Numerous articles relating to clothing were collected. Included here are one shell button with four holes, one plastic button with four holes and one plastic button with two holes. Also recovered were two zipper slides, one shoe lace eye, one snap, and one clothespin spring.

Most of the personal material collected are medicine bottle fragments including two aqua, one clear, and one made of dark cobalt blue glass. Two short cosmetic jars made of milk glass and two cologne bottles were also recovered.

ACTIVITIES

The activities encompass a wide variety of material. Various nails and other fasteners are included here. Blacksmithing is represented by two pieces of slag and one piece of metal. Bail ears and one bail pail were collected. Fencing is represented by the 27 wire fragments and 17 nails. One unusual item included under this heading is the aluminum can lid with the raised impression of a mother cat doing laundry. One hundred five pieces of badly corroded iron were removed from feature S1.

DISCUSSION

Napoleon Bonaparte Anderson was born in 1825 in Kentucky

He moved to Texas about 1859 and shortly thereafter purchased a large tract of land in Dallas County. His marriage to Mary Jane Penn in 1859 provided a link to the other major landowner along Cedar Hill ridge, and the two families remained as prominent, successful ranchers in the area. As early as 1860, N. B. Anderson was recorded as joint heir to the estate of John Penn, along with three other Penn sons. Only Andy Anderson was capable of taking over the land in 1892, the year of his father's death. Andy Anderson continued to prosper as a horse breeder and rancher, seemingly in synchrony with his uncle, Andy Penn.

Little is known of the details of the first stages of Anderson family development of the land overlooking the spring now surrounded by ruins. Test excavations have indicated the presence of significant in situ deposits which may shed light on the nature of the first structures, the activities characteristic of initial settlement, and the pattern of growth which led to the completion of the "plantation" house which stood until the 1940s. N. B. Anderson's initial purchase of about 2000 acres in Dallas County indicate that he came to Texas a comparatively wealthy man. His marriage to Mary Jane offered additional security, which is reflected in various censuses during the Civil War and Reconstruction periods. It is possible that they owned slaves throughout the Civil War, and in the 1870 census several blacks are recorded as being in residence at the ranch. These patterns of settlement stand in contrast to the many settlers who arrived with little means and who struggled to gain a foothold in the area. Archaeologically and historically these contrasts offer the potential to explore differing patterns of settlement and growth.

41DL191 THE POOL SITE (1880-1890?)

SITE SETTING

The Pool site is located on Belt Line Road at the edge of the high terrace overlooking Mountain Creek Valley. Occupied until just prior to this study, the site presented the most undisturbed context at the beginning of the testing phase. Vandalism and ultimately arson have destroyed the main house.

The site consists of a main house and several outbuildings (Figure 11-50). The main house was, at the time of the SMU survey, occupied and well maintained. The outbuildings all were surrounded by work areas or working pasture. Introduced trees surrounded the house and mesquite trees surround most of the outbuildings. Water was supplied by wind driven pumps which were located behind the main house. Testing revealed no alluviation in historic times; this was quite expected, since the site is approximately 15 m above the Mountain Creek floodplain.

SITE APPEARANCE

The main house dominated the overall farm complex (Figure 11-50). It was relatively modern in appearance (Figures 11-51, 11-52, and 11-55). This situation does not immediately convey the rather long sequence of modifications which the structure has

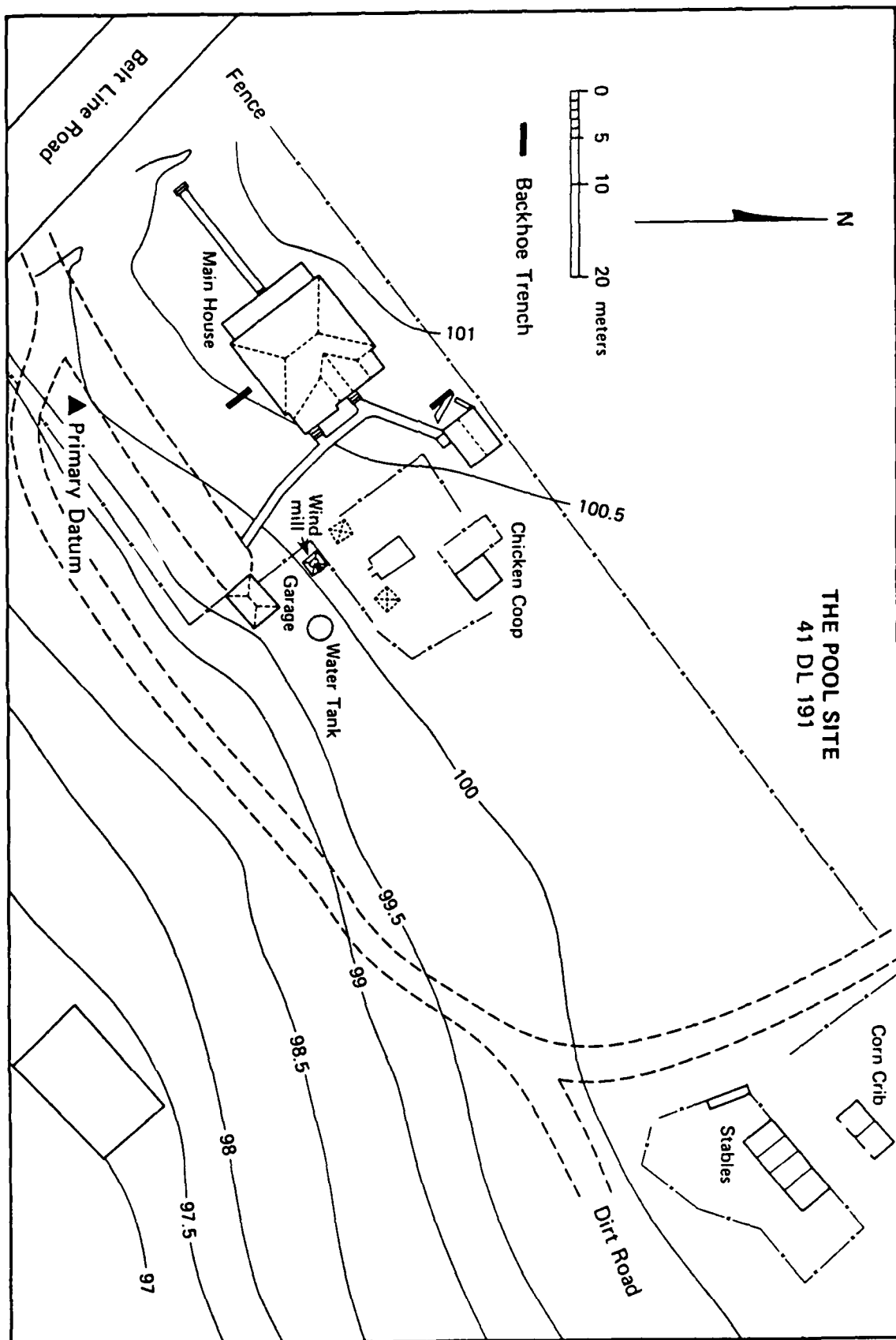
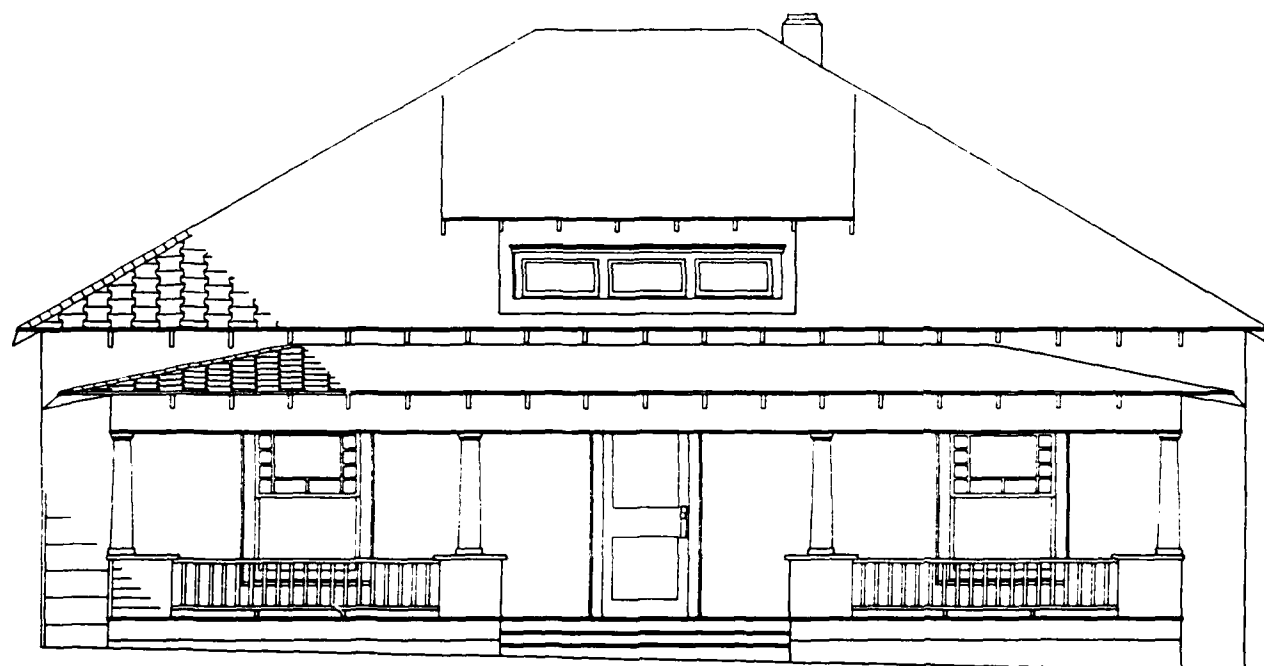


Figure 11-50. Map of the Pool site (41DL191).



THE POOL SITE
41 DL 191
Main House
Southwest Elevation

0 1 2 meters

Figure 11-51. Southwest elevation of the main house at the Pool Site (41DL191).

undergone in the last 80+ years.

Until recently it was surrounded by an iron fence and was well landscaped. Its latest architectural style is paralleled by the single car garage set behind and to the side of the house. A small three room structure, also behind the house, was the residence of a domestic worker for some years. Two cellars (both abandoned) and a chicken house are also behind the main house. The wind driven water pump and a cement water tank complete the main site complex. A barn stood downslope and to the south of the main house. Since the time of the SMU survey, the barn has been completely salvaged, and only a few piles of lumber and a heap of debris marks its location. Farther back behind the house are the remains of some cattle working pens, a corn crib, and some sheds.

ARCHITECTURAL HISTORY

The modern floorplan of the main house was remarkably disjointed (Figure 11-53). This chaos was real, but was the last (and final) state of a previously ordered architectural evolution. The age of the first structure has yet to be determined; it was a dogtrot frame structure which served as the core of later house

forms (Figure 11-54). The dogtrot house was doubled into a variation of the theme of the four pen house described by Jordan (1978). The porch floor of the original dogtrot is weathered, indicating that it was open. It is presumed that the porch remained open after the building was doubled (Figure 11-55). At some later time the wide passages at either end of the doubled dogtrot were narrowed to the width of a single door.

The next construction phase is poorly known since it involved extension of the house to the rear. This portion of the house had been later removed and sold. The servant quarters behind the main house were also salvaged from the removed portion of the main house. Miss Ruby Pool indicated that a long porch extended across the back of the house and also that at one time the central hall extended through the length of the house. It is not clear as to whether there were four or six rooms to the central-halled house of which she spoke. Following removal and sale of the back of the house, the clumsy additions to and partitioning of the remainder of the main house were made. These were dominated by addition of the bathrooms and pantry. At the same time, the wall of the front hall was moved, making the front of the house into three rooms (Figure 11-55), the central hall was closed off, and the closets were added to this new "room" off the kitchen.

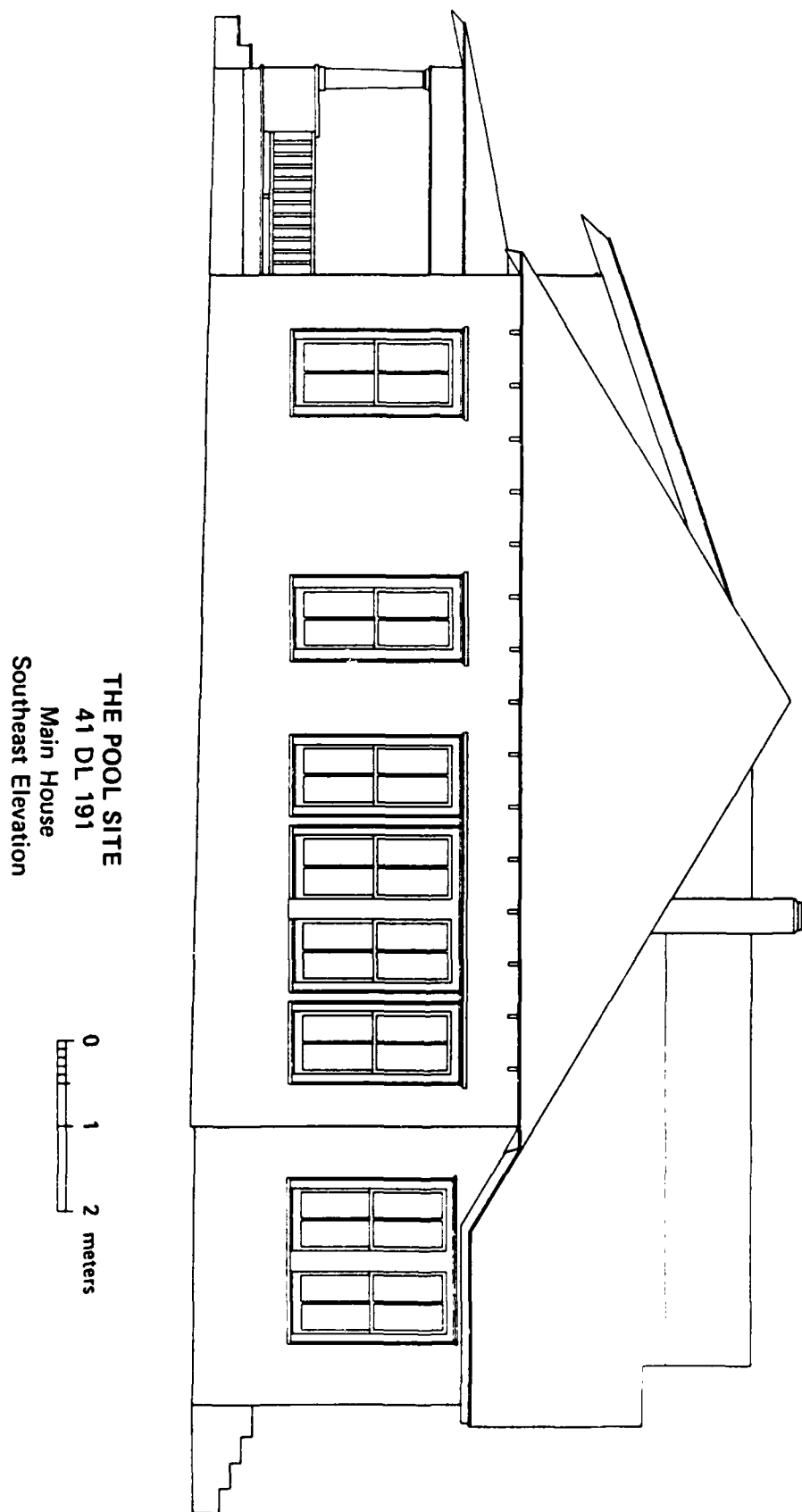


Figure 11-52. Southeast elevation of the main house at the Pool Site (41DL191).

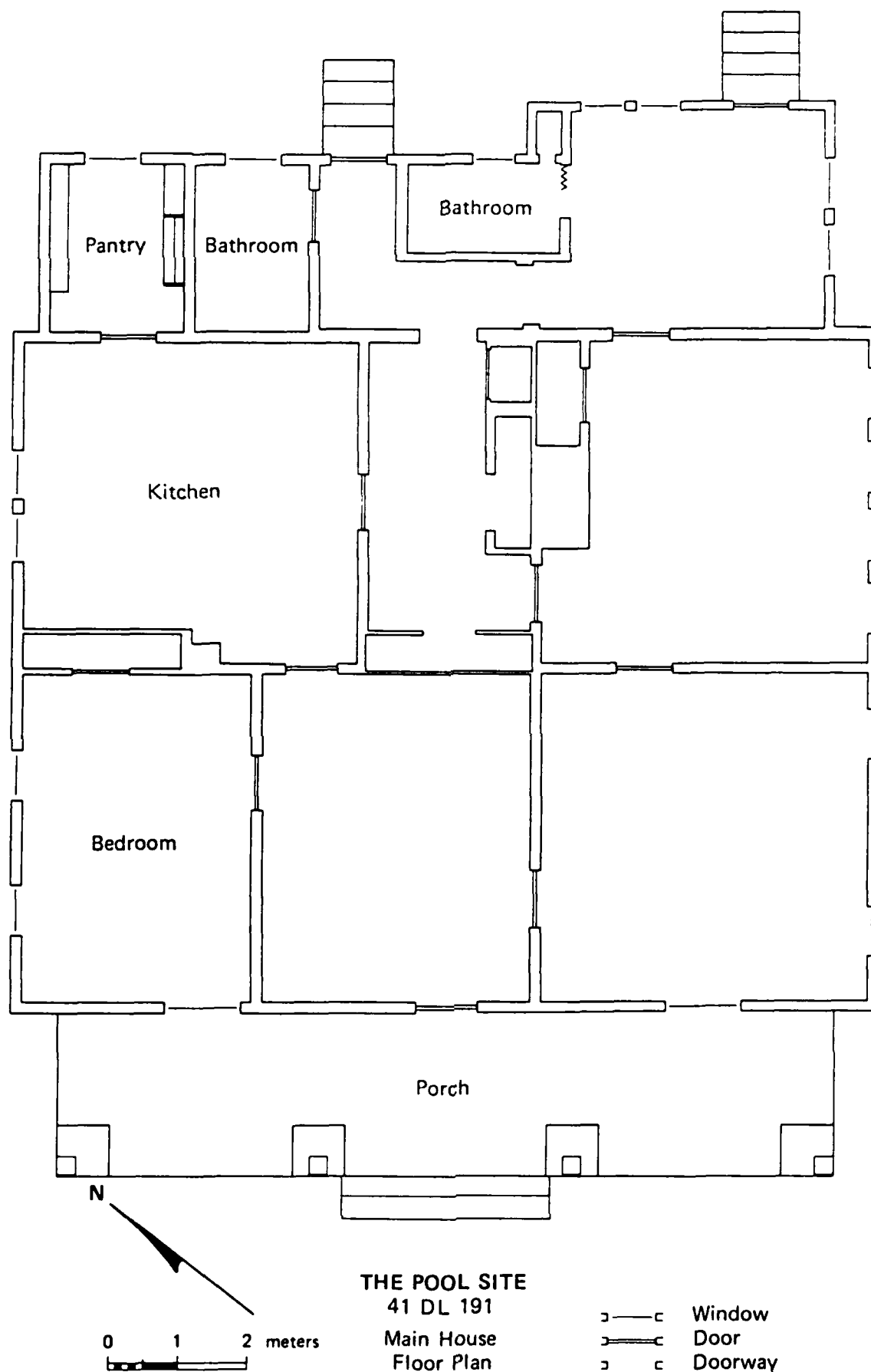


Figure 11-53. Floor plan of the Main house at the Poole Site (41DL190).

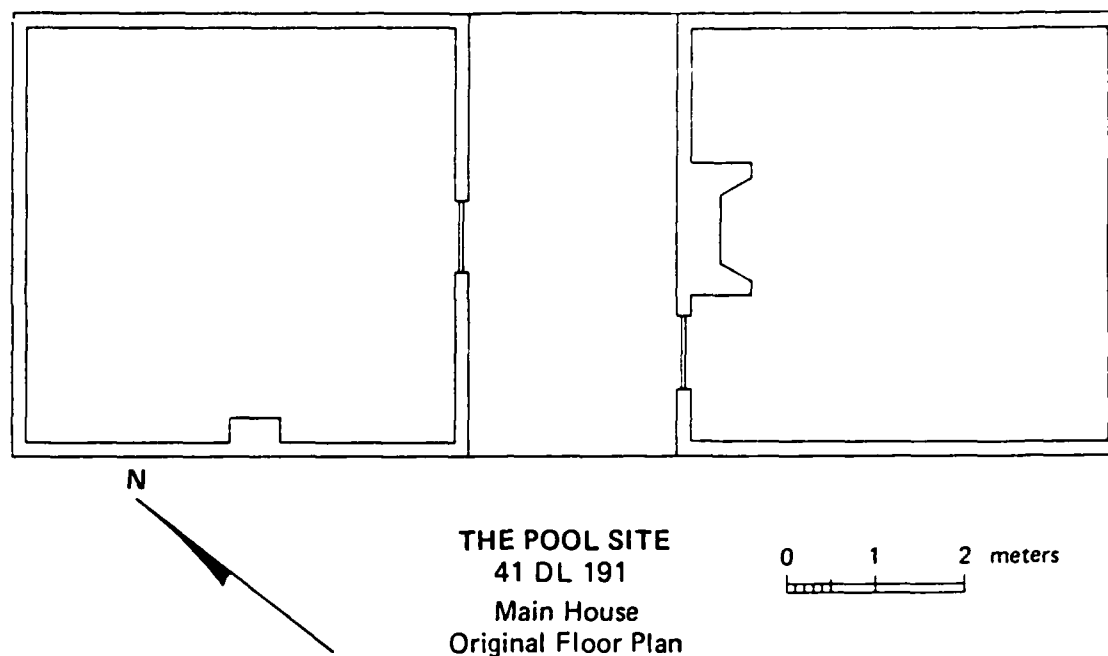


Figure 11-54. Original floor plan of the main house at the Pool site (41DL191).

The roof covering the main house was a factor in the slow realization that the house had undergone so many changes. This hipped-type roof had simply been added over all preceeding wall tops and concealed the fact that the roof form changed in tempo with the floor plan modifications.

The original dogtrot was built on a foundation of cottonwood (?) piers. Along the outside, long axes of the dogtrot massive beams were set on the row of piers. Roughcut sleepers were set across the axis of the house on these beams. The foundation of the original fireplace, made of handmade bricks, rested on the ground below the floor of the house. Stout 2 × 4" studs were used to frame the house. These were best exposed in the attic of the house. A pitched roof with the ridge running the long axis of the house capped the structure, but the presence of original porches or porch roofs could not be verified during this phase of work.

The walls of both rooms were approximately 11 feet tall. The interior walls and ceilings were originally covered with beaded tongue and groove boards. The exterior walls were covered with clapboard and painted white. All of this construction involved use of cut nails.

Windows and door placements were not fully determined because of wall coverings. It appears likely that each of the three exterior walls of each of the dogtrot pens had two windows. The unusual placement of the fireplace at the interior wall of the south room first suggested that the house may have initially been a single pen structure. Continuous structural elements indicate this was not the case. The fireplace location meant that the doors opening to the trot were not symmetrically placed.

The fireplace in the southern had been covered for some time. It originally was made of handmade brick and had a brick hearth. Sometime later it was converted to accommodate a stove chimney. The cookstove chimney was visible in the attic, yet its base was covered by wall board in the kitchen.

The floors of the original house were uniformly cut single pieces of ash or possibly heart of pine which did not have any knots. The doors were mostly panel type in the house at the time the survey was done. It is not known if they were original. Simply decorated mouldings around the doors and windows were executed by a local carpenter and probably were not original to the dogtrot.

Doubling of the dogtrot was easily detected by the new construction techniques. Wire nails were used throughout. The interior walls and ceilings were all horizontal 1 × 12" boards. More recent additions made to the whole house included at least two phases of electrical wiring, addition of a wood burning stove to the front north room, and the addition of gas lines and space heaters to the whole house. The modern exterior had been considerably done over to a 1930s style with exposed rafters, a flat sloping front dormer, multi-paned windows in front, pedestaled porch pillars, etc. (Figures 11-51, 11-52).

The garage seems to have been added after the major modifications to the main house. It is covered with shiplap and has a hipped roof and interior walls made of lap-jointed 1 × 12's. The garage has a cement foundation for a large pump of some unknown character. This was probably used to pump water, but it was not discussed with Miss Pool.

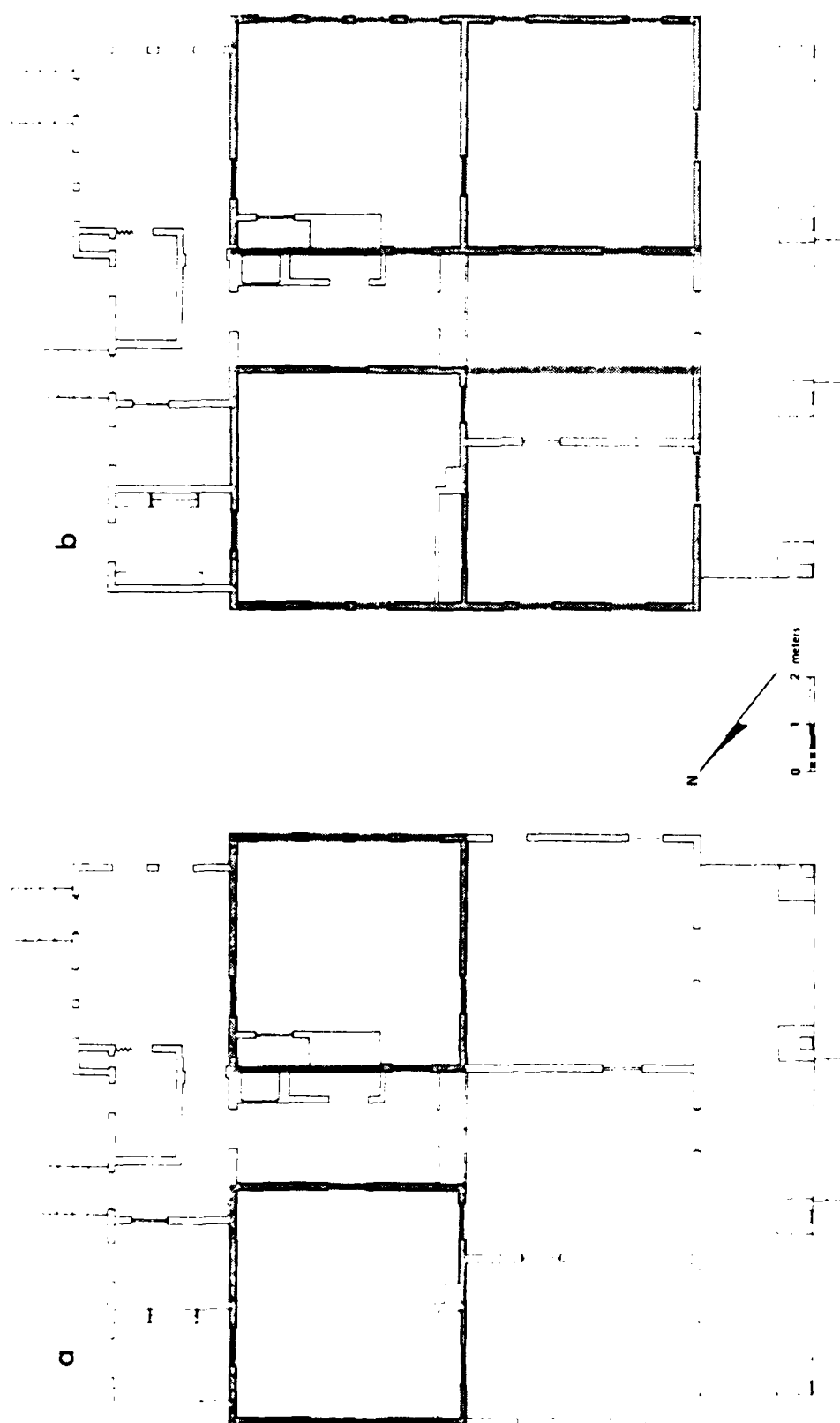


Figure 11-55. Architectural history of the main house at the Poole site (41DL190). (a) Original floor plan; (b) Modified "Dogtrot."

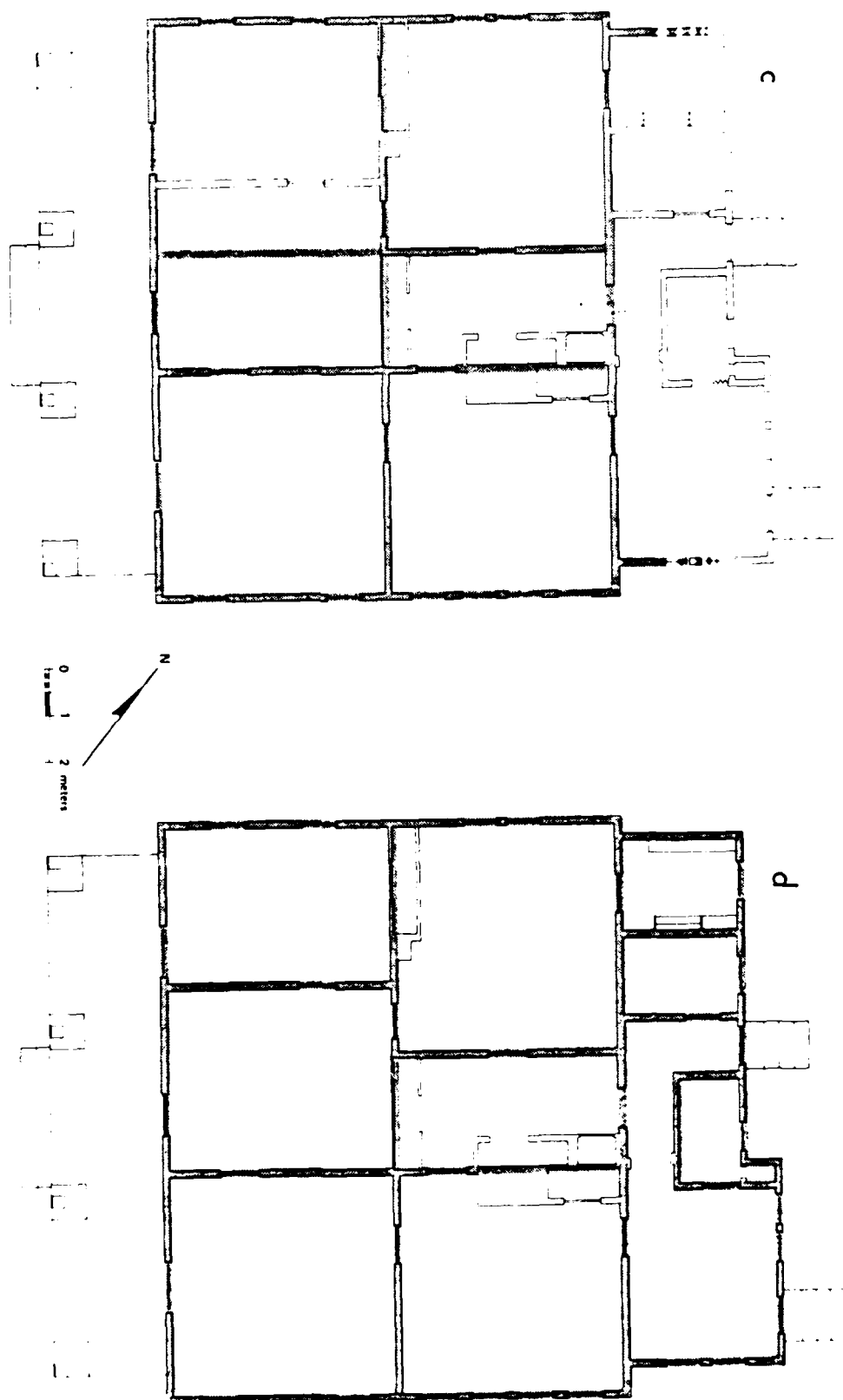


Figure 11-55. Architectural history of the main house at the Pool site (41DL190) continued. (c) Additional modifications; (d) Final modifications.

The cellar discovered with the backhoe trench is of unknown age. The other cellar seems to be newer, but it too is not well dated. The cement block chicken house was constructed in 1955.

The barn south of the house was noted but not photographed by the SMU survey crew. Clear evidence of a blacksmithing area was noted on this survey. Miss Pool indicated that her brother used the area for blacksmithing as late as the 1930s, but that he did this only casually. It remains an important cultural feature nonetheless.

The other buildings are all frame construction and appear to be quite young. The corn crib was last used for storing some cottonseed and straw and is a typical double crib made of planks. The other structure is a multi-purpose shed and storage room. These are within and around a small corral and cattle chute.

ARCHAEOLOGICAL INVESTIGATIONS

Two backhoe trenches were excavated at the Pool site (Figure 11-50). The first was placed near the small house behind the main house where a small portion of a sidewalk terminated abruptly. It was suspected that it might be an abandoned privy location. Trenching quickly revealed that the feature still contains artifacts such as canning jars and pottery. The walls are intact but the roof has collapsed. Miss Ruby Pool confirmed that the cellar had been filled in many years ago when snakes began to inhabit it. Its age is not known. The other backhoe trench was placed just south of the main house. This revealed no in situ materials.

A promising area for artifacts pertinent to the site's occupation history is underneath the house. There a fully intact hole-in-top can was found eroding from the soft, wind or water-lain deposits under the original dogtrot. The can was evidence that these deposits had remained largely undisturbed for some time (such cans have not been used since the turn-of-the-century). No additional artifacts other than very recent trash were observed in the small corner of the crawl space which was examined. The eroded area indicates that the can was completely buried, however, and that period trash accumulations can probably be recovered from this area.

ARTIFACT DESCRIPTIONS

Glass Containers

Two glass containers were recovered from 41DL191. One container of clear glass is a medicine bottle with raised marks down both sides of "KREM..."

The other artifact is a light olive green wine or champagne bottle. This bottle has the characteristics horizontal striations and high luster of a product formed in a turn-paste mold. It has double rings around the mouth applied 5 mm below the lip and a kick-up in the base measuring 2.9 cm from the base to the top of the recess. Bottles of this type were produced between 1880 and 1920 (Newman 1970:72).

Ceramics

Five "semi-porcelain" sherds of a single bowl were collected. All are decorated with polychrome rose transfer or decalomania, overglaze elements. The rim sherds exhibit scalloped edges and silver gilt line work following the rim. A green underglaze hallmark is that of the Edwin M. Knowles Co. of East Liverpool, Ohio, established in 1901 (Barber 1904:117).

Three decorated porcelain fragments were recovered. One cup sherd exhibits a brown painted line overglaze, but is not complete enough to reveal a specific design. Two of the sherds have overglaze transfer prints. One of these is a floral/geometric pattern on the exterior of what appears to be a bowl. The remaining sherd has a polychrome floral print applied on the interior of the vessel.

The only stoneware sherd collected is a fragment of a large molded crock. A beige Bristol-type glaze covers both the interior and exterior of this vessel.

Metal Containers

A single "hole-in-top" can was recovered from under the structure. Cut from sheet iron by hand, these cans were then shaped around a cylinder and the seams soldered. After the tops and bottoms had been soldered in place, food was forced through an opening in the top. A smaller cap was then soldered over the hole. To vent gases while the contents were cooking, a pin hole was left in the top. In the final step, a drop of solder sealed the pin hole. The process, initiated around 1815, persisted with variations through the nineteenth Century (Fontana and Greenleaf 1962:68).

Construction Materials

Three green fragments of plate window glass were collected. Two of these measure 1.9 mm in thickness and one 2.6 mm.

Personal Possessions

One shell button was recovered. Measuring 13 mm in diameter, it has a recessed center with two holes and decorative cuts around the edge. Several pieces of silk, all belonging to a lady's handkerchief, were recovered. The "hankie," originally white, is finely embroidered with floral designs. Sixteen sections of newspaper were recovered. These, having been stored in a nearby trunk, were in moderately good condition. They are portions of the "Texas Baptist and Herald" of Dallas, Texas; the dateline reads June 16, 1898.

Pool Interview

Miss Ruby Pool, a life-long resident of the Mountain Creek area, was among those kind enough to grant us an interview.

Miss Pool is the daughter of Charles Burke Pool, one time "proprietor of a magnificent estate of more than a thousand acres along Walnut and Fish Creeks, included in the George Wilson, McKinney, Williams and Thomas J. Jone surveys" (Hill 1909:217). Miss Pool has an extensive knowledge of the area and was able to enlighten us on many points, relating both to the Pool site and the entire Project area.

Charles Burke Pool was born in Alexander County, North Carolina, in March 1861. Mr. Pool was the son of Nathan A. Pool, one time teacher and a Confederate Army Captain during the Civil War. After the war, his hearing failed him; and, forced to give up teaching as a profession, he became a farmer. In 1874 Nathan Pool moved his family to Mansfield, Texas, where he continued to reside until his death in 1900.

Charles Burke Pool was 13 when his father moved to Texas. Both he and the other children in the family attended school at Baylor University in Waco; but, after completing one year of school, Charles decided to try his luck at farming and stock-raising instead. By 1885 he had settled on Walnut Creek and rapidly became a prominent citizen.

Charles Burke Pool appears to have been both economically and socially successful throughout his life. This economic prosperity is evident through the large amounts of property he eventually came to own. His social success can be glimpsed through many of the stories Miss Pool related to us during our conversation.

It is noteworthy that his unique property came to him with the marriage of his first wife, Cordelia Grimmit. It was in this manner that he acquired the tract of land upon which 41DL191 is located. Probably due both to its location and its owner's congeniality, this property became a gathering point for neighboring families. One of the area's many artesian wells was located here and much activity was centered around it. As related to Miss Pool:

...down there by those barns was a flowing well. And it flowed 35 years. It used to have a stream about that big (approximately 3 inches). And so, everybody for miles and miles around when it would get real hot summer-time...they would come down there lots of times to get water for their cattle, let them drink...And also down there was a pretty good sized cement tank that used to be up off the ground three feet or more...That's where people everywhere from all kinds of denominations would come and baptize. And the men would go up to the big barn and dress.

Aside from occasional gatherings, the primary activity was farming. While corn and oats were regularly planted, the major emphasis appeared to be on cotton. "Down in the bottoms, it was rich land...we used to get three-fourths a bale to the acre" (Pool). As he owned too much land to work by himself, Mr. Pool engaged renters or tenants to help with the farming.

He had, let's see, four rent houses. And he would have men and families live in those rent houses and they raised cotton and corn and things like that...He would furnish all the teams and all the equipment and they would do the work and give him so much...He'd rent it to them on "thirds and fourths." (Pool)

This system was apparently profitable enough to allow for many improvements on his properties, especially his home (41DL191). While Miss Pool did not know when the original house was built, archaeological and archival evidence indicates that the "dogtrot" was built before the property was acquired by

Mr. Pool. He was, however, responsible for many of the renovations. At one time the house was much larger than it is today. It projected an additional 30 feet on the east or back side and large porches surrounded the entire house. Many of the enlargements were designed by Richard Glenn, Mr. Pool's cousin. Mr. Glenn was not a professional architect or builder, but apparently enjoyed that kind of work as he built many homes in the area. A craftsman as well, Mr. Glenn was responsible for the decorative moldings surrounding many of the interior and windows of the Pool house.

Some years after the death of her father, Miss Pool modified the interior and reduced the size of the house:

You see, the rooms were 16' x 16' and so I cut off the dining room and the kitchen. We had a back porch that was 30 foot by 15...The bathroom was back there and the utility room...I just had them whack all that off and then we still had 3 bedrooms, hall, pantries, and two baths on that...Put the closet in the back hall; it was a hall that went all the way through the house, you know. And then I moved a wall over in front and made that (northwest) bedroom smaller and had the dining room in front...You know there's a big fireplace there in the house. All we did was board it up...after we got Butane heat. (Pool)

The remaining section that was removed was sold. "Somebody made a whole house of it" (Pool).

In addition to the main house, Mr. Pool constructed numerous outbuildings at 41DL191.

We had a big tin barn there (immediately south of the garage). And people would come do a little bit of blacksmithing there...

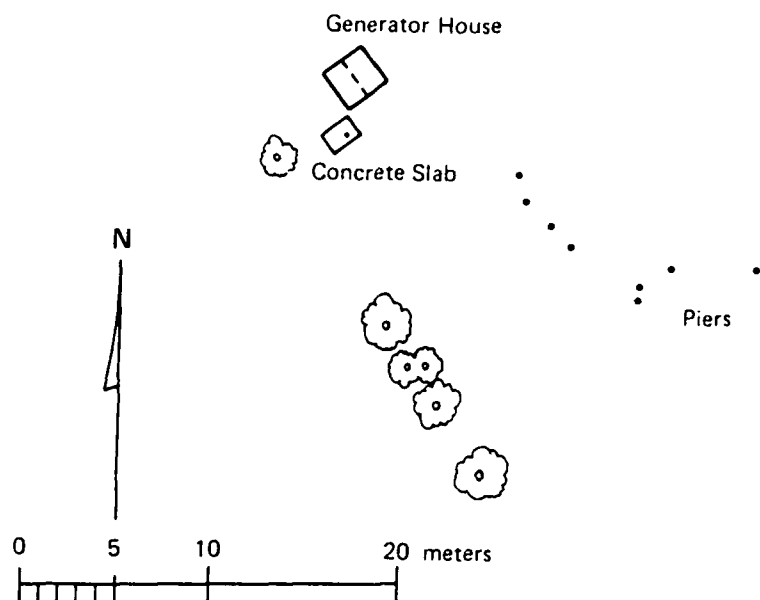
Long ago we had a huge, huge, huge, big barn that burned about 1932 or 1933, I imagine. But, anyway, all on one side were big bins upstairs and down. And then it had an open place where you could drive all the way through. Then, down below, over on this side, they had a whole lot of bins and stables for the horses and a manger where they put out food for them. And they had great big bins where they'd keep cottonseed or oats or corn...Right there by it was this little barn, they called it the cow barn, where they used to milk...Then there was another barn and at one time it was a dairy...That little house that was down there. You know what that was? Years ago, when I was just a little girl we didn't have electricity and Papa always liked good light, so he had a carbide plant, and it produced a gas that came into the house. You just turned it on and lit it. (Pool)

Mr. Pool also built a "feed barn" east of the main house. The "cinder block" house, was added by Miss Pool, who kept chickens there.

Cordelia Pool died in 1895; and, after "...they batched around there for a while" (Pool), he married Orienta Wolff, the daughter of W. C. Wolff.

Mr. Wolff was a "pioneer" of Dallas County and early in his career taught school at Cedar Hill. Later, in 1867 he began to practice law in Dallas. In 1883 Mr. Wolff published "Magnitude in Order" from which the following passage was taken: "The father of this family (W. C. Wolff) was one of the early promoters of Trinity River navigation, and has lived to see the government of the United States practically admit its importance" (Wolff 1833). Miss Pool commented:

...they called him the father of Trinity River navigation...That's what I said, if this isn't ironic, that he would do all that and then we'd have to get moved out by the Trinity River navigation. (Pool)



THE POOL TENANT SITE
41 DL 191

Figure 11-56. Map of the Pool tenant site (41DL191).

THE POOL SITE-EXTENSION

Several structures south of the main Pool site (and related to it) were examined during the second phase of work. All are mentioned by Miss Ruby Pool in the oral history taken during the first testing phase.

A small tack barn is standing due south of the Pool house and barn. It measures 2.5×3 m and is in good condition. Cedar poles serve as the foundation and frame. Vertical 1×12 planks with battens form the sides. The shake roof is supported by a truss frame and lathing. The structure has a dirt floor. Many nails and hooks were added to the trusses and walls, some of these still have various pieces of tack hanging from them.

A pile of V-notched cedar logs and some limestone blocks are located near the tack barn. These are the apparent remains of a log barn which stood here until some years ago. Miss Pool indicated that the logs were probably removed to this location to be reused as part of the barn. In turn, most have been removed by unknown persons to be reused in another structure. No in situ remains of this barn could be detected.

The Pool Tenant site is located about 1500 m southeast of the tack barn. This four-roomed tenant house was built by Charles Pool about 1920, and was occupied for many years by various

tenants who farmed on "thirds and fourths." The house itself is almost completely gone today (Figure 11-56). A few piers are still intact, with differing heights indicating a porch extended across most of the west face of the structure. The north-south oriented house had chimneys (ceiling supported) in at least two rooms, one on the north and one on the south. Fallen wood indicates a plank structure with probable battens. The distribution of piers and wood is inconclusive with respect to the configuration of the rear rooms. Either a "T" or an "L" arrangement could be inferred.

The small house which contained the carbide generating plant for the Pool family house stands just northwest of the tenant house (Figure 11-56). It is built on a foundation of 4×5 and 2×6 sills which are lap jointed. The frame is covered with shiplap on the outside and horizontal 1×12 boards on the interior. The walls are insulated with cottonseed. There is a 2×6 subfloor overlain by pine boards; this construction presumably was necessary to support the power plant. The structure has a simple pitched shake roof. Nearby is a concrete slab with a small pipe in the middle; this may have supported some equipment related to the plant.

No further work at any of these locations is deemed necessary, owing to their poor condition, and lack of apparent artifacts.

41DL192 THE PENN SITE (1854)

The Penn Site is a complex of historic structures located on the southern side of Mountain Creek Valley near its juncture with Walnut Creek Valley. The structures and associated features are dispersed over the edge of the bluff which separates the floodplain from the higher ground to the south. Occupied continuously by the Penn family from 1854 to recent times, this site is the best example in the Lakeview area of a well preserved ranch-farmstead. The diversity and quality of architectural expressions at the site give it regional significance. This status led to the decision by the Corp of Engineers and the Texas Department of Parks and Wildlife to develop the site into an in situ historical park. Regrettably, actualization of these plans could not fully keep pace with the vigorous efforts of vandals, thieves and arsonists; the progressive deterioration of this site during the course of these investigations provided a painfully clear lesson in the realities of historic preservation. Once abandoned, significant properties are vulnerable to both vandals and professional salvagers. Without prompt security measures, architectural-archaeological studies can be thwarted and preservation potentials can be depleted quickly.

John ("Major") Penn and his wife Nancy Anderson Penn settled in North-Central Texas in the early 1850s, bringing their children with them from Illinois. Major Penn lived east of the Lakeview area, near Wheatland. His son, John, built a one room house (which still stands) near a spring at the Penn site, and in 1859 married Lucinda Moore. They had eight children and John Penn became a noted rancher in this area. John's sister, Mary Jane, married Napoleon Bonaparte Anderson, and settled with him at the Anderson site (41DL190), farther west on the same bluff overlooking Mountain Creek Valley. The Penn site came into the hands of Andrew (Andy) Jackson Penn, who was born there in 1876. Ranching and farming activities under Andy's direction continued the prosperity of the family. Andy died in 1964. His wife Deetta survives, and along with other family members provided much information on the site and the Penn family in an oral history taken in 1977 by Mr. Wilson Dolman of Texas Parks and Wildlife. That interview and family documents provided by Deetta Penn served as a basis for this brief family history. They also are the main source of information concerning the age and histories of several of the structures at the site.

SITE SETTING

The Penn site consists of a more or less continuous series of structures along the northern edge of the prominent bench on the flanks of the hills which overlook Mountain Creek Valley (Figure 11-57). The oldest structures, including the 1854 house, are at the western edge of the site flanking a deep gully which contained the spring and later the well which provided water for the Penns until after the Depression. This older group of structures, mainly of timber framed and log construction, continued to be used even after construction of the "main house" in 1876. The main house has been burned by vandals, but formed the nucleus of the eastern portion of the site. A large

feeding barn in the center of the site was built (or modified) in 1918. Around the houses and barns are several outbuildings, well, cisterns, and windmills.

ARCHITECTURE AND ASSOCIATED FEATURES

The following descriptions are based on observations and photographs taken during several visits to the site during both phases of investigations at Lakeview. The structure numbering system is the informal one used by staff from the Texas Parks and Wildlife during a reconnaissance in January of 1981. *Features other than standing buildings will be discussed according to their proximity to numbered structures.*

1 - The Red House

This plank house is the easternmost structure at the site. It consists of a single pen with a single shed room addition. This may have been one of the houses used for renters and sharecroppers by the Penn family, but it appears to date to this century; the Penn family felt that it had been moved to the site.

2 - Chicken Coop

This small pole and corrugated metal structure is of recent construction and is of functional interest only. It seems to relate only to the latest period of site occupation.

3 - The Small House

This small one pen plank house is situated just southeast of the main house. It was a well maintained structure, apparently serving as a residence, but the Penns do not mention its use in the Dolman interview. The single door opens on to the enclosed backyard of the main house. The exterior is finished in clapboard and the original shake roof has been partially repaired with composition materials. A single stove was situated at the north end of the house, with a brick chimney capped in an arched manner. There are no plumbing or wiring features.

4 - The Main House

The original structure was built by John Penn in 1876. It was a central hall plan house, with symmetrical rooms on an east-west axis. The family consensus is that the central hall was always enclosed, but large double doors at each end permitted conversion of the hall to a breezeway. Fireplaces originally were located at each end of the house. These were removed in the early Depression, when Andy Penn effected major changes in the structure.

The original house was of frame construction, with cut nails

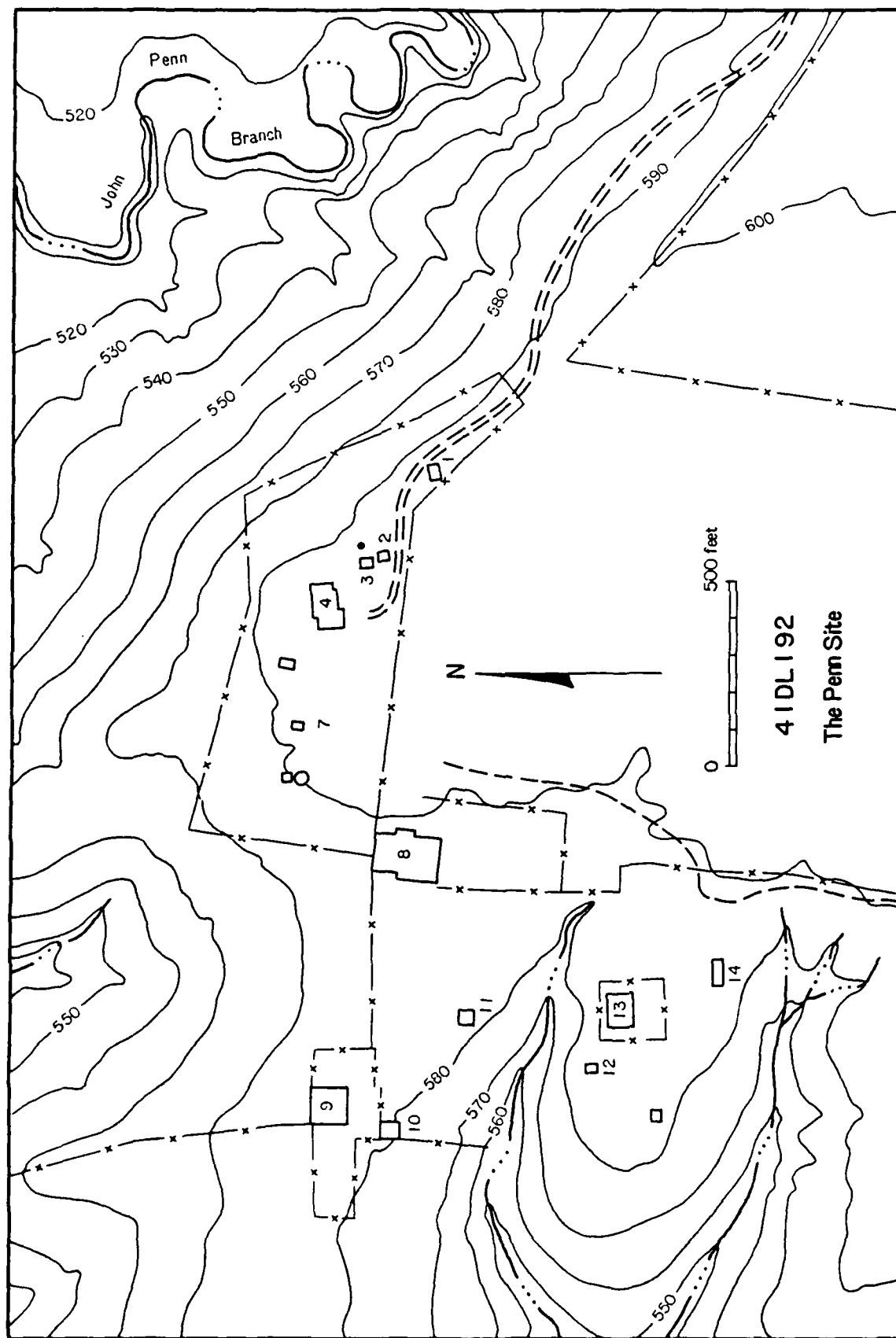


Figure 11-57. Map of the Penn site (41DL192).

apparently used throughout. The eastern room was the kitchen, while the western room and the central hall served as bedrooms. The Penn family suggests that the main entry was on the south side and that a porch there had been a part of the original structure. Two masonry/brick cisterns probably date to the original construction period; these are located just south and east of the kitchen.

An exceptional cellar is situated southwest of the kitchen. It is a circular structure, with masonry walls and a conical brick roof. The handmade bricks have wood ash glaze in places. The stepped masonry entry faces east. A similar construction technique has been noted for some ice houses built in the Illinois-Indiana area in the mid-nineteenth century (T. Jordan, personal communication), but no other local examples are known. It is possible that the Penns brought the style to the area from the Midwest.

During the early part of the Depression, Andy Penn made substantial modifications to this house. The chimneys and fireplaces were removed and replaced with windows. A new bedroom was added on the south side of the west pen and a double fireplace was built between the rooms. Porches were built along the entire west side of the house, and separately along the north and east sides. Part of the southern porch was enclosed to form a bathroom. After these modifications, the kitchen, with both woodburning and modern stoves, served as the living room, with the hall and two western rooms as bedrooms.

This fine structure was progressively vandalized between its abandonment and finally its burning in 1981. The now exposed foundations reveal the basic sequence of construction quite well. Despite the great loss in the fire, there is still archaeological potential to investigate the areas surrounding the structure, including the cisterns.

7 – Outbuildings

Three outbuildings of relatively recent construction are situated in a row extending west from the mainhouse. These may partially overlap with the area of a former orchard and garden which the Penn family maintained for years. The first structure is a plank garage, which according to the Penns was built to accommodate a Model T. The second garage-storage building is frame with corrugated metal siding. The last is a smaller plank shed with a concrete pad inside which seems to have supported a pump for the well situated just south of the structure. A windmill over the well was either abandoned, or used when the water table was higher.

8 – The 1918 Barn

This large, badly deteriorated barn was constructed in 1918, but contains a log schoolhouse reportedly built in the 1850s. The core of the structure is a double pen barn, with the schoolhouse and a plank pen on a north-south axis.

The schoolhouse is a single pen, square notched structure in fair condition. The original doors are located on the present east and west sides, while another door on the present north side

probably was the location of a fireplace in the original structure. The superstructure is missing, and may have been modified when the building was relocated to the barn site. The Penns report that the schoolhouse stood for years behind the main house, but that it had been moved to that location sometime earlier.

The other pen of the barn is a plank structure, the same size as the schoolhouse, and built with cut nails. It is situated on a possibly later poured concrete foundation. From the internal evidence of modifications, it seems possible that this double crib barn may be older than the larger "1918" barn, and may date to the nineteenth century. The "1918" barn mentioned by the Penns seems more likely to be the much larger structure superimposed on the smaller one.

The large barn superimposed on the double crib barn has undergone at least one major modification, involving elevation of the roof and possibly addition of some of the gables which extend to the north, west, and east and a major shed addition to the south. It is a pole/frame structure with substantial loft areas for storage of hay. It was used as a feeding barn by the Penns in its present form. The east-west gables appear to have been raised at least once, perhaps to allow larger wagons to enter or to permit better air circulation to keep the hay dry. This main structure is in such poor condition that restoration would seem prohibitively expensive even if it were possible. The log schoolhouse is a significant structure, and should be preserved, perhaps in situ along with the plank crib of the original barn.

9 – The Old Barn

This fine example of a double crib log barn is reported by the Penns to have been constructed in the 1850s by John Penn. The barn has been well maintained and is in excellent condition; today it is covered by a modern metal roof, and concrete appears to have been added as a foundation under the log pens. Otherwise the structure is intact and largely original.

Each pen is about 5 m square, and is made of massive hewn cedar logs with half dovetail notching (Jordan 1978). The trot between the pens has been enclosed. Shed additions on the north and south sides have provided storage and feeding areas, and several original wooden feeding troughs were present in these areas. The structure is surrounded by several fenced feeding and watering areas, and to the west is the sheep pen described by the Penns. There Andy Penn kept sheep at night to protect them from prey. A large old single cylinder engine was mounted just east of the structure; this was used to grind corn. It was stolen in 1981.

10 – Single Crib Log Structure

Situated just southwest of the Old Barn, this log structure probably served as a storage building. It is about 3 m square, has a single entry door on the east side, and shed extensions on the east and south sides. It is made with a V-notched technique (Jordan 1978); thus each of the three log structures at this site has been constructed with different notching techniques—a very

unusual situation (Jordan, personal communication). This may indicate that all of the structures were not made by the same craftsman, and John Penn may have had others build them for him.

This structure is in excellent condition. A handmade feeding trough is still situated in front of the structure, enclosed by a small fenced area, and other pens for working livestock surround the structure.

11 - Granary

This structure is located between the Old Barn and the Penn homestead. It is in poor but seemingly restorable condition, but is significant architecturally nonetheless. This is a timber framed structure of excellent workmanship. Partially or fully hewn logs constitute the framing, with mortice/tenon and pegged joints. Extant nails are mainly cut, but some renovation over the years has been done with wire nails. The single crib measures about 4×3 m, with a shed addition to the east for storage of machinery. The studs extend to the ground, forming the foundation. The pitched roof, on a north-south axis, appears to have covered a storage loft, with access by a rustic door on the south gable. The interior walls were made of horizontal pine planks, and the exterior is finished in clapboard.

Outbuildings of this nature are rarely built with such fine workmanship; this is the first timber framed outbuilding seen in North-Central Texas according to Jordan (personal communication). It is very similar to the granary in front of the Penn homestead, except the later is framed with milled lumber.

12 - Frame Outbuilding

This small frame structure is situated just northwest of the Penn homestead. It measures approximately 3×3 m, and appears to have functioned last as a storage shed for food and supplies. It is in good condition, but appears to be much more recent than the original homestead, possibly dating to the period of modification of the homestead.

13 - The Penn Homestead

This structure includes the single pen timber framed house built by John Penn in 1854. This is the earliest firmly dated structure in the Lakeview Project area. At some later time the house was expanded to central hall plan, with a room on the eastern end slightly larger than the original. The front porch was extended at that time, and a rear porch was added to the east of the kitchen area behind the original house. A porch room is situated on the western end of the original porch.

The original house was built facing south. The single large room was about 6 m square, and was framed in the same manner as the timber framed granary described earlier. There is no evidence of a fireplace in the room, but one could have stood where the eastern door to the added hall is situated. A kitchen with a woodburning stove (now stolen) was in a shed room on the

northern end of the house. The framing consists of stout roughly hewn studs, which are morticed and pegged together. These are covered by board clapboards on the exterior. The interior walls were also finished with clapboard which seems to be an unusual feature, perhaps demanded by availability of milled lumber at that time.

The expansion of the house into a central hall floorplan appears to have been done in one phase. The standard framing, shiplap siding, and wire nails suggest that this was all done in the early part of this century, perhaps as late as 1930. Phasing of this activity with the expansion of the main house needs to be investigated by further interviews with the Penn family however.

This structure and the original Penn house in particular are deteriorating quickly; it seems questionable as to whether the building may be restored for public use. Nonetheless, significant architectural data are still in need of collection. The fine measured drawings prepared by a class from the University of Texas at Arlington have begun these efforts, but detailed documentation of many details seems warranted so that the architectural data may be fully preserved in the event of any possible plans for site development.

Significant archaeological deposits are evident near this structure. Abundant debris is present under the front porch and presumably under the entire structure. Comparisons of the materials in relationship to the two main phases of construction should be undertaken if recovery of these materials is effected. Significant trash deposits were observed to the north of the house on the slopes of and in the gully which separates this house from the buildings to the north. Systematic testing around this and other structures may likely yield buried archaeological deposits as well.

14 - Granary

Located just to the southeast of the Penn homestead, this granary provides an interesting parallel to the other timber-framed granary (Structure 11). The only significant difference between these two structures appears to be in the use of milled lumber and spikes for Structure 14. Well executed mortice/tenon joints were still used for the latter. The plan of the structures is identical, with a shed on the east side and a loft door on the south gable. The original clapboard exterior has been largely replaced by corrugated metal siding; probably as a result, this structure is exceptionally sound today. While it is tempting to date Structure 14 later than Structure 11, the remarkable similarities between these structures suggest that caution be exercised here. The differences could be explained only by differential availability of milled lumber; unless these availabilities can be controlled for, it cannot be assumed that the log timbered structure is earlier. Together, these two granaries comprise an important resource illustrating excellent nineteenth century craftsmanship.

DISCUSSION

Despite the heavy toll inflicted by vandalism at this site, it remains an important and highly significant resource for his-

torical research and preservation efforts. This significance derives from the remarkable continuity and success of the Penn family as ranchers and farmers in Dallas County, from the outstanding diversity and integrity of the various architectural expressions at the site (both as architectural forms *per se* and as an integrated functional-temporal entity), and from the archaeological potential the site exhibits in terms of analyzing temporal and functional variability within a site which has remained well preserved until very recent times.

In the care of the same family for over 120 years, this site offers a unique opportunity to archaeologically examine the patterns of functional, spatial, and temporal variability in the deposition of cultural refuse around the widely spaced structures. Particularly with additional information from the Penn family concerning the activities associated with the various structures, unusual control over the actual nature of structure use and the dispersal of various activities across the site may be effected here.

Beyond these facets of the site's significance is its potential for public use. From the inception of archaeological studies at Lakeview the outstanding opportunities to develop this site into a living museum have been appreciated. Its proximity to the Metroplex and to the facilities which draw thousands of visitors to the area annually indicate the great benefit which could be realized by making this site and its history available to the public. This educational potential should be developed to the fullest extent possible.

Further significance for the site is indicated by its importance as a comparative base for other sites in the Lakeview area.

Comparisons in terms of site structure should be made for sites with later initial settlement, for sites with different economic foci, and for sites initially settled by families with different ethnic origins. The foci of these studies are outlined in the following chapter.

41DL196 THE HINTZE TENANT SITE (1900)

SITE SETTING

This site consists of a single structure located at the upland/floodplain junction just south of Walnut Creek and about 750 m west of Belt Line Road (Figure 11-58). The structure is surrounded by young mesquite and several mature bois d'arc trees. The slope behind the structure is thickly grown with mesquite, while a stand of trees running in front of the house seems to flank an old road or fence line. Now abandoned fields extend away from the site to the north and east. Despite the low lying site setting, no evidence of recent alluviation was encountered during test excavations. A stock tank is situated upslope from the house, but no water source or well near the house was found.

SITE APPEARANCE

The site consists of a single wooden structure surrounded by a

recent barb wire fence (Figure 11-58). A possible hog or dog house formerly stood outside the house, but probably not when the site was occupied. The site is unusually devoid of surface litter and exterior features. (This prompted the use in the field of the casual term, the "nothing site.") A low mound behind the house was tested (See Discussion below) and a deep trash pit was discovered. Trash burial may account for the absence of surface scatter of artifacts.

The structure is intact, though rapidly deteriorating. The front porch has collapsed and the rest of the house is nearing collapse. Both chimneys are precariously attached to the remains of the roof and the ceilings of their respective rooms. All of the window frames have been removed, but all doors remain intact.

ARCHITECTURAL HISTORY

This site appears to have only a single construction phase represented. The house was built shortly after the turn-of-the-century by the Hintze family. It bears strong resemblances to the 1898 house at the Hintze site.

The floorplan is that of the basic double pen house (Jordan 1978:113). The plan is identical to those common to log structures in the mid- to late nineteenth century in Texas. The roof ridge runs north-south and the porch is on the east side (Figure 11-59). Each room has a front door, and the north room has a back door. The two rooms are joined by a door set near the front of the rooms. The rooms are perfectly square and the house is, with the exception of the back door, perfectly symmetrical (Figure 11-60). The roof is a Louisiana type (Jordan 1978) with wide-facing gables connected by a single pitched roof with a frame ridgepole. The porch roof continues from the house roof without a break in pitch angle.

The foundation of the house consists of bois d'arc piers which have been sawn to level. The floor sleepers butt against stringers set on these piers. Some of the piers were later replaced with crudely poured concrete blocks. The house is a modified "box and strip" type. It is unframed and derives its structural strength from the vertical 1×12 " uprights which form the interior walls. These uprights are joined at their tops by stringers and by 2×4 " joists across each room. The gable end 1×12 "s extend to the top of the gable. The roof is framed with 2×4 " rafters covered with 1×4 " lathing and wooden shingles.

The window and door frames are all made of 1×4 " plain boards. The window frames are inset into the house interior since they are considerably thicker than the wall. This permitted accommodation of the crude window sashes, and left the outside of the house with a "normal" appearance for the windows.

The front and sides of the house are covered with clapboard attached with wire nails. The back of the house is finished with traditional 1×4 " strips over the flat joints of the upright 1×12 "s. This exterior treatment certainly betrays efforts to make the front of the house presentable while economizing on the rear exterior covering. The gable ends and soffits are boxed in, lending a neat trimmed appearance to the house. The exterior was originally painted; traces of the paint suggest either white or

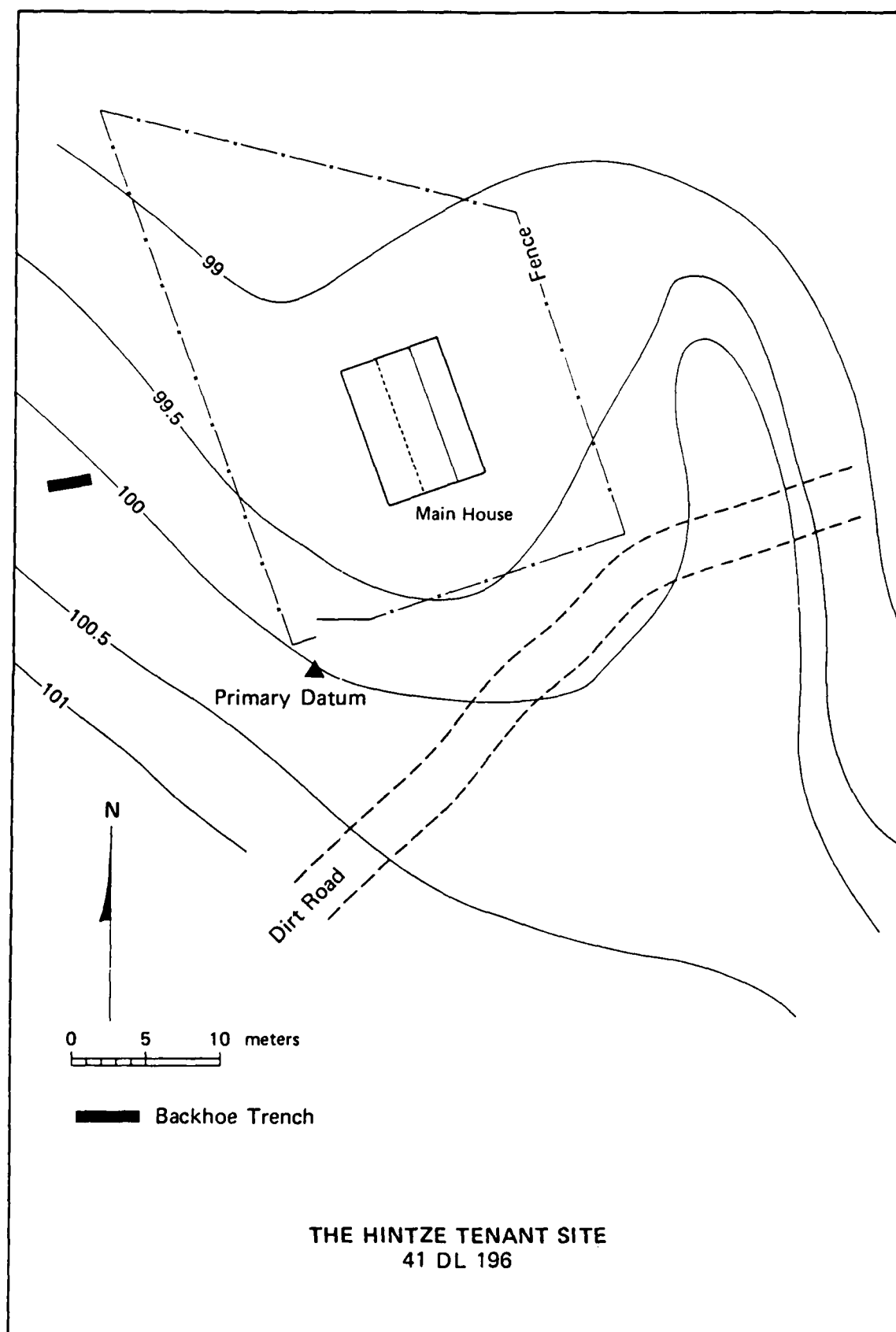


Figure 11-58. Map of the Hintze tenant site (41DL196).

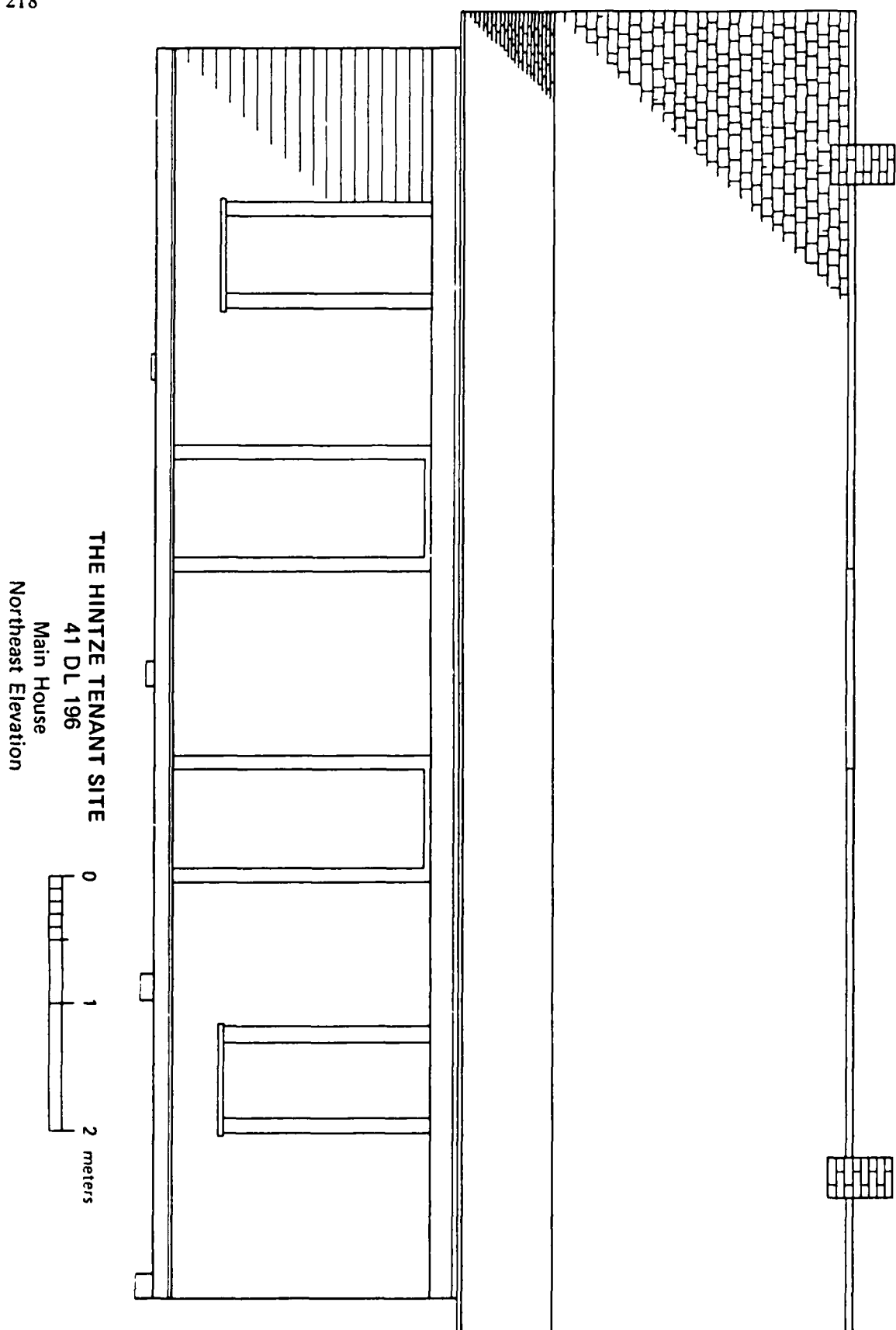


Figure 11-59. Northeast elevation of the main house at the Hintze tenant site (41DL196).

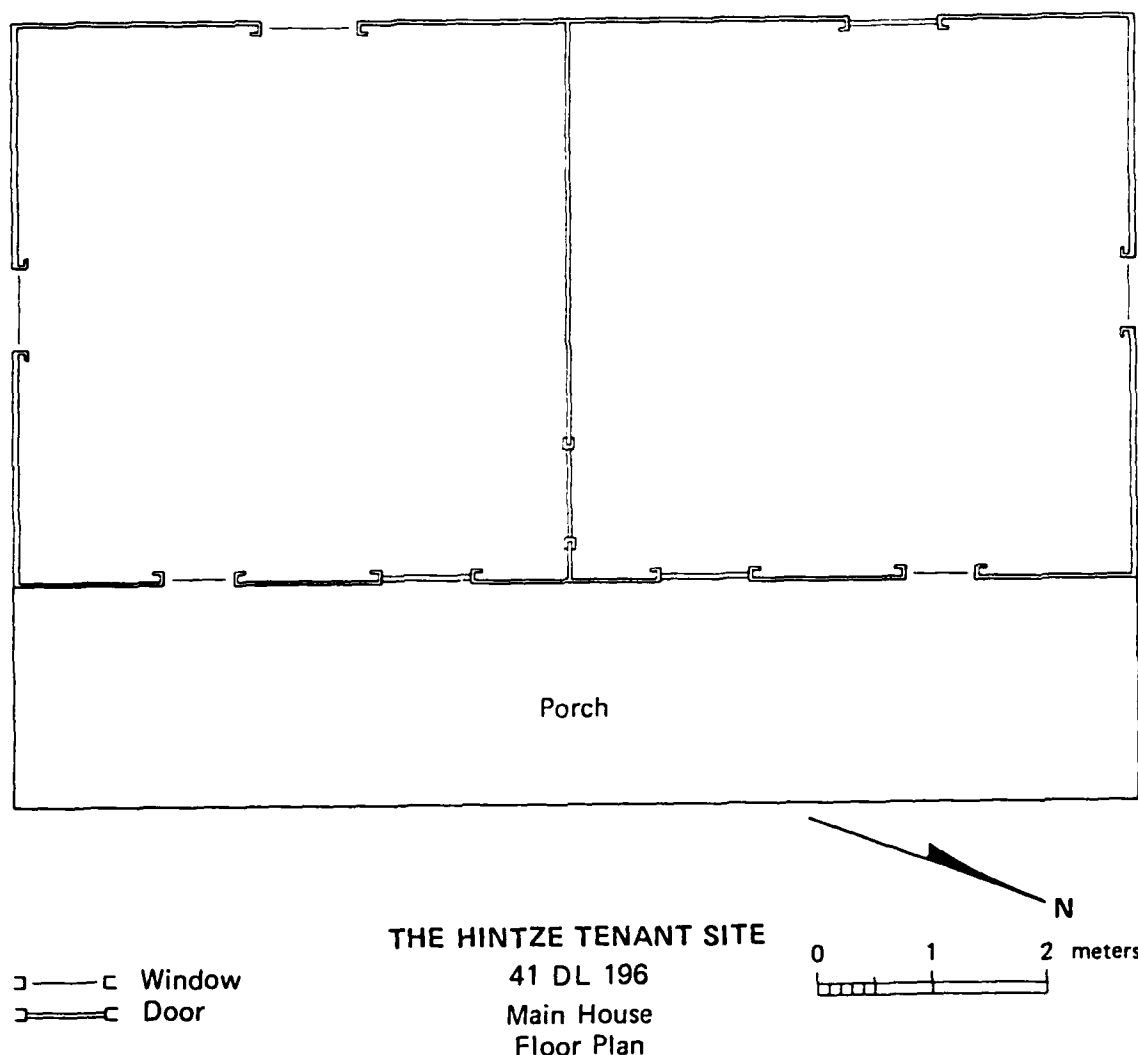


Figure 11-60. Floor plan of the main house at the Hintze tenant site (41DL196).

pale yellow walls and white trim.

The interior was wallpapered during its last occupation. White mopboards and mouldings and a dark painted ceiling must have created a neat interior appearance paralleling the exterior.

Heating and cooking facilities were provided by two stoves, located near the ends of the building. Chimneys with ATLAS bricks still remain in their original positions. It seems unlikely that a cooking fire in the house during the summer months would have been endurable, but no evidence of exterior cooking facilities were observed.

ARCHAEOLOGICAL INVESTIGATIONS

A single backhoe trench was excavated at the rear of the structure in the vicinity of a low mound (Figure 11-58). Just

below the surface the trench penetrated a deep trash pit full of turn-of-the-century debris. No extension of the trench was attempted, since the preservation of intact trash deposits warranted later controlled excavation. A sample from the trash pit was recovered by hand from the backhoe backdirt pile and is described and discussed below. The presence of additional trash pits seems quite likely.

ARTIFACT DESCRIPTIONS

Domestic Utensils

Glass containers

Food Storage Containers. This comprises the largest grouping of bottle glass; 16 clear fragments were recovered, repre-

senting five containers.

Medicine. Of the four containers collected, two are panel bottles. Only one medicine bottle was complete enough for a positive identification. This was a "LYRIC" bottle, a clear, graduated container, produced in a variety of sizes by the Illinois Glass Works from 1916 to 1929 (Toulouse 1972:264).

Beer. Seven fragments recovered represent two containers, both produced during the early 1900s.

Liquor. One amethyst neck was collected from what appears to be a liquor bottle. The neck has an applied mouth of the wide-collar, underrring variety. Mold marks extend up through the underring, indicating that the bottle was probably produced between 1880-1913 (Newman 1970:73).

Ceramics

Earthenware. Only two earthenware sherds were recovered, one plain and one decorated. The decorated sherd appears to have "flown blue" decoration; but, as it has been burned, this cannot be definitely established. Neither of the earthenware sherds are complete enough to determine vessel form.

"Semi-Porcelain." One cup fragment of "semi-porcelain" was collected. This sherd has overglaze, stamped polychrome floral decorations on the interior.

Stoneware. Two stoneware crock fragments were recovered; both probably belong to the same storage container and have an Albany type slip-glaze interior and exterior.

Metal Containers

This group includes 50 fragments representing 10 individual cans. All of the containers are of the crimped seam type and range in diameter from 3" to 4.25".

Domestic Furnishings

These include a copper gasket lamp fitting and a portion of a clear glass light bulb. The remaining article is a cast iron grill fragment from a cooking stove.

Other Artifact Groups

Building Hardware. The only item associated with building construction recovered is a fragment of a white porcelain door knob.

Construction Materials. Five fragments of window pane glass were collected from 41DL196. All of these are green tinted and range in thickness from 1.5 mm to 1.6 mm, indicating that they were produced sometime after 1845, but are not modern (Crouch 1978:94). Three nails were also recovered, two box type (10d and 6d) and one common 20d.

Ordinance. The metal base of a paper shotgun shell with a "Remington New Club No. 12" headstamp and a .38 caliber

short cartridge (Bearden primed center fire, produced after 1880).

Miscellaneous Metal. Both items recovered are of undetermined use. One tube or pipe fragment and one lightweight brace or spring attachment.

Faunal. Faunal material consists of one unidentifiable mammal bone fragment and numerous egg shell fragments.

Miscellaneous Non-Metal. This includes one piece of orange plastic and one fragment of walnut shell.

DISCUSSION

This site is significant in its relationship to the nearby Hintze site (41DL182). Built about three years after the original Hintze home, this was the residence of other Hintze family members (see Hintze Oral History summary). It is instructive to note some of the construction changes compared to the earlier house, such as a complete change from cut to wire nails, the much simpler floorplan, etc. Completely different trash disposal patterns are evident as well. Sheet trash is evident all about the older house, while neat trash pits characterize the Hintze tenant site. The close age and direct family relationship encumber "ethnic" pattern detection with respect to trash disposal habits.

Further work at this site should involve excavation of the located trash pit, as well as the search for others in the immediate vicinity. Analysis of these artifacts should be done to provide further data for comparison with the Hintze site as well as others in the Lakeview area.

THE B. F. SMITH SITE

This site is located on the high ground southwest of the Penn site, overlooking Belt Line Road. This land was acquired by the Smith family in 1888. Features originally thought to be older stone foundations near the present house were cleared and proved to be isolated slabs of rocks and portions of sidewalks leading from the main house to various outbuildings. It is almost certain that the main house does not date to the nineteenth century and no evidence of the earlier occupations could be found.

The site is dominated by the main house, located on the western edge of the building concentration (Figure 11-61). A single car garage with attached sheds is just north of the house. Small sheds, a privy, and wells flank the house to the east and south. No major farming or ranching structures are present.

The main house is a modified two pen structure, the original portion of which measures approximately 8.6 × 5.0 m. It is a "transitional" plank house in that 2 × 4 studs are used on edge (the wide dimension being in the plane of the wall) as spacers between the exterior planks and the interior wall materials which are horizontal. Portions of the original vertical planks have been removed and No. 105 siding added to the exterior. The house now has only one front door, but the central window may have been a door at one time. A central brick chimney, supported by a "pantry" pedestal, served as an outlet for stoves in both rooms. The whole house stands on cedar piers, with conventionally

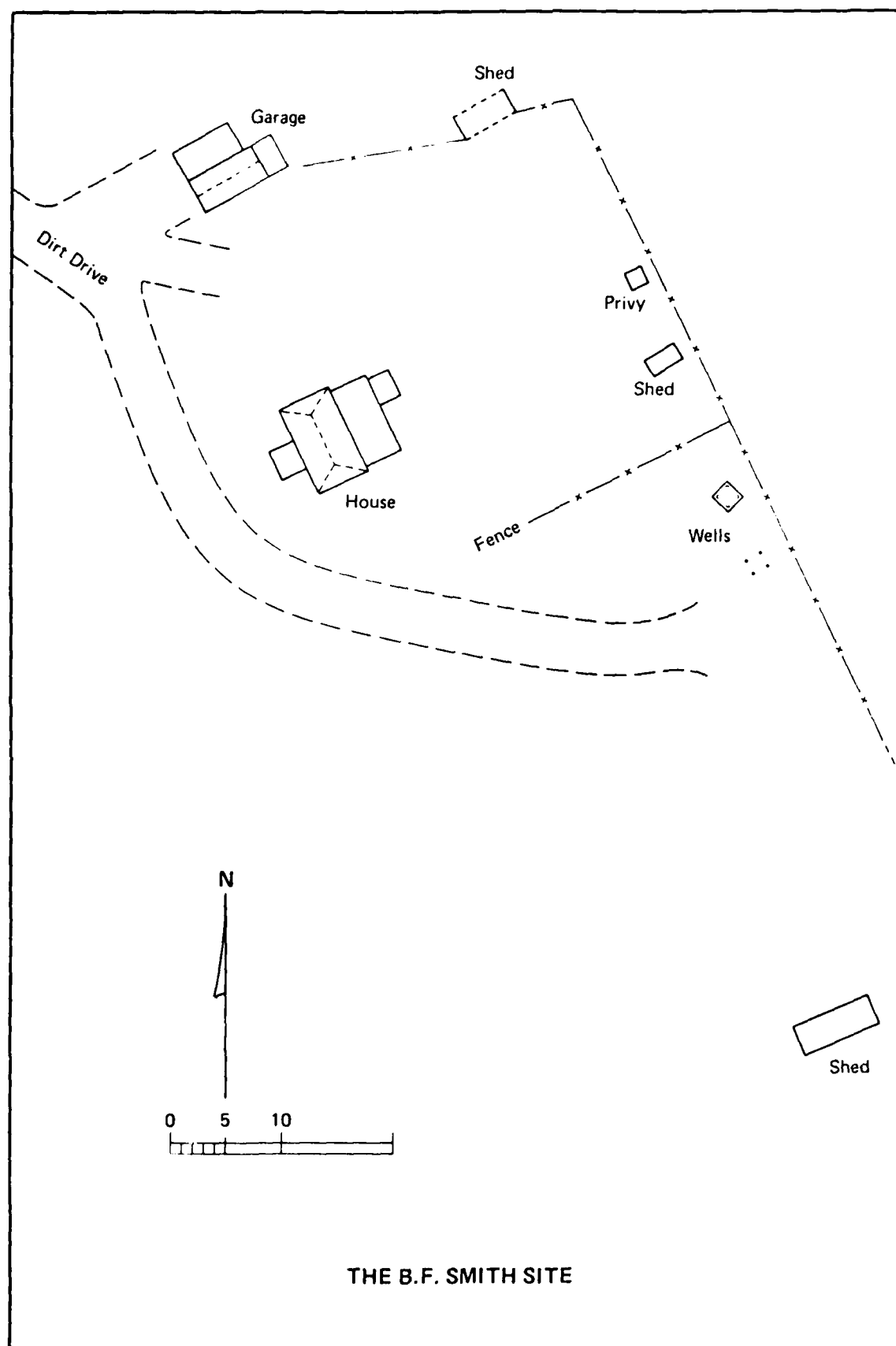


Figure 11-61. Map of the B. F. Smith site.

arranged sills, floor joists, and tongue and groove flooring. The shake roof is supported by 2×4 rafters joined at a 2×4 ridgepole. A modern framed porch has been added to the eastern part of the house. This was later closed off in part, creating one new room and either a kitchen or bath.

The garage is a pole-board/batten structure with a shake roof. As with the house, wire nails are used throughout. A shed addition to the rear has a cement floor and a pedestaled brick chimney for a stove pipe. The other plank shed appears to have been used for storage. The privy is board and batten with a pole frame; it has been modernized with a cement pipe and one hole wooden seat. The shed south of the privy appears to have been a smokehouse at one time. The interior walls are smoke black-

ened, and hinged wooden covers are present for openings in the walls similar to those in the smokehouse at the Reitz site. The other sheds are small plank or corrugated metal structures of recent construction.

Although no informants with knowledge of this site were located, it appears that for some time the site was occupied by persons who did not work the land. Gardening and possibly some poultry were raised, but little other farming or ranching activity is indicated.

The absence of early architectural elements, or visible artifact accumulations diminish the potential for further investigations at this site.

12

Synthesis and Cultural Resource Management Plan for the Historical Resources at Lakeview Lake

This section will present a brief synthesis of the historical archaeology at Lakeview, summarizing both seasons of testing. This will serve as an introduction to the research design, which is an expansion of the preliminary research strategy presented in the first testing report. Implications of the research hypotheses are presented which in turn bear on the proposed research methods for the mitigation phase of research at Lakeview. The final section of this chapter includes statements of site significance, an assessment of the adverse and beneficial impacts on the historical resources at Lakeview, and a list of recommendations for further research.

HISTORICAL ARCHAEOLOGY AT LAKEVIEW: AN OVERVIEW

The second phase of testing at Lakeview significantly changed the impressions which were made during the initial testing of four sites. The prediction that testing of the sites not considered in 1979 would not provide a significant increase in variation in architecture or other site features within the sample has proved to be quite inaccurate. Rather, the sites tested during the second phase of work display a remarkable range of variability in site structure, site function, architectural style and

technology, etc. Increased background research, including archival studies and oral histories, have substantiated a much longer and more diverse record of historic occupations in the Lakeview Project area; several Antebellum sites are well documented, some of which were occupied not only through the Civil War and Reconstruction periods, but also on to modern times. The prediction that tenant house sites would dominate the Late Victorian Period has been shown to be quite inaccurate as well. Although preservation and detection of structures appears to be a problem in this regard, the Lakeview area is clearly dominated by primary residences throughout the late nineteenth century. In brief, the current status of historical studies at Lakeview is considerably changed over that achieved by the first testing phase; this status will now be briefly reviewed.

THE ANTEBELLUM PERIOD (to 1861)

A number of confirmed and probable sites at Lakeview have initial components within the Antebellum period. Most notable among these are Penn (41DL192), Anderson (41DL190) and Loyd (41TR39), with well documented initial settlement and construction between 1854 and 1859. Strong possibilities for roughly contemporary initial occupations have been defined for

the Lowe (41TR40) site. Tract registers and other data indicate numbers of settlements in the area beginning with the first Peters Colony Contract in 1841, and one Republic of Texas grant to the Teodviski family in 1838. No actual remains at any of the sites can be dated to the ca. 1840-1850 period; this certainly may reflect poor preservation and/or detection of such early components, but the historical data suggest that at least some primary sites should be located within the Project area.

Unfortunately each of the sites attributed to this period has been occupied until very recent times. This situation should complicate analysis of the initial settlement variation, particularly with respect to artifactual assemblages. The Penn and Loyd sites may have the potential for stratified assemblages, particularly in dug wells, while the Anderson site may be much less suitable for stratigraphic study. The Lowe site has a cistern/well, but its age is not easily estimated at this time.

Architecturally, these sites conform to the relatively simple format suggested for this period, while the paucity of log structures may reflect the absence of true pioneer sites in the sample. The Loyd house is a log structure, yet it was considerably more than a cabin, reflecting the resettlement of the family from the Dallas area. Single pen structures are indicated for the Penn site (Figure 12-1), although these are "folk" framed, with well executed mortice and tenioned hewn studs and joists/sills. Similar techniques applied to a considerably different structure type are indicated at the Lowe site. A "cabin" has been recorded to have been built by N. B. Anderson upon his arrival to the area at 41DL190. It is possible that remains of an early structure are present at the site, but testing did not confirm this. More substantial structures appear to have been built at the site just before or during the Civil War.

Except for several outbuildings at the Penn site, little is known of the barns, cribs and other non-domestic architecture for the period. Definition of such structures is essential for further research, since these structures are most likely the locations of important activities not carried out near the residences. Slave quarters are documented but not located at the Loyd site; they may be present at the Anderson site, but are considered to be questionable owing to the border state (Kentucky) background of N. B. Anderson. The Illinois origin of the Penns may also diminish the possibility of slave associations for that site.

In the main, the Antebellum sites at Lakeview are quite different than the 'cabin plus 40 acres' stereotype of the pioneer settlement. Each reflects the location of families with means to acquire enough land for ample subsistence if not immediate cash crop or ranching activities. The longevity of the families presence in the area testifies to the success of each family. All, however, have relatively modest beginnings architecturally at least, and economic modesty is implied as well. Between 1850 and 1860 the population of Dallas County more than doubled, and that of Tarrant County increased almost tenfold. This suggests that vastly increased sources for materials as well as markets for products were available to these people. It is pertinent to ask whether these conditions are manifest in the material culture preserved at these sites.

THE CIVIL WAR AND RECONSTRUCTION PERIOD (1861-1875)

Population growth slowed dramatically in Dallas County in the decade following the start of the Civil War; Tarrant County actually lost population in this period. Of the families studied at Lakeview, not a single new settlement is recorded between 1859 and 1876 (Figure 12-2). The number of land transactions in the Project area for this decade is equal to those of the previous one, however, suggesting that agricultural-ranching land acquisition presumably involved people living marginal to the project area.

The implications of this apparent stagnation in economic growth and settlement rates may be discernible archaeologically. Materials dating to this interval should have accumulated at the stable sites in considerable densities, but would obviously be quite rare at sites settled after ca. 1875. There are certain indications that the tenant farming system became better established in the region during this period, but no known tenant sites can be certainly dated to this time at Lakeview. Additional research on families such as the Penns and Andersons may help clarify the labor-land use patterns for this period. Censes for the latter indicate residence of blacks at DL190 in the 1870s. Location and study of presumably separate quarters for these hired hands might provide an important contrast to possible slave quarters from the pre-1865 period.

THE LATE VICTORIAN PERIOD (1876-1910)

This period witnessed the most significant episodes of growth in the region during the nineteenth century. The population of Dallas County nearly tripled between 1870 and 1880, and then nearly tripled again in the following decade. This pattern is reflected in the Project area by the high rates of land transactions, as well as an influx of new settlers. Foreign immigrants, such as the Holvecks from France and the Hintzes from Germany are represented in the study area, as are families from the Northeast such as the Ballwegs. Rapid assimilation of these various newcomers to local conditions is indicated. They all appear to have quickly entered into farming of cotton, corn, oats, etc., as well as more limited raising of cattle.

The "gap" in new settlers between the late 1850s and the late 1870s appears to be reflected in the paucity of log structures in the project area. If a "typical" new residence for this period may be defined it is a two pen plank house with slightly varying floorplans and exterior treatment, and with one or two stoves but no fireplace (Figure 12-1). The two pen plank house has its origins in the flatland South (Glassie, 1975). As this construction type spread across the south in the mid-nineteenth century it was regionally modified, but almost always had a central fireplace between the pens or two fireplaces, one on each end wall. The only fireplace in a structure dating to this period is in the single pen plank house built by the Holvecks in 1882 (Figure 12-1), not considering the quite different architectural expression at the Bowman (1907) house.

It seems that between the Civil War and ca. 1875 log structures had become nearly extinct as far as the record of

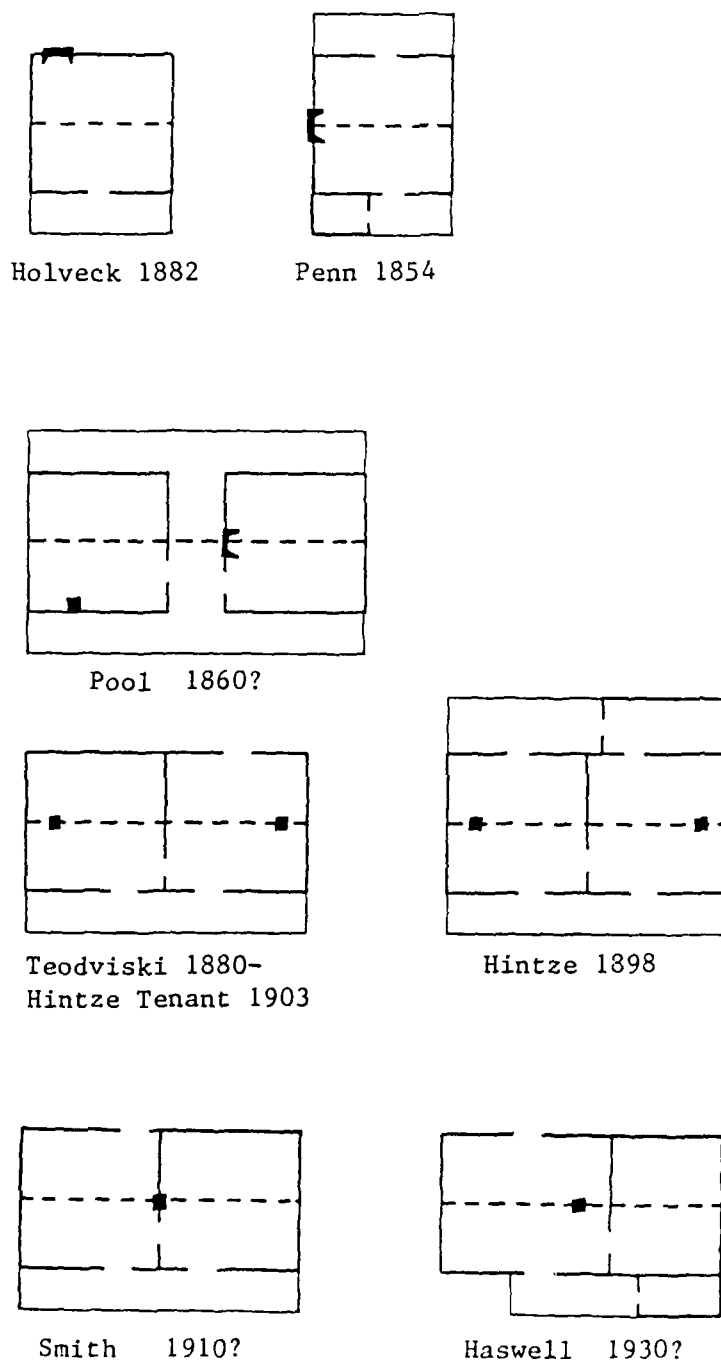
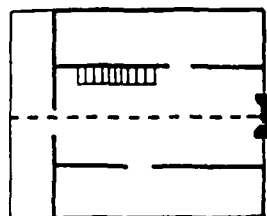
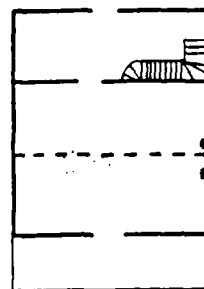


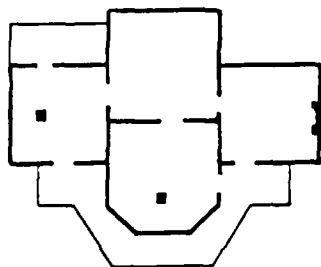
Figure 12-1. Schematic floorplans of various houses in the Lakeview Project area.



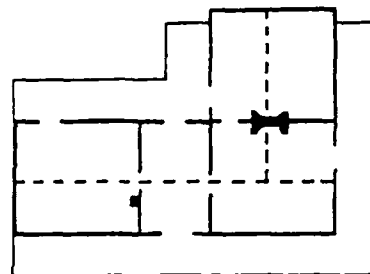
Lowe 1855?



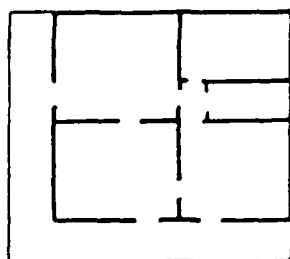
Marrs 1380?



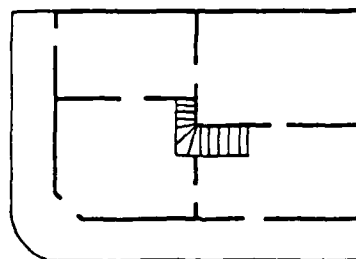
Bowman 1907



Penn 1918



Seeton 1925



Foster 1915?

Figure 12-1. Continued.

	TRANSACTIONS	HOMESTEADS
1830	X	X
1840	XXXXXXX	X
1850	XXXXXXXXX	XXXXXX
1860	XXXXXXXXX	
1870	XXXXXXXXXXXXXXXXX	X
1880	XXXXXXXXXXXXXXXXXXXXX	XXXX
1890	XXXXXXXXXXX	
1900	XXXX	
1910	XXXXX	X
1920	XXX	X

Figure 12-2. Land sale transactions in the Lakeview Project area between 1830 and 1929. Based on tract histories in Dallas and Tarrant Counties. Inheritances, sales within a family and resale of same tract within same year excluded. Numerous small transactions in 1850-1852 within Hughes Tract (see Historical Background) also excluded. Homesteads refer to sites tested; known or probable tenant sites excluded; some actual homestead locations not known (e.g., Marrs in 1950).

Lakeview is concerned. Moreover, the availability of cheap milled lumber and the means of the new settlers resulted in almost exclusive use of plank constructions for initial residences. The absence of fireplaces must also be related to economic potentials of the settlers, and the assumed availability of stoves at reasonable prices.

With few exceptions (such as the Ballweg 1900 house) the houses and barns of this period are owner constructed, and therefore manifest ideosyncratic differences which transcend availabilities of materials. The classical two pen floorplan would probably be the most common if a large sample were available. This is represented by the original Teodviski (tenant) house, and the Hintze tenant house (Figure 12-1). These structures verge on being folk architecture owing to the essential simplicity of the floorplan and the limitations of the lumber sizes. Different floorplans, such as the Cumberland type of the Hintze (1898) house are tempting as different ethnic or economic expressions; yet the Hintze (1898) house was built by the same man who made the Hintze Tenant (1903) house, and there is not a single "German" element in either structure. Rapid assimilation of local traditions is implied. Likewise, the Holveck (1882) house is a classical "box and strip" type, constructed by a recently arrived Frenchman. The archaeological implications of such patterns warrant careful investigation. Architecturally speaking, very rapid acculturation is implied by the small number of historically documented sites in the Lakeview area. Without adequate historical controls, purely archaeological or architectural data from sites in this period may have little bearing on

the ethnicity of the residents. The use of the appellation "tenant" structure for many of these residences is equally inappropriate in many cases, as shown by the sites at Lakeview.

Another cautionary note is provided by trash disposal patterns at two of the sites. Extensive sheet trash is present at the Hintze (1898) site, much of it dating to the turn of the century. At the Hintze Tenant (1903) site, sheet trash is almost non-existent, and backhoe trenching revealed at least one deep trash pit to the rear of the house. These houses were built by the same man and were occupied contemporaneously by the same extended family. Without good historical controls, quite erroneous conclusions as to the ethnicity of the respective inhabitants could be inferred. In the same vein, the fact that the large Victorian house at 41 TR42 was a rent house for almost all of its use period is similar evidence that form and function are frequently unrelated in this period. Sound historical research will be imperative to realistic assessments of many aspects of individual site histories and intersite relationships. The sites at Lakeview provide an opportunity to investigate these patterns, thereby generating potentially useful models of acculturation patterns vis a vis architectural expressions, intrasite structure, material acquisition patterns, etc.

Economic hardships during the 1890s seem to be reflected in the patterns of land acquisition at Lakeview. Paradoxically, the prominent pattern is one of growth at most of the sites investigated, with land holdings for several families increasing throughout the period (e.g., Penn, Anderson, Hintze, Pool, Ballweg, etc.) Fewer land transactions overall, and no new

settlers are recorded for the known sites. As may generally be the case, somebody benefits during hard economic times. The general historical data suggest that tenant farming increased in the region during this period, yet there is little field evidence for this pattern. Additional intensive surveys in the region might better reveal the suspected pattern.

POST-VICTORIAN PERIOD (1911-)

Several sites in the Project area evidence new occupations in this period, which is essentially the beginning of fully modern use of the area. The Foster (41TR188), Seeton (41TR47) and Haswell (41DL43) sites are examples. Architecturally, these indicate persistence of simpler patterns such as the plank house (e.g., Haswell), while early twentieth century floorplans with at least four rooms and no hallway are also indicated (e.g., Seeton, Foster).

RESEARCH DESIGN FOR HISTORICAL RESOURCE MITIGATION

As thoroughly discussed by Raab, Bruseth, and McIntyre (this volume) the determination of site significance, and hence the statutory obligations for mitigative efforts, must be accomplished within a framework of research objectives, expressed formally in a research design. Their discussion of "middle range theory," or a balance of constructs between strictly empirical and overly general applications are most appropriate for consideration of the Lakeview historical sites. The absence of sound regional cultural-historical frameworks for the historic period has promoted the tendency for descriptive emphasis in some cases. But this situation should not compromise the development of a research design which maximizes contributions to both regional and disciplinary studies of behavioral processes, therefore going well beyond descriptive archaeology. The sites at Lakeview offer the potential to address several pertinent archaeological issues from a systematic research vantage point. The cultural historical issues are important but clearly can be addressed more effectively along with rigorous efforts to explain the processes associated with formulation of the cultural historical record.

The status of historical research in the region is important to the consideration of a research design for the Lakeview historical sites. So little systematic research has been conducted that even the most basic historical frameworks have not been outlined, and processual investigations are virtually nonexistent. In this context there seems to be substantial need for systematic research. At this stage of historical research it seems appropriate to effect some balance between the study of archaeological variability vis a vis behavioral mechanisms and more specific patterns of variability which may be related to regional cultural historical frameworks. The former level of investigation offers greater potential to contribute to anthropological theory, while the latter can contribute to regional models of archaeological variability and change in the historic period. Both of these areas may be addressed within the goal of historical

archaeology described by South (1977:321) as "...the explication of patterned material remains of culture stemming from human occupation." Both of these should be addressed from an explicitly archaeological perspective, while relying on historical data when possible.

Future work at Lakeview should not entail the "pseudo-history" South describes as attempting to describe archaeological data as manifestations of historical events (1977:327). Even though a number of "historical contradictions" to apparent material patterns at Lakeview have been indicated (e.g., the differing trash disposal patterns within the Hintze family sites), these cannot be taken as omens of misplaced interpretations or archaeological futility. The approach to historical archaeology at Lakeview must exploit the historical record to the fullest; but in the final analysis, mitigative efforts at Lakeview should be essentially archaeological in thrust, and therefore should focus on variability in the material record of human occupations as it relates to archaeologically detectable processes of human behavior. To do less would take this proposed work out of the realm of modern archaeology and render a product of historical inquiry supported by dogmatic searches for material evidence of known facts.

In this sense the theoretical perspectives for the research design should logically be derived from contemporary archaeological theory. The status of theory in historical archaeology is at best nascent, since initial statements concerning this area of archaeology are both recent and relatively poorly digested (e.g., South, 1977). This is clearly a period of theory building in historical archaeology. Individual efforts, especially those in a context of cultural resource management, have the potential to contribute to theory building in a substantial manner; given that much of the theory building to date has been conducted in eastern Colonial settings, a radically different cultural-historical context, such as the nineteenth century West, may serve as an important test cases for certain constructs, and as sources for new constructs. The important empirical basis for much of the theory generated in Colonial contexts is lacking for the nineteenth century West. Archaeology in this setting must entertain the possibility if not the likelihood that different approaches, assumptions and interpretations may eventually characterize the study of mid to late nineteenth century sites in the west. Overall however, the distinctly unifying perspective of human behavior-material remains patterning analysis suggests that similar problems may be addressed with comparable theory.

The focus of study for pattern detection is intersite variability, including site structure, architectural form and function, artifact assemblage composition and distribution within the site. The primary variables determining patterning of these categories are ethnic origin, economic adaptation-intrasite functional structure, and temporal trends in these factors.

ETHNIC ORIGIN

In a study of the Frontier Model of intersite variability, Lewis (1977) indicates that ethnic origins of initial settlers is one of the key variables determining patterning at various times in the development of new settlements. Homogeneity, largely imposed

by close ties with the source area of the settlers is characteristic of the initial periods of settlement. With time this homogeneity is altered by new trade relationships and the evolution of local centers of production and commerce. Although designed to treat towns, this basic approach has relevance to the study of variability at Lakeview; quite different settlement processes are at play here, however, and transformations of Lewis' approach are necessary.

Lakeview archaeological sites clearly represent several phases of immigration, each represented by several newly established residences. Different ethnic and/or geographic origins for settlers have been defined for these phases. Focussing mainly on architectural data, at least two internally variable periods (1850s and ca. 1875-1910) may be outlined.

Earlier it was proposed that intersite variability during initial periods of settlement would be characterized by differences in ethnic origin, rather than functional differences between sites. This was based on an assumed "frontier" status of most initial settlements, with artifactual variability deriving from the different source areas of the settlers. More work at Lakeview has indicated that few truly "pioneer" type settlements are present in the available data bases. Rather, initial settlements are represented by sites inhabited by families who arrived with the means to purchase land and immediately begin interacting with the local systems as something quite different from subsistence settlers. Few data if any are available to evaluate other aspects of the material culture record other than architectural data already collected. Recovery and analysis of artifactual data, as well as additional data on site structure and architectural forms should permit systematic treatment of intersite variability. Geographic diversity in the sources of the initial settlers is documented, but all came from the South or Midwest as far as can be determined; no foreign immigrants have been documented. Folk or vernacular architectural manifestations are characteristic; log structures (at the Loyd and possibly Anderson sites as well as log barns at the Penn site) and log braced frame houses at the Penn and Lowe sites are evidence of possible geographic differences in origins. The extent and nature of other differences are yet to be determined.

In the later phase of settlement, ethnic differences are indicated by immigrants from Germany (Hintz, Sprinkle), France (Holveck), as well as geographic differences for resettled Americans (Ballweg). For the former group, the absence of well defined architectural differences stands in contrast to patterns in other areas (e.g., Central Texas) where ethnic differences in architecture are well documented. The main difference between the North Central Texas and Central Texas regions seems to be in the lack of ethnic concentrations in the former area. It is proposed that the rapid acculturation apparently expressed at Lakeview may indicate the absence of an "ethnic threshold" population which would foster the perpetuation of source area traditions in architecture and possibly other material patterns as well. Dallas County was, and to a large degree still is, a area settled by many ethnic and geographic groups; no outstanding communities of settlers have predominated any given period. Such a mixture of immigrants may have promoted a rapid assimilation into "local" traditions at the expense of old ones, particularly when foreign immigrants were involved.

ECONOMIC ADAPTATION

It had been earlier proposed that a ranching-farming dichotomy might be observed among the sites at Lakeview which would assist in explaining intersite variability in site structure as well as artifact assemblage composition. This dichotomy does not seem to be clear, as most of the families engaged in farming as primary activities and many practiced ranching to some degree. The Andersons and Penns both seem to have emphasized cattle raising and horse raising to a greater degree than others, but farming is the dominant economic adaptation indicated.

Temporally, a shift from intensive production of food for family consumption might be expected to give way to increasing acquisition of commercial produce. This can in part be addressed via faunal and container analyses. Local informants suggest that gardening and canning were practiced for long periods—in many cases to today. Such a pattern would suggest that temporal shifts in container types would be evident.

Maintenance activities, for example those practiced by a blacksmith, are evidenced at several sites. The Pool, Reitz and Hintze sites have blacksmith shops. Comparison of blacksmithing debris is an effective means to assess many on-site activities requiring the support of a blacksmith (farrier related, wagon, farm implement, tool maintenance, etc.). Detection of these sorts of activities can improve explanation of relative differences in the ratios of commercial to folk crafted items in assemblages. Control over intrasite patterning of activities is most important to the assessment of intersite differences in economic adaptation and functional diversity.

Location and study of possible slave quarters as well as hands living close to primary residences may provide important information on such peoples activities, not to mention the ethnic-economic differences expected in contrast to landowners' assemblages (Otto 1977).

DIACHRONIC CHANGE

Certain patterns of change seem to be somewhat clear at this time, and thus are not appropriate areas for rigorous testing. A general trend from folk to vernacular architecture seems to be suggested by the sites at Lakeview as in other areas of Texas during the same period (Jordan 1978).

The availability of milled lumber as a cheap building material is well documented, with plank or framed structures dominating the area after 1875. The interval between 1860 and 1875 is not well known, although some sites (e.g., Pool) may have structures dating to this period.

Some assumed trends need systematic investigation. The changing availabilities of commercial goods, as well as changing source areas for them need substantial research. Increasing rail and river commerce are indicated for the last half of the nineteenth century, but archaeological implications of material availabilities have not been established. Whether these availabilities are manifested equally at the various sites is of importance to the evaluation of the intersite variability, and the possible "frontier" pattern of change within a rural area.

Possible shifts in economic emphasis must be investigated archaeologically. Much of the study period is not well described in detail by either historical documents or oral histories. Shifting markets for products such as cotton, corn, or livestock may well be reflected in archaeological data at the Lakeview sites. Evidence in the form of temporal shifts in economic patterns could include both artifactual and architectural manifestations at well dated sites. The general "farming" adaptation described earlier is thus a generalization which is as yet of little empirical use.

RESEARCH HYPOTHESES

The following research hypotheses are presented as foci for further investigations at the historical sites at Lakeview. They are by no means inclusive, nor the only appropriate ones for the structuring of mitigation efforts. In fact, alternatives would be expected from competitive proposals which might address other problems of importance to the mitigation effort. The status of historical studies in the region, as well as the status of theory in historical archaeology suggest that several basic factors relating to intersite variability need to be seriously investigated prior to development of useful models for the region. Here the roles of ethnic diversity and economic adaptation are emphasized, as indicated in the previous discussions.

RH1 Intersite variability during the historical period at Lakeview is in part explicable by ethnic differences of the settlers-occupants of the sites.

I1 Architectural manifestations reflect patterning determined by ethnic traditions of the original settlers.

I2 Artifact assemblage differences among sites are patterned according to ethnic differences, reflecting different preferred sources of imported commodities as well as differential introduction of personal possessions.

To some degree there is evidence that this hypothesis is falsifiable, particularly with respect to implication one. Available data suggest that rapid acculturation and assimilation of local architectural styles and technologies are expressed by settlers with different ethnic origins in the Lakeview area. Such a pattern is not well described in the literature, and may, if supported by further research, be an important consequence of marked ethnic diversity and distinct ethnic minorities in regions such as North Central Texas. This possibility warrants careful consideration of the Lakeview data.

Control over the ethnic origins of the settlers at specific sites is clearly a prerequisite to testing this hypothesis. Such controls are feasible at many of the Lakeview sites, but may not be possible for equally numerous sites in other regions—especially sites which have been abandoned for long periods. With good historical controls, it is important to investigate the ethnic determinism, if any, in patterning of architectural and artifactual variability between sites.

The alternate to the hypothesis, namely that variability between sites crosscuts ethnic origins may be more difficult to reject at Lakeview. It is important to investigate this alternative, especially with respect to artifact assemblages in the consideration of the overall problem. At Lakeview, this hypothesis can be

best addressed in the later settlement periods (post-1875) when ethnic differences among the settlers are discernible in the historical data. It is unfortunate that such controls are not available for earlier periods of settlement.

The available historical data should not be taken as a measure of self-fulfilling prophecy with respect to this hypothesis. The architectural data have been explored at less than the full documentation level, and artifactual data bearing on the hypothesis have hardly been treated at all. Current knowledge notwithstanding, the role of ethnic diversity in the patterning of material culture is an important issue for historical archaeology. The opportunity to investigate the responses of various ethnic groups to new acculturative situations, and the manifestation of those responses in the archaeological record is an important opportunity to enhance modelling of archaeological variability in the late nineteenth century West.

RH2 Intersite variability during the historical period at Lakeview is largely explicable in terms of functional manifestations of different or similar economic adaptations of the settlers-occupants.

I1 Initial settlements will reflect less extensive trade and communication networks, and hence will manifest more evidence of subsistence agriculture-ranching as well as folk production/maintenance of implements and facilities. Minimized availability of commercial foodstuffs and utensils will be reflected in lower discard rates than in later periods and greater curation of containers and implements.

I2 Following the initial settlement period, intersite assemblage variability should decrease, owing to increased market availability of supplies (implements, containers, etc.).

I3 Following the initial settlement period, intersite functional variability will be proportionate to economic specialization (farming versus ranching) and economic productivity.

This hypothesis addresses the notion of archaeological "patterns" as South's approach to archaeological variability. The main thrust of his method and theory offer an important challenge to the study of situations radically different from the colonial south. Are there broadly uniform patterns to the assemblages associated with late nineteenth century sites in this region which are explicable in terms of general functional-cultural systems such as have been defined for the Colonial period? What impacts do American industrialization and communications networks have on such systems with respect to rural agricultural-ranching systems? If such patterning is not detectable in the Lakeview area perhaps a radically different systems network is implied, requiring different theoretical constructs. An important aspect of this hypothesis is the acceptability of more than one possible "pattern" among the sites, possibly reflecting multiple functional systems which are not discernible by historical investigation. This possibility must be entertained, and thoroughly explored archaeologically. Care must be taken to differentiate between status-related differences among assemblages, as South's approach generally assumes.

METHODOLOGICAL IMPLICATIONS OF THE RESEARCH DESIGN

Adequate investigation of the research hypotheses will necessarily entail a number of research methods critical to the collection of data which bear on the issues suggested. Intersite variability is the main focus of the research, but intrasite variability resulting from both functional and diachronic differences in the primary and secondary deposition of artifacts must be controlled to adequately treat sites as comparative units. As South (1977) indicates, the comparison of "assemblages" must be done for total site assemblages when possible lest major activities be excluded from the recovery process. At Lakeview distinct partitioning of activities in various areas of the sites is apparent. Recovery of artifact samples simply from the house areas of sites will result in most cases in a quite biased appraisal of the complete functional character of the assemblages. Likewise, different trash disposal loci at sites may bias temporal and/or functional variability assessment unless efforts to adequately sample the site are emphasized.

Architectural investigations should focus on detailed documentations to not only permit treatment of the research hypotheses, but in several cases to provide a practical data base for other researches in the future. Loss of significant structures is anticipated as a result of Project implementation, and architectural documentation is the sole means by which much of this data can be mitigated. Accurate recording of the materials, construction technology, detailed form, and modification history of appropriate structures is necessary.

Artifact recovery techniques should focus on intrasite patterning in order to adequately define both temporal variability and functional diversity of site assemblages. Standing or ruined structures will in many cases serve to direct these recovery techniques, as will locations of trash accumulations. A number of sites are remarkably devoid of trash. This pattern may be significant in itself, but otherwise presents real problems with respect to functional and cultural assessment of such sites. With increasing distance from the site proper (defined by structure concentrations) the control over trash associations clearly diminishes. Good judgement will have to be used in the selection of trash areas for sampling.

Artifact analyses will require detailed classification of functional and temporal associations of various artifact classes, as well as intense research on source areas. Functional classification of artifacts is essential to the testing of the research hypotheses. Preliminary functional classification schemes are implicit in the assemblage descriptions in this report, but there is more than enough room for improvement and refinement.

Assemblage comparisons should be undertaken with both functional and temporal emphasis for treatment of several problems. Source area analysis, by time period when possible is also important and will require considerable archival and historical research.

DETERMINATION OF SITE SIGNIFICANCE

The significance of the historical resources at Lakeview is crucial to the formulation of a mitigation plan. Determination of site significance must be accomplished with respect to eligibility for inclusion in the National Register of Historic Places to enable continued commitment of Federal funds for research at certain sites; but more importantly a reasonable threshold of significance should be determined based on the status of both regional and disciplinary archaeological investigations of the historical period and the potential of a given site to contribute substantially to those investigations. The research design has indicated several problem areas for which the Lakeview sites have such potentials. It is in this research-oriented context that a level of significance may be better established which simultaneously meets the obligations of Federal statute and the demands of responsible research (Raab and Klinger 1977).

Lakeview presents a somewhat new situation with respect to historical archaeology and historical site evaluation. It represents one of a number of recent projects in which multiple historical sites of relatively modest stature (in traditional historical terms) are present. This situation offers the possibility of multisite research which until quite recently was restricted to prehistoric settings in cultural resource management. Their potential significance lies more in the realm of culture process studies than with respect to ideosyncratic investigations of particularly important persons or uniquely important events. The present study offers the potential to investigate processes which evolve about common people in common circumstances in the historical period—precisely the situations which have been systematically ignored in historical archaeology (unless they were in more romantic Colonial settings). Like prehistoric sites, the historical sites at Lakeview undoubtedly have many cultural and functional analogs in the region which may offer the same research opportunities. The status of researches on this 'population' of sites is remarkably low, however, making the potential significance of sites at Lakeview proportionately high. Thus, while any single site in the Lakeview area may fail to meet traditional criteria for historical significance, their real significance must be measured against the theoretical and regional issues to which they may contribute within a framework of systematic research.

A number of sites in the Project area are regarded as significant with respect to their potential to "yield" information important in ...history." Moreover, in the view of Scovill, Gordon, and Anderson (1972) many of these sites have social, scientific and educational significance as well. They contain information concerning the lives of persons which is important to countless residents of the region who have strong cultural ties with the kinds of people who settled and developed the Lakeview area. Several sites contain both information and research visibility which have potentials to significantly contribute to local and regional educational programs through well planned programs involving the public during and after actual research activities.

Because of their clear potential to contribute important information to the study of the historical period in this region, as well as their potential to provide data relevant to the actualization of the research design presented in this report, which addresses issues relevant to contemporary archaeological method and theory, the following sites are deemed eligible for inclusion to the National Register of Historical Places: 41TR39, 41TR40, 41TR42, 41TR45, 41TR48, 41DL181, 41DL183, 41DL190, 41DL191, 41DL192, 41DL16.

PROJECTED IMPACTS ON THE HISTORICAL RESOURCES AT LAKEVIEW

Both adverse and beneficial impacts on the resources at Lakeview may be predicted as a result of project implementation. Unfortunately many adverse impacts have already been realized. The acquisition of sites by the government and their subsequent abandonment has led to the rapid deterioration of sites through vandalism, theft and decay. Much important information has irretrievably been lost. Adverse, unavoidable impacts in the form of site destruction or site inundation may also be anticipated for sites still in decent condition for study. The potentials for site preservation at sites located in park areas must be weighed carefully against the possibilities of continued site damage resulting from public access as well as the plans for park development. At the least, standing structures in park areas would seem to pose too great a liability in terms of maintenance or possible injury to the curious to warrant their widespread preservation. Specific sites, such as the Loyd homestead could be developed and maintained for public use, and others (e.g., Penn and Anderson) are being actively considered for development by the Texas Parks and Wildlife Department.

In the main, however, the potential destruction of most of the sites at Lakeview would have to be considered deleterious with respect to their significance and potential to contribute to historical studies.

Certain beneficial impacts from Project implementation may also be outlined. The location and initial study of archaeological sites in the Project areas stand as real contributions to regional historical investigations. Presumed activities during the mitigation phase of research will further these contributions and thereby increase the beneficial impacts of the Project. With respect to the alternative of preservation however, Project implementation should have a net adverse impact on the total population of cultural resources at Lakeview.

RECOMMENDATIONS

The following recommendations are presented as potential guides for implementation of a mitigation stage of investigations at Lakeview. Work at specific sites is recommended on the basis of a perceived potential for the work to contribute to research goals outlined in the preceding research design. Many of these specific potentials have been alluded to in previous discussions, but they will be emphasized again here when necessary.

Site significance determinations have been made in view of those research goals. Thus the potential of a certain site to contribute to the study of ethnic diversity, or intersite functional variability, or architectural change has been considered in the evaluation process. Virtually without exception, the sites listed in this recommendations section have been chosen because they have the potential to reveal data which will bear on multiple research issues.

WORK AT SPECIFIC SITES

41TR39 The Loyd Site (1859)

Considerable amounts of work are necessary at this site, which has unusual potential to study mid to late nineteenth century lifeways.

Test excavations, followed by major excavations where warranted, should be implemented near the main house, and in areas to the north and east where features such as the wells, cellar/smokehouse, and possible trash disposal areas are indicated. Special emphasis should be placed on tests to the east of the main house where the slave quarters were located. Work on the main house should be directed towards delineation of the presence and condition of any original structural elements and their potential for stabilization. Serious consideration should be given to the preservation of this structure if possible.

41TR40 The Lowe Site (1865)

Full documentation of the main house at this site is needed. Testing of the well/cistern at the northeast corner of the house should be carried out to determine if full excavation is warranted; if so, the well should be excavated in order to recover possible stratified deposits. Block excavations near the house should be undertaken to recover artifact samples. Some of these pits should be located under the house. Additional excavations near outbuildings and trash disposal areas to the north of the house are necessary to ensure adequate sampling of the site for functional analyses.

41TR42 The Fat Cat Site (1907)

Complete mapping and architectural documentation of most outbuildings is recommended for this site. Much work on the main house has been completed, yet details need to be further recorded; the outbuildings will be quite easy to document. Excavations in the house area as well as near the outbuildings should be undertaken to recover adequate samples of artifacts for functional and chronological studies. These are important owing to the age and function of the site (1907+) as well as the possibility that earlier components are present. The well behind the main house should be tested, and if warranted, excavated to recover stratified deposits.

41TR45 The Reitz Site (1876)

Further excavations at this site are recommended to provide

data on the functional and cultural character of the occupations, particularly the earlier components (ca. 1876-1900). Additional recovery of artifacts from the house area, as well as near the several outbuildings is necessary. The main outbuilding areas for further investigation include the blacksmith shop area, the suspected early barn to the northeast of the blacksmith shop, the barn north of the main house, and the smokehouse area.

41TR48 The Marrs Site (1859)

Documentation of the main house at this site is necessary. Excavations around the house, in the cellar, and in the trash disposal areas to the east of the house are necessary to recover artifact samples for functional and cultural analysis.

41TR57 The West Grave (1872)

No archaeological work at this site is warranted, but management concerns include restoration and protection of the grave as indicated in previous discussions.

41DL181 The Hintze Site (1898)

Additional excavations and surface collections at this site are necessary to provide better artifactual samples for analysis. These should be conducted primarily in the vicinity of the main house, the trash disposal and probable privy areas to the east of the house and in the vicinity of the barn.

41DL183 The Holveck Site (1882)

Complete documentation of the main barn, and additional details on the construction of the small plank house are needed at this site. While no early concentrations of artifacts were located at this site, their possible recovery should be attempted owing to the importance of this site to the research design. Limited excavations in the area of the old house should be undertaken to attempt recovery of buried deposits, and excavations around the main barn should be undertaken to recover artifacts relating to other activities.

41DL190 The Anderson Site (1859)

Extensive excavations at this site are warranted owing to the presence of significant in situ deposits in the vicinity of the main house. Test trenching of areas to the south and north of the house should be undertaken to locate outbuildings and probable quarters of black farmhands. Excavations in the vicinity of the main house should completely define the architectural features present, as well as the artifacts associated with various areas/

components of the structure(s). Excavations should be conducted to the west of the house around the smokehouse and in areas where burning has not occurred. The cellar should be stabilized for preservation, and particular emphasis should be given to the curation of the painted genealogy over the cellar fireplace.

41DL191 The Pool Site (1860-1880?)

Excavations should be carried out under and around the main house to recover artifacts relating to the age and character of the occupations. Excavations in the cellars behind the house should include partial sounding of the entire depth to recover artifact samples. Excavations in the barn area should recover samples from the general fill and the blacksmithing area.

41DL192 The Penn Site (1854)

Depending on the final disposition and development plans for this site, intensive architectural and archaeological investigations are necessary. Complete architectural documentation of each structure at the site is necessary. Test excavations should be undertaken in the vicinity of any structures which are to be removed or demolished to determine the impact of such activities on in situ archaeological materials and/or concealed architectural features. Testing of trash areas in the gully north of the original Penn home should be undertaken to determine the significance of such deposits and their vulnerability to park visitors. Every effort should be expended to ensure that full mitigation is effected when anything less than total preservation of structures and associated deposits is envisioned as part of the site management plan.

41DL196 The Hintze Tenant Site (ca. 1900)

Excavations in the trash pit area behind the house is necessary to recover artifact samples for analysis and comparison with other sites, particularly the Hintze site.

Ancillary Investigations

As part of the mitigation effort, sufficient extension of the archival and oral history work should be undertaken to maximize the background for the archaeological investigations. Interviews with members of the Penn and Holveck families are important potentials for work at sites occupied by their families. Similarly the Reitz family may be able to provide more information on the nature of occupations at 41TR45. Archival work should focus on details of the site histories, with further collection of data from tax records, probates, and family papers necessary.

Appendix I

Profile Development of the Low Terraces and Floodplain of the Mountain Creek Area, Dallas County, Texas

David R. Pheasant

INTRODUCTION

Many trenches cut into the floodplain and lower terraces of the Mountain Creek area were examined for soil profile and stratigraphic section information. Seven of these trenches were selected as soil pits for more detailed field description and laboratory analyses. Three soil profiles were described for the T-2 terrace, one for the T-1 terrace, and three for the floodplain.

The floodplain and terrace nomenclature and classification is that used by Crook and Harris (1957), although they did not work in Dallas County. The floodplain is considered to be some 20 ft. above grade, the T-1 terrace is approximately 50 ft. above grade, and the T-2 terrace is some 70 ft. above grade. Within the study area, Mountain Creek has a grade of between 470 and 455 ft. a.s.l. Thus, the floodplain and terraces have the following approximate ranges of elevation:

floodplain (or T-0 Terrace)	475 to 490 ft. a.s.l.
T-1 Terrace	505 to 520 ft. a.s.l.
T-2 Terrace	525 to 540 ft. a.s.l.

Sequent to two days of field reconnaissance and discussion

with the project archaeologists, it was decided that the soils work should be directed to answering three broad sets of questions concerning the geologic and environmental history of the area. These questions are paraphrased as follows:

(1) How stable and how old is the present floodplain surface? Is there evidence for significant aggradation during historical times? Do paleosols exist beneath the floodplain surface, and if so, how old are they?

(2) What is the mode of origin of the T-1 surface in the Cobb-Poole area? What is the relationship between the T-1 surface and the geological material that forms the T-2 terrace?

(3) Is there evidence for a near surface paleo-groundwater table on the T-1 and T-2 terraces? What is the age of the paleo-groundwater table?

METHODOLOGY

The terrace and floodplain soils of the Trinity Drainage Basin are commonly formed by a complete interaction of three sets of environmental factors. These factors may be classified as: (1) geological sedimentary processes; (2) pedogenic processes; (3) groundwater geochemical processes. In interpreting a soil profile

an effort must be made to distinguish the process responsible for a particular profile characteristic. In some instances more than one process may be able to form a characteristic.

Changes in geological deposition within a profile are designated by Roman numeral prefixes. The Roman numerals are used independently of the Arabic numerals. The letters and Arabic numerals are used to classify the various soil horizons. Wherever possible the nomenclature and classification is based on the methodology of the Soil Survey Staff (1952 and 1962). Redundancy is found when describing the C horizons if subdivision is based on differences in parent material (lithologic discontinuities). The change is denoted by changes in both Roman numerals and Arabic numerals. However, bearing in mind the complicated and numerous changes in parent material found in the floodplain and terrace soils, it was decided that it would be more advantageous to keep both sets of numbers mutually independent. A note of caution should be inserted: It is not permissible to attempt inter-site soil profile correlation based solely on the Roman numerals sequence.

Groundwater geochemical effects are included with pedogenic characters in the field descriptions. However, during the subsequent discussions and interpretations, the effects of the two sets of processes are distinguished. This is the traditional way of describing a profile, and this method has been adopted.

The field descriptions of the soil profiles were made on October 16, 17, and 19, 1979. This was shortly after the study area had been drenched with heavy rains. Some of the uppermost horizons of the various soil profiles reflect colors and matrix consistencies which are the result of the percolating moisture. Where this is so, the color description is marked by an asterisk. Soil pH and soil texture were either measured or, in the latter case, estimated in the field. These were later verified or, in a few cases, modified when the results of the laboratory analyses were subsequently known.

Samples were taken from most of the described horizons. Many of these were sent to the Soil Testing Laboratory, Colorado State University, for analyses of grain size, pH, organic matter (OM), and calcium carbonate. The grain size, organic matter, and calcium carbonate are given as percentages by weight of the soil lines (<2 mm grain size). The grain size classification and texture classification is that of the U.S. Department of Agriculture (Soil Survey Staff, 1952).

The number of soil profiles selected and the types of laboratory analyses chosen were partially predicated on the limited time and budget available for soil and geological work. The number of sites and techniques chosen are not necessarily the optimum desirable; they reflect what was considered most beneficial within the established limits of the Project.

BRIEF DESCRIPTIONS OF THE SOIL PROFILE LOCATIONS AND ENVIRONMENTS

FLOODPLAIN SITES

Borrow Area E2

Site W40-N250. Figure 4-1 (Chapter 4) shows the location of site W40-N250. The borrow area is on the southern side of Walnut Creek. The surface has been ploughed in recent times and is flat with slopes of less than two percent. Within ten meters of the soil pit, there is a densely wooded area that lies parallel to Walnut Creek. The soil site is probably the closest of all floodplain sites to an existing waterway. (See Tables 1-7 for this and the following discussion.)

Site E100-N282. Figure 4-1 shows the location of site E100-N282. It is approximately one hundred meters to the west-northwest of site W40-N250 and is on the south side of Walnut Creek. As is the case with site W40-N252, site E100-N282 is located in a ploughed field. The elevation of both soil profile sites is between 490 and 500 ft. a.s.l.

Borrow Area C1

Site E420-S655. Soil profile site E420-S655 is in Borrow Area C1 on the southern side of Mountain Creek several hundred meters to the south of its junction with Walnut Creek. The soil site is in a ploughed field with a gradient of two percent or less. It is several tens of meters west of the river bed. The elevation of the floodplain surface at this location is about 480 ft. a.s.l. The site is separated from the two E2 borrow area sites by

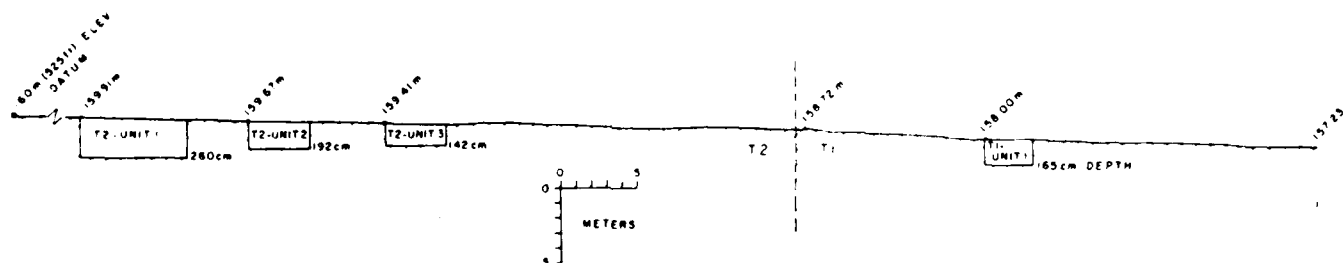


Figure I-1. Sectional view of the T-1 and T-2 terraces near the Cobb-Poole site (41 DL148) in relation to soil sampling units. Horizontal and vertical placement of test units to scale.

an interfluvium with both T-1 and T-2 terraces and with a maximum elevation of 530 to 540 ft. a.s.l.

TERRACE SOILS

The T-1 and T-2 terrace soil pits are close to the Cobb-Poole site (41DL148). The area is north-northeast of the confluence of Walnut and Mountain Creeks (Figure 2-1).

Terrace T-1

Site 41DL148 (Unit 1), Terrace T-1 (Figure 1-1). The T-1 Unit 1 soil pit is on a surface with elevations between 500 and 520 ft. a.s.l. The surface has a gradient of two to five percent. The soil pit is located high on the surface close to a slight break in slope which is used to distinguish the boundaries between the T-1 and T-2 surfaces. The T-1 terrace surface is covered with both wooded and savanna type of vegetation.

DISCUSSION AND INTERPRETATION OF THE SOIL PROFILE DATA

FLOODPLAIN SOILS - DISCUSSION

Borrow Area E2

Soil Profile at E100-N282. The soil pit was 1.6 m deep. The soil profile was divided into seven soil horizons. The upper three horizons were classified as A horizons based on the high percentage of organic matter contained in these horizons, and on the dark color of the matrix. The lower four horizons were classified as C horizons. The C horizons had less organic matter and lacked any clearly defined B horizon characteristics.

Textural changes in the soil matrix were detected with depth in the profile. The textural changes were not the result of pedogenic processes; they were the result of changes in the original sedimentary character of the geological deposit. The textural changes in the parent material are denoted by changes in the Roman numeral prefixes.

The relatively high organic matter concentration in the C horizons suggests that some organic build-up may have occurred with each successive depositional episode; alternatively, some organic matter may have been fixed on the surface of the clay components at the time of deposition.

The IIIC1cn horizon has several features that are noteworthy. The original depositional bedding is preserved in some places. This indicates the soil has not been greatly disturbed by pedoturbation and probably has not undergone many periods of prolonged drying. Secondly, manganese concretions are visible in this horizon. Manganese concretions may indicate the former presence of a fluctuating water table for a prolonged period of time. Thirdly, there is an obvious decrease in organic content from that in the IIA13 horizon. This suggests that the IIIC1

horizon was probably not exposed as a paleo-soil surface.

The A horizons are 57 cm deep. It is possible that the parent material for these horizons aggraded over several depositional periods and that A horizon formation was cumulative with each succeeding depositional period. Even so, the A horizons are relatively well developed and may have been stable for several hundred years.

Soil Profile at W40-N250. The soil pit was nearly 2 m deep; only the upper 1.2 m of the soil profile were described. Within this 1.2 m depth, ten changes in the soil matrix were noted. The changes are not associated with pedogenic processes but are the result of changes in the original sedimentary deposit, i.e., they are related to changes in the parent material. Each change in parent material is denoted by a change in the Roman numeral prefix.

The organic matter varies slightly but repeatedly with depth. The organic matter is generally highest where the soil horizon is darker. Designation of soil horizons was based mainly on color changes, changes in texture, and changes in soil structure. The horizons are classified as either A horizons or C horizons. None of the horizons were maturely developed enough to be designated as B horizons.

The upper 36 cm of the profile was classified into A1, A12, and IIC1 horizons. Below this there is a sequence of buried A and C horizons, none of which are well-developed. The buried horizons are designated by the suffix "b". Thus, immediately below the IIC1 horizon there is a IIIA1b horizon.

The upper A horizons are 26 cm deep. They are sub-naturally developed and not particularly deep. Depositional textural changes were not noted for these horizons. There is a textural change in the underlying horizon.

The IIIA1b, VA1b, VIIA1b, and IXA1b horizons are thin; they are between 5 and 11 cm thick. Each of the Ab horizons is slightly darker than the Cb horizon beneath it; and, with the exception of the IXA1b horizon, they have slightly more organic content than the Cb horizons. Some of the Ab horizons have retained their original geological bedding. This indicates that they were exposed at the surface to plant root action and to small animal action for a minimum of time. For the Ab horizons beneath a depth 61 cm, it is difficult to tell whether or not the increase in organic matter and darkness is due to pedogenic changes or is a function of a change in depositional environment.

Iron oxide and hydroxide mottling in many of the horizons and the presence of manganese concretions in the A12 horizon suggest that the profile has been influenced by a high fluctuating water table.

The soil profile as a whole is not well-developed, and the upper 36 cm is probably less than five hundred years old. It may be younger.

Borrow Area C1

Soil Profile at E420-S655. The soil pit was 1.7 m deep. The soil profile was texturally consistent with depth with only a slight increase in clay being noted with increasing depth. The soil was divided into seven horizons. Five of the horizons were A horizons and the lower two were classified as C horizons.

The organic matter content for the profile is relatively consistent to a depth of 69 cm. A decrease in organic matter occurs in the A3 horizon, and a further detectable decrease in organic matter occurs in the C2 horizon. The matrix changes color at the 69 cm depth. The A3 horizon (69-87 cm) has characteristics of both an A and C horizon. The C1 horizon was based mainly on a change in the soil matrix color.

The soil is calcareous throughout its depth. Calcareous nodules in all of the horizons, except the Ap horizon (p indicates plough zone), suggest that the profile has been affected by a relatively high and fluctuating water table. Iron oxide and hydroxide mottles in some of the horizons also suggest the former presence of a ground water table.

The soil is montmorillonitic and has the potential to be a vertisol, i.e., to be modified by pedoturbation processes. The matrix does not appear to be greatly mixed by this process. On the other hand, large cracks in the profile face displayed slickensides, and all the snail shells were fragmented—crushed perhaps.

The A horizon is sufficiently deep to suggest a fairly mature soil. However, A horizon build-up may have been aided by periodic aggradation of clayey material with high organic content. Additionally, the high calcium carbonate content of the Ap horizon does not suggest any prolonged period of leaching by soil waters.

FLOODPLAIN SOILS - INTERPRETATION

The three floodplain (or T terrace) soils are relatively young. There are not B horizons. The least developed soil profile is at W40-N250. This soil profile, or stratigraphic section, clearly shows that overbank deposition has occurred periodically. Buried paleo-surfaces have accumulated little organic matter; fragile original sedimentary structures are generally visible and little deformed. The most prolonged stable period, as shown in the W4N250 profile, is the present-day surface. However, even here the build-up of organic matter is not well-developed. The soil is porous and highly permeable, yet downward translocation of chemicals has been very limited. The uppermost soil in this profile is estimated to be 5500 years old. It is unlikely that the uppermost soil is older than 500 B.P.

The two other soil profiles may be slightly further removed from their respective creeks. They have heavier textures and darker color values. Because of this, it is more difficult to read their history or to estimate their relative ages. Both soils may have accumulatively aggraded A horizons. Sedimentary structures in the C horizons, of the soil at E100-N282, are little disturbed. At E40-S655 very little leaching of the calcium carbonate has taken place. The two soils tend to look more developed than they actually are. On the other hand, the presence of the former high water table may have slowed the subaerial development of the soils. The degree of soil development may not truly match the ages of the parent materials. It is the opinion of the investigator that the two soils have probably been developing for a period that is greater than 50 years and probably several hundred years.

TERRACE SOILS - DISCUSSION

Terrace T-1

Soil Profile at 41DL148 (Unit 1). Terrace T-1. The soil profile described for the T-1 terrace is at location 41DL148 (Unit 1) Terrace T-1 (Figure I-1). The soil pit was 1.65 m deep. The soil profile was divided into six soil horizons. The uppermost horizon is an A horizon. Beneath this A horizon, there are three B and two C horizons.

The texture of the soil profile changes dramatically at about the 19 cm level. It changes from a sandy loam to a clay loam. The change in texture is thought to be due partially to a change in parent material, i.e., the original geological deposit, and partially to eluviation of clay from the upper horizon(s) into the IIB1tcn horizon.

Beneath the IIB1tcn horizon, the soil texture is rather similar in all horizons with only a slight decrease in the clay content. All of the horizons beneath A1cn are thought to have had a homogeneous parent material with no major changes in the original grain size characteristics.

The IIB1tcn horizon has the reddening and clay build-up that are characteristic of certain B horizons. The dark color is thought to reflect the downward movement of organic matter into the B horizon after the B horizon was formed, hence, the B1 designation.

The IIB21cn and IIB22cn horizons are continuations of the IIB1tcn horizon. The red coloring is most pronounced in IIB21cn. It is not known if there is an illuvial clay build-up in the IIB2 horizons.

Throughout the soil profile there is evidence for a former higher ground water table. Manganese concretions occur in all horizons (this is denoted by the suffix "cn"), and iron oxide and hydroxide mottles occur in all horizons. The two C horizons have a greyish coloring which is thought to be due to ground water gleying (this is denoted by the suffix "g").

Terrace T-2

Soil Profile at 41DL148 (Unit 1) Terrace T-2. The soil pit for Unit 1 Terrace T-2 was 2.6 m deep. The soil profile is divided into nine horizons. These include two A horizons, one B horizon, and six C horizons. The geological parent material in which the soil formed was not homogeneous throughout the soil profile. Four different parent materials are recognized. Each change in parent material is denoted by a change in the Roman numeral suffix.

The uppermost 50 cm of the soil profile is divided into an A1 and A12 horizons. The horizons have dark brown or dark greyish brown coloring and granular ped structure.

A change in parent material and soil color occurs in the IIB2 horizons. The IIB21 horizon has a reddish hue. The clay content appears to be similar in both the IIB21 and IIB22ca horizons which suggests that illuviation of clay has not been an important factor. The high organic matter percentage of the two horizons is curious. A slight build-up of calcium carbonate occurs in the

IIB21. The IIB22ca horizon has a considerable build-up of calcium carbonate with calcium carbonate nodules and coatings on pebbles. The accumulation of calcium carbonate is denoted by the suffix "ca" and could be the result of ground water precipitation.

The IIB3ca horizon is transitional to the IIC1ca horizon. In the IIB3ca and underlying IIC1ca horizon there is considerable calcium carbonate build-up, nodularization, and apparently reversible cementation. Other indications of paleo-ground water effects are the appearance of reddish mottles that become more distinct with depth in the profile.

Lower in the profile there are at least two additional changes in parent material and further evidence for paleo-ground water build-up of calcium carbonate.

Soil Profile at 41DL148 (Unit 2) Terrace T-2. The soil pit for Unit 2 Terrace T-2 was 1.9 m deep. The profile is divided into eight horizons, two A horizons, two B, and four C horizons. Several changes in parent material are denoted by changes in the Roman numeral suffixes.

The A1cn horizon has a few manganese concretions. The origin of these concretions is not clear. There is a change in texture and soil color in the IIA3 horizon, which might be part of an older B horizon, into which organic matter has been illuviated.

The IIB21t and IIB22t are probably argillic B horizons (hence the suffix "t"). The illuviation of clay may account for all the change in texture noted in these two horizons. Manganese concretions are common in both horizons. These may be associated with paleo-ground water effects, but mottling was not noted in either horizon. There appears to be little calcium carbonate in either horizon.

The underlying IIC1ca and IIC2ca horizons have significant accumulations of calcium carbonate and nodularization. The calcium carbonate build-up affects the coloring of the soil horizons. Other paleo-ground water effects appear as manganese concretions and reddish mottles.

Changes in parent material occur twice below the 154 cm level. The gravel layer, which was noted in Unit 1 of Terrace T-2 at the 165-190 cm level, is at the 154-184 cm level in Unit 2. Paleo-ground water build-up of calcium carbonate is noted in this gravel layer.

Soil Profile at 41DL148 (Unit 3) Terrace T-2. The soil pit for Unit 3 Terrace T-2 was 1.4 m deep. The soil profile is divided into six horizons, two A horizons, three B horizons, and one C horizon. There is a significant textural break at the 29 cm level which suggests a change in parent material. Below the 29 cm level, the parent material may have had a relatively homogeneous texture.

The two A horizons are relatively rich in organic matter. The A1 horizon has some secondary calcium carbonate whereas the IIA3 horizon has very little, perhaps, none. There is some change in texture between the two horizons. It is probable that the parent material was texturally different. Yellowish red mottling in the IIA3 horizon suggests that this may have been part of an older B horizon in which organic matter has accumulated, hence, the IIA3 designation. The abrupt smooth boundary between the two horizons may indicate an erosional unconformity.

The IIB2 horizons have much higher clay contents. They are most likely the results of changes in the parent material. Small manganese concretions appear in the IIB2 horizons along with reddish and yellowish mottles in the IIB22cn horizon.

The IIB3 horizon is transitional to the IIC3ca horizon. A considerable increase in calcium carbonate occurs in the IIC3ca with coatings on pebbles. Small manganese concretions are also present. It is thought that the calcium carbonate is a paleo-ground water accumulation.

TERRACE SOILS - INTERPRETATION

The four soil profiles on the T-2 and T-1 terraces are maturely developed. Each profile has a B horizon. These B horizons have similar textures, similar reddish or yellowish red hues, and are interpreted as having been formed from similar parent materials. It is thought, but not proven, that the parent material had a reddish color and that some, if not all, of the redness of the B horizons is inherited from the parent material. An attempt to trace the extent of the original geologic deposit indicated that the reddish matrix was only found peripherally to the T-2 terrace at its lowest elevations and appeared to be present at the innermost and highest parts of the T-1 terrace. The geologic deposit was present locally and may, in places, have been removed during the formation of the T-1 terrace surface.

If the reddishness was not inherited from the parent material, it is not at all clear why the reddening occurred in some trenches but not in others that were nearby. From the viewpoint of pedological processes and environmental conditions, no obvious changes were noticeable.

At the top of the B horizons, there is a depositional discontinuity and perhaps an erosional unconformity. The B horizons appear to have been truncated. The uppermost A horizons were formed in part, or in some cases totally, in what appears to be a younger, superimposed sediment. The truncation phenomenon was not confined only to these B horizons but was noticed in a number of soil profiles in trenches cut at higher elevations on the T-2 terrace.

Ground water processes have affected the four terrace soils, particularly in the lower parts of the profiles. The ground water effects include: (1) Gleying in the T-1 terrace soil; (2) Mottling of iron oxides and hydroxides; (3) Manganese concretions; and (4) The build-up, and in places nodularization, of calcium carbonate. Some of these features indicate a succession of alternating oxidizing and reducing environments often associated with fluctuating water tables. The ground water effects are generally within a meter of the present-day surface but, with the exception of the manganese nodules, are not generally present above the B horizons.

It should be pointed out that certain of these ground water effects can be formed by other processes and in other environments. It is the juxtaposition of several of these possible ground water effects in the same profile that argues strongly for a high paleo-ground water table. There may have been more than one period of high ground water. It is debatable as to whether or not the T-1 terrace soil profile was affected by the same ground water table as affected the T-2 terrace soils.

The lack of redness in the lower part of certain of the B horizons and C horizons may be due to the prolonged reducing effect of ground water. This is thought to be the case in the T-1 terrace soil profile.

CONCLUSIONS

The A horizons of the Floodplain soil profiles are sufficiently developed to suggest that the soils have been developing for several tens of years and probably longer. On the other hand, the C horizons have experienced little detectable geochemical modification and retain some of the original sedimentary structures. It seems unlikely, in my opinion, that the soil profiles have been developing for more than five hundred years. However, there is evidence for a high water table within a meter or less of the soil surfaces. Such a high water table may have slowed the development of the C horizon by preventing plant root action and limiting the action of burrowing animals.

The floodplain profile at W40-N250 has evidence of periodic

aggradation and several short-lived paleo-surfaces. None of these surfaces appear to have been as long-lived as the present soil surface at this site.

The soils on the T-1 and T-2 terraces are more maturely developed than the floodplain soils. The B horizons of all four soils have similar textures and may well have formed from similar parent material, i.e., the same geological deposit.

The B horizons may have been truncated after the soils were already maturely developed. The coarser textured material in which the A horizons have developed may be a later geological deposit. An alternative explanation that the A horizons are mainly the result of downward leaching of clay colloids is not favored at this time.

The soil profiles indicate that the T-1 terrace in the Cobb-Poole area is erosional into the T-2 terrace material. In terms of development there appears to be little difference in the degree of subsoil development of the T-1 and T-2 terrace soils.

In both the T-1 and T-2 terrace soils there is evidence for a paleo-ground water table within a meter of the present soil surface. The age of the ground water table is not known.

Appendix II

Observations on the Faunal Remains from the Lakeview Project: Phase One

Bonnie C. Yates

Osteological material from three sites and subsurface test areas were submitted for identification and analysis to the Zooarchaeology Lab at the Institute of Applied Sciences, North Texas State University, Denton, Texas. The faunal remains were washed and labeled by the excavators prior to submittal.

In general, the preservation of the bones is fair to poor with evidence of pitting, root etching, and post depositional fracturing. Some fragments evidence various stages of mineralization, probably resulting from leaching of ground water with a high mineral content. Other fragments appear water worn.

Of the sites, 41DL148, the most extensively excavated site, yielded the most bones. The identified fauna is typical of animals native to Texas; however, rabbit is under represented in the assemblage when compared to species lists of other sites in North Central Texas. Deer is the predominant species found in each sample, but every vertebrate class except amphibia is represented.

SITE 41DL148

The preservation of faunal remains at 41DL148 is fair to poor, and the surfaces of many bones are etched by roots and

pitted by leaching. The mineral content of the ground water must be high since several fragments show beginning stages of mineralization.

Of the 466 bone fragments recovered from this site (Table II-1), 58% (270 fragments) were found in Unit 1 (Chapter 3). Unit 1 also contained identifiable elements from all but four of the species represented in the sample (Table II-1). The four species absent from Unit 1 are opossum (Unit 3, Level 1), fish (Unit 4, Level 1), and red fox and box turtle (Surface). The surface and shallow subsurface recoveries suggest that these animals are recent and intrusive, especially red fox, which is an introduced species to Texas (Davis 1974), and box turtle, which was recovered with some of its thin, perishable, horn-like scutes still attached. Two opossum vertebrae and one very small fish vertebra (the only fish element recovered) come from Level 1; therefore, their association with human artifacts is questionable.

Deer elements are the most common identifiable bones in this sample. Each level of Unit 1 (below Level 1) yielded some deer bone with a concentration in Levels 2 and 3 and again in Levels 6 and 7. Unit 10 (Chapter 3) also contained a concentration of deer elements in Level 4 with a minimum of two individuals, based on the presence of two right naviculocuboid tarsal bones, one larger than the other, suggesting sexual dimorphism or a significant age difference between the individuals. A mandibular

TABLE II-1. Vertebrate Remains From Unit 1, 41DL148, by Level.

Level	Total Bone	Unidentifiable		Identifiable Animal	N
		N Burned	N Unburned		
1	10	1	7	Rodent sp. Turtle sp.	1 1
2	38	6	25	Pocket gopher Deer Lg. mammal	1 5 (1B) 1
3	27	1	18	Deer	8
4	21	1	15	Pocket gopher Deer Turtle sp.	1 1 2
5	37	4	26	Pocket gopher Cotton rat Deer Turtle sp.	1 2 2 2
6	31	2	21	Deer cf. Turkey Musk/Mud turtle	5 1 1
7	27	0	18	Deer Turtle sp.	5 4
8	29	2	17	Pocket gopher Cotton rat Rodent sp. Deer Turtle sp. Snake sp.	1 1 2 3 2 1
9	43	5	17	Pocket gopher Vole sp. Beaver Rodent sp. Deer Lg. mammal cf. Turkey	2 1 2 11 3 1 1
10	1	0	0	Deer	1
15	6	0	6	none	0

* (B) indicates # of burned elements in total.

third molar recovered from Unit 1, Level 3, shows wear indicative of a mature deer between 5½ to 7 years of age at death (Severinghaus 1949).

Only eight identifiable bones are burned, and four of these are deer elements. A burned antler fragment from Unit 1, Level 2, indicates that at least one male deer had been taken, although it is possible that the site's inhabitants found the antler already shed and suitable for tool use. The antler fragment is too damaged to assess modification as a raw material.

Other burned deer elements include a large petrous process from Unit 1, Level 5, but it is impossible to determine whether or not this cranial element is from the same skull as the antler fragment from Level 2. A burned unfused distal tibia fragment was recovered from Unit 1, Level 3, but no other elements from an immature deer were found. Lastly, a burned deer metatarsal fragment was recovered from Unit 4, Level 1.

The remaining burned bone consists of a tooth enamel fragment from Unit 10, Level 4, and a broken tool tip from Unit 1, Level 8; both fragments are from deer-size animals. Non-deer burned bone consists of a turtle shell fragment (Unit 12, Level 1) and a broken rodent tibia from Unit 1, Level 9.

Level 9 (in Unit 1) contained 73% (11 fragments) of unspecified rodent remains as well as 33% of the pocket gopher elements and the only vole element (Table II-2). These rodents are known to burrow deep underground (Burt 1964) and, therefore, could be considered intrusive except that the presence of a burned rodent element suggests other causal possibilities such as a grass fire, refuse burning, or roasting. The burned leg bone could have resulted from a rodent carcass caught in a grass fire attributed to natural causes, to human agents, or from the bone's inclusion with materials gathered from the refuse heap and burned by the site inhabitants. If roasted, this area of a rodent's body would burn quicker than fleshier parts. It should be mentioned also that human coprolite studies at Hind's Cave, South Texas, indicate that rodents were eaten without cooking (Williams-Dean 1978). Therefore, the question of whether or not these rodent remains are intrusive cannot be completely answered based solely on the issue of burned/unburned condition.

No butchering marks are apparent on any of the identifiable deer elements, and only six deer-size fragments have any cuts or scratches that could be attributable to food processing or tool making, although several unidentifiable fragments appear to have the characteristic spiral fractures known to facilitate marrow extraction. For example, one notable deer-size fragment from Unit 1, Level 5, was snapped in such a way that a small tang (8 mm) of interior bone projects from the broken edge; no modification is apparent on the projecting tang. This break could be duplicated by holding a bone of previously fractured bone shafts horizontally with both hands palms down. The thumbs are placed in the center forming the fulcrum. When the fingers are pulled back and the thumbs pushed forward, the bone snaps leaving a jagged break. (Replication was performed by author.)

A deer ulna from Unit 1, Level 7, was fashioned into a round tipped tool with shine and wear visible on the lower 3.5 cm of the worked end. A series of deep, eroded notches occur on the edge of the half-moon-shaped articulation, but their purpose and origin are unknown.

Another fragment from a tool tip, similar in width and thickness to ulna tool tips, was recovered from Unit 1, Level 8. This specimen is burned and clearly shows longitudinal striations and shine from work and wear.

One modified fragment was collected from the surface. It is also deer-size in thickness and is almost 4 cm long and 1 cm wide. At some time, this bone must have lain in such a position that one end was exposed to weathering; approximately 2.5 cm is natural bone color and the remaining 1.5 cm is bleached white. The white end is cut and smoothed flat, but the opposite end is roughly rounded with a deep transverse cut about 5 mm from the rounded end. Both inner and outer surfaces are abraded to various degrees of smoothness. If the transverse cut had been completed, removing the rounded tip the fragment would be symmetrically divided by color tone. Perhaps this fragment was intended for adornment when completed.

A small, thin fragment from Unit 1, Level 5, has an irregular hole near one tapered end, but this piece has recently broken longitudinally leaving the hole open on one side and the original width and length of the fragment indeterminable. The slightly eroded surface has some shiny areas but lacks striae or scratches. The hole appears drilled from both sides since the wall of the small hole slants toward the broken end on one side and toward the rounded end on the other side as if the bone had been turned over to drill from the opposite side. The small size and broken condition prevent any ascertainment of function although, morphologically, the fragment fits characteristics of needles.

In summary, 25% of this sample was identifiable at least to vertebrate class with deer elements comprising 46% of the identifiable faunal remains. Unspecific rodent bones rank second in frequency and occur clustered in Unit 1, Level 9. As discussed above, some of these may be intrusive. Broken turtle shell ranks third, but species determination was precluded by the fragmentary nature of the shell except for one plastron fragment from a musk or mud turtle (Family Kinosternidae) recovered in Unit 1, Level 6, and the recently dead box turtle from the surface.

Vertically, Level 9 of Unit 1 contained the greatest variety of fauna including most of the rodent bones, the deer ulna tool, bird, and beaver (Table II-1). A tibiotarsus fragment from a large bird found in Level 9 compares well with turkey as does a femur fragment from Unit 1, Level 6, although both elements are very fragmentary. Two teeth fragments (a molar and an incisor) from this level are probably beaver; however, no post cranial elements from this species were found.

41DL147

The small sample recovered from 41DL147 contained a total of 14 bones with 7 of these identifiable (Table II-2). Only two units at this site yielded faunal remains, all of which were in fair to poor condition. Again, some of the fragments appear partially mineralized, indicating a high mineral content in the groundwater.

Deer elements include a phalange and a metacarpal fragment. A small, fragmented ulna from Unit 1, Level 4, may indicate

TABLE II-2. Number of Elements per Species by Site.

Species	Scientific Name	41DL147	41DL148	41DL184	Borrow Areas
Opossum	<i>Didelphis virginiana</i>		2		
Cottontail rabbit	<i>Sylvilagus floridanus</i>	1			
Eastern fox squirrel	<i>Sciurus niger</i>			1	
Plains pocket gopher	<i>Geomys bursarius</i>		6		
Hispid pocket mouse	<i>Perognathus hispidus</i>	1			
Cotton rat	<i>Sigmodon hispidus</i>		3		
Vole sp.	<i>Microtus</i> sp.		1		
cf. Beaver	<i>Castor canadensis</i>		2		
Rodent			15 (1B)		
Red fox			1		
White-tailed deer	<i>Odocoileus virginianus</i>	2	54 (1B)	2 (2B)	
Cow	<i>Bos taurus</i>				20
large mammal	cf. <i>O. virginianus</i>	1	6 (1B)	2	2
cf. Turkey	<i>Meleagris gallopavo</i>		2		
Musk/Mud turtle	<i>Kinosternidae</i>		1		
Box turtle		1	9		
Turtle sp.			13 (1B)	3 (3B)	
Snake sp.			2		
Fish sp.			1		
Fossil shark sp.		1		2	
Total ID		7	118	10	22
ID burned			(8)	(5)	
unid. burned		1	95	19	
unid. unburned		6	253	32	
Total Bone		14	466	61	22

* (B) indicates # of burned elements included in total.

either a young white-tailed deer or perhaps a female; however, the diagnostic areas on this ulna are obliterated, precluding positive identification.

The only evidence of rabbit at the Lakeview sites (a fragmented molar) was recovered at 41DL147 from Unit 2, Level 1. Unit 2 also contained a fossil shark tooth from Level 1 and a pocket mouse humerus from Level 4. Since hispid pocket mice burrow straight down (Burt 1964), this element may be intrusive. The only burned bone from this site is an unidentifiable fragment from Unit 2, Level 1. One other unidentifiable fragment is mineralized.

41DL184

Sixty-one pieces of bone were recovered from 41DL184, and 10% of these are identifiable. The identifiable bones consist of fox squirrel, boa constrictor artiodactyl, and turtle (see Table II-3).

A neo-natal fox squirrel humerus was recovered from the surface, but its condition appears recently weathered and, therefore, is considered intrusive.

The artiodactyl remains are probably deer, but both elements are too fragmentary for positive identification. Both fragments

are burned lower leg bones, a metatarsal fragment, and a terminal phalange fragment from Levels 4 and 2, respectively. In addition, two tooth enamel fragments were recovered and can only be attributed to large mammal; both were unburned and undiagnostic to species.

All of the turtle shell fragments (3) are burned. They were recovered from Levels 1, 6, and the surface. Two of these small undiagnostic fragments are of similar thickness and appear to be from one individual. The third and smallest shell fragment (Level 6) is very worn, and its relationship (if any) to the others is indeterminable.

Thirty-nine percent of the total sample are burned, and most of these are unidentifiable pieces from deer-size animals (Table II-3).

BORROW AREA TEST

Twenty-two pieces of cow bones were recovered from tests conducted in borrow pits at Lakeview (see Table II-2). Sub-surface testing at Unit E-1 (E134/S42) produced 19 bones from two calves, both younger than six months. These are most likely domestic cattle, as the area had been recently used as pasture and both individuals were recovered near the surface.

TABLE II-3. Faunal Remains from 41DL184.

Unit/ level	Unidentifiable*		Identifiable*
	#B	#UB	
0-0	1	1	1 turtle shell (B) 1 fox squirrel humerus
1-4	1		
1-5	1		1 large mammal tooth fragment
1-7	1	2	
2-1			1 turtle shell (B)
2-2	5	18	1 fossil shark tooth 1 deer phalange (b)
2-3	4	6	1 large mammal tooth fragment
2-4	1		1 deer metatarsal fragment (B)
2-5		1	
2-6		1	
3-1		2	
3-3			1 fossil shark tooth
4-1	1		
4-2	3	1	
4-4	1		
4-5	1		
4-6			1 turtle shell (B)
5-2	1		

* (B) indicates burned bone

Appendix III

Prehistoric Faunal Ecology of the Lakeview Project: Phase Two

Phillip Murry

In this study of the Lakeview Project, the recovery of vertebrates through excavation and screening has provided information for interpretation of the ecology of the area during periods of human occupation. In this review the vertebrate communities as a whole, or synecology, are detailed, and the ecology of the smaller taxonomic groups, or autecology, is reviewed.

All faunal elements recovered from the sites were identified using the author's comparative skeletal collection and that of the Shuler Museum of Paleontology at Southern Methodist University. A faunal list was compiled for each site, and when applicable minimum numbers of individuals and age were calculated (Tables III-1 and III-2); additional data not included in this faunal summary are on file with the Archaeology Research Program of Southern Methodist University.

In a general sense we can place all of the sites within the prairie biome. However, the vertebrate remains show that there was considerable interaction between the fluvial, grassland, and deciduous forest communities. Such a diversity of habitats is generally found only adjacent to permanent waterways where the prairie, aquatic community, and hardwood forests are within close proximity.

That there is a dominant aquatic influence is clearly evident in

the remains found. A few indeterminate teleost fish remains were found in 41DL149, and a single large *Ictalurus* vertebra was removed from Unit 4, Level 7 of 41DL199, belonging to either *Ictalurus punctatus*, the channel catfish, or *Ictalurus furcatus*, the blue catfish. Both of these species are native to the larger streams and rivers of the state, and both seem to prefer permanent streams with clear, flowing water (Jones 1973). Therefore, we may assume that there was a permanent, continuously flowing river within the field area. This hypothesis is further supported by the presence of other classes of aquatic vertebrates at 41DL199 and other Lakeview sites. For example, scutes belonging to the softshell turtle, *Trionyx spinifer*, were also found at 41DL199, Unit 4, Level 7. *Trionyx* is found almost exclusively along permanent rivers and streams, never venturing far from their banks (Conant 1975; Webb 1970). Other turtle scutes, most of which have been identified as belonging to the genus *Chrysemys*, were found in Units 4 and 4a of site 41DL149, in Backhoe Trench 1, 41DL189, Area H, and also in Unit 6 of site 41DL199. *Chrysemys*, as *Trionyx*, prefers permanent bodies of water. Ranid frog remains found in Levels 2, 3, and 4 of Unit 4a, 41DL149, also show that an aquatic influence was present within those levels, although some species, such as *Rana utricularia*, are often found well away

from water during the summer.

Agkistrodon piscivorus, the cottonmouth water moccasin, and *Natrix*, the water snake, found in Unit 5, Level 4 of 41DL149, again reveal the dominant aquatic influence on the occupants of the Lakeview sites. *Agkistrodon* very rarely ventures from the water or onto the river banks and only occasionally is found as far as a mile from permanent watercourses (Werler 1978). *Agkistrodon* is usually absent from swift, deep, cool water (Moore 1965). *Natrix* is similar to *Agkistrodon* in habitats although at least one species, *Natrix rhombifera*, may be found some distance from the water within grassy areas (Webb 1970).

Coluber constrictor, the black racer, found in Units 4, 4a, and 5 of 41DL149, is transitional in habits between the aquatic and terrestrial environments. Webb (1970) stated that he often found this species in trees and near water in Oklahoma and even found one swimming in Lake Texoma approximately 75 yards from shore. Raun (1965) found *Coluber constrictor* in a variety of habitats including fields, grasslands, open woods, and brushy areas.

The influence of the prairies on human occupation of Lakeview is apparent when one begins reviewing some of the mammals found at the sites. *Sigmodon hispidus*, the hispid cotton rat, was found in Levels 2, 3, and 4 of Unit 4a, and in Level 3 of Unit 5 within 41DL149. *Sigmodon* is generally found within tall grass areas where species such as bluestem (*Andropogon*), cordgrass (*Spartina*), and sedges (*Carex*) supply both food and protection. This species seldom inhabits hardwood areas and generally avoids areas subject to flooding (Davis 1974; Lowery 1974). These little rodents also are limited to areas with a mean annual temperature greater than 55° and a growing season of 180 days or more (Findley et al. 1975).

One element identified as a second phalanx of a bison was recovered from Unit 5, Level 2 of 41DL149. According to Olsen (1960), this phalanx has a straight dorsal margin and deep concavity on the anterior surface for insertion of the tendon. This description agrees very well with that of the specimen from Lakeview, and comparison with a phalanx from the Shuler Museum confirms that diagnosis. *Bison bison* was restricted to the open prairies and was a seasonal migrant to Texas and Florida during the winter. The southern form was a small, slender, fast-moving animal. The size of the herds ranged from a family group of a cow, bull, and their offspring to herds of thousands of individuals. These animals fed almost exclusively of grasses such as blue grama grass (*Boutela gracilis*), sand dropseed (*Sporobolus cryptandrus*), tumble windmill grass (*Chloris vesticillata*), paspalum (*Paspalum* sp.), buffalo grass (*Buchloe dactyloides*), and little bluestem (*Andropogon scoparius*) (Bailey 1971; Davis 1974; Lowery 1974; Martin et al. 1951; Walker et al. 1975).

Remains of *Sylvilagus floridanus*, the eastern cottontail rabbit, were found at Level 2, Unit 5, 41DL149, in Areas G and H of 41DL189, and in Unit 7, Level 4 of 41DL199. The cottontail never ventures far from brushy areas but will venture into grassy areas during twilight and at night where it feeds on green grass and herbs. During times when such vegetation is not available, this species will feed on bark and twigs of shrubs and trees.

Another species that is generally found within hardwood areas is *Odocoileus virginianus*, the white-tailed deer. Bones and teeth of this deer, found in many levels of almost all sites, were the most abundant vertebrate remains at the Lakeview locality.

The white-tailed deer in Texas is fond of areas with live oak (*Quercus virginiana*) cover. During the fall and winter months, more than half of the food sources may be taken from this species (Martin et al. 1951). At other times, two-thirds of their food may consist of grasses and weeds (Davis 1974). In fact, the white-tail seems to prefer areas transitional between the prairie, hardwood forest, and aquatic communities. Grasslands provide a graze area during the spring and summer; woodland areas provide food during winter as well as year-round cover for the deer. The white-tail deer also spends considerable time around watercourses, especially during the summer, and will plunge into water to elude predators (Rue 1978).

One species of mammal, found almost exclusively in hardwood forests, is the woodland vole, *Pitymys (microtus) pinetorum*. This little rodent was found in Units 4, 4a and 5 of 41DL149. *Pitymys* prefers to burrow in areas with thick leaf mold and loose soil and is rarely, if ever, found in areas of sparse rainfall.

CONCLUSION

The Lakeview region seems to have been a transitional zone influenced by grassland, hardwood forest, and fresh water aquatic communities. Most vertebrates were recovered from 41DL149, and any conclusions concerning the prehistoric ecology at Lakeview are derived from data at that site. From the presence of *Sigmodon*, we know that the mean annual temperature was greater than 55° and that there was a growing season of 180 days or more. We also know from the presence of *Pitymys* and the aquatic species that there was adequate rainfall and a permanent watercourse within the area. From the species of fish and aquatic reptiles, we know that the current velocity was probably not extremely great (as shown by the presence of such genera as *Agkistrodon*) although the stream generally flowed year-round. The presence of numerous white-tailed deer remains show that this was an exceptional habitat for this species with hardwood forest, grassland, and aquatic communities within close proximity. The grassland area was probably dominated by such tall-grass species as *Andropogon* and *Spartina* and was the preferred habitat for *Sigmodon*. The deciduous forest within this area probably had a large supply of oak for the deer and loose soil, and abundant leaf litter in which *Pitymys* lived and burrowed.

PREHISTORIC FAUNAL UTILIZATION AT LAKEVIEW

Large concentrations of bone (Table III-3), especially those of the white-tailed deer (*Odocoileus virginianus*), were found at Lakeview. Interestingly, the largest concentrations of both

burned and uncharred bone were within those areas influenced by more than one ecologic community. For example, very large concentrations of burned bone were found in Units 4 and 4a of 41DL149. These were also the areas where there were dominant elements representing all three communities: woodland, grassland, and aquatic. Similarly, the large concentrations of bone in Unit 7 of 41DL199, although primarily dominated by woodland species, also had some aquatic influence. The diversity of wildlife within areas where these communities are within close proximity (i.e., floodplains along the watercourses) provided diverse and abundant food resources.

Other units within the study area contain almost exclusively remains of white-tailed deer. All white-tail bones were found including appendicular, axial, and cranial elements which probably indicate that the entire deer was transported for butchering. This also may indicate that the deer were killed within the immediate vicinity and that the major portion of the deer was being utilized for food, hide, and toolmaking.

According to Driver and Massey (1957), deer were often taken in pitfalls along trails. A low barrier would be constructed in front of the pit inducing the deer to jump. Stakes implanted in the bottom of the pit would impale the fallen deer. Also, visual disguises (horns and hide) as well as auditory decoys were utilized. Blowing on a leaf or piece of grass to imitate the cry of a fawn would sometimes attract does. Prime bucks could be called by striking antlers together in imitation of fighting bucks in "rut."

A phalanx of *Bison bison* and several fragments of long bones probably referable to that species were found in Unit 5 of 41DL149. It would probably be quite difficult and dangerous to

hunt bison before the introduction of the horse into North America. The most effective means would be to drive the bison (usually by setting prairie fires) into box canyons or pounds especially constructed for that purpose, or over cliffs. Visual decoys also were utilized in hunting the bison (Driver and Massey 1957).

Rabbits, rodents, and reptiles were found in a number of sites within the study area. Rodents were often captured using deadfalls of stone or wood and by utilizing rodent skewers. These were simply sharpened sticks which were plunged into the animals' burrows and twisted in hopes of snagging the hide and hair of the rodents. Barbed reptile hooks were constructed also with which both reptiles and rodents could be retrieved from holes or crevasses. Rabbits often could be flushed from cover, surrounded, and clubbed in organized hunts.

There is no indication (burned bones, evidence of butchering) that rodents and reptiles were utilized extensively. However, this may be misleading since these smaller faunal elements are often overlooked at sites and are subject to taphonomic factors which do not greatly affect large bones. I believe it is significant that those areas with the greatest concentrations of burned bone also have the greatest concentrations of fish, reptile, and rodent remains. These concentrations (from three communities) are probably not natural but represent the actual fauna utilized by the inhabitants at Lakeview. However, it is difficult to envision that some members were utilized extensively, such as the aquatic snakes *Agkistrodon* and *Natrix*, with their nasty dispositions and foul smelling, musky discharges.

Table III-1. Identifiable Faunal Material from Sites 41DL149, 41DL189, 41DL199, and 41EL29.

41DL149

Unit 1 - 20-30cm	<u>Odocoileus virginianus</u>	left ulna
30-40cm	<u>Odocoileus virginianus</u>	p3 upper
Unit 2 - 10-20cm	<u>Odocoileus virginianus</u>	1st phalanx
30-40cm	<u>Odocoileus virginianus</u>	m1 and m2 lower, anterior cervical vertebrae, left scapula, distal metatarsal
70-80cm	<u>Odocoileus virginianus</u>	p3 and p4 lower
Unit 3 - 10-20cm	<u>Odocoileus virginianus</u>	distal metapodial
Unit 4 - 10-20cm	<u>Chrysemys (?)</u>	scutes
	<u>Odocoileus virginianus</u>	metapodials (2), proximal right femurs (2), incisor, long bone fragments
	<u>Pitymys pinetorum</u>	m1 lower
	<u>Sigmodon hispidus</u>	left femur
	<u>Sylvilagus floridanus</u>	left pelvis
	<u>Bubo virginianus</u>	distal tibiotarsus
	<u>fish bone</u>	placement uncertain
20-30cm	<u>fish bone</u>	vertebrae
	<u>Pitymy pinetorum</u>	m1 lower
30-40cm	<u>Chrysemys</u>	nuchal plate
	<u>Coluber constrictor</u>	vertebrae
	<u>Odocoileus virginianus</u>	metapodial, right tibia, left scapula
40-50cm	<u>fish bone</u>	toothplate
Unit 4a - 10-20cm	<u>fish bone</u>	vertebrae (2)
	<u>Chrysemys (?)</u>	scutes
	<u>Coluber constrictor</u>	vertebrae

Identifiable Faunal Material

continued

Unit 4a - 10-20cm	<u>Rana</u> sp.	vertebrae
	<u>Pitymys pinetorum</u>	m1 upper, left mandible w/teeth
	<u>Sigmodon hispidus</u>	m1 lower
	<u>Odocoileus virginianus</u>	right mandible
	20-30cm Fish bone	vertebrae (4)
	<u>Rana</u> sp.	left ilium
	<u>Coluber constrictor</u>	vertebrae
	<u>Sigmodon hispidus</u>	left mandible w/m1 and m3 uppers, distal humeri 2 right and 1 left, left pelvis
	<u>Pitymys pinetorum</u>	m1 upper, m2 lower
	<u>Odocoileus virginianus</u>	partial molars
Unit 5	30-40cm Fish bone (shad ?)	vertebrae (2)
	<u>Rana</u> sp.	vertebrae
	<u>Pitymys pinetorum</u>	m1 upper
	<u>Sigmodon hispidus</u>	m1 and m3 uppers, m1 lower
	<u>Turdus migratorius</u>	proximal left humerus
	0-10cm Bird bone (large)	vertebrae
	<u>Coluber constrictor</u>	vertebrae
	<u>Odocoileus virginianus</u>	partial molar
	10-20cm <u>Bison bison</u>	phalanx, longbone fragments
	<u>Odocoileus virginianus</u>	left calcaneum
20-30cm	fish bone	vertebrae

continued

Identifiable Faunal Material

Unit 5 - 20-30cm	<u>Sigmodon hispidus</u>	left humerus
	<u>Odocoileus virginianus</u>	distal left dentary
30-40cm	<u>Natrix</u> sp.	vertebrae
Shovel Test *	<u>Odocoileus virginianus</u>	right astragalus, middle portion left femur
41DL189		
Surface - 0 cm	<u>Odocoileus virginianus</u>	proximal left scapula
Area B	<u>Odocoileus virginianus</u>	left calcaneum
Area C	<u>Odocoileus virginianus</u>	right ulna
Area D	<u>Sigmodon hispidus</u>	left mandible w/m1 upper, m2 upper and 1 incisor
	<u>Odocoileus virginianus</u>	partial proximal tibia
Area E, Feature 2	<u>Odocoileus virginianus</u>	1st phalanx
Area G	<u>Sylvilagus floridanus</u>	p3 upper
Area H	Turtle	scutes
	<u>Sylvilagus floridanus</u>	distal metapodial
	<u>Odocoileus virginianus</u>	right tibia, distal portion 1st phalanx, proximal metatarsal, anterior portion axis vertebrae, p3, p4 lower, p2 upper, m2, m3 lower
Backhoe Trench 4	<u>Odocoileus virginianus</u>	distal metapodial
	turtle	scutes
	lizard	vertebrae
	<u>Pitymys pinetorum</u>	molar

Identifiable Faunal Material

41DL199

Unit 1 - 20-30cm	<u>Odocoileus virginianus</u>	distal left tibia
40-50cm	<u>Odocoileus virginianus</u>	distal right tibia
Unit 4 - 10-20cm	<u>Odocoileus virginianus</u>	middle portion left femur
20-30cm	<u>Odocoileus virginianus</u>	proximal metatarsal
50-60cm	<u>Odocoileus virginianus</u>	distal left tibia
60-70cm	<u>Odocoileus virginianus</u>	middle portion metapodial
	<u>Ictalurus</u> sp.	vertebrae
	<u>Trionyx</u> sp.	scutes
Unit 7 - 10-20cm	<u>Odocoileus virginianus</u>	molar fragment
20-30cm	snake	vertebrae
	<u>Odocoileus virginianus</u>	right astragalus
30-40cm	<u>Odocoileus virginianus</u>	partial incisor, proximal portion metapodial
	<u>Agkistrodon piscivorous</u>	vertebrae
	<u>Sylvilagus floridanus</u>	distal metapodial
50-60cm	<u>Odocoileus virginianus</u>	partial molars, 1st phalanx caudal vertebrae
60-70cm	<u>Odocoileus virginianus</u>	m2 lower, left calcaneum

41EL29

Surface - 0cm	<u>Equus caballus</u>	p2 lower

Table III-3. Total Faunal Material, by Site, From all Proveniences.

	41DL149	41DL186	41DL189	41DL198	41DL199	41EL29	41TR1	41TR58	41TR59	41TR60	41TR61
Total Identified Bone From all Proveniences	81	19	19	19	1	1	-	-	-	-	-
Total Unidentified Bone From all Proveniences	1878	8	117	3	745	-	34	2	-	2	3
Total	1959	8	136	3	764	1	34	2	-	2	3
										2912	

Appendix
IV

Photographs
and
Tables
of
Prehistoric
Artifacts

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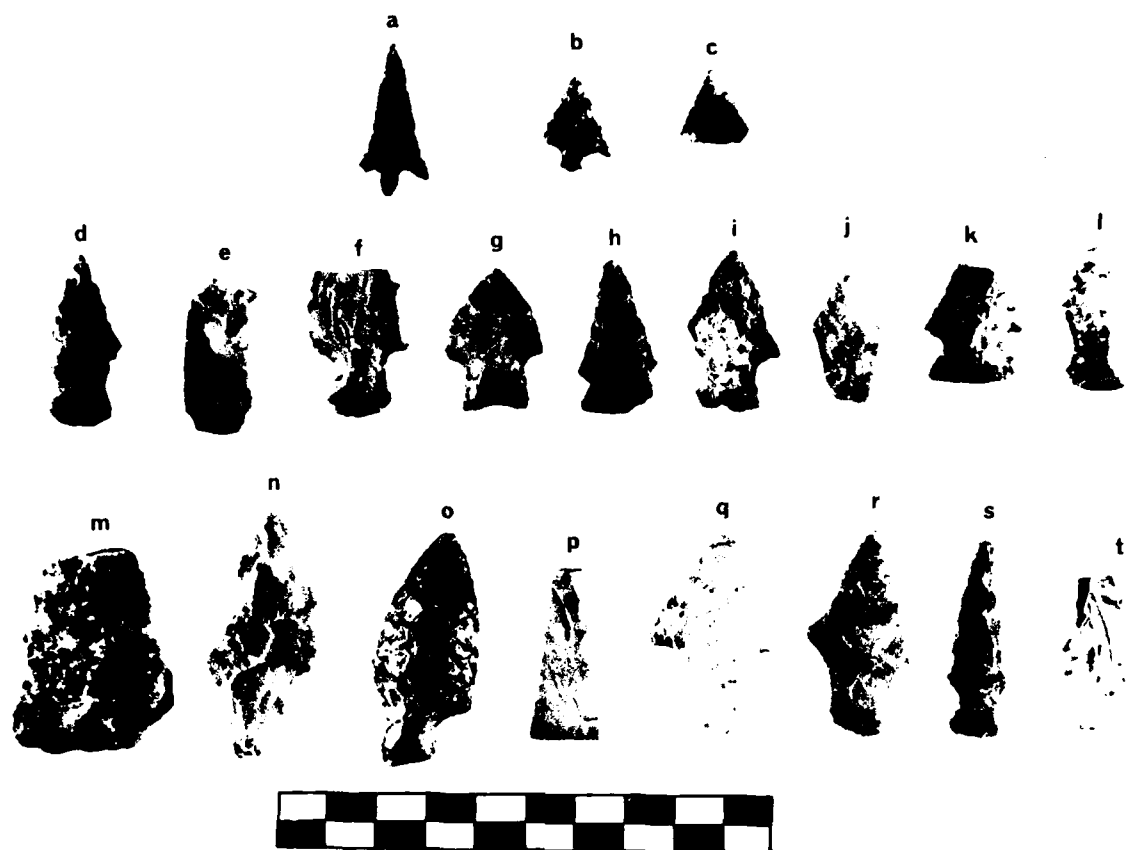


Figure IV-1. Projectile points from Lakeview archaeological sites. a - 41DL149-4.2; b - 41DL147-2.3; c - 41DL148-4.1; d - 41TR61-3.3; e - 41TR-0.0; f - 41DL199-2.2; g - 41DL199-0.0; h - 41DL184-0.0; i - 41DL189-0.0; j - 41DL199-7.7; k - 41TR61-0.0; l - 41TR59-0.0; m - 41TR59-0.0; n - 41DL189-0.0; o - 41DL184-1.4; p - 41DL199-2.2; q - 41DL184-0.0; r - 41DL189-0.0; s - 41TR61-0.0; t - 41TR60-0.0.



Figure IV-2. Projectile points from Lakeview archaeological sites. a - 41DL149-4.2; b - 41DL184-0.0; c - 41DL199-7.6; d - 41DL149-5.2; e - 41DL149-5.2; f - 41DL149-4.3; g - 41DL148-5.1; h - 41TR61-0.0; i - 41DL189-0.0; j - 41DL148-1.7; k - 41DL199-7.7; l - 41DL199-0.0; m - 41DL199-0.0; n - 41DL184-0.0; o - 41DL149-4.2.



Figure IV-3. a,b - flake tools (41TR61-0.0 both); c-e - orange core flakes (41DL148 trench E, 41DL148-5.1, 41DL148-1.1); f-h - *pieces esquillees* (41DL184-0.0, 41DL148-1.3, 41DL184-0.0); i-o - flake tools (41TR59-0.0, 41TR61-0.0, 41TR59-0.0, 41DL149-1.1, 41TR61-0.0, 41TR61-0.0, 41DL198-0.0). Note: arrow denotes striking platform and line around margin of tool indicates area of retouch or utilization.



Figure IV-4. Selected stone tool artifacts. a - large flake (41TR61-0.0); b - flake tool (41TR61-0.0); c - unifacial "duck bill" scraper (41DL149-4.2); d - limonite celt bit (41DL199-0.0); e - smoothed pebble (41DL199-7.2); f,g - flake tools (41TR61-0.) both; h - ground hematite slab (41DL149-4.2). Note: arrow denotes striking platform and line around margin of tool indicates area of retouch or utilization.



Figure IV-5. Stone tool artifacts. a - large biface (41TR61-0.0); b-f - hammerstones (41DL100-0.0, 41DL199-7.5, 41TR59-0.0, 41TR59-0.0, 41DL199-0.0).



Figure IV-6. Groundstone tools. a,c - manos (41DL148-0.0, 41DL184-0.0), b - "nutting stone" fragment (41DL198-0.0).



Figure IV 7. Metate fragments, a - 41TR59.0.0, b - 41DI199.0.0

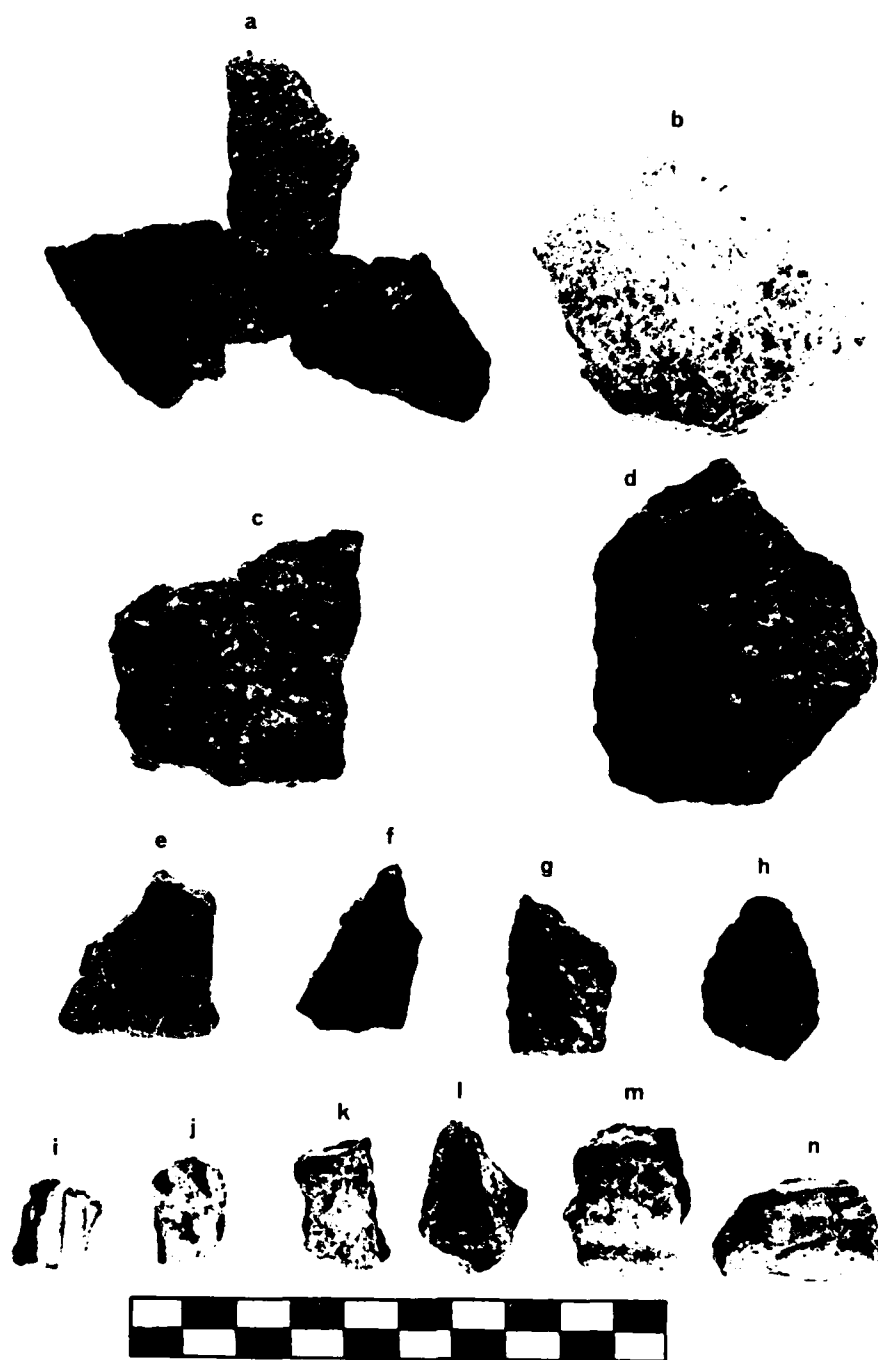


Figure IV-8. Selected ceramics from Lakeview archaeological sites. a - 41DL149, trench I; b - 41DL148, trench E; c - 41DL148-10.3; d - 41DL148-15.0; e - 41DL148, trench E; f - 41DL148, trench A; g - 41DL148-1.5; h - 41DL148 10.3; i - 41DL149-0.0; j - 41DL148-1.1; k - 41DL148-1.9; l - 41DL148-1.2; m - 41DL148-1.9; n - 41DL148, trench E.



Figure IV-9. Utilized faunal material. a - deer ulna tool (41DL148-1.9; b - mussel shell tool (hoe) or ornament (41DL148-1.2); c, d, and f - modified bone (41DL148-1.5, 41DL148-0.0, 41DL147-2.4); e - snapped bone (41DL148-1.5).

SITE 41DL147

Category	Unit 1				Unit 2				Shovel Testing
	1	2	3	4	1	2	3	4	
Chipped Lithics									
Debris									
Complete flake	1		2		2	1	1	4	1
Broken flake									3
Nondiagnostic shatter			2		2	2		2	
Tools									
Arrow Point							1		
Biface									3
Retouched flake								1	1
Fire cracked rock									2
Burned clay ³									
Bone ³									
Shell ⁴	21		18	8	1			7	
			1	1	1	1	1	1	

1 1x1 m unit

2 10 cm levels

3 Measurement in grams

4 Minimum number of bivalves based on pseudocardinal teeth

5 Includes shovel tests and backhoe trenches

SITE 41DL148

Category	Surface	Unit ¹											Unit ¹					Unit ¹		Unit ¹		Unit ¹		Unit ¹			
		1											2					3		4		5		6			
		1	2	3	4	5	6	7	8	9	10	11	1	2	3	4	5	1	2	3	1	2	3	1	2	1	2
Sherd	Decorated	1	1	1																							
Plain	Chipped Lithics	1		3	1	1																					
Debris	Complete flake																										
Broken flake	Nondiagnostic shatter	3	6	3	1	2	2	1	1	2		1	1														
Tools	Arrow Point	1																									
Dart Point	Biface																										
Pieces esquillees	Flake	2				1																					
"Orange core" flake	Pebble fragment	2	1																								
Nondiagnostic shatter	Fire cracked rock																										
Groundstone	Hammerstone	1																									
Abrading stone	Daub ³	1																									
Bone ³	Shell ⁴		1																								
		26	3	39	28	20	31	30	33	16	50	2	<1														
		1	3	3	5	5	2	2		1	1																

¹Unit 1 = 2 x 2 m, remaining units = 1 x 1 m

²10 cm levels

³Measurement in grams

⁴Minimum number of bivalves based on pseudocardinal teeth

⁵Includes shovel tests and backhoe trenches

SITE 41DL149

Category	Surface	Unit ¹ 1					Unit ¹ 2					Unit ¹ 3					Unit ¹ 4					Unit ¹ 4a				
		Levels ²					Levels ²					Levels ²					Levels ²					Levels ²				
		1	2	3			1	2	3	4	5	1	2	3			1	2	3	4	5	1	2	3	4	
Sherd																										
Decorated																										
Plain																										
Chipped Lithics																										
Debris																										
Complete flake																										
Broken flake																										
Nondiagnostic shatter																										
Tools																										
Dart Point																										
Arrow Point																										
Scraper																										
Biface																										
Retouched flake																										
Fire cracked rock																										
Hematite																										
Worked hematite																										
Daub																										
Bone																										
Shell ⁴																										

¹ = 1 x 1 m unit² = 10cm levels⁴ = Minimum number of bivalves based on pseudocardinal teeth

Continued

Category	Unit ¹				Backhoe Trench	Shovel Test 6	Shovel Test 8	Shovel Test 10	Shovel Test 11	Shovel Test 12	Shovel Test 14	Shovel Test 16	Shovel Test 18
	5 Levels ²												
	1	2	3	4									
Sherd					63 sherds/ from one vessel								
Decorated													
Plain		1											
Chipped Lithics													
Debris													
Complete flake		12	1										
Broken flake	11	22	13	3	2				1		1		
Nondiagnostic shatter			1										
Tools													
Dart Point													
Arrow Point		2											
Scraper													
Biface			1										
Retouched flake			3										
Fire cracked rock													
Hematite													
Worked hematite													
Daub							4	5	1	1	4	3	4
Bone													
Shell ⁴	3	1				1		1	2	1			1

¹ = 1 x 1 m unit² = 10cm levels³ = Measurement in grams⁴ = Minimum number of bivalves based on pseudocardinal teeth

SITE 41DL184

	Surface	Unit ¹ 1										Unit ¹ 2										Unit ¹ 3										Unit ¹ 4									
		Levels ²										Levels ²										Levels ²										Levels ²									
		1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
		1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
Chipped lithics																																									
Debris																																									
Complete flake	23																																								
Broken flake	26																																								
Nondiagnostic shatter																																									
Tools																																									
Dart Point	4																																								
Biface	1																																								
Pieces esquillees	2																																								
Flake	7																																								
Nondiagnostic shatter	1																																								
Fire cracked rock																																									
Groundstone	2																																								
Daub ³																																									
Bone ³	3																																								
Shell ⁴	11																																								

1 = 1 x 1 m units

2 = 10 cm levels

3 = Measurement in grams

4 = Minimum number of bivalves based on pseudocardinal teeth

SITE 41DL186

Category	Surface	Unit 1			Unit 3			Trench C	Trench H	Trench I
		Levels			Levels					
		1	2	3						
Chipped lithics										
Debris										
Broken flake	3		1	1	4		2			1
Tools										
Retouched flake	1				1			1		

SITE 41DL189

Category	Surface	Area B	Area C	Area D	Area E	Area F	Area H	Trench 2	Trench 4
Chipped lithics									
Debris									
Complete flake								1	3
Broken flake	2	2		1					4
Nondiagnostic shatter									2
Tools									
Dart point	4								
Retouched flake									2
Core	1								
Daub		5	6		1				
Worked bone							1		
Shell ⁴		27		1	14	2			4

¹ = 1 x 1 m unit² = 10cm levels³ = Measurement in grams⁴ = Minimum number of bivalves based on pseudocardinal teeth

SITE 41DL198

Category	Surface	Unit ¹		Unit ¹		Unit ¹		Unit ¹		Unit ¹		Unit ¹		Unit ¹	
		1		2		3		4		5		6		7	
		Levels ²	1	2	3	4	1	2	3	4	1	2	3	4	5
Chipped lithics		1	2	1	2	3	4	1	2	3	4	1	2	3	4
Debris															
Complete flake	58			1	1	1	1					1			
Broken flake					4	2	5	3		2	1			4	3
Nondiagnostic shatter					1										
Tools															
Retouched flake	8			1										1	
Pitted stone	1														
Core	1														
Hammerstone	1														
Shell ⁴	1														
Historic Artifacts															
Metal		2		1										1	
Glass		9		3											

¹ = 1 x 1 m unit² = 10cm levels³ = Measurement in grams⁴ = Minimum number of bivalves based on pseudocardinal teeth

SITE 41DL199

Category	Surface	Unit ¹						Unit ¹						Unit ¹						Unit ¹						Unit ¹					
		Levels ²						Levels ²						Levels ²						Levels ²						Levels ²					
		1	2	3	4	5	6	1	2	3	1	2	1	2	1	2	3	4	5	6	7	1	2	1	2	1	2	3	4	5	6
Chipped lithics																															
Debris																															
Complete flake	6	1	1	3		1	1	1	1	1									1												
Broken flake	41	20	23	21	3	5	6	4											5	3	2										
Nondiagnostic shatter	1	10	5	3			2			2																					
Tools																															
Dart point																															
Arrow point	3								1																						
Projectile point frag.		1							1																						
Biface	2																														
Retouched flake	14			1	1			1	1	1									1												
Fire cracked rock																															
Groundstone	1				1						1																				
Core	2																														
Hammerstone	1																														
Celt bit	1																														
Abrading stone	6																														
Shell ⁴	28	7	5	1			3	3	2		2	3		2	5	8	5	2		4		2		4		1					
Historic Artifacts																															
Metal	1						7				1	3		1																	
Glass	7						3				2	2	2	2	2											1					

- ¹ = 1 x 1 m unit
² = 10cm levels
³ = Measurement in grams
⁴ = Minimum number of bivalves based on pseudocardinal teeth

SITE 41EL29

Category	General Surface	
Chipped lithics		
Debris		
Broken flake	4	No
Tools		subsurface
Biface	1	artifacts
Retouched flake	1	

SITE 41TR1

Category	General Surface	
Chipped lithics		
Debris		
Broken flake	6	No
Tools		subsurface
Biface	1	artifacts
Shell ⁴	2	

⁴= Minimum number of bivalves based on pseudocardinal teeth

SITE 41TR58

Category	Surface	Unit ¹ 1		Unit ¹ 2			Unit ¹ 3		Unit ¹ 4		Unit ¹ 5	
		Levels ²		Levels ²			Levels ²		Levels ²		Levels ²	
		1	2	1	2	3	1	2	1	2	1	2
Chipped lithics												
Debris												
Complete flake	2											
Broken flake	7			1			2					
Tools												
Dart point	1											
Retouched flake	6											
Shell ⁴	1											
Historic artifacts												
Metal	2	1	1	1		1	1				1	
Glass	11	1	3	1	1	1	1			1	2	2

SITE 41TR59

Category	Surface	Unit ¹ 2		Unit ¹ 4		Unit ¹ 5		Unit ¹ 6	
		Levels ²		Levels ²		Levels ²		Levels ²	
		1	2	1	2	1	2	1	2
Chipped lithics									
Debris									
Complete flake	1					2			
Broken flake	7								
Tools									
Dart point	1								
Scraper	1								
Biface	1								
Retouched flake	3								
Groundstone	1								
Core	1								
Hammerstone	2								
Historic artifacts									
Metal						1			1
Glass	7			1				8	3

¹ = 1 x 1 m unit² = 10cm levels⁴ = Minimum number of bivalves based on pseudocardinal teeth

SITE 41TR60

Category	Surface	Unit ¹ 1		Unit ¹ 2		Unit ¹ 3		Unit ¹ 5	
		Levels ²		Levels ²		Levels ²		Levels ²	
		1	2	1	2	1	2	1	2
Chipped lithics									
Debris									
Complete flake	3								
Broken flake	25	1				1			
Nondiagnostic shatter	1								
Tools									
Dart point	1								
Biface	1								
Retouched flake	2								
Core	1								
Shell				1					
Historic artifacts									
Metal	1	1							
Glass	25			1		1		1	

SITE 41TR61

Category	Surface	Unit ¹ 3			Unit ¹ 7				Unit ¹ 8	
		Levels ²			Levels ²				Levels ²	
		1	2	3	1	2	3	4	1	2
Chipped lithics										
Debris										
Complete flake	10									
Broken flake	72	1			1	4	1	2	1	
Nondiagnostic shatter	5									
Tools										
Dart point	2			1						
Arrow point	1									
Projectile point fragment	2									
Notch	2									
Scraper	2									
Biface	2									
Retouched flake	13									
Axe (hoe?)	1									
Celt bit	3									

¹ = 1 x 1 m unit² = 10cm levels

Appendix V

Pollen from Feature 2 of the Cobb-Poole Site (41DL148)

Anne Woosley and L. Mark Raab

Chapter 3 of this report describes the discovery and documentations of Feature 2 of the Cobb-Pool site. Briefly, Feature 2 is described as a prehistoric (A.D. 800-1200) basin-shaped pit, approximately 7-8 m in diameter and about 140 cm deep. Additionally, smaller prehistoric pits or intrusions were excavated into the bottom of this feature to a depth of about 180 cm. Fill within Feature 2 is thought to evidence two possible occupation surfaces. Feature 2 contained a variety of prehistoric artifacts including ceramics, chipped stone, and animal bone. In Chapter 3 it is suggested that Feature 2 may represent a prehistoric habitation structure.

A variety of important questions arise from the postulation of Feature 2 as a prehistoric habitation. Although Feature 2 contains Gibson Aspect Caddoan ceramics (Chapter 3), can we be certain that Feature 2 and the ceramics are contemporaneous? If Feature 2 was a habitation, is there evidence that economic species of plants were present? If Feature 2 was a residence, and therefore part of a settlement, is there any indication of environmental factors that might have influenced the location of the settlement? These are questions to which pollen analysis might help provide answers. Accordingly, a series of soil samples was removed from Feature 2 to address these problems.

The discussion of Feature 2 in Chapter 3 describes the sampling method employed to recover sediments suitable for pollen analysis and soils chemistry (Chapter 6), the field samples having been halved for the two analyses. We might reiterate here, however, that a vertical series of samples was taken from the lowest level of Feature 2 to the present ground surface in 10 cm increments. These samples were intended to show any changes in pollen type frequency through time and also clarify various activities that might be responsible for filling the feature. A horizontal series of samples was taken in a stratigraphic zone (ca. 140 cm below the surface) that was thought to be a possible floor zone at the bottom of Feature 2 and from pits excavated into the bottom of the main feature. The horizontal series of samples was intended to reveal evidence of pollen from economic species that might be preserved on an occupation surface and within postholes or storage pits in the floor of a habitation. The locations of both sampling series are indicated in Figure 3-7 (Chapter 3). Of these samples, twenty were selected from points in the profile of Feature 2 that were believed to be most useful to the investigative questions at hand. Table V-1 presents the results from analysis of the twenty samples.

We might note here that only twenty samples were submitted for analysis because the pollen work at Lakeview was regarded

as exploratory during the Phase Two operations. It should be borne in mind that previous attempts to recover pollen from archaeological sites in North Central and East Texas have generally met with failure. Richner and Lee (1977:17-19; Raab and Woosley 1982) discuss the problem at some length, pointing out that although samples have been submitted for pollen analysis from many projects in the region, results have thus far produced no pollen data or grain counts that are so low as to preclude meaningful evaluation. Analysis was limited to twenty samples in order to minimize the expense of studies that, judging from past results, might well produce no useful results.

Richner and Lee (1977:18) suggest that failure to isolate pollen from prehistoric contexts may be due to destruction of pollen by fungi. This difficulty also may be part of a more global pattern in which the sediments of arid lands, with alkaline, highly oxidized soils, have proven particularly intractable to extraction of pollen (Woosley 1978). Pollen samples from the Lakeview Project were treated with methods developed for use on arid-lands sediments. These methods are described elsewhere by Woosley (1978).

The results of the pollen work at the Cobb-Poole site, however, are a dramatic break with the pattern of poor results obtained in the past. Pollen preservation within all samples is excellent. The smallest grain count obtained from the twenty samples was 198 (Sample 9, Table V-1) and the largest was 1204 grains (Sample 18, Table V-1). Moreover, pollen grains from the Lakeview samples showed little fragmentation or distortion.

Several conclusions are warranted by the pollen evidence from the Cobb-Poole site. First, the stratigraphic distribution of pollen Families/Genera/Species (FGS) strongly suggests that the sediments below 78 cm in Feature 2 are prehistoric. Figure V-1 displays the percentage frequencies of fifteen FGS based on the data in Table V-1. For example, Figure V-1 presents the information on *Zea* (corn) from Table V-1, i.e., *Zea* pollen represents less than 5% of the pollen extracted from Sample 25. Fifteen FGS were selected for display that illustrate crucial aspects of the data in Table V-1. The first five genera presented in Figure V-1 (*Zea*, *Gossypium*, *Cucurbita*, *Juniperus*, and *Prosopis*) constitute an association that one would expect to encounter in a surface pollen sample at the site in view of the fact that site 41DL148 is located in an agricultural field. The presence of pollen from cultigens such as corn, squash/gourd, and cotton in such a locality is predictable. Furthermore, extensive stands of mesquite and cedar (*Juniperus* sp.) in the site area are clearly represented in the surface sample. The salient aspect of the stratigraphic distribution of these genera, however, is that all but *Prosopis* are restricted to the surface control sample (Sample 25). *Prosopis* pollen is found at 78 cm level as well. It should be pointed out, too, that samples from the

stratigraphic interval between 78 cm and the surface were not submitted, owing to the restriction of sampling to twenty specimens as discussed above. It may well be that various FGS would be present in samples from the gap between Samples 12 and 25. The important point here, however, is that none of the pollens associated with the modern environment occur below 78 cm. The fact that *Prosopis* (5 grains, Table V-1) occurs at a depth as great as 78 cm suggests possible transportation downward by rodent burrowing, shrink-swell cracks in the soil, or other means. The important point, however, is that there is no evidence of contamination from the distinctively modern pollen in levels below the 78 cm level, suggesting that sediments in Feature 2 below that level are probably prehistoric and undisturbed by modern land use.

Second, the probability that the sediments below 78 cm are prehistoric is strengthened by the presence of other pollen distributions in Figure V-1. Note that both oak (*Quercus*) and grass (*Poaceae*) pollens increase below the 78 cm level. That increase is consistent with the interpretation of a savanna-like environment with an oak overstory and a grass understory on the terraces and uplands of the Trinity River and its tributaries when the native vegetation was intact (Dyksterhuis 1948).

A third and more striking pattern, however, is the distribution of the pollen of water-loving plants (*Typhaceae*, *Scirpus*, *Juncaceae*, *Nymphaeaceae*). Two of these, *Typhaceae* (cattails) and *Scirpus* (bulrush) are represented in the surface pollen sample at low frequencies. The other two hydrophytes appear only below 78 cm. The suggestion here is of an environment with more permanent water than the contemporary environment of the site.

The presence and/or relatively high frequency of pollen from water-loving plants below 78 cm, plus an increase in oak and grass pollens in the lower levels of Feature 2, reinforces the likelihood of greater effective moisture levels when the site was occupied. The increase in *Chenopodiaceae* at the expense of *Compositae* below 78 cm points in the same direction. Whether the apparent increase in effective moisture is the result of major environmental factors such as an increase in precipitation or the result of more localized phenomena such as springs or streams in the site area or transport of plants to the site for economic purposes cannot be determined on pollen data alone.

Finally, many of the plants represented by the pollen in the site are of known economic use. We might note, for instance, that some nut pollens are particularly abundant in the lower levels of Feature 2 (Table V-1, Figure V-1), including features (Chapter 3) indicated as possible storage pits. The high frequency of *Juglans* (walnut) may well represent use of this species as a food resource. The following list presents some of the economic uses of plants represented by pollen from Feature 2 (Table V-2).

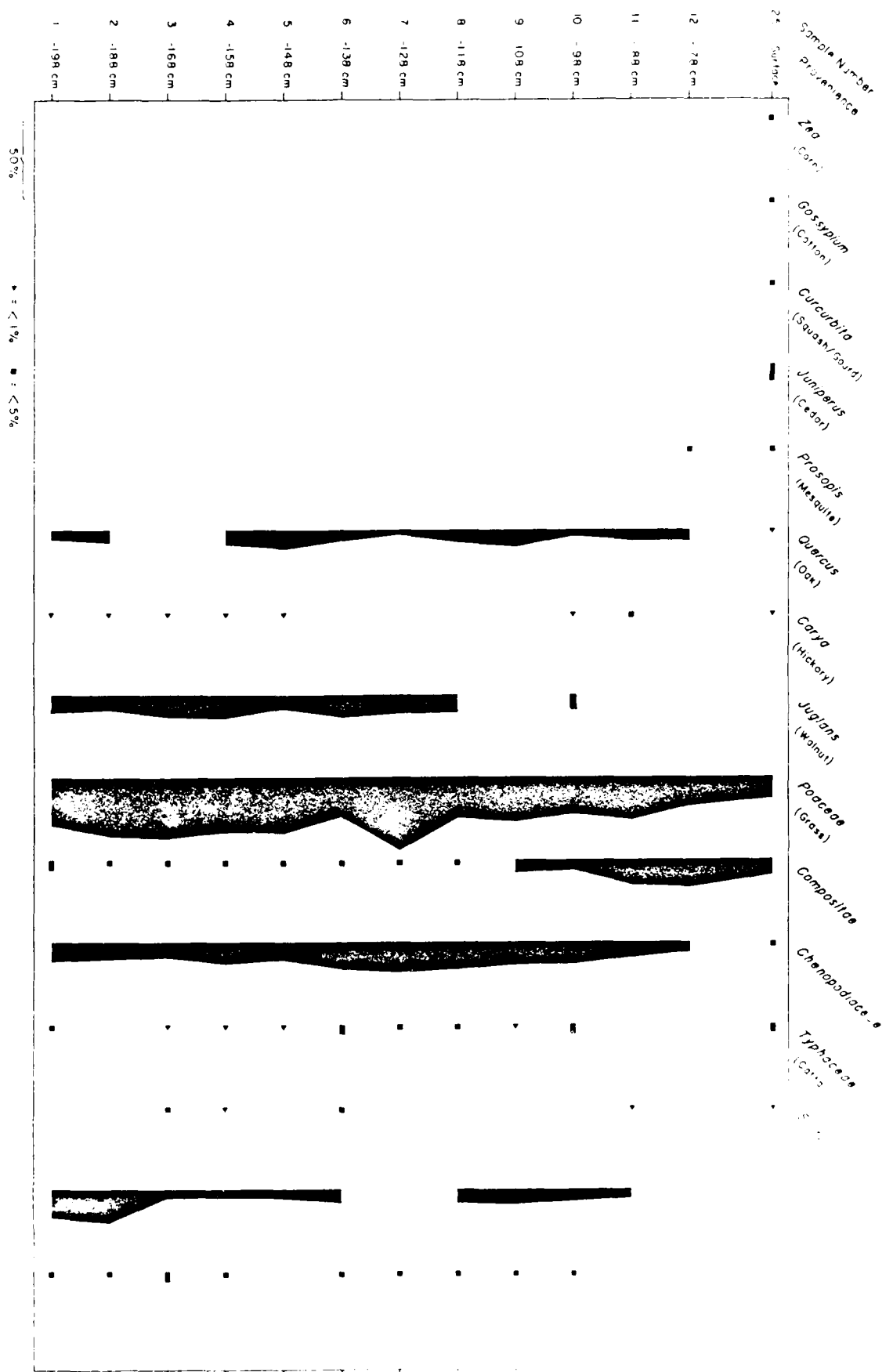


Figure V-1. Frequency diagram of selected pollens from Feature 2, Cobb-Poole Site (41DL148) by 10 cm stratigraphic levels.

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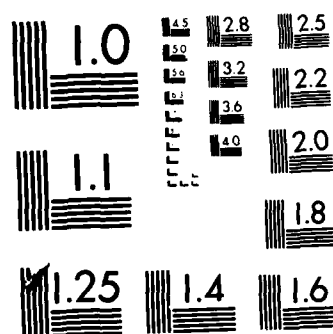
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TABLE V-2
Economic Uses of Plants Represented by Pollen from Feature 2, 41D148.

FAMILY	HABITAT	COMMENT
Anadardiacea <i>Rhus</i> (sumac)	Tropical, but a few temperate.	Common associate with woody habitats. Used for tannins and resinous properties.
Asclepiadaceae <i>Asclepias</i> - milkweed	Tropical, but a few temperate	Medicinal, emetics and purgatives. Low grade down.
Betulaceae <i>Alnus</i> - alder	Northern temperate regions.	Wood as raw material.
Brassicaceae or Cruciferae	Cosmopolitan, strong in temperate regions.	Condiments, garnishes, frequently wild plants used. Seed edible, but the glucosinolates (responsible for pungency) are toxic, especially to animals.
Cactaceae <i>Opuntia</i> - prickly pear	Perennial, xerophytic trees, shrubs, characteristic of habitats with erratic rain falls or drought periods. Survive in heavy night dews as temperatures fall.	On surface, speaks of dry conditions. Fruits eaten, though perhaps not in this context.
Caryophyllaceae	Large family, mainly temperate, herbaceous plants.	Characteristic of disturbed habitats.
Chenopodiaceae	Temperate and subtropical. Often in saline soils, e.g., alkaline prairies.	Seeds of many edible.
Asteraceae or Compositae	Cosmopolitan.	Food plants, also medicinal. Contribute to diversity of habitat thereby promoting stability of habitats. Characteristic of dry grasslands. Seeds, weeds of disturbed areas. <i>Senecio</i> is poisonous.

FAMILY	HABITAT	COMMENT
Cucurbitaceae	Cultivated.	On surface, modern crop.
Cupressacea <i>Juniperus</i>	Tree, open area.	Modern. Surface only.
Cyperaceae <i>Scirpus</i> - bulrush	Grass-like herb of wet places.	Used in construction, huts (?).
Equisetaceae	Chiefly swampy places. Spike like conifer.	Some used for polishing.
Euphorbiaceae	Tropical, some temperate. Large family, herbs, shrubs, trees.	Seeds of <i>Croton</i> a drastic purgative, may cause death.
Fagacea <i>Quercus</i> - oak	Temperate and tropical forests.	Hardwood and seeds edible.
Fabaceae or Leguminosae	Cosmopolitan.	Foods, dyes, timber. Great variety of habitats from xerophytes to aquatic to climbers.
Juglandaceae <i>Carya</i> - hickory <i>Juglans</i> - walnut	Northern temperate and subtropical small family of deciduous trees.	Edible nuts, oil, wood. Also pecans.
Juncaceae <i>Juncus</i> - rush	Cosmopolitan, mainly in cold temperate and montane regions. Wet/damp habitats.	Stems used in basketry, mats, huts.
Lamiaceae or Labiatae	Cosmopolitan.	Mostly on open ground. Surface. Function modern clearance. Some seeds edible, medicinal.
Liliaceae	Cosmopolitan.	Some bulbs eaten, <i>Allium</i> . Others for soap and many toxic.
Malvaceae <i>Gossypium</i> - cotton	Cosmopolitan, but centered in South America. Herbs, shrubs and trees.	Disturbed ground. Some wet loving. Cotton all modern, lower level mallows are something different.

FAMILY	HABITAT	COMMENT
Nymphaeaceae	Cosmopolitan in fresh water ponds, lakes and streams.	<i>Nymphaea</i> (water lilies) seeds and rhizomes are edible. Others can roast seeds. Speaks to perennial water source.
Pinaceae <i>Pinus</i> - pine <i>Larix</i> - larch	Forests.	Surface, modern perhaps some distance wind traveled.
Plantaginaceae <i>Plantago</i>	Temperate and in mountains of tropics.	Disturbed ground plant.
Poaceae or Gramineae	Cosmopolitan.	Disturbed ground. Weeds and important plants. Seeds of many edible, etc. Part of oak land.
Polygonaceae	Cosmopolitan. Most in temperate northern regions.	Edible seeds, stalks, leaves, some berries. Many moist-loving. Sorrel with forests.
Portulacaceae	Cosmopolitan, herbs and sub-shrubs. Especially represented in South Africa.	Starchy root-stalks eaten. Cultivated as pot herb.
Ranunculaceae	Temperate and cold regions of northern hemisphere. Herbs.	Some poisonous.
Rosaceae	Cosmopolitan.	Wild berries edible, e.g., <i>Rubus</i> . Also associate open areas in forest.
Rubiaceae	Tropical, but few temperate.	Madder as a dye. <i>Cephaelis</i> for drug ipecacuanha, a drastic purge.
Salicaceae <i>Salix</i> - willow <i>Populus</i> - poplar	Northern temperate trees, shrubs.	Basketry, bows. Good because <u>rapid</u> growth of plants. Colonize readily under favorable conditions.

Appendix VI

Zoological Approaches to Historical Site Analysis

Bonnie C. Yates

Faunal analysis for historic sites entails consideration of as many variables as does faunal analysis for prehistoric sites, although generally of a different nature. In common with prehistoric analysis, bone from historic sites is primarily food refuse, deposited near living quarters, dispersed by scavengers and covered by later occupational debris. In contrast, American historic faunal remains often consist predominantly of domesticated animals, and the tools, structures and processing techniques reflect cultural and technological schemes different from indigenous prehistoric cultures. To explore these differences, eight variables are considered along with possible inferences or suggestions for directions of further inquiry; furthermore, these notions are especially geared for late nineteenth and early twentieth century settler sites in Texas and Oklahoma.

SPECIES UTILIZATION

Even in Texas where cattle was king or at least an important economic entity, most pioneer homesites reveal pork as the main protein source. This is a result of many simple factors: 1) cattle produce too much meat for a nuclear family; 2) preservation of relatively moderate amounts of pork was more manageable; 3)

cattle require fresh grass and grain fodder, while hogs can subsist on a variety of feeds from free ranging on acorns to garden vegetable waste; and 4) the weight of a beef carcass for processing is generally prohibitive for one individual, whereas a hog carcass weighs less and the skin is edible. Most immigrating families brought their own hogs and chickens specifically to raise as food sources when they resettled. Their cattle were either for use as draft animals (oxen) or for milk products (cow), not for slaughter.

The herds of Longhorn cattle were considered by many to be indigenous, but the Longhorns along with sheep had been introduced by the Spanish when they had established their missions throughout the Mexican Territories in the seventeenth and eighteenth centuries. After the Civil War, sheep and cattle drovers battled fiercely over grazing rights while the fence-building farmers often helped themselves to trespassing cattle while they surreptitiously killed for food, calling the beef "slow elk" (Ferris 1967). Longhorn meat was considered tough and stringy anyway. Imported European breeds (Shorthorn and Herefords), when crossed with the Texas cattle, improved the meat. Most beef was raised on large cattle ranches and was destined as a commodity for eastern markets; it found a place on settlers' table either as veal (slaughtered easily) or in portions

divided among relatives or neighbors (meat clubs).

From settler literature, early reminiscences and oral histories, hogs are recounted as the primary species for meat well into the Depression era. This suggests that pig bones should account for the majority of faunal remains from sites of this time period. Chicken ranks second in mentioned frequency and should, therefore, be the second most frequently identified taxa. Beef, sheep, and goat remains may indicate participation in or access to activities such as those associated with the cattle industry, pastoral husbandry, or different ethnic groups.

AGE AT SLAUGHTER

Veterinary research provides aging methods for modern domestic animals based on epiphyseal fusion of long bones and tooth eruption sequence (see Brown 1949; Jowsey 1958; Peyer 1968). Zooarchaeological research has added much to the literature for aging domestic faunal remains (see Silver 1969; Cornwall 1974; Schmid 1972).

Current practice dictates slaughter of commercial species at young age, thus insuring meat tenderness. This is not new knowledge, yet selective killing based on age is routine information for the zooarchaeologist in determining deviations from this pattern at a particular site. Some animals may be selected at more than one age or routinely culled from the stock at a certain age. Chaplin reminds us that "... if meat were to be preserved. . . then the selected animals would be killed at the most favorable season" (1971:135). For Texas, this is generally in the early winter in order to avoid spoilage. However, on special occasions when much food would be quickly consumed, seasonal temperature would have little effect on age selection.

BUTCHERING PATTERNS

The most commonly requested information about butchering at historic sites related to types of meat cuts and the tools used to make them. Cuts can usually be determined by recognition of the body element and by extrapolation to an analogous modern cut from a butcher's chart. Quite often the expertise of the meat cutter, or lack of it, is readily apparent.

Butchering is a skill passed on between master and apprentice. Formal instruction is limited even on-the-job-training. Therefore, cut bone which conforms approximately with the standard cuts indicates experience in the person wielding the saw.

The type of saw used is sometimes among the recovered artifacts and may often be confused with woodworking hack saws. Moreover, the same saw may have served both functions on the farm. Handsaw marks on bones from late sites may or may not reflect home-slaughtered beef. The presence of local butchers is sometimes noted in occupation census records. Detection of power saw marks is a relative dating procedure indicating commercial meat and therefore, relatively recent

material (use of electricity).

Hog slaughtering is described often in oral histories. The usual process was to slaughter one hog in early winter (more if being shared or for a large family) and hang the carcass in a tree or from a hoist if available. The animal was dipped in a tub of boiling water to facilitate hair removal, then eviscerated with choice entrails set aside for preferred recipes (e.g., chitterlings, kidney pie, etc). Then the carcass was lowered onto a flat board where the head was removed (and saved for head cheese) and the ribs and backbone cut out. Hams and bacons and steak portions were then trimmed, and the trimmings were saved for sausage making and lard rendering. The clean skin was often boiled for hours to produce lard (which was skimmed off) and cracklings (which delighted the children).

The meat portions that were not cooked fresh were prepared for curing or canning.

CURING PROCESS

Curing recipes hardly varied. For example, the most common means was to cover the meat with plain salt (an important commodity sometimes obtained with difficulty), but one oral history recounts using a recipe developed by Texas A & M "College" (now University) that called for a little salt, red and black pepper, brown sugar and saltpeter, which was claimed to be very superior to a salt box or brine solution; "I never did lose a hog by spoiling" (Fordyce Sims, Sr., oral history, 1977).

Preservation of meat by pickling (sugar and/or salt in brine solution), dry salting and smoking were the common methods employed before refrigeration. Brine barrels and salt boxes as well as cellars and some smokehouses are artifacts associated with meat curing.

The dry curing method with salt, sugar and other spices required orderly procedures dependent upon 1) size of meat portion, 2) type of portion (bacon vs. hams) and 3) desired taste. First, the meat is allowed to cool overnight, requiring that this procedure be undertaken in cool weather. Then, the portions are rubbed with the mixture and carefully laid aside for seven days, at which time the meat is removed for a second round of rubbing and patting. A third rub is scheduled for hams seven days later. Bacon requires only 1 or 2 rubbings. The meat is then set away for curing in a cool place for about 3 days per pound for hams and 2 weeks for bacon (Henrickson 1978). This may have been done in the cellar or smokehouse depending upon ambient temperature. After the curing is completed, the hams are generally washed and placed in tight-fitting bags and hung in the smokehouse to dry overnight prior to smoking (Henrickson 1978).

Henrickson describes the modern smoking process that does not differ from the general principles employed in early days. Perhaps unknown to the farmer was the biological processes involved, but he certainly knew that meat would "sour" if curing procedures were not followed.

Evidence of animal/man hostilities is sometimes apparent as well. Bones of predators such as wolf, fox, bobcat, coyote, hawk and eagle suggest kills made while protecting livestock, as well as sport hunting or fur trading for supplemental income.

ETHNIC DIFFERENCES

Ethnic differences in meat processing, butchering, or species choice is very difficult to assess. According to an elderly German butcher of more than 50 years, "there's only one way to cut up an animal" (Joe Fischer, personal communication) and he, therefore, doubts that the bones would reveal the ethnic makeup of the butcher. Further investigation by zooarchaeologists, however, might reveal subtle patterns in butchering or preferences in age distribution or types of meat. For example, faunal remains from a French fort, a Spanish mission and a German settlement could be examined for these differences in central southern states.

TRACES OF TRANSITION TO COMMERCIAL FOODS

A combination of clues will help trace the changeover to commercially prepared food by occupants of early homesites in Texas. Occupation records and oral histories can reveal dates for the establishment of butchers, grocers, and marketers. For example, the first chronicled evidence for a professional butcher for Dallas County was from the 1870 census. A butcher was then available to the urban area providing a market of rural hog-raisers as well as a place for inhabitants of either area to obtain fresh beef on a piece basis.

On site it is difficult to determine the origin of meat from its refuse, i.e., whether it was purchased outside the site or processed at the site. Waste bones such as non-meaty elements (lower leg, crania and teeth) are used as indicators that whole animals were processed at the site (Chaplin 1971).

Of course, the presence of tin cans of various shapes and sizes indicates a definite use of foods prepared outside the site, but it is not definitive evidence that home-prepared foods did not continue at the site. Often these cans could be purchased or obtained for the purpose of home canning meats and garden stuffs. Careful attention to sequence of artifact retrieval, record search and faunal analysis is required.

CONCLUSION

Bone debris analysis gives an incomplete picture of the subsistence activities of the occupants of an historic site, but faunal analysis coupled with other information can help fill in the gaps. Historical references are replete with comments about sausage making, offal recipes, and fruit and vegetable dependence. These activities rarely leave material remains. The presence of bones or certain structures (coops, cribs, and pens) will indicate, however, the availability of raw materials (chickens, corn, and pigs, for example) useful in those activities.

The combination of heat and smoke is usually effective in reducing significantly the surface bacterial population of the product. Smoking may be accomplished by hanging the meat 6 feet from the smoldering coals of hardwood that are smothered with hardwood dust. Any hardwood will produce the desired

smoke; but hickory, apple, elm, cherry or maple are most commonly used. Softwood gives off an undesirable resinous flavor to the meat. The temperature in the smokehouse should be maintained at about 140 (60 C) and humidity at 60%. When the smoking is completed, the fire should be allowed to burn out and the meat left hung to cool.

Temperature and humidity could not be controlled by most early farmers and butchers, so the hams were generally left longer in the smokehouse.

STRUCTURES USED FOR ANIMAL PROCESSING

The existence of an outbuilding of moderate size with an abundance of charcoal is highly suggestive as functioning as a smokehouse. The size and shape of smokehouses are known to vary depending on size of resident groups, and multiple usage. For example, when interviewed for Foxfire 3, W. Shope constructed a smokehouse with a storage loft. He erected it up against a hillside where a ramp to the loft was at ground level on the hilltop. He further noted that underground chambers also served as potato or fruit cellars underneath the smokehouse. Quite contrary to the structure's name, sometimes the meat was not smoked at all, especially if it were divided into the other storage compartments. In these cases, charcoal concentrations may be entirely absent.

Sometimes the smokehouse was simply used to store the meat while being salt cured, a process lasting from 1 week to 4 months in Texas, depending on the severity of winter and earliness of spring. When the weather warmed, the meat was boiled and hung on pegs to be smoked for as long as a couple of weeks (Billie J. Loe, personal communication).

In the very early days, meat was smoked over the fire in the hearth inside the house, obviously smoking up the house as well. Afterwards, the meat was stored on pegs also on interior walls (Madden and Jones 1977).

SUPPLEMENTAL ROLE OF WILDLIFE

Bones of game animals are frequently recovered from historic sites. The proportion of game to domestic remains may indicate the success of a settler in establishing his livestock, considering the hazards of drouths, freezes, hungry Indians, rustlers, predators, and basic mismanagement. Usually, wild meat could be taken fairly close to home.

Most early settlements were located near water and trees for lumber. This meant that riparian game was usually available, i.e., deer, turkey, water fowl, beaver, rabbit, opossum, raccoon, bear and sometimes alligator. Bison or pronghorn are noted from some localities.

The location of bones and the ratios of bones to artifacts have been used to develop theories comparing proximity of structures with secondary refuse disposal. Schiffer (1972) defines secondary refuse as material discarded away from its place of use, and South (1977) asserts that the amount of bone relative to other artifacts "allows identification of an adjacent as opposed to a

peripheral secondary midden deposit." In other words, an area with a high bone to artifact ratio suggests odorous refuse discarded at a distance (peripheral) to living/working quarters, and a low bone ratio suggests disposed material near or around a structure (adjacent). Therefore, the presence of identity of a structure can be determined by the ratio of bone to artifact even when the structure no longer exists. The study is called the Brunswick Pattern of refuse disposal and was developed for analysis of intrasite relationships at eighteenth century British-American sites in North Carolina (South 1977). With appropriate modifications for nineteenth century material culture, the pattern could be useful in evaluating behavior patterns for early settlers in Texas.

FAUNAL REMAINS FROM HISTORIC SITES AT LAKEVIEW

SITE 41DL190

A total of 48 bone fragments were recovered from 7 test squares at the Anderson site. Test pits located on the house area yielded the most bone debris. Seventy-five percent of the recovered bone is burned to some degree. Whether the bone was burned in the conflagration of the house or in roasting is indiscernible. Of the total fragments, 26 are unidentifiable to species but are recognizable as large mammal remains. All are burned except one fragment. These 26 large mammal fragments are most likely domestic pig. Identifiable pig remains dominate the recovered samples with 16 elements from both adult and immature individuals. With three exceptions, the pig elements are from crania or feet implying that the recovered pieces are primarily "waste" bones or bones discarded during the butchering process. These include teeth, cranial fragments, metapodials and phalanges. Analysis of loose teeth (none were found intact) indicates an immature pig killed before reaching 2 years old. This is based on the recovery of an unerupted maxillary third molar and a permanent maxillary third premolar; if these are from the same individual, the sequence of eruptions would occur between 1 and 1.5 years of age (Schmid 1972).

The morphology of a burned adult mandibular canine tooth indicates a boar. Two other adult teeth fragments and pieces of burned enamel were also recovered.

These burned adult pig teeth were all found in the Feature (S-1/N) material some distance from the house. Burned immature pig bones were recovered from squares E6, E8, and G8, while unburned immature pig bones occurred only in square C7.

Only immature pig bones exhibit saw marks. These elements are the three exceptions mentioned above as not being cranial or podial "waste" bones. A burned radius from square E8 has had its proximal end removed by a smooth slanted cut. Irregularities in the striations suggest action of a hand saw although these have been obscured by post-depositional abrasion. A vertebral fragment representing a loin cut exhibits saw marks 1 cm behind and parallel to the cranial side of the centrum. Lastly, a cut scapular fragment representing a butt cut (probably a blade steak) exhibits striations that are uniform suggesting an

electric saw; furthermore, the cut faces of the blade are parallel to each other, i.e. the fragment has consistent thickness. The cut bones in this sample do not conclusively indicate turn-of-the-century origins; in fact, analysis of the cut marks on the scapular and vertebral fragments more strongly suggests electric saw characteristics, and therefore, gives these bones a relatively modern origin.

Evidence of non-domestic fauna suggests occasional hunting by the occupants or by their domestic dogs (if any). One element from each of the following wild animals was recovered: raccoon - (R) distal humerus fragment, jackrabbit - unburned (L) astragalus, cottontail - unburned (L) pelvic fragment, fox squirrel - unburned (R) proximal femur. All of the wild forms are hunted for sport and consumption by rural Texans today. The paucity of remains from each animal is attributable either to the small area tested or to the action of scavengers. The jackrabbit element appears worn, either by gnawing or by digestion. All of these non-domestic animal bones were recovered in the house area.

Invertebrates are represented by three different genera/species of mussel. All of these invertebrate remains were recovered in level 1 of W2 and W10 squares.

In summary, these tests indicate utilization of both domestic and wild fauna as well as aquatic invertebrates. Relative dating of the faunal remains does not support early origins. The domestic pigs in the test samples had been butchered on site, but analysis of cut marks suggests modern butchering methods. Burning of the bones may have resulted when the main structure on the site was destroyed by fire; however, the bones from the feature located some meters from the house site are also burned.

SITE 41TR45

Tests conducted at the Reitz site yielded 75 fragments of bone from both domestic and non-domestic animals. Only 16 fragments were unidentifiable, but it is evident that most of these are from moderately large mammals (cf. pig). The remaining 75% (59/75) are identifiable to some degree.

Pig and chickens are the most frequently identified domestic forms. All of the seven pig elements are from immature animals, i.e., those whose bones have unfused epiphyses, and these elements are exclusively from the feet. There is some evidence to suggest that this collection of feet elements represents "trotters" or pickled pig's feet. Most likely they are "waste" bones from young animals slaughtered at the site; however, in the absence of cranial "waste" bone, the possibility that "trotters" as a food item cannot be ignored. Two cut bones are tentatively identified as pig and are discussed below.

Chicken bones are more numerous ($n = 14$) and exhibit greater morphological diversity. Although this is a small sample and few singular elements are repeated, several individuals are suggested based on size and relative age. For example, a small left scapula from one individual is certainly not related to a very large left coracoid recovered in the same square. Even though they are not the same element, their disproportionate sizes indicates two individuals. Some of the small mature-looking bones have affinities with prairie chicken. The lesser prairie

chicken. *Tympanuchus pallidicinctus* was common to north Texas until very recent times (Jaques 1947; Blair et al. 1957; Texas Parks and Wildlife 1979). If not from prairie chicken, they may indicate the utilization of smaller domestic fowl such as guineas or bantams. In Olsen's examination of bones from Awatovi, for example, illustrations of recent domestic chicken elements reveal a wide range of sizes (Olsen 1978). The specimens from testings at the Reitz site have the characteristic roughness of immature avifauna suggesting the prevalent practice of slaughtering fowl when young and still tender.

Of five bones that exhibit saw marks, two are identified as beef remains. One is a "ring" from a right distal femur shaft indicative of a round steak cut. It shows good evidence of hand saw marks in which the sawing striations are irregular, and even though they are roughly parallel to each other, the angle of execution and amount of pressure must have varied. The bone was not turned as it was cut because the direction of the striations is the same on either cut plane; however, the thickness of bone is not consistent, being 14 mm on the lateral side and 9 mm on the medial side. A false start is suggested by a faint cut on the anterior side of the bone where the sawing began but was stopped and moved a couple of millimeters up the shaft in order to make a thicker steak. If completed, this false cut would have rendered a cut of consistent thickness. It was recovered from the surface of Square 7.

The other beef element is a clump of cancellous bone from a proximal humerus discarded from either an arm steak or a pot roast cut. The edges have been gnawed by dogs as evidenced by small circular depressions and corresponding columns of missing bone. Recovery of this bone was made in Level 1 of Square 4.

Now whether the beef was actually dispatched and butchered on the site is difficult to determine. Generally farm folk considered beef too large to process at home unless they had heavy duty equipment, proper preservation facilities, and a large family to utilize the great amount of meat generated by slaughtering beef. Without more evidence of "waste" bone on the premises, one must assume that the beef came from a local butcher or from the family's participation in a community meat club in which many families obtained portions whenever a beef was slaughtered by one of the members. This was done to use all the meat before it spoiled (Joe Fischer, personal communication).

For the same reasons (lack of "waste" bone), it is difficult to determine whether pigs were butchered on the site. The recovery of two small ovoid "rings" conform better in size with pig although the exact body parts are not discernible. One of these may be a ham steak bone from a picnic or shoulder. The other is a section of a limb bone (perhaps a femur) which plainly exhibits evidence of a hand saw. The marks are very irregular in spacing and depth; furthermore, it is possible to determine the orientation of the bone when cut because of two faint false start cuts on one side and a small tang of bone that projects from the opposite side when sawing was incomplete. The width of the saw blade is determinable from the tang as 1 mm wide. Both of these were recovered from Square 1 near the surface.

The last cut bone recovered is unidentifiable but appears to be a pelvic fragment from a medium-sized mammal and is cut

transversely across the body of the ilium. It was removed from Level 1 of Square 5.

The only other domestic animal identified is a cat. A femur from the surface of Square 5 is complete and bleached white from exposure but lacks many deep cracks indicative of long exposure. The possibility exists that it is recent and intrusive to the site.

A fulcrum or pulley-bone from a duck is the only bone recovered from Square 6. It is unlikely that this animal was a domesticate because it compares well with that of gadwall and is too small for domestic duck. This species and others of the *Anas* genus migrate and winter throughout Texas (Peterson 1960).

Other wild game represented at this site include cottontail, fox squirrel, and a nearly complete carcass of a young opossum. Elements of this animal are found in every square except 4 and 6.

An innominate recovered in Square A1, subsurface, is tentatively identified as muskrat. According to Blair (1974) and Burt (1952), Tarrant County is not in the muskrat's range although Caras (1967) shows its range extending throughout Texas except in the south central area. Hall and Kelson (1959) exclude practically all of Texas from the muskrat's range. The animal prefers marshy habitats including drainage ditches and creeks (Blair 1974). The Reitz site is less than 1/2 mile south of Walnut Creek, and it is quite possible that they were available early in the occupation of this site.

Two elements from the right side of a young gray fox were unearthed from Level 1 of Square 4. Remains of this animal could indicate the necessity of protecting a chicken yard from predators instead of the use of fox as a food item. Both elements are unburned.

The following list summarizes the domestic and non-domestic animals identified from the Reitz site excavations:

Domestic:

- pig (*Sus scrofa*)
- cow (*Bos taurus*)
- chicken (*Gallus* sp., cf. *Tympanuchus* sp.)
- cat (*Felis catus*)

Non-Domestic:

- opossum (*Didelphis virginiana*)
- gray fox (*Urocyon cinereoargenteus*)
- fox squirrel (*Sciurus* sp.)
- cf. muskrat (*Ondatra zibethicus*)
- duck (*Anas* sp.)

SITE 41TR40

The faunal remains recovered from the Lowe site are few in numbers and represent only non-domesticates. The vertebrate remains include a mandible from an adult opossum, a pelvis fragment from a cottontail rabbit, a carapace fragment from an unknown species of turtle, and two small unidentifiable fragments from a mammal larger than a dog. Two unidentifiable mussel shell fragments were recovered near the old cistern on the property.

Only four test squares yielded faunal remains: the opossum

jaw and mussel fragments were found near the house, and the turtle shell and rabbit element were recovered in the light trash area between the house and small shack.

All of these items were found subsurface in Level 1 and none is burned. The absence of identifiable domestic animals suggests subsistence based on hunting for meat protein or a late occupation utilizing prepared foods. The recovered sample is extremely small, and inferences of this type are offered with reservations.

SITE 41TR42

Three of five test squares yielded bone at the Bowman site. Square 1 under one of the north walls of the house yielded a catfish element and a small fragment from a large mammal (probably pig). The latter, is burned white indicating exposure to intense heat. Square 3 is located near the rear of the house on the west side. This square yielded the most faunal remains consisting of elements from pig, chicken, cotton rat, house cat, and one tiny mussel shell fragment. Square 5, in the trash area northwest of the house, yielded two burned large mammal fragments in the upper 5 cm of Level 3. Squares 2 and 4 in the backyard contained no bones or invertebrate shells.

The species found at this site are typical of early farm residences. The recovered pig element, an incisor, indicates that the animals were raised on the property and probably slaughtered there as well. The large mammal fragments are most likely pig also and were burned either as contents of trash or as a consequence of open fire roasting. The former possibility is more plausible.

A chicken wing bone (humerus) is from a young bird. Unfortunately one element and a few broken bird-like fragments cannot confirm whether the birds were raised for consumption on the site or purchased already dressed. Recovery of the catfish element suggests fishing as a means of supplementing subsistence or as recreational use of nearby waterways. No other fish elements were found, but recovery of mussel shell further attests to utilization of those water sources.

SITE 41DL187

All of the faunal remains from the Ballweg site tests come from Levels 1 and 2 of a small outbuilding. A total of 70 pieces of bone were recovered and 77% (54) of these are identifiable to some degree. The remaining 16 unidentifiable pieces are not restricted to one size class or one vertebrate class but are splinter fragments from bones representing all the identified fauna. Most are large and small mammal fragments, and some are unidentifiable bird. No burned bones were observed in this sample.

The domestic stock represented here includes pig and chicken,

but beef bones dominate the sample. A dense clutter of machine-sawn beef bones were unearthed from Level 1 of the south 1/2 of the test pit. These bones indicate butcher cuts such as round steak (4 bones), blade steak (1 bone), arm steak (1 bone), rump roasts (2 bones), heel of round roast (2 bones), various loin steaks (6 bones), and ribs. Vertebral epiphyseal seals are unfused indicating a young animal. Several hind leg bones appear to be from the same left femur; however, the rump roast bones are from a right innominate. Elements of the forequarters are also present. These facts suggest one complete animal, professionally butchered, and preserved for one family's use. The origin of the beef is undeterminable, it may have been raised on the premises and delivered to the meat processor or purchased outright from the butcher. The saw marks indicate modern techniques, i.e., smooth straight cuts with parallel striations.

Pig elements are limited to ribs, vertebrae and three bones from the forequarters. These also exhibit modern saw marks. The cuts represent the butt and picnic areas of pork. Without evidence of pig husbandry on the premises, it is suggested that pork was also obtained commercially.

Only two chicken bones were recovered, both wing bones from young fowl. More than likely these too were purchased food items. Remains of chickens are more abundant if raised on the premises for consumption. More extensive excavation will provide stronger inferences regarding husbandry activities at this site.

The nearly complete remains of one cottontail rabbit and one adult opossum comprise the wild fauna. A single bone from a neonatal opossum was also recovered. From the amount of commercially prepared meat remains and the evidence of carnivore gnawing on those remains, it is suggested that the wild game was appropriated and dispatched by non-human predators (i.e., dogs, coyotes, or cats), although pleasure/sport hunting (without consumption) and natural death cannot entirely be ruled out.

Incidental fauna include remains of black rat, small frog (*Bufo* sp. 2 individuals) and a single toe bone from a dog.

The following list summarizes the domestic and non-domestic animal remains from the Ballweg site testing operation.

Domestic:

- pig (*Sus scrofa*)
- beef (*Bos taurus*)
- chicken (*Gallus* sp.)
- dog (*Canis* sp.)

Non-Domestic

- opossum (*Didelphis virginiana*)
- cottontail (*Sylvilagus floridanus*)
- black rat (*Rattus rattus*)
- frog (*Bufo* sp.)

Bibliography

- Ahler, S. A.
1973 Chemical Analysis of Deposits at Rodgers Shelter, Missouri. *Plains Anthropologist* 18:116-131.
- Arrhenius, O.
1931 Dis Bodenanalyse im Dienst der Archäologie. *Zeitschrift für Pflanzenernährung, Düngung und Bodenkunde*. Teil B 10:427-439.
- Arrhenius, O.
1934 Fosfathalten i Skanska Jordar. *Sveriges Geologiska Undersökning*, Ser. C, No. 383, Arsbok 28, No. 3.
- Arrhenius, O.
1935 Markundersökning och Akeologie. *Fornävn* 30:565-576.
- Arrhenius, O.
1954 Chemical Denudation in Sweden. *Tellus* 6(4):326-341.
- Arrhenius, O.
1963 Investigations of Soil from Old Indian Sites. *Ethnos* 28, (2). Stockholm.
- Asch, N. B., D. L. Asch, and R. I. Ford
1972 Paleoethnobotany at the Koster Site: The Archaic Horizons. *Illinois Valley Archeological Program, Research Paper* 6.
- Bailey, V.
1971 *Mammals of the Southwestern United States*. Dover, New York.
- Barber, Edwin Atlee
1904 *Marks of American Potters*.
- Beardsley, R. K., P. Holden, A. D. Krieger, B. J. Meggers, J. B. Rinaldo, and P. Kutschie
1956 Functional and Evolutionary Implications of Community Patterning. In *Seminars in Archaeology*, edited by R. Wauchop. Society for American Archaeology, Memoir 11.
- Bennett, J. W.
1976 Anticipation, Adaption, and the Concept of Culture in Anthropology. *Science* 192(42):847-853.
- Binford, L. R.
1964 A Consideration of Archaeological Research Design. *American Antiquity* 29:425-441.

- Binford, L. R.
1973 Interassemblage Variability—The Mousterian and the "Functional" Argument. In *The Explanation of Culture Change: Models in Prehistory*, edited by C. Renfrew. Duckworth, London.
- Binford, L. R.
1977 *For Theory Building in Archaeology*. Academic Press, New York.
- Binford, L. R.
1978a Dimensional Analysis of Behavior and Site Structure: Learning from an Eskimo Hunting Stand. *American Antiquity* 43:330-361.
- Binford, L. R.
1978b *Nunamiut Ethnoarchaeology*. Academic Press, New York.
- Binford, L. R.
1980 Willow Smoke and Dogs' Tails: Hunter-Gatherer Settlement Systems and Archaeological Site Formation. *American Antiquity* 45(1):4-20.
- Binford, L. R., and J. B. Bertram
1977 Bone Frequencies and Attritional Processes. In *For Theory Building in Archaeology*, edited by L. R. Binford. Academic Press, New York.
- Binford, L. R., and S. R. Binford
1966 A Preliminary Analysis of Functional Variability in the Mousterian and Levallois Industries. In *Recent Studies in Paleo-Anthropology*, edited by J. D. Clark and F. C. Howell. *American Anthropologist* 68(2).
- Black, C. A.
1960 *Soil-Plant Relationships*. Wiley and Sons, New York.
- Blair, W. R., A. P. Blair, P. Brodkorb, F. R. Cagle and G. A. Moore
1957 *Vertebrates of the United States*. McGraw-Hill Book Co., New York.
- Blalock, C. A.
1960 *Social Statistics*. McGraw-Hill, New York.
- Boehm, C.
1978 Rational Preselection from *Hamadryas* to *Homo Sapiens*: The Place of Decisions in Adaptive Process. *American Anthropologist* 80(2):265-296.
- Bohannon, C. F.
1973 Excavations at the Mineral Springs Site, Howard County, Arkansas. *Arkansas Archeological Survey, Research Series No. 5*.
- Brown, G. T.
1949 *Dentition as Indicative of the Age of Animals of the Farm*. 9th Edition. John Murray, London.
- Bruseh, J. E., and T. K. Perttula
1981 Subsistence and Settlement Patterns at Lake Fork Reservoir. *Archaeology Research Program, Southern Methodist University*.
- Bruseh, J. E., and L. M. Raab
1979 *Proposal for Lakeview Phase II Archaeological Work*. Proposal Submitted to the U. S. Corp of Engineers, Fort Worth.
- Bryant, V. M.
1969 *Late Full-Glacial and Postglacial Pollen Analysis of Texas Sediments*. Ph.D. Dissertation, the University of Texas at Austin.
- Bryant, V., and H. J. Shafer
1977 The Late Quaternary Paleo-environment of Texas: A Model for the Archeologist. *Bulletin of the Texas Archeological Society* 48:1-25.
- Buehrer, F. E.
1950 Chemical Study of the Material from Several Horizons of the Ventana Cave Profile. In *The Stratigraphy and Archaeology of Ventana Cave, Arizona*, by E. W. Haury, pp. 549-563, University of Arizona Press, Tucson.
- Burgess, R. J., and K. L. Kvamme
1978 A New Technique for the Measurement of Artifact Angles. *American Antiquity* 43(3):482-486.
- Burt, W. H.
1964 *A Field Guide to the Mammals*. Houghton Mifflin, Boston.
- Burt, W. H.
1952 *A Field Guide to the Mammals*. Houghton Mifflin Co., Boston.
- Byrd, C. L.
1971 Origin and History of the Uvalde Gravels of Central Texas. *Baylor Geological Studies, Baylor University, Bulletin* 20.
- Caras, R. A.
1967 *North American Mammals*. Meredith Press, New York.
- Chandler, S. M., and J. A. Ware
1976 The Identification of Technological Variability through Experimental Replication and Empirical Multivariate Analysis. *Newsletter of Lithic Technology* 5:24-25.
- Chaplin, R. E.
1971 *The Study of Animal Bones from Archaeological Sites*. William Claus and Sons, Ltd., London.
- Christensen, W.
1935 *Jordens Forforsyrsindhold som Indikator for Tidligere Kultur og Bebyggelse: En Studie af Ermitageslettens Historie*. Copenhagen: I Kommission Hos C. A. Reitzels Forlag.

- Cleland, C. E.
1966 The Prehistoric Animal Ecology and Ethnozoology of the Upper Great Lakes Region. *University of Michigan. Anthropological Papers of the Museum of Anthropology* 29. Ann Arbor.
- Cochran, J. H.
1928 *Dallas County—A Record of its Pioneers and Progress*. Arthur S. Mathis Service Publishing, Dallas.
- Coffee, D. R., and R. H. Hill
1974 *Soil Survey of Grand Prairie, Texas*. U. S. Department of Agriculture, Soil Conservation Service.
- Collins, M. B.
1975 Sources of Bias in Processual Data: An Appraisal. In *Sampling of Archaeology*, edited by J. W. Mueller. University of Arizona Press, Tucson.
- Comp, T. A., and D. Jackson
1977 Bridge Truss Types: A Guide to Dating and Identifying. *History News* 32(5).
- Connors, S. V.
1959 *The Peters Colony of Texas, A History and Biographical Sketches of the Early Settlers*. The Texas State Historical Association, Austin.
- Cook, S. F., and R. F. Heizer
1962 Chemical Analysis of the Hotchkiss Site (CCO-138). *University of California Archaeological Survey, Report 57(1)*: 1-25.
- Cook, S. F., and R. F. Heizer
1965 *Studies on the Chemical Analysis of Archaeological Sites*. *University of California, Publications in Anthropology*, 2. University of California Press, Berkeley.
- Cordell, L. S., and F. T. Plog
1979 Escaping the Confines of Normative Thought: A Reevaluation of Puebloan Prehistory. *American Antiquity* 44(3): 405-429.
- Corent, R.
1975 *A Field Guide to Reptiles and Amphibians of Eastern and Central North America*. Houghton Mifflin, Boston.
- Cornwall, I. W.
1956 *Bones for the Archaeologist*. Phoenix House, London.
- Crook, W. W., Jr., and R. K. Harris
1952 Trinity Aspect of the Archaic Horizon: Carrollton and Elam Foci. *Bulletin of the Texas Archeological Society* 23: 7-38.
- Crook, W. W., Jr., and R. K. Harris
1957 Hearths and Artifacts of Early Man near Lewisville, Texas, and Associated Faunal Material. *Bulletin of the Texas Archaeological Society* 29: 9-97.
- Crouch, Daniel J.
1978 *Archaeological Investigations of the Kiowa and Comanche Indian Agency Commissaries: 34-CM-232*. Museum of the Great Plains, Lawton.
- Cruxent, J. M.
1961 Phosphorus Content of the Texas Street Hearths. *American Antiquity* 28: 90-91.
- Dallas County Soils Book
1922 *Dallas County Soils Book: Advance Sheets*. Washington D.C.: U. S. Bureau of Soils.
- Dauncey, K. D. M.
1952 Phosphate Content of Soils in Archaeological Sites. *Advancement of Science* 9: 33-36.
- Dauncey, K. D. M.
1952 Phosphate Content of Soils in Archaeological Sites. *Advancement of Science* 9: 33-36.
- Davidson, D. A.
1973 Particle Size and Phosphate Analysis-Evidence for the Evolution of a Tell. *Archaeometry* 15: 143-152.
- Davis, W. B.
1974 *The Mammals of Texas*. Texas Parks and Wildlife Department Bulletin 41.
- Dawson, C., and T. Sullivan
1973 Excavations at Lake Lavon: 1969. *Southern Methodist University, Archaeology Research Program, Research Report No. 25*.
- Deetz, J.
1967 *Invitation to Archaeology*. Natural History Press, Garden City, New York.
- Deetz, J., and E. Dethlefsen
1963 Soil pH as a Tool in Archaeological Site Interpretation. *American Antiquity* 29(2): 242-243.
- Dietz, E. F.
1957 Phosphorus Accumulation in Soil of an Indian Habitation Site. *American Antiquity* 22(4): 405-409.
- Dillehay, T. D.
1974 Late Quaternary Bison Population Changes on the Southern Plains. *Plains Anthropologist* 19: 180-196.
- Dixon, K. A.
1977 Applications of Archaeological Resources: Broadening the Basis of Significance. In *Conservation Archaeology: A Guide for Cultural Resource Management Studies*, edited by M. B. Schiffer and G. J. Gumerman, pp. 277-290. Academic Press, New York.
- Dixon, W. J., and F. J. Massey
1969 *Introduction to Statistical Analysis*. McGraw-Hill, New York.

- Doelle, W. H.
1977 A Multiple Survey Strategy for Cultural Resource Studies. In *Conservation Archaeology: A Guide for Cultural Resource Management Studies*, edited by M. B. Schiffer and G. J. Gumerman. Academic Press, New York.
- Donaldson, B. R.
1975 An Archeological Sample of the White Mountain Planning Unit, Apache-Sitgreaves National Forest, Arizona. *U. S. Department of Agriculture, Forest Service, Southwestern Region, Archeological Report No. 6*.
- Driver, H. E., and W. C. Massey
1957 *Comparative Studies of North American Indians*. Transactions of the American Philosophical Society 47(2).
- Dumond, D. E.
1977 Science in Archaeology: The Saints Go Marching In. *American Antiquity* 42(3):330-347.
- Dunnell, R. C.
1971 *Systematics in Prehistory*. Free Press, New York.
- Dunnell, R. C.
1978 Style and Function: A Fundamental Dichotomy. *American Antiquity* 43(2):192-202.
- Dyksterhuis, E. J.
1948 The Vegetation of the Western Cross Timbers. *Ecological Monographs* 18(3):325-376.
- Eddy, F. W., and H. E. Dregne
1964 Soil Tests on Alluvial and Archeological Deposits, Navajo Reservoir District. *El Palacio* 71(4):5-21.
- Eidt, R. C.
1973 A Rapid Chemical Field Test for Archeological Site Surveying. *American Antiquity* 38(2):206-210.
- Eidt, R. C.
1977 Detection and Examination of Anthrosols by Phosphate Analysis. *Science* 197(4311):1327-1333.
- Etherington, J. R.
1975 *Environment and Plant Ecology*. Wiley and Sons, Great Britain.
- Fernald, M. L., and A. C. Kinsey
1943 *Edible Wild Plants of Eastern North America*. Idlewild Press, New York.
- Ferring, C. R., and N. Reese
1980 Archeological Investigations at Four Historical Sites within the Lakeview Reservoir Area, Dallas County, Texas. Draft Report Submitted to the Army Corps of Engineers, Ft. Worth District.
- Ferris, R. G. (editor)
1967 *Prospector, Cowhand, and Sodbuster*. The National Survey of Historic Sites and Buildings XI. U. S. Dept. of the Interior, National Park Service, Washington, D.C.
- Findley, J. S., A. H. Harris, and C. Jones
1975 *Mammals of New Mexico*. University of New Mexico Press, Albuquerque.
- Fish, P. R.
1978 Salvaging the Survey: A Case Study in Georgia. *Mid-Continental Journal of Archaeology* 3(2):333-351.
- Fish, C. K., P. R. Fish, and R. W. Jefferies
1978 An Examination of Interfluvial Settlement in the Georgia Southern Piedmont. *University of Georgia Laboratory of Archaeology Series, Report No. 15*.
- Flannery, K. V.
1976 Empirical Determination of Site Catchment in Oaxaca and Tehuacan. In *The Early Mesoamerican Village*, edited by K. V. Flannery, pp. 103-107. Academic Press, New York.
- Fontana, B. L., and J. C. Greenleaf
1962 Johnny Ward's Ranch. *The Kiva* 28(2).
- Foxfire 3
1967 Anchor Press/Doubleday, New York.
- Fried, M. H.
1967 *The Evolution of Political Society*. Random House, New York.
- Frison, G. C.
1977 *Prehistoric Hunters of the High Plains*. Academic Press, New York.
- Gallagher, J. G.
1978 Review of: An Evaluation of Archeological Resources at Aquilla Lake. In *An Evaluation of Archeological Resources at Aquilla Lake*, by S. A. Skinner, C. Shaw, K. Huckabay, and M. L. Bartsch, Appendix 5, pp. 296-300. *Southern Methodist University, Archaeology Research Program, Research Report No. 117*.
- Gearing, F.
1958 The Structural Poses of 18th Century Cherokee Villages. *American Anthropological Society Memoir* 93.
- Geertz, C.
1969 Two Types of Ecosystems. In *Environment and Cultural Behavior*, edited by A. P. Vayda. Natural History Press, New York.
- General Soil Map
1978 *General Soil Map of Dallas County, Texas*. U. S. Department of Agriculture, Soil Conservation Service.

- Goodrum, P. D., V. H. Reid, and C. E. ...
1971 Acorn Yields, Characteristics and Management Criteria of Oaks for Wild Life. *Journal of Wildlife Management* 35:520-527.
- Goodyear, A. C.
1974 The Brand Site, a Techno-Functional Study of a Dalton Site in Northeast Arkansas. *Arkansas Archeological Survey Research Series* 7.
- Goodyear, A. C.
1980 *A Hypothesis for the Use of Cryptocrystalline Raw Materials among Paleo-Indian Groups of North America*. Paper Presented at the 36th Annual Meeting of the Southeastern Archeological Conference, Atlanta.
- Goodyear, A. C., L. M. Raab, and T. C. Klinger
1978 The Status of Archaeological Research Design in Cultural Resource Management. *American Antiquity* 43(2):159-173.
- Gould, R. A.
1974 Ethno-Archeology, or Where Do Models Come From? (A Closer Look at Australian Aboriginal Lithic Technology). Paper presented at the Meeting of the Australian Institute of Aboriginal Studies, Canberra.
- Gould, R. A.
1978 The Anthropology of Human Residues. *American Anthropologist* 80:815-835.
- Gould, R. A.
1980 *Living Archaeology*. Cambridge University Press.
- Green, J. R.
1977 Tenant Farmer Discontent and Socialist Protest in Texas 1901-1917. *Southwestern Historical Quarterly* LXXXI(2):133-154.
- Gunn, J.
1979 Global Climate and Texas Moisture. In *The Impact of Climatic Change*, edited by J. Gunn et al. Center for Archaeological Research, University of Texas at San Antonio.
- Hall, E. R., and K. R. Kelson
1959 *The Mammals of North America*. Ronald Press, New York.
- Henrickson, R. L.
1978 *Meat, Poultry and Seafood Technology*. Prentice-Hall, Inc., Englewood Cliffs, New Jersey.
- Henry, D. O., C. V. Haynes, and B. Bradley
1976 Quantitative Variations in Flake Stone Debitage. *Plains Anthropologist* 21:57-61.
- Hill, L. B.
1909 *A History of Greater Dallas and Vicinity* 11.
- Hilliard, J. E.
1979 Nutritional Differences and Human Selection of Oak Acorns. Paper Presented at the Arkansas Academy of Science Meetings.
- Hole, F., K. V. Flannery, and J. A. Neely
1969 Prehistory and Human Ecology of the Deh Luran Plain: An Early Village Sequence from Khuzistan, Iran. *University of Michigan, Memoirs of the Museum of Anthropology* No. 1.
- House, J. H., and D. L. Ballenger
1976 An Archaeological Survey of the Interstate 77 Route in the South Carolina Piedmont. *Institute of Archeology and Anthropology, University of South Carolina, Manuscript Series* 104.
- House, J. H., and R. W. Wogaman
1978 Windy Ridge: A Prehistoric Site in the Inter-Riverine Piedmont in South Carolina. *Occasional Papers of the Institute of Archeology and Anthropology University of South Carolina Anthropological Studies* No. 3.
- Hughes, J. T., and P. Willey
1978 Archeology at MacKenzie Reservoir. *Texas Historical Commission, Archeological Survey Report* 24.
- Jaques, H. E.
1947 *How to Know the Land Birds*. William C. Brown Co., Dubuque.
- Jochim, M. A.
1976 *Hunter-Gatherer Subsistence and Settlement: A Predictive Model*. Academic Press, New York.
- Jones, R. A.
1973 Blue Catfish. In *McClaine's New Standard Fishing Encyclopedia*, edited by A. J. McClaine, pp. 144-145. Holt, Rinehart, and Winston, New York.
- Jordan, T. G.
1978 *Texas Log Buildings: A Folk Architecture*. University of Texas Press, Austin.
- Jowsey, J.
1958 Age and Species Differences in Bone. *Cornell Veterinarian* 58:74-94.
- Keller, J. E.
1974 The Subsistence Paleoecology of the Middle Neches Region of Eastern Texas. Ph.D. Dissertation: University of Texas, Austin.
- King, T. E., P. P. Hickman, and C. Berg
1977 *Anthropology in Historic Preservation: Caring for Culture's Clutter*. Academic Press, New York.
- Krieger, A. D.
1940 Chemical Alteration of Archaeological Remains. *Society of American Archaeology Memoirs* 5:126-136.

- Krieger, A. D.
1946 *Culture Complexes and Chronology in Northern Texas*. University of Texas Publication 4640.
- Kuchler, A. W.
1969 *Potential Natural Vegetation of the Conterminous United States*. American Geographical Society, Special Publication 36.
- Larson, L. H., Jr.
1972 Functional Considerations of Warfare in the Southeast during the Mississippi Period. *American Antiquity* 37:383-392.
- Laville, H.
1976 Deposits in Calcareous Rock Shelters: Analytical Methods and Climatic Interpretation. In *Geoarchaeology: Earth Science and the Past*, edited by D. A. Davidson and M. L. Shackley. Westview Pub, England.
- Lee, R. B.
1968 What Hunters Do for a Living, or, How to Make Out on Scarce Resources. In *Man the Hunter*, edited by R. B. Lee and I. DeVore. Aldine, Chicago.
- Lewis, M.
1895 *History of Texas Together with a Biographical History of Tarrant and Parker Counties*, Lewis, Chicago.
- Lewis, K. E.
1977 Sampling the Archaeological Frontier: Regional Models and Component Analysis. In *Research Strategies in Historical Archaeology*, edited by Stanley South, pp. 151-196. Academic Press, New York.
- Lorch, W.
1939 *Methodische Untersuchungen zue Wustungsforschung*. Arbeiten zur Landes und Volksforschung, Band 4. Anstalt für geschichtliche Landeskunde aus der Friedrich Schiller Universität, Jena.
- Lowery, G. H.
1974 *The Mammals of Louisiana and Its Adjacent Waters*. Louisiana State University Press, Baton Rouge.
- Lutz, H. J.
1951 The Concentration of Certain Chemical Elements in the Soils of Alaskan Archaeological Sites. *American Journal of Science* 249: 925-928.
- Lynott, M. J.
1975 Archaeological Excavations at Lake Lavon: 1974. *Southern Methodist University, Contributions in Anthropology No. 16*.
- Lynott, M. J.
1977 A Regional Model for Archaeological Research in North Central Texas. Ph.D. Dissertation, Southern Methodist University.
- Lynott, M. J.
1979 Prehistoric Bison Populations of North Central Texas. *Bulletin of the Texas Archaeological Society* 50:89-102.
- Lynott, M. J., and D. E. Peter
1977 1975 Archaeological Investigations at Aquilla Lake, Texas. *Southern Methodist University, Archaeology Research Program, Research Report No. 100*.
- MacDonald, G. F.
1968 Debert: A Paleo-Indian Site in Central Nova Scotia. *National Museum of Canada, Anthropological Papers No. 16*.
- Madden, R. R., and T. R. Jones
1977 *Mountain Home*. U. S. Dept. of the Interior, National Park Service, Washington, D.C.
- Mahler, W. F.
1972 Botanical Literature Survey of the Trinity River. In *Environmental and Cultural Resources within the Trinity River Basin*. Assembled by J. V. Sciscenti, pp. 58-130, *Southern Methodist University, Archaeology Research Program, Research Report*.
- Mallouf, R. J.
1976 Archeological Investigations at Proposed Big Pine Lake, 1974-1975, Lamar and Red River Counties, Texas. *Texas Historical Commission, Archeological Survey Report No. 18*.
- Mallouf, R. J.
1978 Review of: An Evaluation of Archaeological Resources at Aquilla Lake. By S. A. Skinner, C. Shaw, K. Huckabay, and M. L. Bartsch. Appendix 5, pp. 301-303. *Southern Methodist University, Archaeology Research Program, Research Report No. 117*.
- Mallouf, R. J., and B. J. Baskin
1976 Archeological Surveys in the Tehuacana Creek Watershed, Hill and McLennan Counties, Texas. *Texas Historical Commission, Archeological Survey Report 19*.
- Marquardt, W. H.
1976 Excavation and Recovery of Biological Remains from Two Archaic Shell Middens in Western Kentucky. Paper presented at the Southeastern Archaeology Conference, Tuscalusa, Alabama.
- Martin, A. D., H. S. Zim, and A. L. Nelson
1951 *American Wildlife and Plants*. Dover, New York.
- McBryde, J. B.
1933 The Vegetation and Habitat Factors of the Carrizo Sands. *Ecological Monographs* 3:247-297.
- McCormick, O. F.
1976 *An Archeological Reconnaissance of Fivemile Creek Flood Plain, Dallas County, Texas*. North Texas State University, Institute of Applied Sciences.

- McElhaney, J.
1979 From Missouri to Texas in 1845: Martin Austin Gaudins Journal. *The Southwestern Historical Quarterly*, 83(2):151-166, Texas State Historical Association, Austin, Texas.
- McGimsey, C. R., III, and H. A. Davis
1977 The Management of Archeological Resources: The Airlie House Report. Special publication of the Society for American Archaeology.
- McKearin, G. and H. McKearin
1941 American Glass. Crown Publishers, New York.
- McMillen, W.
1951 *Statistical Methods for Social Workers*. University of Chicago Press, Chicago.
- McMillan, R. B., and W. E. Klippel
1981 Post-Glacial Environmental Change and Hunting-Gathering Societies of the Southern Prairie Peninsula. *Journal of Archaeological Science* 8:215-245.
- Moore, G. M. (editor)
1965 *Poisonous Snakes of the World*. U. S. Government Printing Office, Washington, D. C.
- Muto, G. R.
1971 A Technological Analysis of the Early Stages in the Manufacture of Lithic Artifacts. M. A. Thesis, Idaho State University.
- Newcomer, M. H.
1971 Some Quantitative Experimentation in Handaxe Manufacture. *World Archaeology* 3:85-93.
- Newman, T. S.
1970 A Dating Key for Post-Eighteenth Century Bottles. *Historical Archaeology* IV:70-75.
- Olsen, S. J.
1960 *Post-cranial Skeletal Characters of Bison and Bos*. Papers of the Peabody Museum of Archaeology and Ethnology 35(3)
- Olson, S. J., and R. P. Wheeler
1978 Bones from Awatovi. *Papers of the Peabody Museum of Archaeology and Ethnology* 70(1 and 2).
- O'Neil, D. H.
1972 pH as an Aid in Interpreting Sequence of Midden Stratification. *UCLA Archaeological Survey, Annual Report* 14:107-119.
- Otto, J. S., Jr.
1977 Artifacts and Status Differences—A Comparison of Ceramics from Planter, Overseer, and Slave Sites on an Antebellum Plantation. In *Research Strategies in Historical Archaeology*, edited by Stanley South, pp. 91-118. Academic Press, New York.
- Peebles, C. S.
1978 The Determinants of Settlement Size and Location in the Moundville Phase. In *Mississippian Settlement Patterns*, edited by B. Smith. Academic Press, New York.
- Peterson, R. T.
1960 *A Field Guide to the Birds of Texas*. Houghton-Mifflin Co., Boston.
- Peyer, B.
1968 *Comparative Odontology*. University of Chicago Press, Chicago.
- Pheasant, D.
1975 A Preliminary Proposal: A Study of Soil Profile Development, Weathering of Minerals, and Clay Mineralogy of the Sandy and Loamy Textured Soils of the Trinity River Floodplain and Terraces in Dallas County. Report on file, Archaeology Research Program, Southern Methodist University, Dallas.
- Plog, F. T.
1974 *The Study of Prehistoric Change*. Academic Press, New York.
- Plog, F. T., M. Weide, and M. Stewart
1977 Research Design in the SUNY-Binghamton Contract Program. In *Conservation Archaeology: A Guide for Cultural Resource Management Studies*, edited by M. B. Schiffer and G. J. Gumerman, New York: Academic Press.
- Prewitt, E. R.
1981 Cultural Chronology in Central Texas. *Bulletin of the Texas Archaeological Society* 52:65-89.
- Proudfoot, B.
1976 The Analysis and Interpretation of Soil Phosphorus in Archaeological Contexts. In *Geoarchaeology: Earth Sciences and the Past*, edited by D. A. Davidson and M. L. Shackley. Westview Pub, England.
- Provan, D. M. J.
1971 Soil Phosphate Analysis as a Tool in Archaeology. *Norwegian Archaeological Reviews* 4:37-50.
- Raab, L. M.
1977 The Santa Rosa Wash Project: Notes on Archaeological Research Design under Contract. In *Conservation Archaeology: A Guide For Cultural Resource Management Studies*, edited by M. B. Schiffer and G. J. Gumerman, pp. 167-182. Academic Press, New Yorks.
- Raab, L. M.
1982 Mesquite (*Prosopis*) Pollen as an Archaeological Indicator of Recent Environments. Manuscript on File, Archaeology Research Program, Southern Methodist University.

- Raab, L. M., J. E. Bruseth, and A. J. McIntyre
1980 Archaeological Testing at Lakeview Lake, 1979: Human Use of the Land. Draft Report Submitted to the U. S. Army Corps of Engineers, Fort Worth District by the Archaeology Research Program, Southern Methodist University.
- Raab, L. M., R. F. Cande, and D. W. Stahle
1979 Debitage Graphs and Archaic Settlement Patterns in the Arkansas Ozarks. *Mid-Continental Journal of Archaeology* 4(2):167-182.
- Raab, L. M., and T. C. Klinger
1977 A Critical Appraisal of "Significance" In Contract Archaeology. *American Antiquity* 42:629-634.
- Raab, L. M., D. McGregor, and J. E. Bruseth
1982 New Pollen and Geological Data on the Paleoenvironment of the Southern Plains Margin: First Season Results (1980-1981) of the Richland Creek Archaeological Project. In *Settlement of the Prairie Margin: Archaeology of the Richland Creek Reservoir, Navarro and Freestone Counties, Texas, 1980-1981, A Research Synopsis*, edited by the Archaeology Research Program, pp. 99-110. *Archaeology Research Program, Southern Methodist University, Archaeological Monographs No. 1.*
- Raab, L. M., and A. I. Woosley
1982 A Terrace Habitat and Late Prehistoric Settlement in North Central Texas: Pollen and Geological Evidence. *Plains Anthropologist*.
- Raspel, C. A.
1979 A Production Stage Analysis of Lithic Artifacts From the Lightline Lake Site, Leflore County, Mississippi. Paper Presented at the 36th Annual Meeting of the Southeastern Archaeological Society, Atlanta.
- Raun, G. G.
1965 *A Field Guide to Texas Snakes*. Texas Memorial Museum, Notes 9.
- Rechenthin, C. A., and H. N. Smith
1967 Grassland Restoration, Effects on Water Yield and Supply, Part V. U. S. Department of Agriculture, Soil Conservation Service, Temple, Texas.
- Richner, J. J., and R. Lee
1977 Archaeological and Historical Survey at Tennessee Colony Lake, 1975. *Southern Methodist University, Archaeology Research Program Research Report No. 104.*
- Richner, J. J., and J. Bagot
1978 A Reconnaissance Survey of the Trinity River Basin. *Southern Methodist University, Archaeology Research Program, Research Report No. 113.*
- Rue, L. R.
1978 *The Deer of North America*. Crown, New York.
- Schiffer, M. B.
1972 Archaeological Context and Systematic Context. *American Antiquity* 37:156-165.
- Schiffer, M. B.
1976 *Behavioral Archeology*. Academic Press, New York.
- Schmid, E.
1972 *Atlas of Animal Bones*. Elsevier Publishing Co., Amsterdam.
- Schnell, I.
1932 Strandlinjbestamningar och Markanalys. *Fornvannen* 40-47.
- Schulz, E. D.
1928 *Texas Wild Flowers*. Laidlow Brothers, New York.
- Schwarz, G. T.
1967 A Simplified Chemical Test for Archaeological Field Work. *Archaeometry* 10:57-63.
- Sellari, C., and D. Sellari
1975 *The Illustrated Price Guide to Antique Bottles*. Country Beautiful, Waukesha, Wisconsin.
- Service, E.
1961 *Primitive Social Organization*. Random House, New York.
- Severinghaus, C. W.
1949 Tooth Development and Wear: A Criteria of Age in White-Tailed Deer. *Journal of Wildlife Management* 13(2):185-216.
- Shafer, H. J.
1978 Lithic Technology at the George C. Davis Site, Cherokee County, Texas. Published Ph.D. Dissertation, University of Texas at Austin.
- Shafer, H. J., P. Dering, and S. P. Baxter
1975 Richland Creek Watershed, Hill and Navarro Counties, Texas: An Archaeological Survey of Structures No. 70, 71A, 77A, 84, 85, 91A, 92A, 92B, 97, 130 and 136. *Texas A & M University, Anthropology Laboratory, Report 14.*
- Shaw, C.
1978 Environmental Setting. In *A Reconnaissance Survey of the Trinity River Basin*, assembled by J. J. Richner and J. T. Bagot, Southern Methodist University, Archaeology Research Program, Research Report 113.
- Shelford, V.
1963 *The Ecology of North America*. University of Illinois Press, Urbana.
- Shuler, E. W.
1918 The Geology of Dallas County. *Bureau of Economic Geology University of Texas Bulletin* 1818.

- Silver, I. A.
1969 The Aging of Domestic Animals. In *Science in Archaeology*, edited by Brothwell and Higgs. Thames and Hudson, London.
- Sims, F., Sr.
1977 Recollections. Ms. on File Cedar Hill Public Library, Cedar Hill, Texas.
- Sjoberg, A.
1976 Phosphate Analysis of Anthropoc Soils. *Journal of Field Archaeology* 3:447-454.
- Skinner, S. A., J. J. Richner, and M. R. Johnston
1978 Dallas Archaeological Potential. *Southern Methodist University, Archaeology Research Program, Research Report No. 11.*
- Skinner, S. A., and D. T. Connors
1979 Archaeological Investigation at Lakeview Lake. *Southern Methodist University, Archaeology Research Program, Research Report No. 118.*
- Skinner, S. A., T. S. Turner D. E. McGregor, and J. H. Rickards
1979 Prehistoric Settlement at Aquilla Lake, Texas. *Southern Methodist University, Archaeology Research Program, Research Report No. 119.*
- Slaughter, B. H., W. W. Crook, and R. K. Harris
1961 Hill/Shuler Local Faunas of the Upper Trinity River. *Bureau of Economic Geology, University of Texas Report of Investigations* 48:1-75.
- Smith, B. D.
1975 Middle Mississippian Exploitation of Annual Populations. *Museum of Anthropology, University of Michigan, Anthropological Papers* 57.
- Soil Conservation Service
1962 *Identification and Nomenclature of Soil Horizons*. U. S. Department of Agriculture, Supplement to Handbook No. 18, Replacing Pages 173-188.
- Soil Conservation Service
1975 *General Soil Map, Dallas County, Texas*. Texas Agricultural Experiment Station.
- Soil Survey Staff
1951 *Soil Survey Manual*. U. S. Department of Agriculture, Handbook No. 18.
- Solecki, R. S.
1951 Notes on Soil Analysis and Archaeology. *American Antiquity* 16:254-256.
- Solecki, R. S.
1953 Exploration of an Adena Mound at Natrium, West Virginia. *Anthropological Papers, Bureau of American Ethnology Bulletin* 151(40):313-395.
- South, S.
1977 *Method and Theory in Historical Archaeology*. Academic Press, New York.
- South, S.
1977 *Research Strategies in Historic Archeology*. Academic Press, New York.
- Stark, A.
1935 *A History of Dallas County*. M. A. Thesis, University of Texas, Austin.
- Stuart, D. E.
1977 Seasonal Phases in Ona Subsistence Territorial Distribution and Organization: Implications for the Archeological Record. In *For Theory Building in Archaeology*, edited by L. R. Binford, Academic Press, New York.
- Suhm, D. A., and E. B. Jelks
1962 Handbook of Texas Archeology: Type Descriptions. *Texas Archeological Society and Texas Memorial Museum*.
- Tainter, J. A.
1979 The Mountainair Lithic Scatters: Settlement Patterns and Significance Evaluation of Low Density Surface Sites. *Journal of Field Archaeology* 6(4):463-469.
- Talmdage, W., and O. Chesler
1977 The Importance of Small Surface and Disturbed Sites as Sources of Significant Archeological Data. National Technical Information Service, Washington, D.C.
- Texas Parks and Wildlife Department
1978 The Lesser Prairie Chicken and Its Management in Texas. *Texas Parks and Wildlife Department Bulletin*, No. 7000-25.
- Thomas, D. H.
1973 An Empirical Test for Steward's Model of Great Basin Settlement Patterns. *American Antiquity* 38:155-176.
- Thomas, D. H.
1979 *Archaeology*. Holt, Rinehart and Winston, New York.
- Toulouse, J. H.
1972 *Bottle Makers and Their Marks*. Thomas Nelson, New York
- Toulouse, J. H.
1977 *Fruit Jars: A Collector's Manual with Prices*. Thomas Nelson, Nashville.

- U. S. Army Engineer, Ft. Worth District
 1972 Final Environmental Impact Statement: Lakeview Lake, Mountain Creek, Trinity River Basin, Texas. U. S. Army Corp of Engineers, Fort Worth District, Texas.
- Van Der Merwe, N. J., and P. H. Stein
 1972 Soil Chemistry of Postmolds and Rodent Burrows: Identification with Excavation. *American Antiquity* 37(2):245-254.
- Vinyard, L. B.
 n.d. *The History of the Cedar Mountains, 1841-1952*. Rhea Printing Co, Dallas.
- Vita-Finzi, C., and E. S. Higgs
 1970 Prehistoric Economy in the Mt. Carmel Area of Palestine: Site Catchment Analysis. *Proceedings of the Prehistoric Society* 36:1-37.
- Vivian, R. C., K. Anderson, H. Davis, R. Edwards, M. B. Schiffer, and S. South.
 1977 Guidelines for the Preparation and Evaluation of Archeological Reports. In *The Management of Archeological Resources: The Airlie House Report*, edited by C. R. McGimsey III, and H. A. Davis. Society for American Archaeology, Washington D.C.
- Walker, E. P. (editor)
 1975 *Mammals of the World*. John Hopkins Press, Baltimore.
- Wallis, W. A., and H. V. Roberts
 1956 *Statistics: A New Approach*. The Free Press, New York.
- Ward, T.
 1965 Correlation of Mississippian Sites and Soil Types. *Southeastern Archaeological Conference Bulletin* 3:42-48.
- Webb, R. B.
 1970 *Reptiles of Oklahoma*. University of Oklahoma Press, Norman.
- Webb, W. P. (editor)
 1952 *The Handbook of Texas Vols. 1 & 2*. The Texas State Historical Association, Austin.
- Weide, D. L.
 1966 Soil pH as a Guide to Archaeological Investigation. *UCLA Archaeological Survey, Annual Report* 8:151-164.
- Werler, J. E.
 1978 *Poisonous Snakes of Texas*. Texas Parks and Wildlife Department Bulletin 31.
- Williams-Dean, Galenna
 1978 Ethnobotany and Cultural Ecology of Prehistoric Man in Southwest Texas. Ph.D. Dissertation, Texas A & M University.
- Willimon, E. L.
 1972 New Local Faunas and Paleoecology (Pleistocene) of North Central Texas. *The Texas Journal of Science* 23(4).
- Willey, G. R., and P. Phillips
 1958 *Method and Theory in American Archaeology*. University of Chicago Press.
- Winters, H. D.
 1969 The Riverton Culture: A Second Millenium Occupation in the Central Wabash Valley. *Illinois Archaeological Survey Monograph 1 and Illinois State Museum Reports of Investigations* 13.
- Wobst, H. M.
 1978 The Archaeo-Ethnology of Hunter-Gatherers or the Tyranny of the Ethnographic Record in Archaeology. *American Antiquity* 43(2):303-309.
- Woods, W. I.
 1975 The Analysis of Abandoned Settlements by a New Phosphate Field Test Method. *The Chesopiean* 13(1-2):1-45.
- Woods, W. I.
 1977 The Quantitative Analysis of Soil Phosphate. *American Antiquity* 42(2):248-252.
- Woosley, A. I.
 1978 Pollen Extraction for Arid-Land Sediments. *Journal of Field Archaeology* 5(3):349-355.
- Yellen, J. E.
 1977 *Archaeological Approaches to the Present: Models for Reconstructing the Past*. Academic Press, New York.

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