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ARCHAEOLOGY OF THE HIGH PLAINS

James H. Gunnerson

Bureau of Land Management
Colorado
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ARCHAEOLOGY OF THE HIGH PLAINS

By James H. Gunnerson

Colorado State Office
Bureau of Land Management
Denver, Colorado
1987

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This document is printed in conjunction with the San Luis Valley Resource Management Plan, the Southeast (Colorado) Planning Analysis Update, the Royal Gorge Resource Area Management Framework Plan, and the Raton Basin Coal Leasing Project. This volume serves as support for the above plans, and is also an integral part of the Canon City District Cultural Resource Management Plan (CRMP).

DESIGNED BY: Leigh Wellborn
SERIES EDITOR: Frederic J. Athearn

FOREWORD

This publication presents an overview of the archaeology of the Central High Plains. The volume provides baseline information about the archaeology of the Bureau of Land Management's (BLM) Canon City [Colorado] District, the U.S.D.A. Forest Service's Regions II and III and the BLM's Albuquerque [New Mexico] District. This work describes the archaeology of portions of five states and represents a large geographic area ranging from the Continental Divide to the plains of Kansas and Nebraska.

A major feature of this work is the fact that it is one of the first such projects that was jointly prepared by the BLM and the Forest Service. Because much of the land managed by these two agencies is adjoining or is in the same geographic region, it was logical to create a document that both groups could use. The Forest Service and BLM also agreed that this database should cover two BLM states and two Forest Service regions, again making this project one of the first of its kind.

One of the primary objectives of both the BLM and the Forest Service is to study and, as needed, preserve significant cultural resources located on public lands. Evidences of our past cover large areas of the national forests and the public domain. In order to provide for the orderly and careful evaluation of these places, this baseline narrative gives our specialists and our managers information by which to wisely conserve our national cultural heritage.

This volume will provide our managers and the professional community with a study that should become the standard reference for this region. Because of the massive amount of research that went into this work, it is unlikely that it will be duplicated in the near future. Therefore, I am pleased to share this important volume with you and we hope that both the BLM and the Forest Service's contribution to the body of archaeology is both long-lasting and useful to the professional reader as well as to the general public.

State Director
Bureau of Land Management
Denver, Colorado

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INTRODUCTION

In 1982, the U.S. Forest Service and the Bureau of Land Management (BLM) contracted with Professor James H.Gunnerson to write an overview of a large area defined as the Central High Plains, a region encompassing eastern Colorado, northeastern New Mexico, western Kansas, western Nebraska, the Texas panhandle, and parts of Oklahoma. The purpose of this study was to provide a baseline narrative for the prehistory in this region in order to enable land managing agencies like the Forest Service and the BLM to understand the extent of prehistoric resources that might be present on these federal lands. The reason for this interest lies in the mandates of various federal legislation requiring agencies to consider cultural values on their lands prior to actions that might destroy these valuable resources.

In order to provide a "starting point" for the consideration of archeologic values, existing data needed to be gathered, synthesized, and then analyzed to provide a foundation from which cultural resources could be managed by the Forest Service and the BLM. To this end, Professor Gunnerson gathered all known literature pertaining to the archeology of this region; he looked at thousands of individual site forms, and he complied a detailed bibliography for the Central High Plains. This has resulted in a rather massive volume that is probably the most comprehensive look at the archeology of this area ever produced.

In addition to a complete view of archeology, Professor Gunnerson, along with his wife Dolores, prepared a companion ethnohistory of the plains that provides the connection between prehistoric peoples and the coming of European settlement. The ethnohistory portion of this project will be published as a separate volume. Between the archeology and ethnohistory of the high plains, we now have a comprehensive view of some 10,000 years of human occupation.

Included in Professor Gunnerson's study are not only descriptions of archeological work that has been done over the year, but also, in a detailed evolutionary system, he displays the various phases of human use of this land.

Included in this study are illustrations of point types, several maps of the region and a truly comprehensive bibliography that is general on the one hand and specific to the various states on the other. The U.S. Forest Service and the BLM are pleased to have been able to assist in the preparation of a monumental study of this nature, and we trust that it will remain the standard for high plains archeology for years to come. Thanks to Professor Gunnerson's exhaustive research, and his dedicated efforts, this work should stand alone in the field of plains archeology for decades. A partnership such as this between the academic community and the Federal Government has proven that documents that are mutually useful can be produced.

In addition, the general public will find Dr. Gunnerson's work most enjoyable reading. With so many uses, a work such as Jim Gunnerson's will find its way onto library shelves throughout the nation, and we hope that those who choose to read it will do so with the knowledge that this work was prepared for us all.

Frederic J. Athearn
Bureau of Land Management
J.Steve Sigstad
U.S. Forest Service
Denver, Colorado
1986

ACKNOWLEDGEMENTS

While preparing this overview of high plains archeology, I benefited from the assistance of numerous individuals representing a variety of institutions.

In an attempt to get the feeling for current activities in the five states involved, personal visits were made to many research organizations and information was solicited from others by mail.

In a number of institutions more than one division, such as aademic departments, museums, or offices of contract archeology, were visited.

Individuals first consulted often kindly queried colleagues on behalf of the project until the list of those who contributed valuable data became unwieldy. Therefore, with few exceptions, specific thanks are limited to institutions.

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Denver Service Center, Bureau of Land Management, Denver
Bureau of Reclamation, Denver
Rocky Mountain Region, U.S. Forest Service, Denver

This document is the end product of a project sponsored by the U.S. Forest Service and the Bureau of Land Management. It was conceived and steered by a dedicated committee made up of Dr. Steve Sigstad, Chair (USFS), Dr. Frederic J. Athearn (BLM), Ms. Chris Kincade (BLM), Mr. Dan Martin (BLM) and Mr. Joe Tainter. Cynthia Bowsman served as research assistant for nearly a year and, in addition to typing the first draft, did a substantial portion of the bibliographical compliation and part of the literature search. Gail Littrell typed the final draft of the manuscript on a word processor and carefully read proof on that draft. Maps and figures were drafted by Marty Haack, Mark Marcuson and Leigh Wellborn (BLM). Dr. Dolores Gunnerson contributed information on the protohistoric and historic periods and edited two drafts of the manuscript.

Although these institutions and individuals have contibuted immeasurably to this work, the shortcoming of the interpretations (that may well need to be modified later) are solely my resposibility.

James H. Gunnerson
March,1986

PROLOGUE

This volume presents a synthesis or overview of the archeology of the Central High Plains. The area is bounded on the north by 41 latitude, on the east by the 99th meridian, on the south by 35 latitude in New Mexico, Texas and Oklahoma and by 37 latitude in Colorado, on the west by the Continental Divide in Colorado and by the eastern foothills of the Sangre de Cristo Mountains in New Mexico. Since relatively little archeology has been done in this area, and most of that on the perimeters, it has been necessary to draw upon work done just beyond the borders to round out a synthesis, and even so, the treatment of complexes and periods is uneven. In some cases, enough information is available for a general summary of a complex. In other instances, where a complex is represented by limited work at perhaps only one site, a detailed description of material recovered is given to provide comparative data should future workers find similar material. Detailed descriptions of diagnostic artifacts, primarily projectile points and pottery, are included in Appendices and are often copied in their entirety. Although the bibliography is not exhaustive, it is extensive, containing many potentially useful items not cited. In some cases entire bibliographies from other works, including annotations, have been reproduced, with credit: references cited are so identified, although not all of the cited references were personally examined (*e.g.,* when they were included in reproduced tables). The major gap in the bibliography is the absence of reports of contract archeology that were prepared in limited numbers and deposited only with appropriate agencies. An effort should be made to compile and publish a list of such reports.

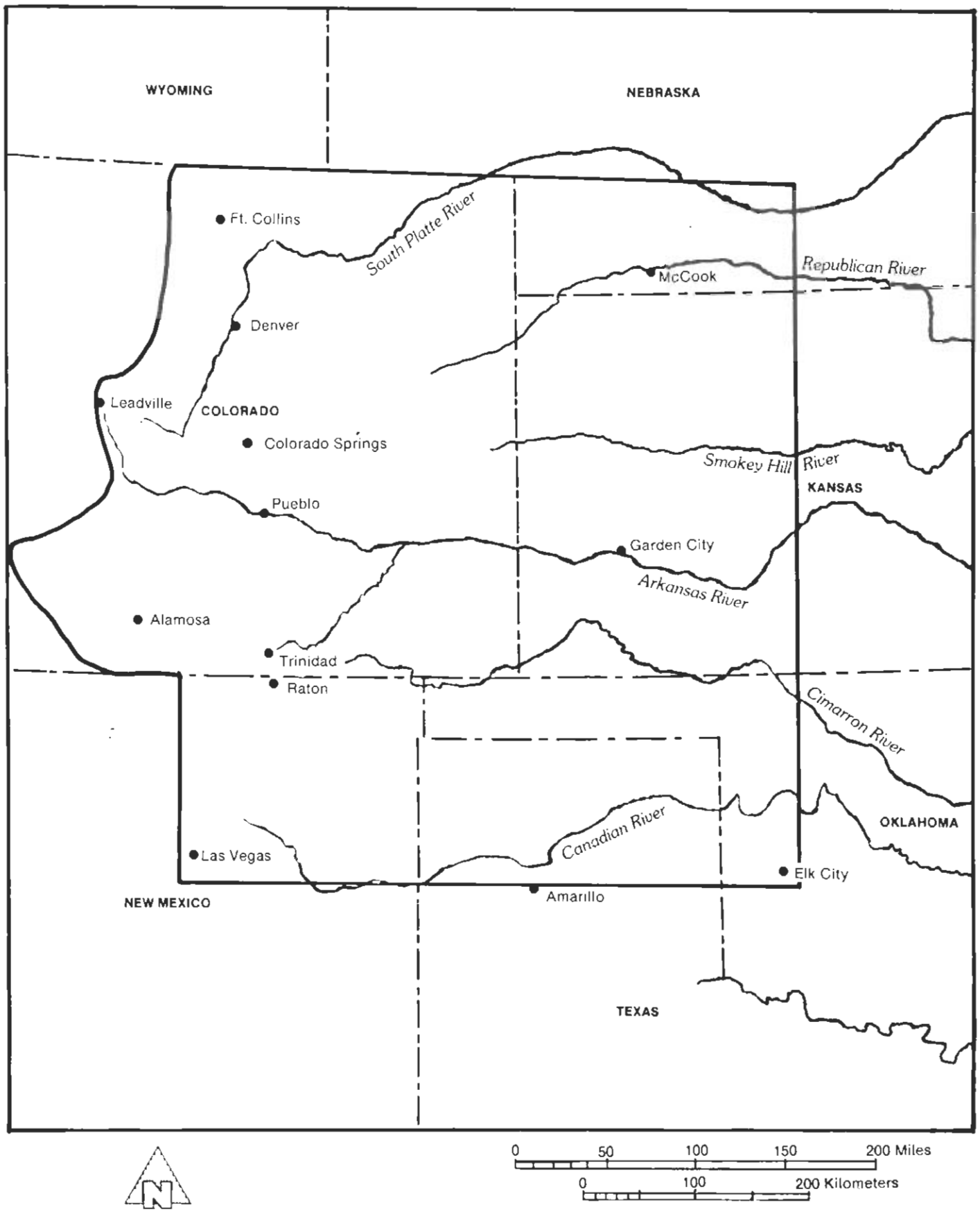
Some interpretations of cultural relationships, especially as implied in the correlation chart (Fig. 2), are speculative and will not meet with universal agreement. Most of the interpretations, however, are testable if additional work is done. This volume can be considered only a first approximation of a synthesis of a poorly known 400,000 square kilometer area through some 15,000 years. Hopefully, it will serve as a point of departure for further refinements.

The Central Great Plains have been occupied for at least 11,500 years and possibly much longer. During this time, the area experienced radical changes in climate that resulted in marked changes not only in the flora and fauna but, to some extent, in the topography. Even after the end of glacial times and the extinction of various Pleistocene species, there were droughts of great magnitude. The plains have seen as much environmental fluctuation as any part of North America and more than most. The marginal nature of the plains, dictated by the rain shadow of the Rocky Mountains, is reflected in the archeological record. This synthesis of the prehistory of the Central High Plains presents a picture of cultural continuity with variations in response to changing environment and diffusion of traits from neighboring areas; migration apparently played a lesser role. Although various phases in the continuum can be viewed as climactic, nowhere in the archeological record do we find cultural climaxes comparable to those in Mesoamerica, the American Southwest, the Mississippi valley, or the Northwest Coast. At best, life on the Central High Plains has been precarious.

Archeological work in the plains has been going on for nearly a century and Europeans have observed Indian life there for nearly four and a half centuries. Systematic professional archeology, however, is only about a half century old and there are still many, many gaps in the archeological record. Some of these will probably never be filled since the area is large, archeologists few and financial support limited. Also, archeological remains are being destroyed at an alarming rate. Much of the field work done in the past has never been adequately reported and in some cases is not represented in the literature at all. This is especially true for work done in the late 1930's under various federally funded "relief" projects, for salvage work done in the late 1940's and 1950's ahead of the construction of major federally funded dams, and for work done by university-sponsored archeological field schools. Fortunately, most of the collections and field notes, some of them very good, have been preserved. Collections and related data that have been reported in print are, for the most part, available for resudy in the light of more recent research and analytical methods, and such reanalysis and reinterpretation is going on, if slowly. Because of the broad scope of the present overview, however, it is based almost entirely on information available in the literature, uneven as it is.

Often, the results of a single survey do not provide enough data to serve as the basis for a meaningful published synthesis although more and more research is being designed to obtain significant results with very limited data; included are questions of resource utilization, ecological concerns, stone working technology, etc., and computerization of data from numerous surveys is making other kinds of research feasible. Whereas once it would have been too time-consuming to glean particular kinds of data from the survey files or even determine if the data were available, it is now becoming possible to quickly retrieve, or at least locate, data in particular categories. Where statistical manipulation is needed, it can often be achieved at the same time by means of an appropriate computer program. One must be cautious, of course, since there are always possibilities of erroneous computer entries, and seldom if ever is all the data desirable for a particular research project available for programming.

Much of the archeological literature consists of reports of excavations at sites chosen for their richness or because they were apparently stratified --



CENTRAL HIGH PLAINS

choices warranted by promise for substantially increasing our knowledge concerning the cultural content of a particular phase or providing the basis for the chronological ordering of phases in a particular region. Before World War II, the published results of regional surveys, such as those carried out and reported by E.B. Renaud of the University of Denver (Downing 1981) in the 1930's, were rare. Renaud provided at least minimal information on all sites found, even where there was very little cultural material present. Fortunately, the information and artifacts obtained during systematic surveys were usually preserved, especially when they were sponsored by some institution such as a museum or university, although provenience sometimes became confused with the passage of time. Early surveys concentrated on areas where sites were expected to be, and incorporated information from local people, such as collectors, farmers and ranchers. In recent years, with the emphasis on historic preservation and the salvaging of archeological material prior to projects that would damage sites, surveys are being carried out even in areas of little promise. The results of such surveys and the reports of mitigation activities at threatened sites frequently do not receive wide distribution. The same can be said of surveys, often employing only random sampling, now being conducted on federally owned lands by the agency responsible for the management of the lands. Thus a large corpus of the archeological data being amassed is still under utilized.

The problem of defining archeological units is complicated by changes in taxonomic systems over the years and differences between systems used in different areas. In the 1930's and 1940's, the McKern or Midwest Taxonomic System was commonly employed in the classification of archeological sites, or rather, the classification of components found at sites. A component was defined as the manifestation at a single site of its use by people having a particular cultural affiliation. Components with essentially identical cultural traits were assigned to a particular *focus*, and *foci* with a high degree of cultural similarity were assigned to a particular *aspect* (Bell 1936: 6-8). More inclusive taxa were the *phase* and *basic culture*. This system had the shortcoming of not including geographical or temporal dimensions, although often these were discussed when a focus or an aspect was defined. At one time the term *culture* was used for a taxonomic unit that could be equated with *focus* or *aspect*, but in the Midwest Taxonomic System, basic culture was the most inclusive taxon. Two other terms commonly used, although not strictly taxonomic, that are commonly used are *complex* and *assemblage*. *Complex* is applied to a group of cultural traits, usually artifact types, that recur together. *Assemblage* is sometimes used in the same way, but is also used for the group of traits found in a component. Complexes, especially, are frequently named as though they were taxonomic units.

In recent years archeologists working in the plains have come more and more to apply the terminology proposed by Willey and Phillips (1958). Their basic unit is the *phase* which is on the same order of magnitude as *focus* or *aspect*; more restricted units are called *subphases*. Phases and subphases are defined in terms of cultural content, temporal span, and geographical distribution. One is tempted to simply substitute the term phase for focus or aspect in cases where the units were defined in the Midwestern Taxonomic System. The two concepts are sufficiently different, however, that this can not be done. Hopefully, all of Plains archeology will eventually be ordered in terms of the Willey and Phillips system, but to do so will require a reexamination of the artifacts and other relevant basic data. For many units, whether they be called foci, aspects or phases, the information available is still inadequate for precise definitions. For the most part, the terminology used in the literature cited will be retained in this overview.

Within the Willey and Phillips scheme, the sequence of phases is established both locally and regionally as initial steps in cultural-historical integration. For broader integration, two additional units are employed: *horizons* integrate approximately contemporaneous phases within a region and *traditions* reflect cultural continuity from phase to phase through time. Willey and Phillips interpret New World prehistory in terms of five stages, essentially evolutionary or developmental: Lithic, Archaic, Formative, Classic, and Post-classic. For plains archeology only the first three of these stages are applicable, although, as will be seen in the present overview, temporal subdivisions within the stages can be identified. Some of these subdivisions of periods could perhaps be defined in terms of horizons, as Willey and Phillips define them, but such terminology has not come into common use. *Horizon markers* in the Plains, with few exceptions, tend to have such long temporal spans that they really do not fit the criteria.

The tradition concept has been employed sparingly to indicate an integrating unit, but not as precisely as Willey and Phillips visualized its being used. The Plains Village Tradition has been the one most commonly referred to, but it has been applied so broadly that nearly all Formative phases in the Plains would be encompassed, including some phases, or at least components, that are not known to have included villages. Thus, there is not yet, and may never be, clear distinctions in the plains between stages, periods, horizons and even traditions. An important step toward cultural historical integration in the plains will come with the definition of phases into which the results of previous research can be fitted. Given the apparently sudden and perhaps frequent shifts in centers of gravity of the

plains populations, it will be crucial to develop a precise chronological framework that is not dependent on culture content.

In this synthesis, an interpretation of the culture history of the Central High Plains will be presented in terms of eight archeological periods plus a review of the ethnohistory of the area. There are no sharp temporal boundaries between these periods since they grade into one another. (In general, however, the more recent the period, the more precise the dating.) Also, the changes that mark the transition from one period to the next did not necessarily take place at the same time in all parts of the area. Both of these concerns are aggravated by the imprecision of the dating methods that have been used and the very uneven nature of the information available.

The earliest period, called "Paleoindian," starts at least 11,500 years ago (9500 BC) and lasts until roughly 6,000 BC. It is a period characterized by the hunting of large mammals, some of them now extinct, with spears and/or darts propelled by atlatls. The mammoth was characteristic of the early part of the period, followed by bison antiquus which gradually evolved into modern bison bison. During this period of at least 3500 years, changes took place in the design of the projectile points and complexes are distinguished on the basis of these differences. Through time there was an ever increasing diversity of point types and hence of named complexes.

The second major period is called the "Archaic," with three subperiods often identifiable. The beginning of the Archaic period is marked by a climate both hotter and dryer than either before or after. This condition, called the "Altithermal," lasted through the Early Archaic period. Also, starting with the Early Archaic, only modern species of animals were present although their geographical range shifted from time to time. Where it is possible to subdivide the Archaic period, the temporal boundaries are roughly as follows: Early Archaic from 6000 to 3000 BC, the Middle Archaic from 3000 to 500 BC and the Late Archaic from 500 BC to AD 500. During the entire Archaic period there continued to be a heavy dependence on hunting with spears or darts, but with the utilization of a greater variety of animals and a heavier dependence upon the gathering of plants. The entire Archaic period saw a continuing diversification of identifiable cultural complexes which often graded into one another. Projectile points continued to be the index artifacts for these complexes. During this period there is evidence of diffusion of traits, or even migration of people into the Central High Plains from essentially all directions. Archaic complexes tended to become more restricted in both temporal and geographical distribution through time.

The "Early Ceramic" period has as its hallmark the presence, for the first time, of pottery, and can be dated at approximately 500 BC to AD 900. Incipient horticulture has been implied for some of the Early Ceramic complexes and evidence of simple structures have been found at some of the sites. Hunting and gathering continued to provide the major part of the diet and, except for the pottery, the artifact inventory did not differ markedly from that of the Late Archaic. Toward the end of the Early Ceramic period, smaller delicate projectile points suggest the introduction of the bow and arrow. Early Ceramic complexes throughout much of the Central High Plains appear to reflect influences coming from the east. In only the southwest corner do the changes appear to reflect innovations from the Pueblo Southwest.

The "Middle Ceramic" period, approximately AD 900 to AD 1500, was a time of culture climax throughout much of the plains. The people adopted the cultivation of corn, beans and squash, built substantial earth lodges, made more varied pottery, and hunted primarily with the bow and arrow. Hunting, along with gathering, still provided a substantial part of the diet. Most of the cultural changes, along with the appearance of a new race of corn, probably came from the Southwest although some ideas for pottery decoration and some new religious beliefs appear to have Southeastern origins. The population itself, probably Caddoan-speaking, may have been unchanged since at least Archaic times. During the Middle Ceramic period there was apparently a substantial growth in population in the eastern portion of the Central High Plains, as well as in the prairies farther east. The dependence on Cultivation of plants in this environmentally-marginal area, however, made the people of this period vulnerable to local climatic fluctuations, especially in rainfall. This resulted in shifting populations and, in the mid 1400's, the depopulation of essentially the entire Central High Plains.

The "Late Ceramic" period, also called the "Protohistoric" period, started about AD 1500. With the return of moister conditions, grass on the high plains again became lush and the bison abundant. Before the former inhabitants, almost certainly Caddoan speakers, could reoccupy the area, the Athabascan-speaking Apaches moved south from Canada and dominated the Central High Plains until about 1720. Not only were the Apaches skilled hunters, even without the horse, they were also adaptable enough to adopt limited horticulture, pottery making, and semipermanent settlements from their sedentary neighbors. The forcing of the Apaches from the high plains in about 1730 by Comanches from the west and Pawnees with French allies and guns from the east essentially marked the end of the Late Ceramic period. Soon after this the cultures of the sedentary tribes on the eastern margin of the Central High Plains started disintegrating under white influence, and especially new diseases, from the east. Throughout the two centuries of the Late Ceramic Period, limited information about the Indians can be gleaned from

accounts by literate European observers. From the middle of the 1700's on, there is sufficient documentary information available that it can be considered the : "Historic Period." This was a time of rapid change leading to continued population decline and the disintegration of aboriginal cultures. The Comanche domination of the Central High Plains, especially near the mountains, lasted until approximately 1800 when there was a rapid and substantial influx of Arapahoes, Cheyennes, Kiowas and Kiowa Apaches from the upper Missouri River area. The Comanche responded by moving the center of their activities to northwestern Texas and were soon followed by the Kiowa and Kiowa Apache. Other tribes, such as the Crow, Blackfeet and Dakota Sioux, soon made their appearance when the colorful but short-lived horse-nomad, bison-hunting, pan-tribal plains culture was at its peak. The Pawnee and Wichita, plus various tribes from the eastern edge of the plains, many of whom had been recently put on reservations there, continued to hunt on the high plains. During the 1860's, the flamboyant Plains lifestyle came to an abrupt end and soon all of the Plains tribes were on reservations. Culture history after the mid-1800's is beyond the scope of this volume.

Environment

The environment of the Central High Plains is characterized by low precipitation and seasonal extremes of temperature. In the past 12,000 years, there have been periods of severe drought affecting all or portions of the area. Periods of markedly lower average temperatures and higher precipitation than present appear to have been less common and to have had less effect on the populations. To a very large extent, the climate is determined by the flow of air from the west and the effect on air flow of the Rocky Mountains at the western edge of the plains. The relatively low rainfall supports only short grass over most of the area, with trees restricted to the water courses. As one gets into the foothills, small evergreens and scrub become common, with substantial stands of large conifers at higher elevations.

Elevation at the eastern edge of the Central High Plains, arbitrarily defined as the 99th meridian, is quite consistently at about 600 m. The Plains slope gently up to the west, with elevations varying from 1,500 to about 2,100 m at the Rocky Mountain foothills. The only major break in this gently sloping plain is the series of connected mesas extending east from the mountains along the New Mexico-Colorado border to the northeastern corner of New Mexico. The northern portion of the Central High Plains is drained by the Platte and Republican Rivers, the central part by the Arkansas River and the southern part by the Dry Cimarron and Canadian Rivers. The extreme southwest corner is drained by the Rio Grande and the Pecos River, which ultimately joins the Rio Grande. All these major rivers except for the Republican head in the mountains and would rarely have gone completely dry. Between the major rivers, water is scarce except for occasional springs, a few of which are very good and dependable, and playas which hold water only in rainy seasons. Except at the height of drought periods, travelers who knew the plains could cross the area in any direction without serious supply problems. Presumably routes feasible under various conditions were well known to the aborigines, and were adopted by European colonists and explorers. Some are reflected in the pattern of modern highways and rail routes.

In good years, the grass on the high plains was abundant and supported large herds of buffalo and a wide variety of smaller animals. Other wild plant foods usable by humans, however, were far less abundant and except for the northeast, southeast and southwest corners of what is here called the Central High Plains, the climate did not permit the growing of corn or other crops, even when the climate was optimum. And in the southwest corner, horticulture would have been precarious without specialized techniques such as irrigation. Throughout the entire area, wherever horticulture was practiced, it was apparently restricted to bottom lands along streams. Since, except in the mountains, trees and permanent water were also restricted to water courses, permanent and semipermanent settlement was also found only near streams.

Detailed descriptions of local environment and available resources can be found in various of the references cited in the bibliography. Especially helpful is *Climate and Man*, the 1941 Yearbook of Agriculture published by the U.S. Department of Agriculture and the *Atlas of American Agriculture, Physical Basis* published in 1936, also by the U.S. Department of Agriculture. The Department of Agriculture has published Soil Surveys for many of the counties in the Central High Plains and these discuss the local environments. The published records of the Weather Bureau provide local information on temperature, precipitation, growing seasons, etc. for numerous stations all over the United States. Most states have Biological Surveys which publish lists of plants and animals found in various parts of the state.

CHAPTER ONE

THE PALEOINDIAN PERIOD

The date of the first peopling of the plains, as of the New World, is still an open question. Although the Clovis complex, with a number of sites dated at 9000 to 9500 B.C., is the earliest well-dated, identifiable lithic assemblage, there is abundant evidence that suggests substantially earlier occupation. The early dates attributed to the Sandia lithic complex, found just to the southwest of the Central High Plains (Hibben 1941; Wormington 1957: 85-91) have been consistently questioned, and thus far, other lithic sites that show evidence of being earlier than about 9500 B.C. (11,500 B.P.) have not yielded distinctive diagnostic artifacts. The question of pre-Clovis (pre-Llano) cultures in the Americas has recently been considered in a volume edited by Humphrey and Stanford (1979). Most archeologists are now in agreement that man has probably been in the New World for at least 20,000 years and perhaps as long as 60,000 years. Evidence for a pre-Clovis occupation in the Central High Plains will be presented later as will a discussion of possible origins for the Clovis complex with its distinctive fluted dart points.

It is highly probable that the Clovis culture, specifically its stone-working technology, is ancestral to all later Paleoindian cultures, with regional traditions evolving. Although our most reliable dates for the Clovis complex come from the plains, similar fluted points have a much wider distribution and it is possible that fluted points were used elsewhere in North America earlier than in the plains. By Middle Paleoindian times, there are distinguishable, but apparently contemporaneous, complexes in the northern and southern plains, with a "boundary" between them somewhere in northern Colorado. By Late Paleoindian times, there seem to be eastern and western traditions meeting in eastern Colorado. Their differences may well be related to environment since they seem to continue on into historic times.

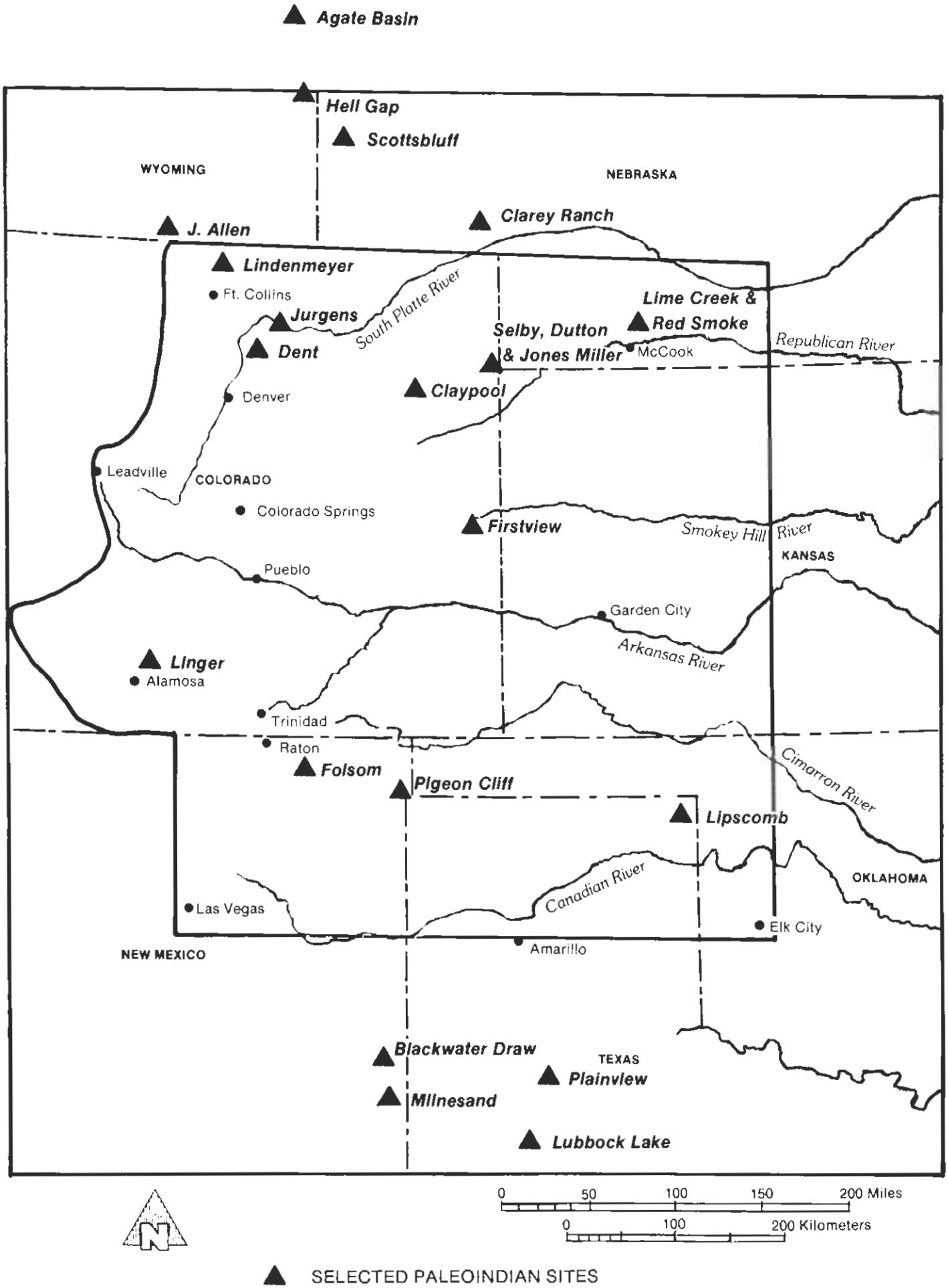
During the Paleoindian period, various species of mammals, especially large ones, became extinct. In a general way, cultural changes coincided with faunal changes: e.g., the only diagnostic stone points found with the remains of mammoth are Clovis points. By the end of the Paleoindian period, which is the beginning of the Archaic period, only the remains of modern animals are found. Paleoindian complexes in general indicate a subsistence pattern based heavily on hunting large animals with darts propelled by spear throwers (atlatls), or with spears that were thrust. At Paleoindian habitation or camp sites, as opposed to the much more common kill or butchering sites, there is evidence that various smaller animals were also eaten, along with wild plant foods. Lifeway was highly nomadic, with structures very simple and apparently uncommon. Both camp and kill sites show evidence of being reoccupied intermittently. Artifacts chipped from stone that can be identified as to origin indicate travel, or perhaps trade, over distances of several hundred miles.

Although Paleoindian research continues to attract the attention of archeologists and the public, there are many gaps in the data. From time to time, excellent summaries of Paleoindian cultures are written (e.g., Wormington 1957; Frison 1978) which synthesize existing information, point out the need for additional research, and indicate the direction it should take.

Pre-Clovis Complexes

The best evidence for pre-Clovis occupation of the Central High plains, which is also some of the best for North America, comes from the Selby and Dutton sites near Wray, in Yuma County, northeastern Colorado (Stanford 1979). These two sites, 27 km apart, are very much alike and could well be representative of numerous similar, but as yet undetected, sites in the Central High plains. Both Selby and Dutton were discovered in the course of deepening two "playas", shallow depressions which sometimes hold water and are commonly called "buffalo wallows." There are thousands of such depressions aligned either with structural joints in the underlying Ogallala formation or with parts of shallow, ponded, arroyo systems. The depressions are into Peorian Loess which is overlain by Holocene soils. The upper boundary of the Peorian Loess in Yuma County, Colorado, could be as old as 29,000 B.P. (Stanford 1979: 105, following Ruhe 1976). At both the Selby and Dutton sites, at least one bone level was found well within the Peorian Loess; in each case the faunal remains contained in the lower levels included horse, camel, bison, and various small mammals, but no mammoth. At the Selby site, a camel metapodial chopper was found in the Peorian Loess, and evidence of butchering was noted on bones from the loess at both sites.

A limonite band marks the transition from the


Agate Basin
Hell Gap
Scottsbluff
WYOMING
NEBRASKA
J. Allen
Clarey Ranch
Lindenmeyer
Ft. Collins
South Platte River
Jurgens
Lime Creek &
Red Smoke
Selby, Dutton
& Jones Miller
McCook
Republican River
Dent
Claypool
Denver
Leadville
COLORADO
Colorado Springs
Firstview
Smokey Hill River
KANSAS
Pueblo
Garden City
Arkansas River
Linger
Alamosa
Trinidad
Raton
Folsom
Pigeon Cliff
Cimarron River
Lipscomb
OKLAHOMA
Canadian River
Las Vegas
Elk City
Amarillo
NEW MEXICO
Blackwater Draw
TEXAS
Plainview
Milnesand
Lubbock Lake
0 50 100 150 200 Miles
0 100 200 Kilometers
N
SELECTED PALEOINDIAN SITES

Peorian Loess to the lowest unit in the fill of the depressions. The fill itself consists of lacustrine deposits made up of interbedded sands, and blocky clays occur in discontinuous lenses. At both sites, the lacustrine deposits contain bones of mammoth, horse, camel, bison, sloth, peccary, deer, antelope, and various small mammals. Most of the bone tools and flaked bones came from the lacustrine deposits. No radiocarbon dates are yet available for the lacustrine deposits, but Stanford (1979: 102) suggests a possible age in excess of 15,000 years.

The contact between the lacustrine deposits and the overlying gleysol is marked by an irregular "flame structure" characteristic of such contacts. Most of the gleysol deposit had been removed by construction work at the Dutton site, but at Selby it contained poorly preserved mammoth bone and evidence of a Clovis occupation. Radiocarbon dates on mammoth bone collagen from this level are 11,710 ± 150 years B.P. and 7880 ± 500 years B.P. (samples SI-2877 and SI-3541). Above the gleysol Clovis level is a dark gray Holocene soil devoid of bones and artifacts.

Except for a scraper at the bottom of a rodent run at the Dutton site, there were no stone tools in the lacustrine (pre-Clovis) level; however, seven tiny impact flakes were recovered during screen washing. It was impossible to determine whether the scraper had fallen down the rodent run or whether it was indeed in situ in the lower level, and the rodent turned laterally when it was encountered. A constellation of other traits, however, leads one to the conclusion that the evidence in the lacustrine level does represent human activity even though each of the bits of evidence alone could be accounted for in some other way (each in a different way). The evidence (Stanford 1979: 108) is as follows:

1. The presence of apparent 'expediency tools' made of bone.
2. The presence of flaked bone.
3. The presence of bone apparently processed for the removal of marrow.
4. The presence of stone artifacts.

Bone expediency tools, used for butchering and hide working, have a sharp edge produced by means of a spiral fracture. They show tiny step fractures, polish and striations. Four choppers, two made from bison tibiae and two from horse tibiae, were found in the lacustrine unit at the Dutton site. All were made "to a pattern," i.e., from distal ends, with the proximal ends of the spiral fractures terminating on the posterior side of the bone. Polish occurs on the ridges and especially on the exterior margins of the spiral fracture where step fractures are also noted. At Selby, two nearly identical choppers made from the distal ends of camel metapodials were found, one in the lacustrine unit and the other in the underlying Peorian Loess. Edge damage and polish are evident on the proximal end of the spiral fracture. A split mammoth rib shows high polish but only on one end. The proximal end of a bison radius shows a spiral fracture with heavy step fracture and polish on the broken end. Several other bone fragments showed step fracture and polish, presumably from being used as scraping tools.

Flaked mammoth long bone was found in the lacustrine units of both sites. Cores, produced by means of spiral fractures, had striking platforms prepared by repeated crushing blows. When striking platforms were properly prepared, long flakes were removed. Linear striations, presumably resulting from the removal of the periosteum to facilitate flaking, are often observable. Some of the bone flakes, from 4 to 16 cm long, show use-damaged and polished edges, while others show no wear and are considered debitage.

Impact fractures, often multiple, on long bones of camel, horse, bison, and mammoth are interpreted as resulting from preliminaries to marrow removal.

The seven tiny flakes from the lacustrine unit at the Dutton site could be intrusive; they were found during screening, so their exact provenance is not known. The flakes, however, are sharply in contrast to the rounded gravel in the deposit, and some had been heat treated. They were probably detached from a chopping tool during use.

Carnivores can and do break and gnaw bones, and bones can be broken and polished through trampling by animals. It seems likely, however, that the probable bone tools from the Selby and Dutton sites were indeed man-made; the breaking and polishing is patterned, not random. Only certain bones (*e.g.*, metapodials, tibiae, etc.) were broken and polished, and those only in particular ways. A personal examination of several of these specimens left no doubt in my mind that they were human artifacts, deliberately fashioned and used. Stanford (1979: 119) also points out that some of these bone tools are analogous to ones from younger sites such as the Jones-Miller site (Stanford 1974), the Casper site (Frison 1974), and the Lubbock Lake site (Johnson 1978), all on the high plains. Similarly modified camel metapodials were also found in the pre-Cody level at the Lamb Spring site, just southwest of Denver, Colorado, which is dated around 13,000 B.P. Also, according to Stanford, bone flakes from the Dutton and Selby sites resemble bone flakes at the Old Crow site in the Yukon (Bonnichsen 1978, 1979; Harrington, Bonnichsen, and Morlan 1975; Morlan 1976, 1978; Irving 1971, 1978). Old Crow is probably comparable in age to Dutton and Selby. The fact that the Lamb Spring site (5 DA 83) produced bones of Columbian mammoth, camel, horse, and bison suggests a pre-Clovis occupation there. Also from this site came Eden-Scottsbluff artifacts dated at about 8000 years ago (discussed as part of the Cody complex), but Eden-Scottsbluff is much too late for the Lamb Spring faunal assemblage. Stanford has recently returned to carry out additional work at Lamb Spring.

Just to the southeast of the Central High Plains, in Kiowa County, Oklahoma, is another possible pre-Clovis site. At the Coopertown site, the skeleton of a young mammoth was found with bones broken as though by human activity. No diagnostic artifacts were found but several rocks were associated that might have served as hammerstones and an anvil. The site was dated at 17,000 to 21,000 years ago (Gilbert 1979: 23; Adrian Anderson 1975).

Clovis Complex

The earliest recognized Paleoindian complex in the plains that contains diagnostic stone artifacts is the Clovis complex. A few sites to the south and west have yielded Sandia points, which may be earlier, but no Sandia points have been found under controlled conditions in the Central High plains (Wormington 1957: 85-91) and the possibility of misidentifying points as Sandia is great. Clovis points and/or very similar fluted points, sometimes associated with the remains of mammoth, have been found over much of the eastern two-thirds of the United States.

Most excavatable sites identified as Clovis are kill sites where the distinctive large, fluted dart points have been found with mammoth skeletal remains. Some mammoth kill and/or butchering sites without the distinctive points have also been tentatively assigned to Clovis. Often, Clovis sites are at the edge of what then would have been shallow lakes or marshy areas, presumably where mired-down mammoths could have been more easily killed. Where dated, Clovis sites fall in a short period from 9000 to 9500 B.C. Geologic evidence indicates that the plains were much wetter at that time (Wormington 1957: 43-59).

A list of Clovis sites from all over the United States, along with radiocarbon dates, was prepared by Haynes (1970: 79) and is reproduced in table 1.

The Blackwater Draw Locality # 1, the type site for the Clovis complex, is located between the towns of Clovis and Portales in about the middle of the extreme eastern edge of New Mexico, about 150 km south of the southern edge of the Central High Plains. Work in Blackwater Draw started in 1932 and has been continued by various institutions ever since (Howard 1935a, 1935b; Cotter 1937a, 1938; Sellards 1952). In 1936 and 1937, Cotter found two fluted points, in unquestionable association with mammoth remains, which became the type specimens for Clovis fluted points. At the same time, two tapering bone cylinders, 7.5 to 10 cm long, with beveled ends were also found; these are most probably bone projectile points. Later stratigraphic studies were undertaken in the area by Evans (1951) who determined that the Clovis material was in the lowest cultural level, which in turn rested on a sterile gravel layer. Above the Clovis level, with its mammoth bones, was a level producing bison bones and Folsom points (Sellards 1952; Wormington 1957: 49-50). Still higher stratigraphically were artifacts that provided the basis for what Sellards (1952) called the Portales complex and is here discussed with the Firstview complex. In contrast to the very dry conditions that now exist in the Blackwater Draw vicinity, during Clovis times the area was a lake or marsh, indicating a generally pluvial period.

In addition to the distinctive fluted dart points, the Clovis tool kit included: "end scrapers, commonly spurred; large unifacial side scrapers; keeled scrapers on large blades; flake knives; some backed [dulled on one edge], worked blades, gravers, and perforators; bone points; foreshafts; and shaft straighteners" (Haynes 1970, 1981). Hester (1966: 130) lists the following specimens, found in the Clovis complex at Blackwater Draw: Clovis points, flakes, blades (struck from cores), side scrapers, end scrapers, gravers, unifacial knives, bifacial knives, flake scrapers, flake knives, hollow edge scrapers ("spokeshaves"), scraper-gravers, scrapers, end-and-side scrapers, choppers, cores, hammerstones, channel flakes, burins, grinding stones, bone artifacts, Enterline side scrapers, projectile point blanks, and paint stones.

There is still a debate as to whether Clovis culture developed in North America from some previous, unspecialized complex or, as Haynes (1970) believes, had its roots in a Siberian complex that spread rapidly across North America once there was free passage from Alaska through glacial ice, possibly during the Two Creeks glacial retreat. Hester, too (1966), makes a good case for the origin of the Clovis culture's being in the Upper Paleolithic of the Old World.

From a historical point of view, the Dent site (5 WL 269), 56 km north and a little east of Denver, Colorado, is significant. Here, in 1932, the association of chipped stone projectile points with articulated mammoth remains was, for the first time, generally accepted (Figgins 1933; Wormington 1957: 43-44). Two of the points, both found in situ, were fluted and of the type that since has been known as Clovis fluted. A third, broken, point was probably of the same type. A great many stones foreign to the area were found in the deposit that contained the remains of one male and 11 female mammoths. The stratigraphy of the site has been largely destroyed, but Harold E. Malde, of the U.S. Geological Survey, who visited the site in 1954, feels that the deposits date from a glacial or early glacial recessional phase. Haynes (1964) reports a radiocarbon date for the site of 11,200 ± 500 B.P. (sample I-622), a date that he accepts as accurate.

The Dutton site, in the northeast corner of Colorado, best known for its pre-Clovis component, contains a Clovis component as well (Stanford 1979: 105). Mammoth bone collagen from the level immediately below the Clovis component has yielded dates of 11,170 ± 150 years B.P. and 7880 ± 150

Table 1. Clovis Radiocarbon Dates (Haynes 1970: 79)

Site	Type	Game	Deposit	Date Years BP
Dent, Colorado	kill	mammoth	overbank alluvium	11,200±500 (I-622)
Clovis, New Mexico	hunting camp	mammoth bison	springlaid sand	11,310±240 (av.)
Miami, Texas	kill	mammoth	pond clay	
Shoop, Pennsylvania	camp	?	terrace soil	
Willianson, Virginia	camp	?	upland soil	
Borax Lake, California	camp	?	alluvial fan	
Ventana Cave, Arizona*	camp	?	volcanic debris	11,290±1000 (A-203)
Naco, Arizona	kill	mammoth	channel alluvium	
Lehner, Arizona	hunting camp	mammoth bison	channel alluvium	11,260±360 (av.)
Union Pacific (UP), Wyoming*	kill	mammoth	channel alluvium	11,280±350 (I-449)
Domebo, Oklahoma	kill	mammoth	channel alluvium	11,160±500 (av.)
Simon, Idaho	cache(?)	?	Prairie soil	
Leikem, Arizona	kill	mammoth	channel, alluvium	
Welling, Ohio	quarry camp	?	terrace soil	
Murray Springs, Arizona	hunting camp	mammoth bison	channel alluvium	11,230±340 (A-805)
Escapule, Arizona	kill	mammoth	channel slope	
Wells Creek, Tennessee	camp	?	upland soil	
Mockingbird Gap, New Mexico	camp	mammoth	channel slope	

*Questionable Clovis identification

years B.P. (samples SI-2877 and SI-3541) and additional samples have been submitted. A Clovis point was found on spoil dirt from the construction activity that brought the site to Stanford's attention. Adhering to the point, and to a flake and a horse tooth found with it, was soil from the matrix of the assumed Clovis level. Furthermore, the flake was found to fit on a core later excavated from that level (Stanford 1979: 115-116).

Just to the east of the southeast corner of the Central High plains, Clovis points were found associated with Mammoth bones at the Domebo site in Caddo County, Oklahoma (Loenhardy 1966; Gilbert 1979; Wilson 1966). Just within the southeast corner, at least one Clovis point has been reported (Gilbert 1979: 14).

Goshen Complex

This complex, which falls chronologically between Clovis and Folsom, has been dated at ca. 9,000 to 8,800 B.C. on the basis of work at the Hell Gap site in east-central Wyoming (Irwin-Williams et al. 1973), the only place it has been found. The complex has been accepted by Frison (1978: 30, 83), but Irwin-Williams et al. (1973: 46) note that Goshen shows many similarities to Plainview and that the two could easily be confused. Their description of the Goshen complex is as follows:

> Typical projectile points of the Goshen Complex are lanceolate with parallel to slightly convex or concave sides and concave bases. In overall outline, they resemble the Clovis form. Flaking technology is excellent, probably executed by a combination of percussion and then pressure flaking. Most flake scars are uniformly directed at right angles to the long axis of the point. Most points are basally thinned by the removal of multiple flakes. Specimens are uniformly very thin and are edge ground along the lower one-third of their length. Also characteristic of the complex are simple convex-edged side scrapers and other side scraper forms; end scrapers with a lateral spur or beak, and small numbers of other end scraper types; spur perforators on small flakes; and utilized flakes. Also recovered were numerous bifacial pieces representing early stages in the manufacture of points and asingle large tear-shaped bifacial knife. This industry contains the highest incidence of true blades of any Paleo-Indian complex at Hell Gap. This technologic feature, plus various similarities in projectile point outline and preference for scraper types, suggests parallels between the Plainview and Clovis complexes. True Clovis materials have been recovered from nearby localities, but none occurred in the Hell Gap valley itself. No Carbon-14 date is available for the Goshen Complex at Hell Gap, but its stratigraphic position indicates a pre-Folsom, post-Clovis placement, about 9000 B.C.

Folsom Complex

This complex, dated at about 10,000 to 11,000 years ago, represents a people who hunted large, now-extinct bison, using distinctive fluted projectile points. The Folsom complex, most completely represented at the Lindenmeier site, will be described in detail in the discussion of that site. The complex received its name from the small town of Folsom in the northeast corner of New Mexico. Near there, unmistakable artifacts, Folsom points, were first found in indisputable association with the remains of an extinct form of animal, Bison *antiquus* (Cook 1927; Figgins 1927; Wormington 1957: 23-29). Bones eroding from an arroyo bank were reported to the Colorado Museum of Natural History (now the Denver Museum of Natural History) which sent a party to investigate. When the significance of the site became evident, various highly qualified archeologists were called in to observe the association of the stone artifacts with the articulated skeletons at this buried kill site. The distinctiveness of the associated points soon led to the identification of other sites, including Lindenmeier in northern Colorado, as belonging to the Folsom complex.

Lindenmeier Site

The Lindenmeier site (5 LR 13), located almost straight north of Denver and just south of the Wyoming line, is still, a half-century after its discovery, the site which has provided the most information about the Folsom complex. Excavation of this important site was carried out by the Smithsonian Institution between 1934 and 1938. For many years, the only information available from this site was in very brief reports by Roberts (1935a, 1935b, 1936a, 1936b, 1937, 1938, 1939a, 1939b, 1940, 1941) and a report of the geology by Bryan and Ray (1940). Fortunately, Roberts' notes were sufficiently detailed that, after his death, the material could be analyzed and a final report published by Wilmsen (Wilmsen and Roberts 1978). Regrettably, attempts to get permission to resume work at Lindenmeier have been largely unsuccessful except for geological work by Haynes (Haynes and Agogino 1960). During the 1935 season, the Colorado Museum of Natural History also had a small party at the site under the supervision of John L. Cotter (1938). Much of the collection made by the discoverers of the site, C.C. Coffin and R.G. Coffin, is in the local historical museum in Fort Collins, Colorado.

The Lindenmeier site is located in the Rocky Mountain Piedmont, in a valley which filled in after the Folsom occupation. Eventually an arroyo cut through the valley fill revealing the occupation level. During Folsom times there were two distinct activity

During Folsom times there were two distinct activity areas: a kill/butchering area and the habitation/camp area. Higher in the fill was a later and much less extensive Archaic occupation; late prehistoric artifacts have been collected from the surface.

Two acceptable radiocarbon dates for the Folsom level at the Lindenmeier site are available. One, for a sample of charcoal collected by Roberts during his excavation, is 11,200 ± 400 B.P. (9250 B.C.) (sample GX-1282) (Wilmsen and Roberts 1978: 39); the other, on charcoal collected by Haynes and others in 1959-1960, is 10,780 ± 135 B.P. (8830 B.C.) (sample I-141) (Haynes and Agogino 1960: 23; Haynes 1964: 1410; Wilmsen and Roberts 1978: 400). Wilmsen and Roberts (1978: 39-42) discuss in detail other dates attributed to the Folsom occupation which are either erroneously attributed or otherwise unacceptable, along with certain problems in the interpretation of the radiocarbon dates. A date of ca. 11,000 B.P. for the Folsom occupation at the site is generally accepted.

The Folsom fluted point, probably more than any other artifact type, has attracted the attention and excited the interest of professional archeologists, collectors, and the general public. The classic form is distinctive, easily identified, beautifully made, aesthetically pleasing and known to be of great antiquity by American standards. The Folsom point is described by Wormington (1957: 263).

The question of Folsom point typology is complicated by the fact that Folsom fluted points are frequently found in association with points which are otherwise identical except that they are unfluted. These are called both unfluted Folsom points and Midland points; this question is discussed further in the section on the Midland complex. Another variation that has received much less attention is what Wilmsen and Roberts (1978: 111-112) call pseudo-fluted points; instead of a true flute, there is simply a large flat original flake surface on one or both faces. Some points have a flute on one face and a pseudo-flute on the other. In general outline these resemble other Folsom points and make up nearly one fifth of all finished points at the Lindenmeier site. Folsom points, like other Paleoindian points, are commonly resharpened. Some broken points had new bases chipped on them. Others were reworked to produce cutting or scraping tools. Not all were reworked. Many of the broken points were apparently broken in the process of manufacture--either split lengthwise or snapped transversely by a hinge fracture. Other points were apparently broken or even shattered during use. The geographical distribution of Folsom points is given by Bell (1958) as the high plains of North America from Texas north to Alberta and Saskatchewan.

A second distinctive and diagnostic item in the Folsom assemblage is the channel flake, the flake removed in the production of the flute. These are very thin and show a single flake scar on one face and multiple flake scars, usually laterally oriented, on the dorsal face. Out of nearly a thousand channel flakes from the Lindenmeier site, all but one was broken, apparently in the process of manufacture.

In addition to diagnostic points and channel flakes, the Lindenmeier site yielded a wide variety of other stone artifacts (Wilmsen and Roberts 1978). Apparently there are no categories or types of artifacts found at other Folsom complex sites that are not represented at Lindenmeier, and apparently no other site has all the types found at Lindenmeier, which, therefore, sets the standards for the complex. Other bifacially chipped artifacts include: projectile point preforms, with flutes on one or both sides; other preforms; small to large bifaces, probably used as cutting or chopping tools; and elongate specimens with a shape suggestive of drills, but without evidence of rotational wear. Unifacial specimens include unmodified flakes; utilized flakes, specimens with distal-edge retouch (end scrapers), specimens with single-edge retouch (side scrapers), specimens with two edges retouched (double side scrapers), notched specimens ("spokeshaves"); some of these have two notches and some appear to have small graver points as well, and specimens with definitely chipped tips (gravers). Several specimens resembling classic paleolithic burins and "limace" are very narrow, much-used scrapers. Other artifacts include: cores, choppers or pounders, flat abrading stones, slightly concave pigment grinding stones with hematite adhering, grooved abrading stones, stones with convex rubbing surfaces, and pieces of hematite and soft limestone showing evidence of abrasion. There was a large number of bone artifacts at the Lindenmeier site including: awls, bluntly pointed rib sections, needles with and without eyes, and a tubular bead. Various pieces of bone had been decorated by incising, including discoidal specimens with short incisions on the peripheries.

Unfortunately, much of the bone from the site was not saved so there is no information on what have come to be recognized as expediency butchering tools. However, the faunal remains that were preserved from the Lindenmeier site can be considered representative of the total inventory. Table 2 shows the total number of specimens and minimum number of individuals indicated (Wilmsen and Roberts 1978: 46).

Elida Site

Hester (1962) describes materials collected from what was apparently a single-component Folsom site in east-central New Mexico, just south of the study area considered here. The site was a blowout, one of 45 Early Man sites discovered by the collector in the immediate vicinity, and the collector had kept everything taken from the Elida site excepting a few points that were in another private collection.

Table 2. Lindenmeir Inventory from Wilmsen and Roberts (1978)

Species		No.
Terrapena cf. *ornata* (Ornate box turtle)	2	1
Lepus americanus (Snowshoe hare)	1	1
Lepus townsendii (White-tailed jack rabbit)	35	2
Cynomys ludovicianus (Black-tailed prairie dog)	1	1
Canis lupus cf. *nubilus* (Gray wolf)	9	1
Canis latrans (Coyote)	4	1
Velpes fulva (Red fox)	12	1
Velpes velox (Swift fox)	1	1
Camelops sp. (Camel)	7	1
Antilocapra americana (Pronghorn)	10	2
Odocoileus virginianus (White-tailed deer)	6	1
Bison cf. *antiquus* (Long-horned bison)	524	13
Unidentifiable	128	
Total	741	

Next to Lindenmeier, this site may have yielded the greatest variety of artifacts from any Folsom component and the inventory provides a good approximation of the entire Folsom tool kit. The number of specimens in each category are in parentheses: points fluted both sides (8), points fluted one side (7), unfluted points (3), channel flakes (13), knives (15), flake knives (4), gravers (23), hollow scrapers (spokeshaves) (6), end scrapers (31), side scrapers (41), cores (16), utilized flakes (290) and unused flakes (116). The fluted points show a great variety of sizes and base fragments outnumbered tip fragments three to one. The unnotched points are highly variable and would not seem to represent a type. Channel flakes were all reused as artifacts. Most of the end scrapers were made on thick prismatic flakes, tend to be small and triangular, and often have graver-like points.

Other Folsom Sites

The Lubbock Lake site, in the northwest edge of Lubbock, Texas (just south of the Central High Plains), is a stratified site noted mainly for its Folsom component. Work at this site by Texas Tech University has continued, intermittently, since the 1940's (Sellards 1952; Black 1974; Johnson and Holliday 1980).

The Blackwater Draw locality (also just south of the Central High Plains) is in the middle of the eastern edge of New Mexico. This site is best known for its Clovis component, which is stratigraphically under a level containing the bones of hundreds of bison (probably of an extinct species) with which Folsom points were associated (Sellards 1952; Wormington 1957: 49-50). Evidence presented by Wendorf (1970) indicates that at both Blackwater Draw and Lubbock Lake there was a period between 8300 and 8600 B.C. (during Folsom times) when summers were markedly cooler and precipitation was more effective. Wendorf raises the question as to what cultural changes, if any, there were in the Folsom complex during this period of a few hundred years when there was considerable and rapid climatic change with corresponding marked changes in the vegetation. Thus far, not enough Folsom sites have been excavated to provide the basic data necessary for an answer.

The Lipscomb Bison quarry, located in the northeast corner of the Texas Panhandle, is interesting and potentially important, but excavation there has never been fully reported. In a preliminary article Schultz (1943) lists 26 stone artifacts, several of which are illustrated. Included are 18 projectile points or fragments (of the 10 illustrated, all are fluted and some conform to the classic Folsom shape), one end scraper, 4 side scrapers, 2 possible flake knives, and a channel flake. Eleven chips were also recovered. Bison *antiquus* remains included 14 articulated skeletons with the bones well fossilized; detailed measurements are given on one of the largest male skulls. Charcoal and ash from the site gave evidence of fire.

Folsom points have been recovered from a number of other sites in the Central High Plains where relatively little additional information was secured, or where the information is not yet available in published form. The Linger site, located in the dune area on the east side of the San Luis Valley in south-central Colorado, yielded Folsom points and a few bison bones, probably of an extinct species (Hurst 1941, 1943; Wormington 1957: 29-30). Other artifacts associated included blades, scrapers, 2 atypical points and a channel flake. The Zapata site, similar to and a few miles from Linger, yielded a whole and a fragmentary Folsom point, 2 scrapers, a graver and a channel flake associated with bones (Wormington 1957: 30). The Powars site, near the small town of Kersey in northeastern Colorado, produced many classic Folsom points and snub-nosed end scrapers. The site was very sandy and the original deposit was apparently destroyed by wind action (Roberts 1937; Wormington 1957: 39). The Johnson site, near La Porte, Colorado (about 24 km from Lindenmeier) yielded a few Folsom points, scrapers and workshop debris (Wormington 1957: 40).

One of the first reports (perhaps the first) of a stone projectile point in association with the remains of an extinct species was by Williston (1902), who described a site on Twelve Mile Creek in Logan County, west-central Kansas. Although a point was found there in direct association with the skeleton of one, or five, or six extinct bison, it is not clear whether this was a kill site or whether a small herd had died of winter exposure including one animal that had been previously, but not fatally, speared in the shoulder. The point disappeared soon after its discovery, but on the basis of the drawing published by Williston (1902), it appears to be either Folsom or Clovis. Richard Rodgers, a graduate student at the University of Kansas, has been able to relocate the site.

Midland Complex

This complex is essentially the same as the Folsom complex except that the points, which are otherwise identical to Folsom fluted points, are unfluted. Midland points were at one time called unfluted Folsom points, and it is not uncommon to find fluted and unfluted points, or even an occasional point with a flute on only one side, at a single site, either Midland or Folsom. The relationship between Folsom and Midland points has been considered by various authors (e.g., Wormington 1957; Agogino 1969; Wendorf and Krieger 1959; Blaine 1968; Perino 1971; Judge 1970; Irwin and Wormington 1970). Irwin and Wormington (1970: 27) state that Midland points "are now regarded as a distinct type." Agogino (1969) takes the position that

some Folsom hunters preferred to flute their points and others did not, but he too recognizes Midland points as a type. Furthermore, he notes that at the Scharbauer site, the Midland horizon is below the Folsom horizon (Wendorf et al. 1955), while at Hell Gap, the Midland horizon is above the Folsom horizon (Smith and Agogino 1966: 201-203). The two complexes are generally considered contemporaneous.

Although the type site for the Midland complex is the Scharbauer site (near Midland, Texas, just east of the southeast corner of New Mexico), the complex is best represented at the Hell Gap locality in east-central Wyoming. The Texas site, however, is famous for the partial human skeleton (Midland Man) found there and generally accepted as dating from the Paleoindian period (Wendorf et al. 1955; Wormington 1957: 241-246).

The Midland complex at the Hell Gap locality is summarized by Irwin-Williams et al. (1973: 47) as follows:

> The characteristic projectile points superficially resemble those of the Folsom assemblage [but are not fluted].
>
> Other characteristic tools include numerous convex side scrapers,double side scrapers, and a few other side scraper forms, as well asbeaked and angle-edged end scrapers. Also recovered were spur perforators, utilized flakes and retouched flakes, various denticulate forms of bifaces, and a single large teardrop-shaped bifacial knife. All these characteristics, with the exception of the relatively large number of side scrapers, are paralleled in the Folsom assemblage.
>
> In addition to the lithic material culture, Locality II at Hell Gap produced evidence of two structures defined by circular alignments of post holes: a small structure, about 2 m in diameter, and a larger one, about 4 m in diameter. These are the earliest known definite remains of plains Indian dwellings. The Midland phase is dated by Carbon-14 at between 8440 and 8740 B.C. at Hell Gap.

Hell Gap Complex

Our information on this complex comes primarily from: several occupation localities in the vicinity of Hell Gap in east-central Wyoming (Irwin-Williams et al. 1973); the Casper site, a bison kill in central Wyoming (Frison 1974a); the Jones-Miller site, a bison kill and butchering site in extreme north-eastern Colorado (Stanford 1974: 29, 1978); and the Sister's Hill site, an occupation site in northeastern Wyoming (Agogino and Galloway 1965).

The Hell Gap level at the type locality has not been directly dated by radiocarbon, but a charcoal sample from below this level gave a date of about 8300 B.C., and the Hell Gap level at the Sister's Hill site, dated at about 7700 B.C., led Irwin-Williams et al. (1973: 48-52) to date the Hell Gap complex at ca. 8000 to 7500 B.C. Agogino (1961) reports a date of 8890 B.C. for the level at Kimball Station containing Hell Gap points (and underlying an Agate Basin horizon), but Irwin-Williams and Frison do not comment on this date.

The only artifact diagnostic of the Hell Gap complex is its projectile point. Other artifacts from the Hell Gap level at the type site are reminiscent of the Agate Basin complex and include an abundance of various forms of side scrapers; fewer end scrapers, principally ones of the angle-edge or beak variety; large elongate bifacial knives; notched scrapers; spur perforators; utilized flakes; and one asymmetrical knife. The latter has a single rounded shoulder, a tapering convex stem and moderately convex blade edges. Projectile points occur in "unusually high proportion" and faunal remains are sparse. No dwelling remains were found and the occupations are thought to represent hunting camps used only briefly.

The Casper site in central Wyoming is a Hell Gap bison kill (Frison 1974). Here a steep-sided, parabolic sand dune had served as a trap into which bison were driven, then killed and partially butchered. A total of 60 separate projectile points or fragments was recovered; except for one Clovis point found on the surface of the sand, all were of the Hell Gap type. After having been broken, many were resharpened to be used again as projectile points; none showed much if any evidence of having been used as knives or butchering tools. Five other chipped stone tools were found: three were combination cutting and scraping tools made on large percussion flakes; the fourth, also a flake tool, had a convex cutting edge and a burin spall; and the last was a blade tool with nearly straight cutting edges. Of the 308 flakes recovered, 48 had resulted from impact fracture of projectile points, but none from the resharpening of any of the points found at the site. Most of the debitage appears to have resulted from the sharpening of cutting or scraping tools. Twenty river cobbles from the site are believed to have been used as hammerstones in the butchering process. Frison (1974) also included a great deal of insightful comment on bison procurement and butchering and on projectile point hafting.

The Jones-Miller site, a bison butchering site in extreme northeast Colorado (Stanford 1974, 1978) is the only excavated Hell Gap site reported from the Central High plains as here defined. Judging by the bones present and their distribution, several kills had taken place close by, and selected portions of the animals had been brought to the site for systematic and near-complete butchering. The various kills had apparently taken place at different seasons, but each involved nursery herds, since far fewer bulls were represented than cows, calves and yearlings. Among the stone artifacts, projectile points greatly predominated and several showed impact

at the Casper site, many of those from Jones-Miller had been used as knives in butchering and showed asymmetrical sharpening; the edges of some had even been backed (deliberately dulled). Other artifacts included four side scrapers or cutting tools and two plano-convex scrapers; a chopper was found near a hearth to the west of the bone bed. Several thousand flakes, many, at least, from resharpening tools, were found clustered in activity areas. Bone tools, slightly more common than stone, show little preparation; wear, polish, and striations occur primarily along broken edges. Bones used as tools were mainly ribs, but also included are metatarsals, metacarpals, humeri, and tibiae. Lithic analysis identified Spanish Diggings quartzite from east-central Wyoming, Republican River jasper from south-central Nebraska, and Alibates dolomite from the panhandle of Texas.

A highly unusual feature at the Jones-Miller site was a large post mold surrounded by nonfunctional artifacts (offerings?) near the center of the bone concentration. Stanford (1978: 93-100) suggests this might have had ceremonial significance comparable to that of "medicine posts" reported in conjunction with hunting in historic times (MacDougall 1896: 273).

Firstview Complex

The Firstview complex has been defined by Wheat (1972, 1978) on the basis of material recovered from the Olsen-Chubbuck site, a bison kill in the extreme east-central part of Colorado, about 16 km south of the town of Firstview in Cheyenne County. A radiocarbon determination on bone collagen provided a date of 10,150 ± 500 B.P. (8200 B.C.) (A-744) for the site. Originally the projectile points had been identified as Eden, Scottsbluff and Milnesand (Chubbuck 1959: 4-10; Wheat 1967: 51). Wheat noted considerable variation, with the points grading from Eden to Milnesand. Upon further analysis Wheat (1972: 140) concluded that most of the points should be assigned to a new type, Firstview points, and the rest classified as San Jon points, described by Roberts (1942). The type site for these points is near San Jon, in northeastern New Mexico, just south of the Canadian River and nearly at the Texas border.

Twenty-seven projectile points and fragments were recovered from the bone beds of the Olsen-Chubbuck site. Other chipped stone artifacts, not abundant, included: 3 end scrapers, one of which had two concave scraping edges, one on either side of the convex scraping end; one side scraper; a large thin flake knife and two used flakes. Chipping debris consisted of only 3 flakes. A hammerstone-anvil, three small used cobbles, and a limonite pebble were also recovered. Worked bone consisted of one well-made pin, 9.2 cm long, and four pieces of bone that showed cutting and/or polishing. Except for the points, the artifacts are not diagnostic.

Wheat (1972: 152) gives the distribution of Firstview and San Jon points as follows:

> Firstview points are known in moderate quantities in the southern plains, where they constitute a major type. Their center of distribution appears to be in the Clovis-Portales area of New Mexico. They are reported from the Clovis Lake beds (Howard 1935a and 1935b), Stratum 5 at Blackwater Draw No. 1 (Sellards 1952), and the Torrance County sites (Haynes 1955). The Olsen-Chubbuck site in southeastern Colorado is the most northerly reported occurrence of the type.
>
> San Jon points are one of the most widespread of all Paleo-Indian projectile points. They are found in substantial quantities in Alberta (Wormington and Forbis 1965), in Montana (Forbis and Sperry 1952), Nebraska (Davis 1962), Wyoming (Finley site, but not from Cody Complex locus, Satterthwaite 1957: Fig. 5, Fi-y), Colorado (Dick and Mountain 1960; Wheat, this volume), and New Mexico (Howard 1935a; Roberts 1942; Sellards 1952; Haynes 1955). It may well be that subtypes will eventually be distinguished in this wide-ranging form.

After a review of six radiocarbon dates of sites that include the Firstview complex or sites containing artifacts of Firstview complex types, Wheat (1972: 156, 164) suggests the time span for the Firstview complex as extending from 8200 B.C. to 7200 B.C., or perhaps 6500 B.C. This span is somewhat earlier than his suggested range of 7000 B.C. to 6000 B.C. for the Cody complex to which the Olsen-Chubbuck site was originally assigned. The basis for his dating of these two complexes is as follows:

> There are 3 radiocarbon dates from relatively pure sites which clearly date the Cody complex. These are:
>
> 6650 B.C. ± 600 (I-245), Hell Gap site, Cody complex level;
>
> 6800 B.C. ± 120 (UCLA-697A), Horner site;
>
> 6890 B.C. ± 140 (UCLA-697B), Horner site.
>
> There are 6 radiocarbon dates which date sites of the Firstview complex or sites containing some Firstview complex types. These are:
>
> 6150 B.C. ± 300 (L-578A), Mac Haffie site-San Jon points;
>
> 6520 B.C. ± 350 (A-512), Blackwater Draw No. 1, Unit E/F contact, post Firstview complex;
>
> 7217 B.C. ± 600 (C-471), Lime Creek, Stratum I-San Jon points;
>
> 7930 B.C. ± 670 (C-471, second run), Lime Creek, Stratum I;
>
> 7940 B.C. ± 290 (A-489), Blackwater Draw No. 1, Unit E (Stratum 5);

8200 B.C. ± 500 (A-744), Olsen-Chubbuck site.

Although the number of artifacts recovered from the Olsen-Chubbuck site was not great, much was learned of the hunting and butchering activities of the people. After a detailed analysis of the data and a comparison with evidence from some 20 other Paleoindian kill sites, Wheat (1972: 164) concludes:

> Finally, as a result of the excavation of the Olsen-Chubbuck site, it can be asserted, with some degree of certainty, that during the latter part of the Paleo-Indian occupation of the Southern plains there were large, well-organized hunting parties, who had mastered the basic techniques of exploiting the economic potential of the great bison herds of the Great plains. These hunters had developed standard methods of hunting, of butchering and preserving great quantities of meat, of hide processing, and probably of making tailored skin garments and shelters. The pattern of exploitation observed at the Olsen-Chubbuck site almost certainly marks a point in a continuous development which began with the earliest bison hunters of late Clovis or early Folsom times, became more sophisticated during late Paleo-Indian times, and changing only in minor aspects through the millennia,constituted the basic economic pattern of the Plainsmen until the near extinction of the bison (and the plains Indians) in the late 1800's.

Other point types very similar to Firstview are Milnesand, Agate Basin, and Plainview, which Wheat (1972: 148) considers "variations of lanceolate points . . . sharing a number of characteristics of flaking, edge-grinding, basal thinning, and so forth." The presence of Firstview, Plainview, Milnesand or San Jon points in a component of a site lead Wheat to consider such a component as being assignable to, or closely related to, the Firstivew complex. He sees the Firstview complex as earlier than, and parallel to, but distinctive from, the Cody complex, where the diagnostic artifacts are Eden and Scottsbluff I, II and III points and Cody knives. Only at the Claypool site does he find any overlap; there, San Jon points are found with a Cody complex assemblage. Wheat considered retaining the name Portales complex proposed by Sellards (1952: 72-74) on the basis of Stratum 5 at Blackwater Draw No. 1, but concluded that the situation at that site was too ambiguous and chose to name the complex "Firstview", for a small Colorado town near the Olsen-Chubbuck site. Thus the Portales complex as manifested at Blackwater No. 1 would become the Firstview complex, with perhaps some older and younger artifacts mixed in.

Since not all archeologists have accepted Wheat's subsuming the Plainview and Milnesand complexes under his Firstview complex, these will be described also.

Plainview Complex

This complex was first described by Sellards (1947) on the basis of material excavated near Plainview, Texas, which is essentially at the middle of the southern limit of the Texas Panhandle. Probably no other Paleoindian complex has been so diversely interpreted. Some authors have used Plainview as a general catchall for sites producing parallel-sided points with concave bases. This usage reflects, at least in part, the fact that there was considerable variation in point styles at the type site. Wheat (1972: 148) groups Plainview points, along with Milnesand, Agate Basin, and Firstview points as essentially a single type, "variations of lanceolate points . . . sharing a number of characteristics of flaking, edge-grinding, basal thinning, and so forth." He assigns these four point types, which form a series or continuum, and also San Jon points, to his Firstview complex. He does recognize, however, that there are sites which have produced only Plainview points.

Johnson and Holliday (1980) agree with Wheat that the points named above are basically similar, but these authors concentrate on the Plainview complex. One of their chief concerns is distinguishing between Plainview points and Golondrina points, which they closely resemble. Their assignment of sites, most of which are out of our Central High Plains area, to these two complexes is summarized in Table 3.

Of special significance for this summary of Central High Plains archeology is the identification as Plainview of points from the Lime Creek and Red Smoke sites by Davis (1953a, 1962). These two sites, located about 0.8 km apart and near jasper quarries, are important because they are primarily camp and stone-working sites. Their Plainview identification has been seriously questioned by Wheat (1972) and rejected by Johnson and Holliday (1980: 104), who suggest a possible Frederick identification for the so-called Plainview points found in the upper level (III) at Lime Creek and in an intermediate level (V) at Red Smoke. Wheat further points out that Davis (1962) misidentified two points from the lowest level at the Lime Creek site as Scottsbluff and Milnesand. According to Wheat, these points conform to the descriptions of San Jon points, although the so-called Milnesand point was broken in the process of manufacture and never finished. Wheat also considers that the Lime Creek knives are actually preforms. Thus, to Wheat, the San Jon points in Level I at the Lime Creek site indicate the presence of the Firstview complex, which he considers related to Plainview even though the levels thought by Davis to be assignable to Plainview are not. Furthermore, this change in identification better fits the radiocarbon dates for the Red Smoke and Lime Creek sites, otherrecent.

The assignment of sites to the Plainview complex

Table 3. Plainview Sites (after Johnson and Holliday 1980)

Site	Location and comments	Radiocarbon dates and comments	References
Plainview	Southern Texas Panhandle. Mesa kill of over 100 extinct bison.	9800 + 600 B.P. Estimated (old method) 7100+ 160 B.P. Not reliable (old method)	Broecker and Kulp 1957 Brannon et al. 1957 Sellards et al 1947 Knudson 1973
Bonfire shelter	Southwest Texas. Bone bed 2 represents 3 separate kills of over 120 extinct bison.	10,230 + 160 B.P. Accepted 9920 + 150 B.P. Accepted 10,100 + 300 B.P. Accepted	Dibble 1968 Dibble 1970 Dibble 1970 Dibble and Lorrain 1968
Lubbock Lake	Just south of Texas Panhandle. Kill/butchering site, 6 or more bison	9883 + 350 B.P. Estimated (old method) 9960 + 80 B.P. Accepted	Libby 1955 Johnson and Holliday 1980 Sellards 1952 Black 1974 Wheat 1974 Kelley 1974 Green 1962 Johnson 1976 Holliday 1977
Lake Theo	Near southeast corner of Texas Panhandle. Limited testing.		Harrison and Killen 1978
Lone Wolf Creek	West-central Texas.		Cook 1927 Riggins 1927 Wermington 1957: 110
Blackwater Draw Locality #1	Center east edge of New Mexico		Wheat 1972: Hester 1972, 1975a: 252, 1975b: 252 Sellards 1952: 74

Table 3. Plainview Sites (after Johnson and Holliday 1980) continued

Site	Location and comments	Radiocarbon dates and comments	References
St. Mary's Hall	Central Texas, camp area		Hester 1976, 1977a, 1978
Johnson Heller	South Texas.		Birmingham and Hester 1976
McCann	Central Texas.		Preston 1969
Acton	Central Texas.		Blaine et al. 1968
Pumpkin Creek	Southern Oklahoma		Wykoff and Taylor 1971
Nall	Oklahoma Panhandle. Surface collection.		Baker et al. 1957
Perry Ranch	Southern Oklahoma. Probably Golondrina.		Saunders 1976 Saunders and Penman 1979
Levi Rock shelter	Central Texas. Probably Golondrina.		Alexander 1963
Red Smoke	Southwest Nebraska. May be Frederick or Goshen.		Davis 1953
Lime Creek	Southwest Nebraska. Wheat (1972: 144) identifies point as Frederick.		

is based on the presence of Plainview points. The type description was presented by Krieger (Sellards et al. 1947: 938-944). The expanded definition, which appeared in Suhm et al. (1954: 472-473), is also to be found in Bell (1958: 74-75) and in Wormington (1957: 264-265).

Since information on the Plainview complex comes almost entirely from kill and/or butchering sites, we probably do not know the full extent of the artifact inventory. In addition to Plainview points, there may be one or more of the following types: Firstview, Milnesand, Agate Basin and San Jon. There is still some uncertainty as to whether some points resembling Meserve (also called Dalton) points are distinct types or represent resharpened Plainview or Frederick points. The use of projectile points for butchering tools and their resharpening or modification for this purpose is generally accepted (Wheat 1972, 1976; Johnson and Holliday 1980). Other Plainview tools include a limited number of unspecialized stone cutting and scraping tools and bone expediency tools, none diagnostic.

The Pigeon Cliff site, about 19 km north of Clayton in the northeast corner of New Mexico (Steen 1955), had a component that was assigned to the Archaic period, but which should probably be considered late Paleoindian with Plainview or Frederick affiliation. The site was at the edge of an ancient swamp which apparently attracted hunters sporadically. In the middle stratum, associated with a large number of bison bones, were found a large projectile point, stemmed and tanged, a graver, and what Steen called a firebox. Apparently from a lower level came what Steen called a reworked Clovis fluted point (probably a Meserve point) and perhaps a milling slab and mano. Wendorf (1960) reports a radiocarbon date of 8280 ± 1000 B.P. for charcoal from the "firebox." The site was destroyed by construction work.

Two Plainview points and one Meserve point are reported by Lintz (1978) from the Johnson-Cline site, an upland dune site in Texas County, the middle county in the Oklahoma Panhandle.

Milnesand Complex

It is uncertain whether the Milnesand complex will continue to be a useful taxon or whether it should be subsumed, as Wheat (1972) suggests, under the Firstview complex, with Milnesand points being one of the possible points associated with this later complex. The Milnesand site, a kill or butchering site, is located in extreme eastern New Mexico a little south of the middle (Sellards 1955). The diagnostic points resemble Plainview points and the type site was considered by Sellards to be related to the Portales complex, essentially what Wheat (1972) is calling the Firstview complex. Wormington (1957) and Bell (1958: 54) give the distribution of Milnesand points as wide-spread over the plains. A "Milnesand" point from the Lime Creek site (Davis 196 has since been reidentified as a San Jon point. Except for the points, there are no traits diagnostic of the Milnesand complex, which also contains scraping and cutting tools.

With regard to Milnesand points, Wheat (1972: 146) states:

> Milnesand points were first described as a separate category by Sellards (1955: 339-344), based on a series of 23 projectiles recovered at the Milnesand site some 40 miles (64.4 km) south of Portales, New Mexico. This series has now been considerably augmented by the publication of 81 additional projectile points by Warnica and Williamson (1968: 16-24). As found in both series, Milnesand points are relatively broad, lanceolate projectile points with bases which range from slightly concave to slightly convex.

Agate Basin Complex

This complex is probably related to the Firstview complex as defined by Wheat (1972) who sees Agate Basin points, along with Milnesand, Plainview, and Firstview, as all being variations on a common pattern.

The Agate Basin complex is known primarily from the northwest plains, but surface finds of Agate Basin projectile points are reported from the foothills region in the general vicinity of Denver, Colorado (Irwin-Williams and Irwin 1966: 219). The Agate Basin site, located in the center of the extreme eastern edge of Wyoming, received limited attention from Roberts (1943, 1951, 1961) and was thoroughly investigated later by Frison (1978: 150-168). At Hell Gap, the best represented complex was Agate Basin, dated at ca. 8500 to 8000 B.C. (about 10,500 to 10,000 years ago). This dating is apparently accepted by Frison (1978: 23, 31, 32) in spite of a date of about 7400 B.C. from the Brewster site (in the Agate Basin locality). If the 7400 B.C. date is also correct, then there would have been considerable overlap between the Agate Basin and Hell Gap complexes. Such an overlap may well have existed, for two determinations on humic acid from the Agate Basin occupation layer at the Frazier site yielded a date of 9650 ± 130 B.P. (7700 B.C.) and 9550 ± 130 B.P. (7600 B.C.) (samples SMU-31 and SMU-32, *Radiocarbon* 16: 373) with an average of 9600 B.P. given by Wheat (1979: 152).

The Agate Basin site was a bison kill, probably a box-canyon-like arroyo up which a small herd of bison was driven until it was trapped at the head. A butchering/processing area was located up the arroyo a short distance from the kill area. Two or three separate functions of the site are indicated, all, however, assignable to the Agate Basin complex. Butchering was thorough, leaving few articulated units. The ages of the young animals suggest a late

winter kill.

Chipped stone artifacts, in addition to points, from the Agate Basin site appear to have been effective but not finely finished. Included are a variety of large cutting and scraping tools, several end scrapers and a wide assortment of retouched flakes and blade tools. Broken bones had probably been used as butchering tools, but bone preservation was not good enough to permit verification that bones suspected of having been tools had actually been used (Frison 1978: 163-176).

In the Agate Basin complex occupations at Hell Gap, the characteristic tools, in addition to the projectile points:

> . . . include a large variety of well-made single and double sidescrapers, notched flakes, spur perforators, simple retouched flakes, and utilized flakes. End scrapers, principally of the beaked and angle-edged forms, are present but are less prominent than previously. There are also some interesting new tools, including a very large form of thin elongated bifacial knife. Bone tools are never common in the Paleo-Indian complexes at Hell Gap, but a delicate eyed needle and a notched and flattened implement are among the Agate Basin materials (Irwin-Williams et al. 1973: 47).

In one Agate Basin occupation at Hell Gap, there was evidence of three superimposed circular structures averaging about 2 m in diameter. The circles consisted of post holes, but no other features were identifiable (Irwin-Williams et al. 1973: 47).

Cody Complex

The Cody complex is widespread over the high plains from Alberta and Saskatchewan, Canada, south into northeastern New Mexico (Wormington 1957: 132-134; Wheat 1972: 152). Wormington (1957: 136-137) proposed that the name "Cody" be applied to the complex characterized by Scottsbluff and Eden points and Cody knives. It was named after the Cody locality in northwestern Wyoming where it was found at the Horner site, investigated by Jepsen (1953a). Irwin-Williams et al. (1973: 52) suggest a date for the Cody complex of ca. 6800 to 6400 B.C.; at the Hell Gap site in southeast Wyoming they have a single radiocarbon date for the Cody complex level of 6650 B.C. (8600 B.P.). Frison (1978: 33-34) apparently accepts their dating of about 8800 to 8400 B.P. but questions a number of radiocarbon dates from the Finley site, in southwest Wyoming, and the Horner site. He reports that the Cody complex is widespread, extending from lower elevations in the plains and intermountain basins to timberline, including an extensive level at the Medicine Lodge Creek site in north-central Wyoming (Frison 1976, 1978; Frison and Wilson 1975).

Within the Central High Plains, the Cody complex is best known from the Claypool site in Washington County, Colorado, about 160 km east of Denver. Information on this site comes from extensive surface collections made by Bert Mountain and Perry Anderson and from limited controlled excavations by the University of Colorado (Dick and Mountain 1960; Malde 1960; Wormington 1957: 128-132). Scottsbluff points have been found as far southeast as Louisiana, and Eden points as far northwest as Alaska, but presumably without the rest of the Cody complex (Wormington 1957: 123-124).

The diagnostic points of the Cody complex are: Eden points, plus Scottsbluff I, II and III points, which Wormington (1957: 136) would classify together as Cody points although points of the various types appear to have reas of distribution that extend beyond that of the Cody complex. According to Wormington's definition, Cody points are essentially what were once called Yuma points.

The type site for the three varieties of Scottsbluff points is the Scottsbluff Bison quarry, located in the extreme west-central Nebraska Panhandle, where these points, previously known from surface collections, were finally found in a kill site (Barbour and Schultz 1932; Schultz and Eiseley 1935). Eden points were first excavated at the Finley site, near Eden, Wyoming, where they were also associated with bison remains (Howard et al. 1941; Howard 1943; Moss et al. 1951; Hack 1943; Frison 1978). Another Wyoming site, the Horner site, has contributed a great deal of information on the Cody complex (Frison 1978).

Other artifacts attributed to the Cody complex at the Hell Gap site (Irwin-Williams et al. 1973: 50) and/or at the Claypool site (Dick and Mountain 1960) include: ground-bit end scrapers, end scrapers on large flat flakes, asymmetrical end scrapers, end scrapers retouched over the entirety of the ventral surface, side scrapers, raclette scrapers, notched flakes, spur perforators, denticulates, utilized flakes, and grooved pieces of sandstone. Chipped stone drills were found on the surface of the Claypool site. Some of the points had apparently also been used as knives.

At Lamb Spring (5 DA 83), just southwest of Denver, excavations by Wedel produced evidence of an Eden-Scottsbluff (Cody) occupation (Wedel 1963: 14) which provided radiocarbon dates of 8870 ± 350 B.P. (6920 B.C.) and 7870 ± 240 B.P. (5920 B.C.) (samples M-1463, SI-45) (Crane and Griffin 1968: 102; Long 1965: 249).

For a discussion of a similar complex with which the Cody complex could be confused, see the section on the Firstview complex in this overview.

Kersey Complex

The Kersey complex is reported from the Jurgens site (5 WL 53), 65 km northeast of Denver, Colorado. The projectile points diagnostic of

this complex are considered by Wheat (1979: 152) to be a:

> . . . regional development of the stemless lanceolate projectile point tradition represented by the Firstview and Milnesand complexes of the Southern and Central Great plains. In this tradition, stemming of projectile points occurs in both Firstview and Kersey points only onpieces salvaged from broken primary points by reworking, while broken Milnesand points were salvaged by a continuous reduction which maintained the essentially lanceolate character of the primary point morphology.

A single radiocarbon date from the Jurgens site of 9070 ± 90 B.P. (SI-3726) (mistakenly reported as 9070 B.C. by Wheat) is consistent with this interpretation and is consistent with a date of 9600 ± 130 B.P. (SMU-31 and SMU-32) for the Frazier site, an Agate Basin complex site a kilometer away in the same (Kersey) terrace, but slightly lower stratigraphically (Wheat 1979: 152).

Wheat's analysis of the artifactual and other data from the Jurgens site is detailed and excellent. The non-reworked Kersey projectile points from the site are represented by 28 specimens, of which three are complete or nearly complete, and reworked points by 33 specimens.

Bifacially-chipped stone knives from the Kersey complex, as classified by Wheat (1979: 84), include: "Stemmed or Hafted knives . . . a Curved Stemmed knife . . . Lanceolate Stemless knives and . . . Wide Flat Stemless knives." The stemmed knives resemble large, stemmed projectile points but are larger, relatively wider and have well-defined shoulders. Some were resharpened so often that their original long blades with convex edges were reduced to short triangular blades, still having, however, the original square bases. Some knives have serrated edges.

Other chipped stone artifacts in the Kersey complex include: preforms, pebble tools, cores or core-hammerstones, combination tools, denticulates, beaks or gravers, end scrapers (of various types), double side-and-end scrapers, side scrapers, double side scrapers, and flake knives. Ground or pecked stone artifacts include: a stone tube (perhaps a pipe), grinding slabs, handstones, anvil/hammerstones, abrading stones, grooved shaft-abraders, and various stream pebbles and cobbles. Bone and antler artifacts include: antler flaking-hammers, atlatl hooks, bones grooved for breaking, an engraved ulna, and various bones and bone fragments used as impromptu tools, probably for butchering. Many of the latter conform to definite patterns in that particular bones were selected and modified, by breaking, in the same ways.

At the Jurgens site, Wheat (1979: 146) noted areas of flaking debris and was able to identify three different activity areas: a long-term camp or habitation site, a short-term camp site, and a butchering or processing site. Each activity leaves a distinctive assemblage of artifacts and debris. Apparently the kill site was elsewhere.

Alberta Complex

Sites of this complex apparently have a distribution to the north of the Central High Plains, but two sites, Hell Gap in the extreme east of central Wyoming (Irwin-Williams et al. 1973) and the Hudson-Meng site in northwestern Nebraska (Agenbroad 1973, 1974a, 1974b) are close enough that the complex should be mentioned here. Irwin-Williams et al. (1973) suggest dates of ca. 7500 to 7000 B.C. for the complex, dates which Frison (1978: 83) apparently finds acceptable. Alberta points were described by Wormington (1957) and Bell (1960) and in general resemble Scottsbluff points.

Frederick Complex

The Frederick complex is defined by Irwin-Williams et al. (1973: 50-51) on the basis of material excavated at Hell Gap in east-central Wyoming. The complex appears to be closely related to that from the poorly-known Jimmy Allen site, located near the Colorado border, nearly straight south of Laramie, Wyoming (Mulloy 1959; Wormington 1957: 144-146). The diagnostic points from the two complexes are very much alike. A radiocarbon date from the Jimmy Allen site of 7900 ± 400 years B.P. (sample M-304) (Mulloy 1959), and a Frederick complex date from Hell Gap (sample number not given) suggest dates of ca. 6400 to 6000 B.C. for the complex (Irwin-Williams et al. 1973: 51). Perino (1971: 2) gives the distribution of Allen points as the western plains and lower flanks of the Rocky Mountains from New Mexico to Alberta; presumably a similar distribution will be established for Frederick points. Recently a bison kill/butchering site in the southeast corner of the Nebraska Panhandle, the Clary Ranch site, assignable to the Frederick complex, has been tested in preparation for extensive excavation (Myers, Tanner and Corner 1980). The upper levels at both the Lime Creek and Red Smoke sites in southwest Nebraska may also be assignable to the Frederick complex (Wheat 1972; Johnson and Holliday 1980). Irwin-Williams and Irwin (1966: 219), in a brief summary of the prehistory of the central foothills of Colorado (essentially the Denver Basin), state that Frederick points have been recovered there, but they do not indicate from which sites nor state the source of their information. Frison (1978) includes limited comments on the Frederick complex from Irwin-Williams et al. (1973) but adds no additonal data.

The Frederick complex, as manifest at Hell Gap, is described by Irwin-Williams et al. (1973: 50-51) as follows:

The typical projectile point seems essentially unrelated to the slowly evolving tradition represented by the Agate Basin-through-Cody continuum. It has a lanceolate outline with a markedly concave base and no distinguishable shoulder or stem. More diagnostic, however, is the specific technique of oblique parallel pressure-flaking executed with great care in a specific order from tip to base so that many ofthe flakes carry over across the mid-section and result in a thin lenticular cross section. These closely resemble the type termed Jimmy Allen, distinguished principally by a greater degree of basal concavity, which may have spatial or chronological implications. Also diagnostic are bifacial knives made on or similar in form to the Frederick projectile point type. The remainder of the tool kit displays both similarities to and differences from earlier periods. The scraper class is dominated by end scrapers, particularly the ventrally retouched, asymmetrical, and ground bit forms. Raclette scrapers, along with several types of side scrapers, are present but are of subordinate importance. Spur perforators, notched flakes, retouched and utilized flakes, and several rubbing stones also occur. The bone industry is better developed than in the earlier complexes and includes well-made bone awls and several well-made incised bone beads.

The structure uncovered at Locality I differs from those in the Agate Basin and Midland occupations on the one hand and shows close parallels to those of later high plains groups on the other. Instead of post hole circles, the dwelling was defined by a circle of small boulders similar to those used by historic tribes to hold down the hide coverings of tipi-like structures. Preliminary information on faunal remains from the Frederick occupation indicates a somewhat more varied use of resources, including not only bison, but also deer,numerous small animals, and a few freshwater shell fish.

Frontier Complex

The Allen site (25 FT 50), in Frontier County, southwestern Nebraska, is the type site for the Frontier complex. Holder and Wike (1949), who excavated the site, considered this complex Archaic, although Wedel (1961: 74-75) discusses it along with the Early Big Game Hunters, i.e., as part of the Paleoindian period. The occupation zones at the Allen site were buried about 6 m below the surface. The radiocarbon dates from the site are somewhat puzzling; two reported by Johnson as from the lower occupational zone are 8274 - 500 B.P. and 10,493 - 1500 B.P., while a third sample, which was a mixture of charcoal from the upper and lower zones, is 5256 - 350 B.P. (F. Johnson 1951: 5, 14). The similarity of the artifact assemblages from the two zones does not support a several-thousand-year age differential. Roberts (1951: 21 f.n.) provides the information that the 10,493 B.P. date was for a sample from below the lowest occupational level and hence older than it. Davis (1953) suggests that the Frontier complex material from the Allen site equates with Zone IV at the nearby Red Smoke site (25 FT 42). There Zone IV lies below Zones V, VI and VII, the latter dated at 8862 - 230 B.P. (sample C-824) and 7970 - 210 B.P. (sample Tx-333). Davis, who excavated Red Smoke, feels that the 7970 B.P. date is closer to accurate (in Deevey et al. 1967: 451), in which case the 8274 B.P. date for the Allen site appears reasonable. Such a date would place the Frontier complex at essentially the temporal boundary between the Paleoindian and the Early Archaic periods.

There is doubt as to whether the points from Stratum V at the Red Smoke site were properly classified as Plainview by Davis (1953). Wheat (1972: 154), citing some unidentified source, states that Irwin refers to these points as Meserve. I. Johnson and Holliday (1980: 102, 104) do not accept a Plainview identification for Red Smoke points and suggest that they may actually be either Frederick or Goshen. Myers (Myers, Tanner and Corner 1980), on the basis of his work with the Frederick complex as represented at the Clary Ranch site, considers Meserve points to be reworked Frederick points.

The Frontier complex, unfortunately, has no truly diagnostic artifacts or traits. At the Allen site, the quality of workmanship on chipped stone tools was only fair and the total collection not great. Projectile points were both small and large. The small ones, about 4 cm long and 2 cm wide, were leaf-shaped with concave bases. One example was found in each of the two levels, and two possible blanks for such points were found in the lower level. The large points, known only from 13 fragments and blanks, were also found in both levels. These points, which had been about 7 cm long and 2.5 cm wide, are more parallel-sided than the small ones. The butts are slightly constricted and the bases are slightly concave. In outline, the large points are similar to Plainview points. The small points are similar to ones from Signal Butte in the Nebraska Panhandle (Strong 1935: 233, pl. 25:1:o) and from Deadman Cave near Salt Lake City, Utah (Smith 1941). Scrapers of the Frontier complex are generally trapezoidal "to the virtual exclusion of the familiar plano-convex or thumbnail scrapers." Five scrapers resemble so-called Clear Fork gouges. One thin ovoid blade and eight larger flat lanceolate blades were recovered, as were three expanded base drills. Ground stone artifacts included abrading stones, possible bolas weights, and hammerstones. Worked bone included needles, awls and a straight "fish-hook," plus miscellaneous pieces of worked bone

scrap. Evidence of 20 campfires or hearths, some of them heavily burned, were found; none of the hearths had been prepared. Field identifications of faunal material included bison, antelope, deer, coyotes, rabbits, mice, rats and prairie dogs; beaver, fish, reptiles, amphibia, and birds were rare. Clam shells and mud dauber wasp nests were also found, the latter burned and broken open. Most of the faunal remains were found in Level I with only a few bison bones in Level II (Holder and Wike 1949)

CHAPTER TWO

THE ARCHAIC PERIOD

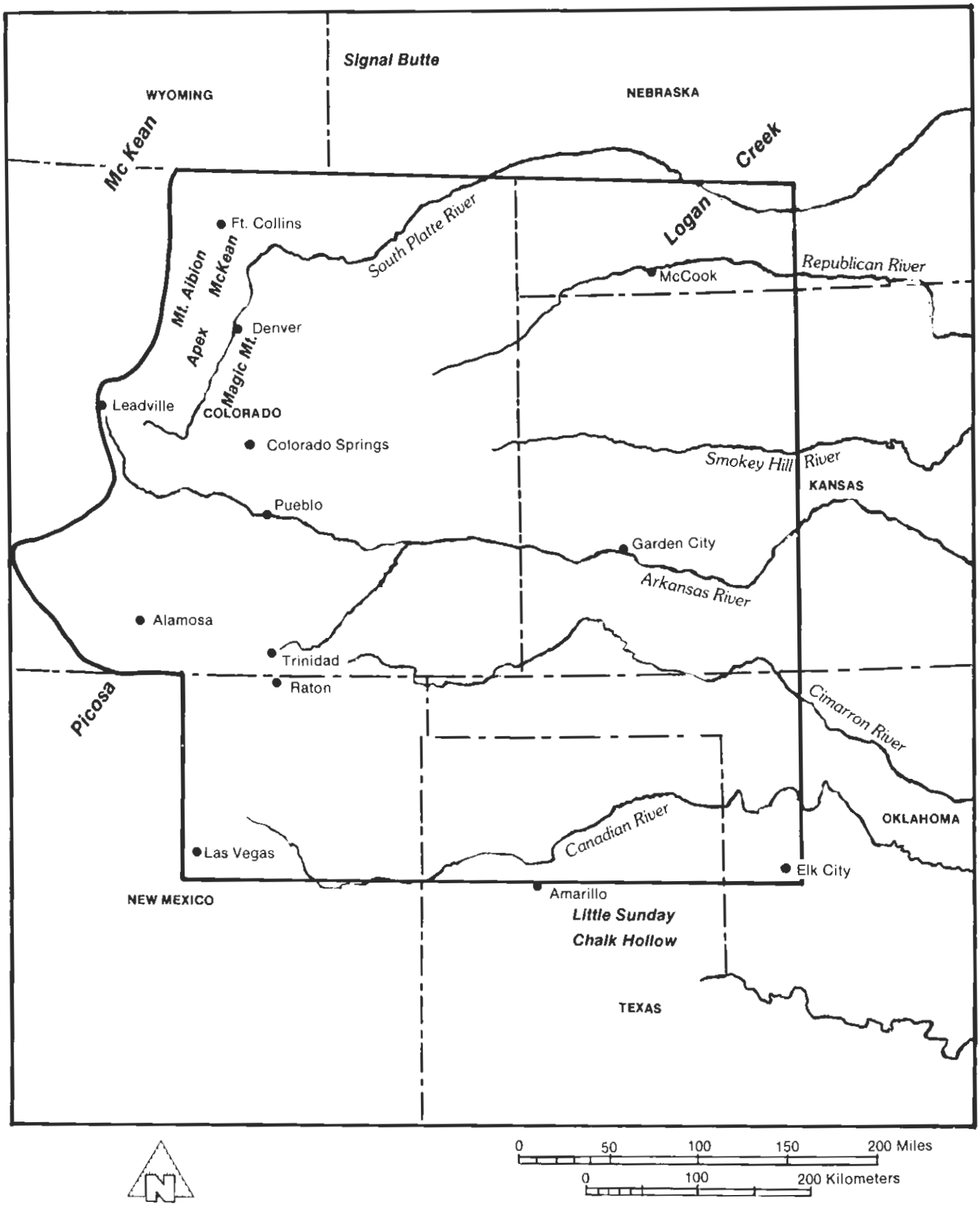
One of the least known periods of plains prehistory, commonly called plains Archaic, lasted from about 8000 years ago (6000 B.C.) until about 1500 years ago. Its beginning is marked by the appearance of large notched spear or dart points and ends with the appearance of pottery. Also, there is no evidence in Archaic sites of the fauna, mostly large, that became extinct at the end of the Pleistocene; only modern forms occur. In his volume *Prehistoric Man on the Great Plains*, Wedel (1961: 86-87) devotes little more than one page to the Archaic period of the Central plains and bases that primarily on the excavation of one site on Logan Creek in Burt County, extreme eastern Nebraska. Most of our information on the Archaic occupation of the high plains comes from the investigation of sites in the foothills and at high altitudes near Denver, Colorado. For a general chronological framework, the recent work by Frison (1978: 83) is useful. His three-part division dates the Early plains Archaic at 6000 B.C. to 3000 B.C., the Middle plains Archaic at 3000 B.C. to 500 B.C. and the Late plains Archaic, overlapping with Middle Archaic, at 1000 B.C. to A.D. 500.

EARLY ARCHAIC

Logan Creek Complex

In the northeastern corner of our Central High Plains a few Archaic sites assignable to the Logan Creek complex have been reported (Kivett 1962; Carlson and Steinacher 1978; Grange 1980: 12-47). The Logan Creek Complex was defined by Kivett (1962) on the basis of excavated material from the Logan Creek site (25 BT 3) located in northeast Nebraska, well out of our area of concern. The diagnostic artifacts included small to medium-sized, side-notched triangular points, often with ground bases; those with concave bases were 20 to 49 mm long and those with straight bases 17 to 35 mm long. A third but rare type is triangular, unnotched with basal thinning, and 26 to 30 mm long. One concave base section of a parallel-sided point with smoothed and thinned basal edges had originally been about 55 mm long. A common scraper type at the Logan Creek site is plano-convex with side notches, usually 15 to 25 mm long, with one specimen 49 mm long. Small end scrapers of the usual Central plains type are rare and up to 24 mm long. Both crude lanceolate blades and delicately flaked parallel-sided blades (represented only by sections) are also present but rare. One T-shaped drill was found. Both milling slabs and handstones were recovered. Bone artifacts and fragments included spatulate forms with serrated edges made from heavy rib sections, splinter awls (common), polished bone scrap (common), tubular beads up to 24 mm long, shaft wrenches (rare), fishhooks (rare), flakers (common), antler drifts and bone needles. Worked mussel shells with serrated edges were also found. Radiocarbon dates from charcoal samples are 6633 - 300 years B.P. and 7250 - 300 years B.P. (about 6300 and 5700 B.C.) (samples M-837 and M-1018). These dates place this site and complex in the Early Archaic. Kivett sees the Logan Creek complex as related to ones to the east, but extending over much of Nebraska, where it is known only from sites south and east of a northeast-southwest diagonal line that cuts the state in half (Carlson and Steinacher 1978: Figure 1).

Our best data from a Logan Creek complex site within the Central High Plains area comes from the Spring Creek site (25 FT 31), a multicomponent site in Frontier County, southwest Nebraska (Grange 1980: 21-47). Because of dam construction time pressure, this extensive site was little more than sampled. It had apparently been used repeatedly by Archaic people, who each time left a hearth and a concentration of bone. The artifact inventory corresponds closely to that of the Logan Creek site except that notched scrapers were not found. Of the 21 projectile points, most were side-notched with a few corner-notched or lanceolate; considerable individual variation is shown. Scrapers were common, but these also showed considerable variation, with thin unifacial side scrapers made on irregular flakes dominating. Bifacial knives and core choppers were present but not common. One grinding slab and four manos were recovered. Bone artifacts were surprisingly abundant and included ulna picks, a scapula pick, fleshers, a shaft wrench, bone abraders, splinter awls, socketed long bones (perhaps digging implements), rib flakers, a tubular bone bead and polished bone fragments. In the faunal remains modern bison was by far the most abundant (a minimum of 12 individuals); other species included wolf or dog (a minimum of five individuals), swift fox, deer, antelope, beaver, cottontail, pocket gopher, prairie dog, vole, pintail, goose and common crow. Nearly all of these later species were represen-



SELECTED ARCHAIC COMPLEXES

ted by only one individual. A radiocarbon date on a combined charcoal sample (M-1364) from six features is 5680 - 160 B.P. or 3730 B.C., which, if recalibrated, would be 4555 B.C. In any case, this date is considerably later than those from the Logan Creek site itself, but still within the Early plains Archaic period.

Three sites (25 FM 4, 25 CN 52 and 25 CN 61) from the south-western corner of the Nebraska Panhandle probably date from the Early plains Archaic period. However, we have no information on these excepting the observations by Carlson and Steinacher (1978: 5) that they have yielded "generalized side-notched points which may be related to the Bitterroot and/or Salmon River types believed by Reeves (1973) to date to slightly before 3000 B.C."

The Altithermal

Major problems of the Early plains Archaic involve the question of the Altithermal, described by Antevs (1955) as a period warmer and dryer than the present, following the period of the Paleoindian big game hunters. Scientists have presented a variety of interpretations as to the effect that the Altithermal had on aboriginal populations. Recently Benedict (1979), who has worked extensively at sites in the foothills and mountains of northern Colorado, summarized the archeology of that area in relationship to the Altithermal. His position is that "the Altithermal was real, severe, more complex than generally envisioned, felt in virtually all parts of [the] western United States, and was the cause of population dislocations that affected much of the North American continent" (Benedict 1979a: 3). He sees the Altithermal not as a single drought but as two short severe droughts, one from 7000 to 6500 B.P. and one from 6000 to 5500 B.P., separated by an episode of increased effective moisture, probably involving late winter and spring precipitation.

Benedict also (1979a: 4) reviewed the Early Archaic sites that were well dated by radiocarbon and noted that there were peak numbers of sites in the mountains 5600 and 7000 years ago with minimum numbers in the plains at 5800 and 6800 years ago. The peaks on the plains occurred at 7300, 6300 and 5300 years ago while the minimums in the mountains were at 7300, 6500 and 5300 years ago. This evidence matches well his postulated drought periods although it would fit better if his earlier drought had been dated about 300 years earlier or between about 7300 and 6800 years ago. A similar but much less dramatic relationship is shown between the number of sites in the Great Basin/Colorado Plateau area and those in the Rocky Mountains, although there was no marked increase after 5700 years ago. This pattern supports Benedict's supposition that there was a movement from the plains into the better watered mountains during the two severe droughts of the Early plains Archaic period, with a reverse movement as conditions improved.

Mount Albion Complex

The Mount Albion complex is the best known of the Early Archaic complexes of northern Colorado (Benedict and Olson 1978a; Benedict 1979). The two excavated sites, the Hungry Whistler and 5 BL 70, from which most of the information has been derived, are located above timberline at elevations of 3500 and 3465 m, almost on the continental divide northwest of Denver. The complex is also known from surface collections representing 22 additional, nearby, high-altitude sites, and from excavations at four foothill sites just west of Denver: Helmer Ranch (Arnold Withers personal communication to Benedict, 1977), the Wilbur Thomas Shelter (Breternitz 1971), Magic Mountain (Irwin-Williams and Irwin 1966), and the LoDaisKa site (Irwin and Irwin 1959).

The type site for the Mount Albion complex is the Hungry Whistler site (5 BL 67), a hunting and butchering station with an extensive game drive system. Preliminary reports on this site (Benedict 1970a, 1970b) were followed by a final report (Benedict 1978e). The game drive system consisted of a dry-laid low stone wall 85 m long, and 17 small stone cairns arranged in lines apparently connecting "tree islands." At two nearby sites (5 BL 65 and 5 BL 66) game drive systems also included rock-rimmed pits which may have served to conceal the hunters. Most of the excavation at Hungry Whistler was in the butchering area where there was abundant charcoal and hearths in two discrete layers. The lower level produced reliable radiocarbon dates of 5800 ± 125, 5730 ± 130, and 5520 ± 190 years B.P. (3850 to 3570 B.C.) (samples I-3267, I-3817 and I-9434). A determination of 5300 ± 130 (3350 B.C.) (sample I-4418) may also date this level, or may contain a mixture of charcoal from the two levels. A fifth date of 4010 ± 90 B.P. (3060 B.C.) (sample I-9777) is from a hearth that had been less disturbed by frost action.

The most abundant projectile points (40) from Hungry Whistler are Mount Albion corner-notched (Benedict 1978a: 47-54), Four examples of stemmed points with concave bases were recovered. Three very fragmentary bases with stems about 10 mm wide were associated with the hearth dated at 4010 B.P. (3060 B.C.) suggesting that by then shafts were considerably smaller. The fourth, with a stem width of 14 mm and sloping shoulders, was associated with the 5300 B.P. (3350 B.C.) sample, which was possibly contaminated. Two other stemmed and shouldered points were found on the surface. Three points recovered are of unique forms.

Other chipped stone artifacts were apparently designed specifically for butchering and/or hide preparation. These include stemmed knives, unifacial knives and scrapers, bifacial knives, perforators, gouges, gravers, utilized core nuclei and micro-tools.

Chipping debris, which was quite abundant, consisted almost entirely of flakes detached during resharpening of tools. Milling slab fragments were common on the surface and in the excavation; five handstones were found.

Site 5 BL 70, occupied almost exclusively by people of the Mount Albion complex, apparently had a function very different from the nearby Hungry Whistler hunting/butchering site. The major emphasis at 5 BL 70 was on camping and gathering wild plant foods, as well as on the completion of partially finished chipped stone tools and the repair and replacement of hunting tools (Olson, in Benedict and Olson 1978: 76-117).

Two radiocarbon dates from hearths at the site, 5650 ± 145 and 5350 ± 130 B.P. (3700 and 3400 B.C.) (samples I-3023 and I-4419) date the Mount Albion occupation. A date of 7650±190 B.P. (5700 B.C.) (sample I-3266), on charcoal from a lower hearth-like feature which, however, had no artifacts associated, probably represents a late Paleoindian or very early Archaic occupation. The 27 Mount Albion corner-notched points from the site correspond well with those from Hungry Whistler but show somewhat less secondary use as butchering and hide-processing tools. Four other points, 3 Hog Back corner-notched points and a small triangular side-notched point (found on the surface and in the loose dirt from a rodent hole) apparently related to a much later occupation not otherwise represented at the site. Other chipped stone artifacts assignable to the Mount Albion occupation include: five ovoid knives, an irregular bifacial flake scraper, two irregular unifacial flake knives or scrapers, two backed flake knives or scrapers, an end scraper, a triangular scraper, a perforator, a spokeshave/perforator, two cores and eight micro-tools. Milling slabs were represented by 81 fragments from at least six specimens, mostly from the excavations; striations show a back-and-forth grinding motion. Seven handstones show one or two secondary grinding surfaces intersecting the primary one at 90 to 130 . A great deal of flaking debris was also recovered, primarily from the fabrication rather than the resharpening of stone tools.

High-altitude sites from which surface collections have been made include 22 with Mount Albion complex components. These are located near the continental divide in Rocky Mountain National Park, and just to the south in the Indian Peaks area. At six of these there are game drive structures presumably used by Mount Albion people. At one of these sites (5 BL 147) there are five superposed systems documenting the evolution of game drive hunting techniques in the Front Range (Benedict and Olson 1978: 119-125).

Mount Albion components are identified by Benedict and Olson (1978: 129-132) at several other excavated sites from along the west side of the hogback west of Denver. Such an assignment is suggested on the basis of photographs, provided by C.E. Nelson, of corner-to-side-notched points from Cherry Gulch. The site has a radiocarbon date of 5730 ± 220 B.P. (3780 B.C.) (sample UGa-1230), and was occupied by mountain-oriented people until later prehistoric times. The Helmer Ranch site (K: 12: 2) has similar projectile points and a radiocarbon date of 5780 ± 160 B.P. (3830 B.C.) (sample W-272).

The easternmost known occurrence of the Mount Albion corner-notched points, according to Benedict and Olson (1978: 130-132), is at the Wilbur Thomas shelter, excavated and reported by Bretternitz (1971), and discussed in the Middle Archaic section of this work. Mount Albion points were likewise reported from the Willowbrook shelter (Leach 1966), which was also excavated and reported under the name of "L. B. Shelter" by Irwin-Williams and Irwin (1966: 223-225). Some of these points are smaller than the ones from Hungry Whistler. Like the ones from the Van Bibber Creek site (C. Nelson 1969; Figure 3), they appear to be part of the continuing Mountain Archaic tradition, but two to three millennia younger than the Mount Albion complex proper.

There are several other excavated sites from which Mount Albion corner-notched points have been recovered (Benedict and Olson 1978: 126-132). The Ptarmigan site (5 BL 170) is located at an elevation of 3460 m in the Fourth of July valley (Benedict 1974). Artifacts are few and fragmentary, but include the diagnostic points, which are probably associated with charcoal dated at 4620 ± 95, 4700 ± 95 and 4745 ± 95 B.P. (2670, 2750 and 2795 B.C.) (samples I-8562, I-8563 and I-8280). An older date of 6450 ± 110 B.P. (4500 B.C.) (I-7458) may date a Bitterroot side-notched (Logan Creek) point at this multicomponent site. The corner-notched points appear to be typologically intermediate between those at the type site of Hungry Whistler and those at the most recent site, Coney Lake (5 BL 94), at which points of the Mount Albion complex have been found. The main differences involve a reduced emphasis on basal and notch grinding and a greater use of cryptocrystalline rock.

Albion Boardinghouse Complex

Near the continental divide, some 55 km west of and in view of Denver, are sites attributable to three different Early Archaic populations dating from the 6000-5500 B.P. drought period on the plains. There appears to have been very little interaction among the groups represented. One archeological assemblage is the Albion Boardinghouse complex, near timberline at 3260 m elevation (Benedict 1975c, 1979). A radiocarbon age for this site is 5730 ± 145 B.P. (3780 B.C.) (sample I-5020). Twenty-three dart points of a distinctive form were recovered. These are 3.5 to 4 cm long, up to 1.5 times as long as wide,

are basically triangular with convex unserrated blade edges, deeply concave serrated bases, and narrow, deep side notches about 2/5 of the way up from the base. Point preforms and decortication flakes were found at the site, indicating that the points were made there, probably from chert which occurs just west of the Continental Divide near Kremmling. Other artifacts include thick bifacial knives and flake end scrapers, along with flakes apparently detached during the resharpening of butchering tools. Fragments of burned cobble handstones and a thick sandstone milling slab indicate that plant food was processed locally. The projectile points are of a style apparently restricted to the southern and central Rocky Mountains, but resemble points from Sudden Shelter in southeast Utah (Jennings et al. n.d., cited in Benedict 1979). Such points also occur at Signal Butte in the western Nebraska Panhandle (Strong 1935; Bliss 1950) and at the Scoggin and Pine Spring sites in the Wyoming basin (Sharrock 1966; Lobdell 1973). These sites (Benedict 1979) all date from between 4670 and 3635 years ago, or one to two thousand years later than the Albion Boardinghouse complex, leading Benedict (1979: 6) to suggest that the point style developed in the latter complex and spread north, west and east from the mountains at the end of the Altithermal.

Fourth of July Valley Complex

Another Early Archaic complex, located at high altitudes in the mountains just west of Denver, is the Fourth of July Valley complex (Benedict and Olson 1973; Benedict 1979). The type site, at an altitude of 3415 m, is covered with snow nine or ten months of the year, and was at the edge of a glacier shortly after it was occupied. Two radiocarbon dates from this single-component site are 5880 ± 120 and 6045 ± 120 B.P. (3930 and 4095 B.C.) (samples I-6544 and I-6545). Artifacts from the type site include bifacial knives, a quartzite chopper, two flake gravers and a number of flakes detached in resharpening tools. The 19 projectile points and fragments include both lanceolate and stemmed varieties, some showing parallel-oblique flaking and alternate edge retouch. The points are intermediate in size, shape, and technique of manufacture between such late Paleoindian forms as James Allen and Pryor Stemmed points and such Middle Archaic forms as McKean Lanceolate and Duncan points. Benedict (1979: 8) suggests that "the McKean Complex evolved from ancestral Paleo-Indian complexes in Altithermal refuge areas such as the Colorado Front Range, and that its rapid spread onto the western plains, 5500-5000 radiocarbon years ago, was made possible by the beginning of Neoglaciation."

Magic Mountain Complex

Our best information for Early Archaic complexes from along the foothills of the Rocky Mountains comes from the deeply stratified Magic Mountain site just west of Denver, Colorado (Irwin-Williams and Irwin 1966). The Magic Mountain complex, the earliest at this site, began about 3500 B.C. and lasted until sometime after 2500 B.C. A radiocarbon date of 2980 ± 250 B.C. was obtained on a sample from about midway through the time span of this complex. This date also marks the beginning of occupation by people of the Apex culture, an occupation that continued for some two and a half millennia. Presumably people of two groups, quite different in their material culture assemblages, both used the site sporadically.

The Magic Mountain complex has as its diagnostic artifacts four types of projectile points: MM 1, 2, 3 and 4 (Irwin-Williams and Irwin 1966: 67-72).

Although the second and third zones from the bottom at the Magic Mountain site contain a mixture of Magic Mountain complex and Apex complex artifacts, Irwin-Williams and Irwin (1966: 178-179) feel that they can identify artifacts of the earlier (MM) points as being of types that occur in decreasing frequency from bottom to top. Also, they note that Magic Mountain types reflect the generalization that "The basic distinctive technological mode prevailing in the Magic Mountain complex and influencing its component artifacts is that of producing prismatic flakes from prepared sub-conical cores." The complex includes a series of tiny, slightly modified micro-prismatic flakes converted into microscrapers, perforators, knives and other tools. Other artifacts include various finely made scraping tools on ends of prismatic flakes, as well as unusual forms: i.e., asymmetrical, extremely convex, narrow-bit, and notched. Also included are specialized unifacial perforators, drills, bifacial perforators, small ovoid bifaces, steep well-made scraper-planes on cores, and several types of bifacial, large, pebble and core choppers. Ground stone artifacts include numerous forms of grinding slabs.

The relationship of the Magic Mountain complex to other sites and complexes is discussed at length by Irwin-Williams and Irwin (1966: 182-190). They have identified seven other sites at which this complex occurs; all are between the type site just west of Denver, Colorado, and the Wyoming line, and lie at altitudes of 1800 to 3500 m. To establish distribution they looked for the distinctive and diagnostic points of type MM 3 in numerous collections, made primarily by amateurs, from all over Colorado. Since MM 3 points represent a very small percentage of the points examined, they feel that this distribution is indeed valid for the complex. Also, their search of the literature failed to disclose the Magic Mountain complex in other areas, although they noted a few similarities between this complex and both Oak Grove material in Oklahoma and Archaic complexes in the Edwards Plateau and Big Bend areas of Texas. Perhaps the greatest resemblance,

and that not strong, is to the Old Cordilleran culture, which extends from western Wyoming north into British Columbia and is apparently considerably older than the Magic Mountain complex. Their conclusion is that the Magic Mountain complex developed in situ in north-central Colorado, with possible influence from one or more directions.

Evidence from the Magic Mountain site is viewed somewhat differently by Benedict and Olson (1978: 127-128) than by Irwin-Williams and Irwin (1966), whose interpretations are summarized in the section of this paper dealing with the Middle plains Archaic. Benedict and Olson point out that the lowest level (F) at Magic Mountain could be contemporary with the Mount Albion complex at Hungry Whistler, since the radiocarbon date for the bottom of the next higher level at Magic Mountain is 4930 B.P. Furthermore, some, but by no means all, of the artifacts in the lowest level at Magic Mountain (assigned to the Magic Mountain complex) are duplicated in the Mount Albion complex, a circumstance which leads Benedict and Olson to interpret the oldest material at Magic Mountain as a mixture of at least two unrelated complexes, one of which is Mount Albion. They also see evidence of an ongoing Mountain Archaic complex until 1500 B.P., with an influx of plains, Great Basin and Southwestern traits rather than a simple replacement (with overlap) of the Magic Mountain complex by the Southwest-affiliated Apex complex.

A burial from Colorado reported by Anderson (1966) is apparently assignable to the Early Archaic or Paleoindian period. The site, 4 LR 99, is located 27 km northwest of Fort Collins, in Larimer County, 32 km south of the Colorado-Wyoming line. A radiocarbon age of 9700 ± 250 years (7750 B.C.) was obtained on collagen from human bone (sample GXO-530); an age of 3540 ± 130 years on the carbonate fraction is considered contaminated and too recent. The bones and associated artifacts were heavily stained with red ocher. The skeleton had been flexed on its left side. The artifacts, unfortunately, are not considered diagnostic. A large bifacially chipped blade and two small blades (one burned) are thought to be preforms but do not resemble Folsom preforms. Other artifacts include a smooth stone (pecked to size and ground to shape), a hammerstone, a broken end scraper, three utilized flakes, two small cut mammal ribs, a perforated elk tooth, seven unperforated elk teeth, and a grooved rodent tooth. The overall evidence suggests that an Early Archaic rather than a Paleoindian assignment is more probable.

Other Early Archaic Sites

In the foothills of the Rocky Mountains to the north and west of Trinidad, near the southern border of Colorado, are nine sites, located by survey, which Lutz and Hunt (1979: 133) attributed to the Early Archaic period. It is not obvious why five of these sites were so assigned, since apparently only four yielded diagnostic points, one point per site.

In his recent review of Archaic sites in the panhandles of Texas and Oklahoma and in the western third of Oklahoma, Baugh (1982: 34-37) makes the point that most such sites are of the Early Archaic period. As for the Central High Plains, he reports only the Kenton Caves, Nall, Johnson-Cline and Shaller sites and bases most of his summary on sites farther south and southeast, drawing on the reports of others: Sellards, Evans and Meade (1947); Willey, Harrison and Hughes (1978); Harrison and Killen (1978); Hester, Lundelius and Fryxell (1972); Johnson and Holliday (1980); Saunders and Penman (1979); Baker, Campbell and Evans (1957); Bell (1954); Burton and Burton (1971); Hofman (1971); and Lintz (1978b). Of special interest is the human skeleton from the Gore Pit site located about 150 km southeast of what we are calling the Central High Plains. The skeleton was deeply buried under alluvium and dated at 7100 ± B.P. or 5150 B.C. (Baugh 1982: 36; Hammatt 1976; Keith and Snow 1976). With the occurrence of well-flaked lanceolate points characteristic of the Early Archaic period at camp and bison kill sites in adjoining areas, the complexes represented could be expected to occur throughout the southeastern part of the Central High Plains. These complexes appear to have their closest cultural relationships to the southeast.

At the Johnson-Cline site, in Texas County, Oklahoma (the middle county in the Oklahoma Panhandle) an Early Archaic occupation is represented by four projectile points, two Palmillas points and two of unnamed types (Lintz 1978b). Lintz concluded that the paucity of Early Archaic points at the site suggested that (1) the site was not intensively utilized in Early Archaic times, (2) the activities were such that few points were left, or (3) the points were reused and left by later people at this multicomponent upland dune site. Palmillas points are described by Bell (1960: 74).

Baugh (1982: 36) sees complexes of "corner-notched and side-notched spear points, a few grinding stones and grinding basins, and several chipped stone scrapers, gouges, and knives" at several sites in northwestern Texas and western Oklahoma. These sites include 34 GR 12, Duncan-Wilson shelter, Johnson-Cline, Shaller, Ross, 24 CD 177, and 34 GR 3 (Leonhardy 1966: 17-32; Burton and Burton 1971: 5-8; Hofman 1971, 1973, 1978b; Lawton 1968; Lintz 1978b).

MIDDLE ARCHAIC

McKean Complex

The best known complex of the Middle Archaic period is the McKean, named for the McKean site in

the northeast corner of Wyoming (Mulloy 1954) and extending at least as far south as northeastern Colorado (Irwin and Irwin 1959: 135-138; Luebbers 1971: 69-74). Frison (1978: 46-50), concerned mainly with the northwest plains, where the McKean complex centers, includes a series of 25 radiocarbon dates for the Middle Archaic ranging from 3000 B.C. to 500 B.C. (5000 to 2500 B.P.) and presents a concise discussion of McKean which is here summarized.

Frison sees the McKean complex as representing a sudden appearance of people both on the open plains and in the intermountain basins, areas previously little inhabited. McKean people were more dependent on plant food than earlier populations, as evidenced by the first appearance of true manos and grinding slabs, and roasting pits. The latter varied considerably in size and shape; some pits were lined with stone slabs, and many had been used repeatedly. Such pits are widespread, and in the plains their use continued for thousands of years, well into the Historic period. In addition to an apparent increase in the utilization of vegetal foods, hunting of large game continued. Perhaps economic activities were seasonal.

In spite of the great variability of projectile points in the McKean complex, they are still the most diagnostic artifacts. Mulloy (1954: 444) recognized the variation, but concluded that "all variants appear so closely connected by intergrades that the writer prefers to regard them as variants of a single norm." The full range has been found at sites other than McKean, but at some sites, such as bison kills, only one variant has been recovered. Some of the variants have been described as separate types, McKean Lanceolate, Duncan and Hanna, by Wheeler (1952, 1954). Some points have long, shallow, lateral constrictions and others have true side notches. Bases may be concave, deeply indented or have true basal notches. A variant of McKean Lanceolate is a large heart-shaped variety. Rarely are stems or blade edges ground. Another form, also found in Level 1 at Signal Butte in the western panhandle of Nebraska, and named "the Mallory Point" by Forbis, is "wide, very thin, with deep side notches placed well forward, and with either straight, slightly concave, or deeply indented base. Sometimes the addition of a deep, narrow basal notch is seen" (Frison 1978: 50). Points range in length from 1.5 to 7 cm. Duncan and Hanna points are reported by Perino (1971: 26, 44) from Saskatchewan and Alberta in Canada and from the states of Montana, the Dakotas, Wyoming, Colorado, Kansas, Nebraska, and Oklahoma. The Duncan points Perino illustrates are from Morgan and Weld Counties, Colorado and two of the Hanna points he illustrates are from Morgan and Carbon Counties, Colorado. Bell (1958: 50) indicates that McKean Lanceolate points are found over much of the western United States, not just Montana, Wyoming, South Dakota and Nebraska as indicated by Wheeler (1952).

Lister (1953: 264-265) suggested that stemmed, indented-base points might be a time marker in the western United States. In addition to the points from the McKean site, he includes in this category such named types as Pinto points, Rio Grande points, Pedernales Indented and Brazos River types, and adds to their area of distribution California, Arizona, Utah, Montana, Nevada, Colorado, New Mexico and Texas. However, his suggested horizon, between Folsom and recent, is quite broad.

Other chipped stone artifacts reported by Mulloy (1954) from the type site include plano-convex snub-nosed end scrapers; spokeshaves (for dressing shafts upwards of 19 mm in diameter); bifacially chipped knives; crude, percussion-flaked cores; and flake scrapers or knives. One complete metate from the lower level of the site consisted of a sandstone slab clearly roughened by pecking on each face, although only one face had been used; a longitudinal trough showed the results of grinding with a mano in a reciprocating manner. Manos and fragments of metates, all of the same type, were much more common in the upper level than in the lower. A bone awl and a fragment of a grooved maul were also found in the upper level. Worked Unio shell was common in the lower, but absent from the upper, level. Hearths were common in both levels. Some were unprepared with fires having been built on the ground surface. Others consisted of pits--hemispherical, straight-sided or irregular -- and unlined or lined with stones. Most were small, but one was over 1.5 m in diameter. Two probable storage pits were also found.

Frison (1978: 51) attributes some of the numerous stone circles or tipi rings commonly found in the Plains to Middle and Late Archaic peoples as well as to later populations. Since artifacts are rare at such rings, which probably represent the locations of otherwise perishable structures, there is apparently no way to establish age for most such sites.

At the LoDaisKa site, a rock shelter just southwest of Denver, Colorado, Cultural Complex C resembles the McKean and Signal Butte I complexes (Irwin and Irwin 1959: 135-140). The identification of this complex is based primarily on artifact typology, since there had been mixing of the various cultural levels. The most numerous points (24) at LoDaisKa are shouldered, concave-base, stemmed dart points which Irwin and Irwin (1959: 22-24, 136) call "Type A" and identify as Duncan points. Two of these (their type A2) could probably be better identified as Hanna points since they have expanding stems with concave bases. They also point out that the largest LoDaisKa points resemble, and are equal in length to, the smallest McKean Lanceolate points from the type site, but correspond more closely to points from Signal Butte I. End scrapers are also assigned to Complex C. Prismatic flakes modified into gravers, cutting tools and possibly scrapers, and all pre-

sumably struck from prepared cores, constitute another trait shared with McKean, although these flakes, too, are larger at the type site. Also found in the same levels as Complex C were milling slabs and rock-filled hearths. Other artifacts which may have been associated with this complex are:leaf-shaped and triangular knives; end-and-side scrapers, discoidal and serrated scrapers, an expanded base drill, perforators, ovoid bifaces, utilized flakes, chopper/hammerstones, a tubular bone bead, paint stones, bone awls, both headed and splinter, and a bone knife.

On the basis of radiocarbon determinations, LoDaisKa Complex C has been dated at 1600 to 1000 B.C. (3550 to 1450 B.P.) (Irwin and Irwin 1961; Irwin-Williams and Irwin 1966: 216). Such a date fits well with those for late McKean complex and the last third of the Middle Plains Archaic as defined by Frison (1978: 83).

At the Wilbur Thomas shelter straight north of Denver, Colorado, almost on the Wyoming line, both upper and lower McKean complexes were identified on the basis of typology. Mixing, however, was such that Woodland artifacts were found even in the lower McKean level (Luebbers 1971: 69-74). Six points attributed to the lower McKean complex conform nicely to the description of Duncan points, but those attributed to the upper-level McKean complex show considerable variety, including one Hanna point, two corner-notched points, and three unnotched specimens. Other chipped stone artifacts included scrapers, graver/scrapers, perforators, bifacially chipped oval knives, and choppers. A mano was found, but no metates.

The Spring Gulch site (5 LR 252) is northwest of Fort Collins, Colorado, and nearly on the Wyoming border. The lower levels of Locality I produced points of the Duncan, Hanna and McKean Lanceolate types (Kainer 1974) along with large corner-notched and side-notched points probably attributable to Plains Archaic. The upper levels showed evidence of Woodland occupation and various non-diagnostic artifacts were found throughout the deposit (Kainer 1974).

LoDaisKa Complex D

The earliest Archaic complex at the LoDaisKa rock shelter has been designated Complex D and dates from 3000 B.C. to 1500 B.C. (5000 to 3500 B.P.) (Irwin and Irwin 1959, 1961), a time span which places it at the beginning of the Middle Plains Archaic period. Complex D is represented in reasonably pure form in the lower meter of the deposit, and mixed, in decreasing proportion, with Complex C artifacts in the next higher 0.6 m. The apparent mixing may be mechanical, representing disturbance of the fill by the most recent occupants, or it may represent use by two culturally distinct groups over a period of years.

Complex D is considered by the Irwins to be most closely related to the Desert Culture, found throughout the Great Basin, but perhaps best known from work at Danger Cave in extreme western Utah (Jennings 1957). Similarities also exist between Complex D, materials from Ventana Cave in extreme southern Arizona (Haury 1950), and the Uncompahgre complex of southwestern Colorado (Wormington and Lister 1956).

The projectile points from Complex D suggesting the strongest connection with the Desert Culture are those Irwin and Irwin (1959: 22, 141) designate as Class D points and describe as follows: "Blade triangular, length three to four times the width, edge sinuous; tapering from barb to center, expanding toward point, then tapering off; stem expanding, narrower than blade, base concave or straight."

Other traits which Irwin and Irwin (1959: 140) attribute to Complex D include: triangular chipped stone knives, a few flake knives, a variety of scrapers-side, discoidal, Uncompahgre, and (rarely) end scrapers. Also present are drills, perforators, utilized flakes, choppers, hammerstones, paint stones, bone awls (both splinter forms and ones with heads, especially some very large forms), a notched rib, used bone splinters, antler flakers, undecorated gaming pieces, tubular bone beads, a tooth pendant, a limestone pendant, worked mica, one quartz ball, and one clay ball. Many of these traits are shared with the Danger Cave assemblage, as are one-hand manos and slab milling stones. A four-plane mano attributed to Complex D is not reported from Danger Cave and the reverse holds for abrading stones.

Apex Complex

The Apex complex, a Middle Archaic complex with southwestern roots found at the Magic Mountain site (Irwin-Williams and Irwin 1966: 216 ff), is dated at about 3000 B.C. (5000 B.P.) to about 500 B.C. (2500 B.P.). The traits diagnostic of Apex are the projectile points, which increase in frequency as ones goes up through three zones, starting with the next to the bottom zone, at the Magic Mountain site. Within the Apex complex some traits are consistent through time while others exhibit stylistic variation and reflect temporal development (Irwin-Williams and Irwin 1966: 72-89, 190-193).

Limited information on Apex burials (Irwin-Williams and Irwin 1966: 196) suggests that graves were located in living areas, contained small amounts of utilitarian goods, and were covered with cairns of medium size stones, including milling slabs. Many bones are missing, suggesting possible secondary burial.

The relationships of the Apex complex beyond the Magic Mountain site are discussed in detail by Irwin-Williams and Irwin (1966: 196-205). Their conclusion is that this component is the extreme northeastern manifestation of the complex ances-

tral to Pueblo cultures, called the "Elementary Southwestern Culture," by Daifuku (1952) and the Picosa Culture by Irwin-Williams (1967). There is little evidence of interaction between the Apex people and those of Complex D at LoDaisKa, 10 km away, even though they overlap in time for about 1500 years. The two complexes had a few similar artifacts, but these were of such a general nature that there is no need to suggest interaction. Occupation of both sites was intermittent during the long time period indicated, and it is quite possible that the two groups exploited the Denver basin according to such different patterns that intergroup contact was rare. The same can probably be said about people of the Magic Mountain complex and the Apex com plex, both of whom utilized the Magic Mountain site intermittently for some 500 to 800 years. Furthermore, Irwin-Williams and Irwin saw no evidence of interaction between the Apex people and the Late McKean complex people who were their neighbors at the LoDaisKa site for 500 years following the Complex D occupation of the site.

As mentioned earlier, Benedict and Olson (1978: 127-129) do not interpret the evidence from Magic Mountain and LoDaisKa as showing this degree of uniqueness and isolation, but see long, on-going use by people following a Mountain Archaic tradition, beginning with visits of Mount Albion complex people as early as 4840 B.P. (2890 B.C.) and showing influence from various directions.

Picosa Culture

The Central High Plains area is on the extreme eastern edge of the northern sector of the Picosa culture as defined by Irwin-Williams (1967). The Picosa culture, essentially synonomous with the "Elementary Southwestern Culture" as defined by Daifuku (1952), is seen as a Middle Archaic complex, with three regional variants, that gave rise to the various Pueblo traditions. As mentioned, Irwin-Williams and Irwin (1966: 196-205) suggest that the Apex culture found in the Denver area is the northeasternmost manifestation of the Picosa culture.

Irwin-Williams (1967: 442-444) characterizes the Picosa culture as representing a sparse population that exploited seasonal food resources by making a "seasonal round," in the course of which they returned sporadically or regularly to specific sites, including rock shelters, where the deposits demonstrate repeated reoccupation. In addition to hunting and gathering, subsistence activities included simple horticulture, which became increasingly important. Characteristic artifacts include flake side scrapers, thicker end scrapers, flat or shallow basin milling slabs, handstones, bone awls, coiled baskets and various other artifacts of perishable materials not commonly found in the plains. Chipped stone projectile points show regional and temporal variation, but are dominated by stemmed, indented-base types.

The only complex within the Central High Plains assigned to the Picosa culture by Irwin-Williams (1967) is the Apex culture, previously discussed. However, there are sites in Colorado with related manifestations located in the San Luis Valley, in Sand Dunes National Monument, near Saguache, and in the mountains west of Trinidad (Swancara 1955; Huscher 1941). The sites in the San Luis Valley are at essentially the northern end of Renaud's (1942) Upper Rio Grande complex, which is also subsumed as part of the Picosa culture.

Farther south, in northeastern New Mexico, Glassow (1980: 71) identified only two sites as Archaic out of the 300 sites he found in the canyons of the Sangre de Cristo Mountains near Cimarron. Of these sites he states:

> Only slightly more evidence exists for Archaic [than Paleoindian] occupation in the Cimarron district. This comes from a rock shelter in Cimarron Canyon at the mouth of Bear Canyon (site no. CI-42), and from another probable shelter in Middle Ponil Canyon at the mouth of Horse Canyon (MP-17) . . . [about eight miles west and ten miles [13-16 km] northwest of Cimarron, respectively]. From the lower levels of the test pit in the apron of midden debris in front of the Bear Canyon shelter, below ceramic-bearing levels came a collection of comparatively large, often heavily patinated hornfels and basalt chipped-stone tools in association with large projectile points. Projectile points of the same size and form have also come from an eroded bank next to a road cut in front of the Horse Canyon shelter, in association with sparse lithics which include an alibates chert "tear-drop" endscraper. The several projectile points (or fragments) from these two sites are similar in size and form to the straight-stemmed, indented-based points described by Irwin-Williams as being predominant during the late Archaic in the northern sector of the Southwest (Irwin-Williams 1967: 452). Other forms of large projectile points have also been reported by residents of Cimarron, including several from site MP-19. However, the general impression is that Archaic occupation was sparse in the Cimarron district.

At high elevations, about 3,350 m, in the southern Sangre de Cristo mountains immediately to the west of the southwest corner of our study area, Wendorf and Miller (1959) report eight Archaic sites. Although there is evidence of limited Pueblo use of the high area about A.D. 1500, presumably for hunting, the main use was apparently by Archaic peoples. "Over half of the identifiable projectile points are . . . thin, leaf-shaped blades with deep, diagonal corner notches." These were predominant at five of the eight sites and are similar to points from near Tesuque, New Mexico, dated by radiocarbon at 2330 ±

250 years ago. Other points from the high-altitude sites are seen by Wendorf and Miller (1959: 48) as resembling ones from near Santa Ana Pueblo dated by radiocarbon at between 2180 ± 250 B.C. and 3300 ± 700 B.C. (Agogino and Hibben 1958). Many of the points from the high-altitude sites have notched or bifurcated bases and are said to resemble ones reported by Renaud (1942) from the Upper Rio Grande near the New Mexico-Colorado line. A large, heavy stemmed point from the easternmost part of the site is considered unique by Wendorf and Miller (1959: 50), who suggest that its origin may lie to the east.

Other Middle Archaic Sites

A hunting blind connected with Archaic game procurement was the most probable function of a rock ring 2 m in diameter reported at the Blue Lake Valley site (5 BL 141) about 48 km northwest of Denver, Colorado, at an elevation of 3370 m (Benedict 1979b). Associated with the ring, which had apparently served to conceal hunters along a game drive, were flakes left from tool resharpening. A projectile point found on the surface 3 m away was probably associated with the ring, and is similar to ones from Porcupine Peak site (5 ST 98) in Summit County, west of Denver, Colorado, and also to ones from the Medicine Lodge Creek site, north-central Wyoming (Frison 1978: Figure 5.40 h, i) where they have been dated at 3020 ± 140 B.P. and 3110 ± 170 B.P. (1070 and 1160 B.C.) (samples RL-96 and RL-559). A wood charcoal sample from near the center of the rock ring at the Blue Lake Valley site gave a date of 3215 ± 90 B.P. (1265 B.C.) (sample I- 8281).

Moomaw (1954) speculated that stone walls found near timberline in the Rocky Mountains might have been connected with game drives, but rejected the idea because he thought there would be better locations than many chosen. He also suggested that Indians might have resorted to hunting in the mountains when drought on the plains made hunting there unprofitable.

Occupation from at least the Middle Archaic on is documented in the 1.9 m of deposit in Draper Cave (5 CR 1) (Hagar 1976). The cave, at an elevation of 2,000 m, is on a southern tributary of the Arkansas River, about 40 km straight west of Pueblo, south-central Colorado. Radiocarbon dated samples from depths of 71 and 126 cm were 3520 ± 70 and 3480 ± 65 B.P. (1570 and 1530 B.C.) (samples UGa-736 and UGa-737). Included in the substantial collection of projectile points from the site is a variety of Archaic points. Some are stemmed, with expanding or parallel-sided stems; others are corner-notched; some have concave bases. There are specimens with straight, convex, or serrated blade edges. Stems and bases may be ground or unground, and point length ranges up to 6 cm. The McKean complex is well represented by variants of Duncan points, but a majority of the points would be assignable to Benedict's Mountain complex. Two cobble-lined hearths and one lined with slabs were found, in addition to numerous concentrations of charcoal not in prepared hearths. A semi-flexed burial, 1m deep, was accompanied by 38 leaf-shaped chert knives up to 10 cm long. There was a prepared hearth 20 cm directly above the top of the burial pit and 60 cm below the surface that established the burial as belonging to an Archaic occupation. Some of the projectile points could be of Woodland authorship, but no pottery was reported. Block metates and fragments were common; some were extensively used. The human skeleton, which was poorly preserved, was described by Finnegan (1976). He compares the Draper Cave skeleton with one of about the same radiocarbon age from the Witkin Burial site (Swedlund and Goodman 1966), and to the Woodland/Archaic(?) skeleton from site 14 TO 301 in Trego County, west-central Kansas (Finnegan 1974). He finds these Plains Archaic skeletons "comparable" to ones from a series of Archaic skeletons found in Alabama, but draws no conclusions as to possible relationships (Finnegan 1976: 28-29). A chemical analysis of the deposits at Draper Cave is presented by Kane (1976) and the flora was analyzed by Lyons (1976).

Two other sites in Colorado, better known for their Paleoindian components, have remains of Archaic occupations in their upper levels. The Lindenmeier site, famous for the Folsom camp, also has an Archaic component dated at 3065 B.C. (5015 B.P.) (Haynes and Agogino 1960: 20-21). Wedel and Metcalf (1962) and Wedel (1963) report material of similar age from the Lamb Spring site just south of Denver, Colorado.

In the foothills of the Rocky Mountains to the west and north of Trinidad, in extreme southern Colorado, are 14 sites and two isolated finds attributed by Lutz and Hunt (1979: 133) to the Middle Archaic period. Each site or find yielded a single diagnostic artifact assignable to one of seven types. The projectile point descriptions are by Lutz and Hunt (1979: 102-103, 127).

On the Chaquaqua Plateau, in southern Colorado just north of the New Mexico line, and about halfway between the Rocky Mountain foothills and the Kansas line, Campbell (1976: 49) reports finding evidence of Early Archaic components at seven sites. Five of them also contained later material, while one contained earlier. In terms of the time periods being used in this study, Campbell's Early Archaic components could better be classified as Middle Archaic. Points represented are assignable to three large stemmed types, Trinity, Pandale and Travis, all of which are found in Texas and the latter two in Oklahoma. Leaf-shaped points identified as of the unnotched Abasolo type may have served as knives. The known distribution of these is in Texas and New Mexico (Bell 1958). Other artifacts from these sites include: bifacially flaked blades and ovates, small

rectangular side scrapers, utilized blades and asymmetrical flakes, unpreformed mortars, one hand unifacial loaf manos, polishers, hammerstones, and bone awls. Most of the sites were surface camps in upper parts of canyons.

In western Oklahoma and the panhandle of Texas there are fewer known Middle Archaic sites than Early Archaic sites in spite of the fact that the earlier period was probably less hospitable climatically (Baugh 1982: 36; Dillehay 1974: 185-187).

LATE ARCHAIC

Frison's (1978: 56-62) review of the Late Archaic in the northwestern plains is relevant to our study. At about 1000 B.C., according to this authority, the points of the McKean complex gave way to large corner-notched or expanding stemmed points such as those of the Pelican Lake type. These have straight to slightly convex blade margins and straight to convex bases. The marked corner notches meet the blade margins at angles ranging from definitely acute to ones approaching 90. Length typically is between 3 and 6 cm with widths ranging from 1/3 to 2/3 the length, the shorter points being the relatively broader ones (Perino 1971: 72). On the basis of a series of 24 radiocarbon dates, Frison dates the Late Archaic in the northwest plains at 1000 B.C. to A.D. 500 (about 3000 to 1500 B.P.).

Magic Mountain Complex B

Following the Late Apex complex at Magic Mountain was Zone B, with contents designated as Complex B, which lasted from about 500 B.C. until about A.D. 800 (2500 to 1150 B.P.). Occupation was much less intensive and only 13 projectile points were recovered. Complex B is most similar to late preceramic Basketmaker complexes in the Southwest and can probably be best interpreted as reflecting greatly reduced use of the site by descendants of Apex complex people.

Salvage archeology at site 5 JF 10 on Van Bibber Creek near Golden, just west of Denver, disclosed an Archaic occupation there (Nelson 1969). Six projectile points with expanding stems, lateral or corner notches, and straight to convex blade edges, as well as three end scrapers were recovered from Zone C. A radio- carbon determination on a sample from this zone provided a date of 190 ± 250 B.C. (2140 B.P.). Four of the six points resemble type MM 20 from Magic Mountain, which is attributed to the Apex complex and continues into Zone B (Complex B). The radiocarbon date of 190 B.C. (2140 B.P.) falls in the early part of the range for Complex B (Irwin-Williams and Irwin 1966: 216).

Other Late Archaic Sites in Colorado

An Archaic occupation level was found at the Willowbrook site (5 JF 6), a stratified rock shelter near Morrison, south-southwest of Denver, Colorado (Leach 1966). Level 3, which is characterized by the presence of Archaic projectile points, was dated at 2215 ± 75 years B.P. (265 B.C.) on the basis of a charcoal sample contaminated with small rootlets and moisture. The next lower level, which yielded no diagnostic artifacts, was dated at 2040 B.P. (90 B.C.) on the basis of similar samples. This apparent reversal suggests that the two levels are essentially the same age. Two hearths, both outlined with rocks, were found in the Archaic level. One had a maximum diameter of 36 cm and a depth of 10 cm; the other had a maximum diameter of 89 cm and a depth of 36 cm. The 10 projectile points from this level are small to medium sized, rather crudely made, with expanding stems. Leach classifies them as "side-notched" but except for one aberrant point, they could be better described as corner-notched. Other chipped stone artifacts include four more or less triangular crude blades and a crude scraper; manos, 10 cm or so in diameter, are essentially round, some having been used on one surface and some on two. Metates are shallow milling slabs with a shallow oval depression on only one surface: there was no evidence of pecking. Ceramics, absent from the Archaic level, occur in the upper level where they are attributed to a Woodland occupation. Also found along with Woodland points in the upper level are specimens that Leach considers Duncan-Hanna and McKean points.

According to preliminary reports of excavations, sites 5 JF 12, 5 JF 51 and 5 JF 52, near Denver, Colorado, have Archaic components, but no basis for such an assignment is given (Medina 1974; Richardson 1974; Stieghorst and Bennett 1973).

In his reports of surveys in the potential Two Forks Reservoir area, some 48 km southwest of Denver, Colorado, Windmiller (1974a, 1974b, 1975) reports at least eight sites showing evidence of Archaic occupation. Precise identification of complexes was not determined, but the sites are thought to include both Early and Late Archaic manifestations.

A burial of Archaic age was found during construction in southeast Denver at the Witkin Burial site (5 AH 6) (Swedlund and Goodman 1966). The burial was in a flexed, semi-sitting position in a pit. It was accompanied by two chipped stone blades, each about 7 cm long and generally oval, a scraper or smoothing tool made from part of a deer skull, and a grooved and split deer metapodial. A radiocarbon date of 1240 ± 80 B.C. (3190 B.P.) (sample GXO-725) obtained for a sample of human bone is too early for the burial to have had Woodland affiliations, even though other evidence would permit such an assignment.

The Running Pit House site, located about 13 km west of Trinidad, about 8 km up a north tributary of the Purgatoire River in extreme southern Colorado,

was excavated in 1954 by Dick (1974). The structure consisted of four connected pits, more or less circular, and a "bench" adjacent to three of them. Perhaps no more than two rooms were occupied at any one time since two of the rooms appeared to have been deliberately filled. The entire structure, very irregular in outline, measures about 6 x 12 m and the pits were about 1 m deep. Twelve posts, in no particular pattern, were found in the rooms and on the benches; many of the posts had been propped up rather than set in holes.

Other artifacts included drills with expanded bases; triangular and elliptical bifacial knives; scrapers; gravers; metates with a trough, basin, or flat grinding surface; manos; worked graphite; a stone pendant; bone heads made from deer phalanges or long bones of small mammals; bone splinter awls and worked shell.

No pottery was found at this site, but the pit house and the resemblance of the points to those from Basketmaker sites in New Mexico suggest some sort of relationship with Basketmaker complexes. A date of A.D. 100 to 400 seems reasonable.

A survey in the foothills of the Rocky Mountains in extreme southern Colorado revealed 17 sites that may be related to Basketmaker complexes in New Mexico and Arizona (Lutz and Hunt 1979: 133). The relationship seems to be postulated solely on the basis of four point types.

About 65 km east of Trinidad, Colorado, is Trinchera Cave, which has received the attention of various archeologists, most of whom worked out of Trinidad State Junior College (Wood-Simpson 1976). Her report, however, is based on her excavation in 1974 and does not incorporate the results of earlier work. The oldest levels at Trinchera yielded large corner-notched points similar to Ellis points of Texas, and also to points of the assemblage found in Zone B at the Magic Mountain site near Denver. These lower levels at Trinchera are of late Archaic age.

On the Chaquaqua Plateau, in southeastern Colorado, Campbell (1976: 49) found Late Archaic materials at ten sites of which he excavated three. The diagnostic points are mainly small to medium, with expanding stems or corner notches, and are assignable to Yarbrough, Ellis, Edgewood, Palmillas and Marcos types. Also found were Shumla points, which are medium sized with edges and stems more or less straight, and with barbs. All of these types have been reported from Texas and Oklahoma (Bell 1958; 1960). All the points are of a size that indicates the use of an atlatl or spear. Other artifacts include: bifacial flake triangulates and blades, utilized ovate and asymmetrical flakes, small triangular side scrapers, one-face loaf manos, biface manos, shell beads and bone beads. Most of the sites were found in the canyons and some of the sites were rock shelters. Bones of both small and large mammals were recovered, with small mammals predominating. Olivella shells indicate trade to the west.

Little Sunday Complex

Although many Archaic sites exist in the Texas Panhandle and contiguous portions of adjoining states, there has been little systematic concern locally with problems of the Archaic period. Hughes (1976), in a thorough review (reprinted in 1978), suggested that most of the Archaic sites in the area probably date from Late Archaic times. And on the basis of his work at the Little Sunday site, about 25 km east of Canyon, Texas, just south of what we are defining as the Central High Plains, Hughes has proposed a Little Sunday complex. Undoubtedly, additional work will provide the basis for defining additional complexes, but, for now, our purposes will be best served by quoting extensively from Hughes (1976):

> Reviews. Archaeological work in the Panhandle, or in the Llano Estacado portion of it, has been reviewed at intervals through the years by various writers, including Krieger (1946), Suhm et al. (1954), Kelley (1964), Hughes (1968), Collins (1971), and Hughes and Willey (in press). These reviews have been able to record very little progress for investigations of the Archaic, since what little work has been done remains largely unpublished.
>
> Surveys. During more than half a century, beginning after his work as a student with Eyerly (1907) at the Wolf Creek Ruins, the late Floyd V. Studer (1931a, 1931b, 1955) recorded scores of sites in the Panhandle, including dozens of Archaic sites. In his archaeological survey of Texas, Sayles (1935) recorded a number of sites in the Panhandle, including some Archaic sites. The survey initiated by Studer was continued beginning in 1952 by Hughes for the Panhandle-Plains Historical Museum, and beginning in 1968 by Harrison for the Museum and by Hughes for West Texas State University. More than 1,000 sites have been recorded, including hundreds of Archaic sites.
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> During the last two decades, scores of Archaic sites have been revealed by an increasing number of reservoir and other special surveys, as reported by Hughes (1959), [W.] Davis (1962), Moore (1966), Sharp (1969), Malone (1970), Hughes (1973a), Hughes and Willey (in press), Marmaduke (in preparation), Hughes et al. (1974), Guffee and Hughes (1974), Hughes and Hood (1975), Katz and Katz (in press) [1976], and Willey and Hughes (1975).
>
> These surveys indicate that Archaic campsites occur mainly on the rims and terraces of playas, valleys, and canyons, especially the latter, and that some of the deepest and richest sites occur at water sources near canyon heads. Many more sites have been recorded in the

canyons and breaks of the Red River drainage, and in the Canadian breaks, than along the valleys and around the playas on the High Plains. The campsites are usually marked by quantities of hearth stones and boiling pebbles, and often possess rock hearths of various kinds. Bedrock mortar holes are sometimes associated with the sites, especially in the Palo Duro and tributary canyons and in the Canadian breaks. Sites that appear to be later are characterized mainly by corner-indented and corner-notched dart points, ovate to triangulloid knives, thick end scrapers, small manos, and thin grinding slabs. Although influences from various directions are discernible, affiliations may lie mainly northward. Seemingly earlier sites are characterized by limited numbers of variable dart points, and an abundance of Clear Fork gouges, choppers, and hammers. The gouges are much more common in the Red River breaks than elsewhere in the Panhandle.

Open Camps. Several open campsites with Archaic components have been investigated by Hughes (1955[a]), Green (1967), Thompson (in preparation), Hughes (in preparation, b), Pearson (1974, in preparation), Wedel (1975 [a]), and Hughes and Willey (in press [1978]). Except for Green's site, which is on the Canadian, all of the sites are in Palo Duro and tributary canyons. All of the Archaic components appear to be late or transitional into Neo-Indian, although the sites of Thompson, Pearson (in preparation), and Wedel are deeply stratified. On the basis of a site on Little Sunday Canyon, Hughes (1955[a]) proposed a Little Sunday complex. Until more of the reports are completed and published, little else can be said about these sites.

Rock Shelters. A few rock shelters with Archaic components have been explored by Hughes (in preparation, a), Hughes (in press), Harrison (in preparation), and Hughes and Willey (in press [1978]). Tests have indicated the presence of Archaic components at several other shelters. As with the open camps, most of the rock shelters are in the Palo Duro Canyon complex, and the Archaic components appear to be late or transitonal into Neo-Indian. Most rock shelters in the Panhandle do not appear to be much older geologically than the Neo-Indian stage.

Bison Kills. Investigations at several Archaic bison kills have been reported by Tunnell and Hughes (1955), Collins (1968), and D. Hughes (in preparation [1977?]). More than a dozen of the kills have been recorded, three have been tested, and one has been excavated. Most of the kills are in the Red River breaks and are very similar in character. The animals appear to have been trapped in large numbers at the heads of arroyos, slain with a distinctive type of broad-bladed, broad-stemmed dart point (Fig. 2), and only partially dismembered. The kills appear to have occurred near the end of the last major episode of arroyo-cutting before the present one, and the points resemble specimens from Bonfire Shelter that have been dated at about 2645 B.P. (Dibble and Lorrain 1968).

Flint Quarries. The famous Alibates quarries, although exploited mainly during the Neo-Indian stage, were also utilized during the earlier stages. The Alibates material is an agate of Permian age. Although little investigated, these quarries have amassed a substantial literature, including Bryan (1950), Green [J.] (1955), Shaeffer (1958), Hertner (1963, 1964), Mewhinney (1965), Kendrick (1966), Hughes (1973b and 1974), Bousman (1974), and Hughes and Taylor (1975). Thanks mainly to the efforts of Studer and Hertner, the Alibates quarries and nearby ruins became a national monument in 1966--the only one in Texas, and the only one of its kind in the nation. In Alibates National Monument and the adjoining Lake Meredith Recreation Area, the National Park Service has recorded and is protecting hundreds of sites, including many Archaic sites.

The Tecovas quarries, although less well known, were also much exploited, especially during the Archaic stage along the Prairie Dog Town Fork of Red River and its tributaries. The Tecovas material is a jasper of Triassic age. Also little investigated, these quarries--and other flint sources in the Panhandle--have been treated by Hughes (1955[a]), Green and Kelley (1960), and in various subsequent reports by Hughes and others. Fortunately, several of the Tecovas quarries are located in or near Palo Duro Canyon State Park and the new Caprock Canyons (Lake Theo) State Park.

Flint Caches. A good many flint caches, some of which may be Archaic, have been discovered in and around the Panhandle, and a few these have been reported by Witte (1942) and [J.] Green (1955).

Rock Art. Since the pioneer work of Whipple (1865), rock art sites in the Panhandle have been described by [A.] Jackson (1938), Kirkland (1942), Kirkland and Newcomb (1967), and Upshaw (1972). Rock art is not common in the Panhandle, and most of it appears to be post-Archaic.

Burials. Possible Archaic burials have been reported by Witte (1947, 1955), Tunnell (1964), and Jokerst (1972). Many burials of probable Archaic age have been investigated but have not been reported. Generally in or near camp-

sites, the skeletons are usually flexed in small shallow oval graves, and are often covered with grinding slabs. Other accompaniments are rare. The skulls are usually long.

Miscellaneous. Local occurrences of various artifacts, some of which may be Archaic, have been reported by Wright (1940), Hesse (1943), [J.] Green (1955), Carter (1959), and others. Space-time distributional studies of many types of Archaic artifacts and features are much needed.

Archaeological research on the Archaic stage in the Texas Panhandle has not yet produced an adequate cultural-chronological foundation on which to construct a towering processual edifice of the kind now fashionable in some areas. What seems to be most needed for now is a lot more old-fashioned writing and digging, probably in that order.

Two archaic sites which have been excavated and reported just south of the present study area are worthy of mention. Both are near or in tributaries of Palo Duro Canyon, about 25 km east of Canyon, Texas. The first, the Little Sunday site, was excavated by Hughes (1955). In a 60 cm thick zone, artifacts, chips, fire-darkened hearth rocks and heat-cracked rocks, presumably from stone boiling, were recovered. Included among the artifacts were 30 end scrapers, 19 side scrapers, eight flake scrapers, seven concave scrapers, five disk scrapers, five gravers, and two Clear Fork gouges. Projectile points of six types were recovered: nine Ellis, seven Refugio, two Palmillas, one Lange and one Folsom. Except for the much older Folsom point, all are either stemmed with parallel-sided or expanding stems, or stemless and notchless. Other stone artifacts included triangular knives, blades, drills, choppers, seven subrectangular manos and five milling stones. Fragments of a conch shell pendant were also found. Hughes suggests a date of 2000 B.C. to A.D. 1000 for the site.

The second Archaic site in the Palo Duro Canyon area is Chalk Hollow, excavated by Wedel (1975a). Here there were two midden zones separated by a sterile zone. The older, dated by radiocarbon at ca. 1650 to 400 B.C., was characterized as having large, heavy, corner-notched points identified, with some uncertainty, as Marcos, Castroville, Williams, and Palmillas types, following descriptions presented by Suhm, Krieger, and Jelks (1954). Also found in this layer were bifacial cutting or chopping tools, bone awls, bone gaming pieces, abundant milling stone and mano fragments, stone slab hearths, but no pottery. Bison bone was especially common in about the middle of this lower level.

The upper level, dated by radiocarbon at ca. A.D. 400 to 850, yielded small stemmed or corner-notched points generally in the Scallorn category, plano-convex end scrapers, bifacial chipped knives, milling slabs and manos, bone gaming pieces and occasional pot sherds of a plain brown ware, probably not of local manufacture. Chipped stone included Alibates dolomite, Tecovas flint, Edwards Plateau chert and obsidian. Bones of a wide variety of large and small mammals were recovered.

Since there are a few bison kill sites in the Texas Panhandle that date from the very end of the Archaic period, it is not surprising that similar sites occur in northwestern Oklahoma. Baugh (1982: 36) identifies these as the Twilla, Bell, Strong and Colloer sites (D. Hughes 1977; Tunnell and Hughes 1955), "characterized by buried beds of bison bones that contained chipped stone butchering tools, flake debris, and occasional spearpoints. The latter are typically large ovate to triangular forms with corner notches". These date from about 1800 years ago (Baugh 1982: 36).

Out of nearly 100 sites reported by Adrienne Anderson (1975: 132) from the upper Dry Cimarron drainage in northern Colfax County, New Mexico, only one site was considered by her to be Archaic. Here "two Marcos-like projectiles and a basalt point" were recovered. These she states are similar to one discovered near Folsom, New Mexico by Honea (1964).

Salvage in the Ute Creek Dam and Reservoir area on the Canadian River in eastern New Mexico (Hammack 1965) located one stratified site (LA 5573) which yielded small corner-notched points in the upper level. The middle and lower levels yielded large stemmed and corner-notched points that "resemble the Texas point typology, especially the Ellis, Edgewood, and Williams point types" (Hammack 1965: 46). A date between 3000 B.C. and A.D. 1000 is suggested. Similar large points were not found in surface collections from other sites in the reservoir.

In the extreme northeast corner of New Mexico and northwestern Oklahoma, Renaud excavated several rock shelters in volcanic formations known as fumaroles (Renaud 1930, 1947:115-118). Deposits, up to 2 m thick, yielded material probably of the Archaic period that he assigned to a "Fumarole Culture." Substantial beds of charcoal and ash suggested prolonged occupation. Faunal remains included bones of bison, deer, elk, jackrabbit, cottontail, coyote, wolf, fox, badger, skunk, prairie dog, various rodents and eagle. Artifacts included numerous metates in the upper two levels, with the most recent ones the larger; all had pecked oval troughs. Bone artifacts included tubular beads and whistles. The chipped stone artifacts were almost exclusively of quartzite, fabricated by percussion and unifacially chipped. These included various crude choppers, or cleavers, faceted pounders, discoidal pieces, large scrapers, thick blades and pointed flakes utilizable as borers. Certainly a great deal of additional information is needed before this complex, if such it is, can be dated or understood. Assigning it here to the Late Archaic period is completely arbitrary.

Renaud also excavated three dry caves near Kenton, Oklahoma, in which were preserved a great deal of perishable material (Renaud 1930, 1947: 119-125). This complex he called the Basketmaker culture because of similarities, especially in perishable materials, to Basketmaker manifestations in the Southwest. Of special interest is the presence of maize. Two grass bundles enclosed shell maize, and a prairie dog-skin bag contained ears of maize. Also found were many cobs, some of them small and thin, numerous kernels of maize, and husk. Other vegetal foods recognized included wild seeds, acorns, wild fruit, and berries; squash was represented by seeds and pieces of rind. Three cakes or disks made of acorns mixed with plums or cherries were recovered. These had a small central hole, presumably for hanging, and weighed up to .75 kg. Faunal remains represented bison, deer, elk, antelope, jackrabbit, cottontail, coyote, wildcat, badger, rodents, birds (including eagle and wild turkey) and turtle.

Metates had pecked oval depressions and manos were of the one-hand type. Chipped stone artifacts, mostly of quartzite, included "a good many points of all sizes," knives, many scrapers of various forms, including end scrapers and concave scrapers, plus knives and borers. These items are characterized as "serviceable artifacts, but not belonging to a beautiful type or an advanced technique." A thin, finely made selenite pendant was also found. Bone artifacts included tubular beads and awls "some flat with many parallel marks . . . suggesting use in basket-making." Wooden artifacts consisted of a knife-like object, perhaps also a basket-making tool, a spear thrower, a dart foreshaft, a tube, a fire drill, and parts of triangular snares. Other artifacts included: woven yucca-leaf sandals of two types; fragments of three or four kinds of baskets, including coiled; pieces and knots of cord and string; and bits of rabbit fur attached to a cord, suggesting a woven fur robe. Renaud also excavated caves on the T.O. Ranch, 45 km east of Raton in northeastern New Mexico. These yielded artifact assemblages very similar to those found at the Kenton Caves and were attributed to the same culture. One of the T.O. Ranch caves yielded the flexed skeleton of a woman accompanied by three metates and many tubular bone beads. Some of the corn cobs found there were stuck on opposite ends of a short stick, a trait also found in prehistoric Pueblo and Fremont Culture (Utah) sites.

Lintz (1980: 4) lists the Kenton Cave sites under the heading of both Woodland and Archaic. Since all these sites lack pottery, I am inclined to consider them Late Archaic.

CHAPTER THREE

THE EARLY CERAMIC PERIOD

The Early Ceramic period, commonly called Woodland or Plains Woodland throughout much of the plains region, is represented by numerous small sites widely distributed over the Central High Plains. Since very few of the westernmost sites investigated and reported upon show intensive occupation, a general summary description must consist largely of inferences based on what is known from the eastern, or prairie lands, of the Central Plains.

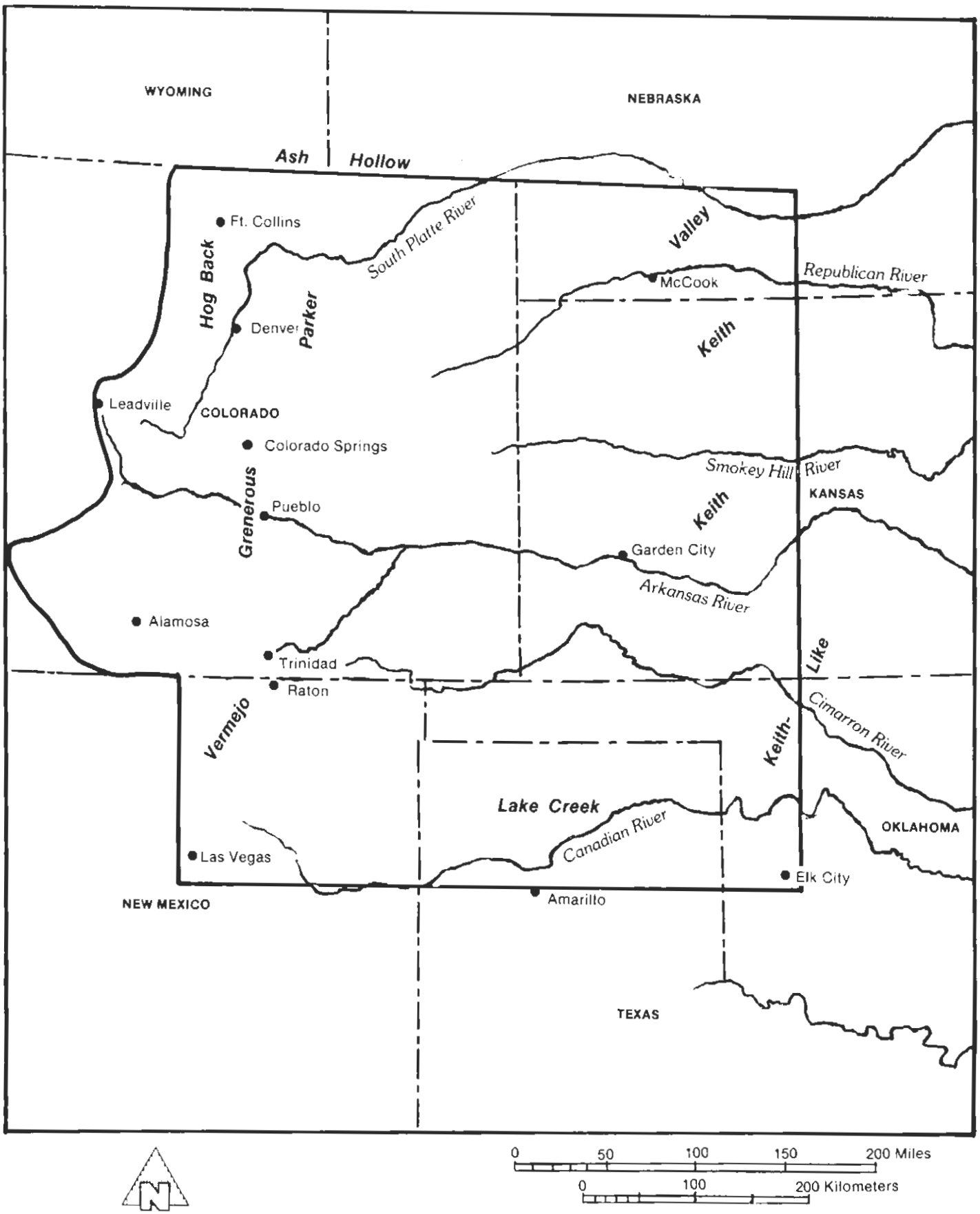
The Early Ceramic period, which started in the Central High Plains at about the time of Christ, or perhaps slightly earlier, brought several important changes in Indian culture. For the archeologist the most significant innovation was the appearance of tall, cord-roughened pottery vessels with pointed bottoms. Although there are various identifiable plains subtypes, pottery of this period closely resembles contemporary and earlier Woodland pottery found over much of the eastern United States. Of nearly equal value for identifying "Woodland" sites was the appearance of small, delicate, stemmed (corner-notched) projectile points of a size that could have been used on arrows. Other changes included a less nomadic life style and, in at least the eastern Central High Plains, simple semipermanent dwellings, more elaborate burial practices and probably rudimentary horticulture. Subsistence, however, continued to be based heavily on gathering and hunting, utilizing a wide variety of resources. Basically, lifeway in the Early Ceramic period did not differ markedly from that in the preceding Late Archaic, from which culture it apparently evolved under eastern influences.

Projectile points from Woodland sites are predominantly stemmed or corner-notched, but within this broad classification they show considerable variation. Most are from 25 to 80 mm long and of poor to fair workmanship; a few show fine workmanship. The margins of the blades are straight to markedly convex and the bases are usually straight to strongly convex. A few are slightly concave, but not notched. Point length varies from equal to the width to three times the width. Rarely is the maximum width of the stem less than ⅔ the maximum width of the blade. Some of the smaller, finer points are deeply corner-notched so as to leave a pronounced barb along each side of the base as well as an expanding stem. A few of the more delicate points have serrated edges. Some of the cruder points could almost be called side-notched instead of corner-notched, in which case the expanding stem may be almost as wide as the maximum width of the blade. Many of these, especially the larger ones, are indistinguishable from certain Archaic points. An occasional point or blade is unnotched, and some of the larger notched points could have served as knives rather than as projectile points. Since the smaller points could have been, and probably were, arrow points, we may well have reflected here, in the Early Ceramic period, the first appearance in the plains of the bow and arrow, used along with spears and/or darts. The introduction of this new weapon may account for the heterogeneity, or lack of standardization, of points. Rarely if ever would one mistake a Woodland point for one made during the Middle or Late Ceramic periods by Upper Republican, Great Bend or Dismal River people, for example.

Other chipped stone tools from Plains Woodland complexes are not diagnostic and do not reflect a very great variety of basic types. End scrapers are reasonably common, of indifferent workmanship and of average size by Plains standards. They are roughly round to oval and usually plano-convex, but some have both the dorsal and ventral faces flat. Some flakes were used as scrapers and/or knives. Well-made chipped stone knives vary from small to medium sized and grade into crude small celts or choppers. The distinctive alternately-beveled diamond-shaped knives, so characteristic of the late Upper Republican complex, have yet to be reported from Woodland sites. Objects of ground or pecked stone include irregular sandstone grooved abraders, shallow-basin milling slabs and cobble hammerstones.

Bone artifacts include awls, made from deer metapodials or splinters of bison(?) bones, a possible digging stick point made from a bison leg bone, serrated fleshing tools made of deer or antelope (not bison) leg bones, and needles. Conspicuously missing are bison scapulae hoes and fishhooks common in Upper Republican sites.

Much of the information on Plains Woodland manifestations, especially in Nebraska, reflects the work and continued interest of Marvin F. Kivett. The first general summary (Hill and Kivett 1941) reports the excavation by the Nebraska State Historical Society of a village, 25 VY 1, in Valley County, Nebraska, some 40 km north of the northeast corner of the present study area. This remains the best-reported Woodland site in the state. In addition to report-



SELECTED EARLY CERAMIC COMPLEXES

ing this site, Hill and Kivett describe in lesser detail 39 other Woodland sites distributed over Nebraska. Photographs of restored pottery vessels and sherds from many of these sites makes this publication especially useful. In 1949 Kivett (1949a: 282-283) published a concise and useful summary description of Woodland village sites excavated in the Medicine Creek Reservoir area in southwestern Nebraska. He also reported work at five other Woodland villages in various parts of the state, two of which are in the present study area (Kivett 1952). Immediately following this, he published an excellent report on the important and thoroughly excavated Woodruff "shell-bead" ossuary, located in Phillips County, northwestern Kansas, virtually on the Nebraska state line. The shell-bead ossuary complex is apparently restricted to a small area that centers near Alma, Nebraska (Kivett 1953). More recently, Kivett (1970) has provided a summary of Plains Woodland culture focusing on environmental adaptations, which he had touched on earlier (Kivett 1948).

Kivett was neither the first nor the only archeologist to be concerned with Woodland (Early Ceramic) cultures in the Central High Plains. Among the first to recognize that there had been pottery-making people on the plains prior to those who lived in well-constructed earth lodges was Fred Sterns (1915a, 1915b), who reported a deeply buried occupation level in extreme eastern Nebraska. Strong (1933: 281; 1935: 184-196) summarized information regarding the "Sterns Creek" site and suggested it be assigned to a Woodland culture with northeastern affiliations, perhaps related to Algonkians. Strong also recognized Woodland pottery from the Nebraska Sandhills as distinctive, but at the time considered it a variant of Dismal River pottery (Strong 1935: 270). He discerned differences between the Graham ossuary, which he assigned to the Upper Republican complex,-and the nearby Marshall ossuary, now attributed to a Woodland complex; however, he did not recognize the significance of the differences. Wedel (1935a: 188-190) demonstrated considerable insight with regard to Plains Woodland ceramics. He described a large, broken pottery vessel from the floor of House 2 at the Red Cloud 3 site (on the Republican River in southern Nebraska, just east of the area considered here) as "intrusive" and markedly different from the Upper Republican pottery from the site. This conical-bottom vessel, estimated as having been about 30 cm in diameter and 46 cm tall, he noted as resembling vessels from Sterns Creek as well as chance finds from southeastern Nebraska. A few sherds from the Red Willow 1 site he also recognized as different from the usual type; from his description, they, too, were apparently of Woodland authorship. Of possible significance for discussion elsewhere in this work, the two houses at Red Cloud 3 were highly aberrant as compared with those at known Upper Republican sites. Excavation at Ash Hollow Cave (Champe 1946) clearly demonstrated that Woodland pottery was stratigraphically below Upper Republican, which in turn was below Dismal River pottery.

Woodland occupation in Kansas was well summarized by Wedel in 1959, but at that time he could report only four Kansas sites in the Central High Plains:the Woodruff ossuary on the Kansas-Nebraska line, already mentioned (Kivett 1953), the Young Burial site (14 SC 2) in Scott County, west-central Kansas (Wedel 1959: 468-475), Occupation B at the Pottorff site (14 LA 1) in Lane County, west-central Kansas, and Coal-Oil Canyon in Logan County in northwestern Kansas (Bowman 1959a-c, 1960a-c). Other reports of Woodland sites in Kansas just to the east of the present study area are included in publications by Bass, McWilliams and Jones (1967), Reynolds (1976, 1979) and Witty (1966), with a recent summary by O'Brien (1980). Although there have now been several foci defined within Plains Woodland (Early Ceramic of the Plains), all of the sites in the western half of Kansas are thus far assigned to the Keith focus, a situation which may well reflect paucity of field work rather than cultural homogeneity. Actually, there is general agreement among those active in the area that Woodland sites are numerous in western Kansas; Earl Monger (personal communication) estimates that there are 100 in Pawnee County, west-central Kansas, alone.

Woodland habitation sites in the northeastern Central High Plains are commonly situated on low terraces along small streams--one or two terraces below where one expects to find Upper Republican sites. Other Woodland sites, however, are on ridges. Detritus and black stain from occupation is often relatively thick, up to 1.2 to 1.5 m. The occupation levels are sometimes buried beneath several decimeters of sterile alluvial and/or aeolian deposit. Within the occupation zone, pits of various sizes, presumably for storage, are commonly found, and broad, shallow basins, apparently representing habitations, are sometimes present. Subsistence was based on hunting and gathering. Although there is no direct evidence, the Plains Woodland people in southwest Nebraska may have practiced limited horticulture as did their contemporaries to the east.

There is more published information on Early Ceramic period sites in Colorado than in western Kansas, a fact which may reflect the sampling. In the 1930s, Renaud collected Woodland or Woodland-like pottery from various sites in eastern Colorado, but it is not possible, on the basis of his descriptions, to distinguish these wares from other Plains pottery. More recent work, which will be summarized later, has identified some 50 components that are probably assignable to the Early Ceramic period and which appear to show affiliation with, or influence from, Woodland manifestations farther east. The general picture now emerging is that the resemblances to more eastern (*e.g.*, Mississippi Valley) Woodland complexes are so attenuated that to call sites of

eastern Colorado "Woodland" is to expand that taxon to an absurd limit--unless we are seeing only camps of Woodland peoples from much farther east who were coming into the area temporarily. Thus far, no sites showing long, near-continuous village occupation have been reported between the 102 meridian and the Rocky Mountain foothills. Within this High Plains area, artifacts diagnostic of the Woodland complex are essentially restricted to occasional thick, cord-roughened potsherds and small corner-notched projectile points. However, since the term "Woodland" is so embedded in the literature, I will be using it frequently, along with "Early Ceramic"; hopefully, when more work is done, terminology will sort itself out.

J. Wood has provided a summary description of Early Ceramic period habitation sites in northeastern Colorado, along with reports of his own investigations at several of these (J. Wood 1967: 601-618, passim). Sites occur both in the open and in rock shelters. Occupation of these sites appears to have been intermittent, possibly seasonal, rather than long-continuing. However, the fact that a few sites were used repeatedly for burial indicates continuity in at least that type of use. Burial sites, for the most part, have not been assigned to particular phases because pottery, the primary criterion for phase assignment, is not found with most of the interments.

Valley Focus

Although current knowledge leaves it unclear as to whether Valley Focus sites are found in the area we here define as the Central High Plains, it seems likely that they do exist there, since the type site, 25 VY 1, is only about 40 km northeast of our area. This site, excavated and reported by the Nebraska State Historical Society (Hill and Kivett 1941) has essentially become the standard by which all other Woodland sites in Nebraska have been compared. Data from this site were utilized heavily in the general description of Plains Woodland culture presented in this study, as well as in earlier generalizations (*e.g.*, Wedel 1961: 90-92). For our purposes, the most distinctive traits of the Valley focus are those relating to the villages, structures, and pottery.

Eight or possibly 10 structures were excavated at 25 VY 1 (Hill and Kivett 1941). These were all quite simple and for the most part close together. Apparently not all were in use at the same time, for some had been filled with refuse after abandonment. In one instance, the building of a structure had destroyed half of another. The structures consisted of oval basins ranging from 3.4 by 4.3 to 6.1 by 7.3 m in diameter, excavated 30 to 60 cm into the subsoil; basin depth (from the occupation surface) could not be determined, but could have been as much as 1.2 m. Near the center of eight of the 10 basins was a hearth about 60 cm in diameter consisting of hard-burned earth covered with ash. The hearths were in no way specially prepared. Post holes were found in one structure, but no pattern was discernible. In other structures rodent activity could have obliterated post holes. No clues were found as to the nature of entrances, nor was there evidence, such as charred logs or burned daub, to suggest a substantial superstructure. Hill and Kivett (1941: 188) concluded that the structures were flimsy, probably consisting of skins or mats supported by light poles and props, and that 25 VY 1, a small, compact site, had been long occupied since an occupational level of 0.4 to 1.0 m of debris had accumulated. The site appeared to have been used year-round rather than seasonally.

Several kinds of Woodland pottery from the plains have been formally established as types. One of the most widespread was described in detail by Hill and Kivett (1941: 173-181) and later named "Valley Cord-roughened" by Kivett (1949b), the type site being 25 VY 1. This type, characteristic of the Valley focus, was defined on the basis of 3,384 sherds, of which 256 were rim sherds. Standards for body form were based on five restored vessels and several sizeable large sections.

Keith Focus

The Keith focus has never been described fully or formally. The designation was apparently first applied to two Woodland sites in Frontier County, southwest Nebraska, by Kivett (1949a: 282-284) who later (1952: 63) published the following brief description:

> A second variant of the Woodland pattern which is characterized by a cord roughened type of ware has been designated the Keith focus. The pottery type believed characteristic of this focus is the Harlan Cord Roughened which lacks the elaborate rim decorations found on many vessels of the Valley Cord Roughened type. In addition this ware is often fabric impressed or cord roughened on the interior surfaces. There is also sufficient divergence in the remainder of the complex to warrant its assignment to a separate focus. Various shell-bead ossuaries which occur along the Republican River in Nebraska and Kansas are believed attributable to this focus.

The geographical distribution of the Keith focus is given by Wedel (1961: 90) as "central and western Nebraska, western Kansas, and eastern Colorado." There is a growing feeling that the Keith focus has become something of a catch-all because of the paucity of detailed information from much of this area. Once additional work is done in western Kansas and eastern Colorado, it may be necessary to divide and/or redefine the focus.

Kivett (1949a: 282), in summarizing his excavations at two Keith focus Woodland sites in the Medicine

Creek Reservoir in Frontier County, southwestern Nebraska, says:

> Habitation areas are in some cases marked by a circular to oval basin, excavated to a depth of 12 to 18 inches [30-45 cm] into the sterile soil below the village accumulation. Near the center of almost every basin is usually a rather poorly defined fireplace on the same general level as the basin floor . . . Post molds and shallow pits often containing refuse occur without regard to a discernible pattern both within the basins and throughout the general village area.

A similar description is provided by Wedel (1953a: 14) specifically for site 25 FT 14, one of the Woodland sites upon which Kivett based his generalization. Radiocarbon dates from these sites are: Site 25 FT 18, A.D. 370 ± 100, and A.D. 820 ± 200 (samples SI-126, M-841); Site 25 FT 70, A.D. 690 ± 80 and A.D. 880 ± 70 (samples SI-197, SI-50). These dates suggest a Woodland occupation along Medicine Creek spanning some 500 years, although the relatively small amount of detritus is not consistent with an intensive or even continuous occupation for such a long period.

Harlan Cord Roughened pottery, not yet formally defined, is diagnostic of the Keith focus. Sherds are described by Kivett (1953: 131-134) as:

> characteristically thick; have over-all cord roughening with cord impressions vertical and parallel on the vessel; and are tempered with crushed calcite, with an occasional inclusion of hematite or fine sand. For convenience, I have designated this type of pottery Harlan Cord Roughened. Superficially, it resembles the Valley Cord Roughened type, which characterizes the Valley Focus of the Woodland pattern (Hill and Kivett 1941: 173-181). It appears, however, to be somewhat less well made and to lack the various rim and lip decorations of the Valley Cord Roughened type.

Kivett (1953: 131-134) reports the occurrence of this distinctive Harlan calcite tempered ware from much of Nebraska, including sites in the following counties: Harlan, Webster, Franklin, Frontier, Sherman, Buffalo, Hooker, Richardson, and Platte, as well as from Phillips and presumably Geary Counties in Kansas. Wedel (1959: 553) reports it from Lane, Logan, and Scott Counties in Kansas and states that "Western Kansas, and perhaps parts of eastern Colorado, thus appear to lie within the range of Keith Focus material." At one site (25 SM 2) on Davis Creek in Sherman County, Nebraska, sherds of both Harlan Cord Roughened and Valley Cord Roughened were excavated from a single burial. However, at sites in Harlan, Buffalo, and Sherman Counties, Nebraska, pottery of the two types did not occur at the same site, but did occur at neighboring sites. A restorable vessel of Harlan Cord Roughened was found on the floor of an Upper Republican house at 25 FR 8 (Red Cloud 3) in Franklin County, Nebraska (Wedel 1935a: 188-189) but the significance of this association cannot be assessed.

Four other pottery types from two Keith focus sites in Hitchcock County, southwest Nebraska, have been described by Kivett (1952). Although these are represented only by small samples at the type sites, they may well be more abundant at other sites. One of these Hitchcock County sites, the Carmody site (25 HK 7) (Kivett 1952: 24-32), is situated on a ridge dividing the Republican River from a tributary, Elm Creek, near its mouth. Bottom land suitable for simple horticulture is nearby. Zone B contained evidence of Woodland occupation, perhaps intermittent. Three areas showed firing: one a circular area outlined with stones, one a rectangular area outlined with sandstone slabs on edge (perhaps a kiln for firing pottery) and an unlined simple hearth or the bottom of a burned pit. Two trash-filled pits were attributed to this occupation as well as three (or more) badly disturbed burials. Prior to salvage archeology much of the site had been destroyed by construction connected with dam building. Artifacts from Zone B included corner-notched projectile points (rare), end scrapers, side scrapers, and a blade fragment, in addition to two categories of pottery.

At the Massacre Canyon site (25 HK 13), also in Hitchcock County, Kivett (1952: 11-12) interpreted as a probable structure a basin 2.6 x 2.1 m. Its depth could not be determined because of erosion, but was at least 0.5 m. He suggested that another basin, 1.2 by 1.5 m, might also have been a structure. Neither basin contained post holes or showed evidence of fire. There may have been other structures at the site that were not detected since the builders might have excavated into village detritus, but not deeply enough to penetrate clean subsoil. However, no hearths were found within village detritus. Four unprepared hearths found at the bottom of accumulated village detritus could simply represent fires made on the original ground surface, or could have been hearths in structures dug through village detritus, but only to the pre-occupation surface. Near one hearth were two post holes, possibly the remains of some sort of structure. One radiocarbon determination on shell from this site indicated a date of 122 B.C. ± 250 (2072 B.P.) (sample M-181) which is probably too early; since it was on shell it should be rejected in any case. The site can probably be assigned to the Keith focus.

Seven burials were excavated within the Woodland village at the Massacre Canyon site. All were found in a fairly restricted area; each was in an individual pit. Five were flexed and of these only three had grave goods. There were chipped stone tools, a paint stone and a shell bead with one; a necklace of 75 shell-disk beads with the second; and tubular-bone and large shell-disk beads with the third. The skeleton of a child had probably been

Table 4. Faunal Remains at Doyle Site.
(Grange 1980: 125)

Species	Minimum Number of Individuals
Bison	1
Deer	1
Antelope	1
Jackrabbit	5
Cottontail	6
Badger	1
Beaver	2
Raccoon	1
Prairie Dog	3
Pocket Gopher (G)	3
Pocket Gopher (T)	2
Prairie Vole	1
Coyote	2
Frog	1
Painted Turtle	1
Canada Goose	1
Eagle	1
Rough-legged Hawk	2
Marsh Hawk	1
Greater Prairie Chicken	1
Common Raven	1
Great Horned Owl	1
Turkey	1
Teal	1
Mallard	1

scattered by rodents. The seventh burial was secondary, partially cremated, and without grave goods.

The Doyle site (25 RW 28) in Red Willow County, southwestern Nebraska, contained one Keith focus Woodland structure that had probably been rebuilt several times (Grange 1980: 108-110). Only half of this structure was excavated by Grange, but it had apparently consisted of an irregular circular basin about 3.8 m in diameter surrounded by a low rim some 5.5 m in diameter. The rim probably represented the fill excavated from the basin, which was about 0.3 m deep. The floor of the basin was covered by 1.4 to 1.5 m of refuse. In the center of the floor was a fireplace. In the fill above the floor were several other hearths which had probably been on floors of later basins dug into accumulated refuse. Grange suggests that there had been five or six house floors distributed vertically in 1 m of fill, but because of mixing and lack of contrast, the floors could not be detected except by the presence of hearths and one concentration of rocks.

Artifacts from the Woodland component at the Doyle site included several types of pottery: Harlan Cord Roughened, Massacre Canyon Variety A (resembles Harlan Cord Roughened but with sand rather than calcite tempering), and unidentified sherds resembling Valley or Feye Cord Roughened but probably a variation on Massacre Canyon Variety A. Only three projectile points were found: triangular unnotched, corner-notched and a triangular side-notched, perhaps intrusive. Other chipped stone artifacts include a bifacial drill, plano-convex drills, knives of various shapes, end and side scrapers of various forms, graver-perforators, a chopper, and worked flakes. Manos, hammerstones and abraders comprised the ground stone artifacts. Bone artifacts include flakers, awls, a scapula digging tool, socketed tool handles(?), bone beads, a worked human fibula, a shell-disk bead, a shell gorget, shell pendants and 22 shells which had been used as scrapers (Grange 1980: 113-124).

Table 4 lists the species represented among the faunal remains (Grange 1980: 125).

Four Woodland habitation sites are reported from south-central Nebraska by Philips (1963) who carried out limited testing at each. These are located in Dawson, Frontier, and Gosper Counties, and help confirm Woodland occupation in the area.

One probable Woodland structure was excavated at site 14 NT 11 in Norton County, northwest Kansas (Blasingham 1963: 28). It consisted of a pit 3.6 m long, 1.6 m wide and 38 cm deep. In the center were two possible post holes but no evidence of fire. Another pit, filled with trash, was 2.1 by 2.4 m and 0.6 m deep but Blasingham did not suggest that this might be a structure.

One of the most thoroughly reported Woodland sites in the Central High Plains, the Woodruff ossuary in northwestern Kansas (Kivett 1953), makes the mortuary practices the best known traits of the Keith focus. Strong (1935) had previously reported both Upper Republican and Woodland ossuaries a few kilometers away in Nebraska, but because of the paucity of diagnostic artifacts with the latter, he had not been able to identify either as Woodland. The Woodruff ossuary (14 PH 4), located in Phillips County, Kansas, only meters south of the Nebraska border, is situated on the edge of a terrace overlooking Prairie Dog Creek, just above the limits of the Harlan County Reservoir. Draws, cut into the terrace on either side of the ossuary, leave it on a point. Some 9 m below the site is a narrow flood plain of the creek. The ossuary consisted of a cluster of at least 14 pits up to 2 m deep, with some intersecting others. Subsequently, a more or less oval basin some 6 m across was dug, removing the tops of nearly all of the smaller pits. The fill of both the pits and the larger basin contained disarticulated human bones. The one articulated skeleton was that of an adolescent buried in a flexed position and draped with numerous strands of beads. It had been placed at the south edge of the basin on its floor, which was 0.9 m below the surface of the ground. Although there had been fires in various parts of the ossuary, and some of the artifacts and human bones showed evidence of having been exposed to fire, the articulated skeleton and its accompanying artifacts showed no such evidence.

Portions of at least 60 disarticulated skeletons were recovered. In a few cases a part of a skeleton had still been articulated when buried. Bones, for the most part, had been thrown in at random, probably after having been either exhumed from a previous burial or collected after disintegration of an exposed corpse. There was no evidence of bundle burials. Skulls were rare and generally poorly preserved. There was no suggestion of cremations *in situ*.

Except for thousands of shell beads, artifacts were not abundant. Pottery, a total of ten sherds, came from various parts of the excavation and probably represents several vessels but only one type. The outer surface of the pottery was cord roughened, with the impressions ranging from fine to coarse. Thickness is from 9 to 13 mm and the calcite tempering was in pieces ranging from fine up to 7 mm across. This ware has been named "Harlan Cord Roughened" by Kivett (1953: 132) and assigned to the Keith focus. Thus far, Harlan Cord Roughened is the only pottery found at any of the several ossuaries which contain large numbers of shell beads. This fact suggests that the practice of including numerous shell beads may be restricted to the Keith focus, although the burial traits of other Plains Woodland groups are very poorly known.

The thousands of disk beads from the Woodruff ossuary occurred on the surface and scattered through the fill either at random or in alignments showing that they were strung at time of deposit. The torso of the articulated skeleton had been wrap-

ped with numerous strands. The beads, of freshwater mussel shell, represented every stage of the manufacturing process, which had involved breaking the shells into roughly round pieces, drilling a central hole, usually from the inside only, and grinding the outer surface smooth and flat. The blanks were then strung and the string of beads ground and polished as a unit. Strings of up to 30 beads, all of uniform size, were found still in alignment. Diameters ranged from 6 to 18 mm with the majority 9 mm or less. It is interesting that unfinished beads, even undrilled blanks, were included with Woodland burials, while only finished (and far fewer) beads were included with Upper Republican burials.

A much less common form of shell ornament (9 complete plus 14 fragments) is a crescent-shaped pendant 6.2 to 12.5 cm long and 1.2 to 1.5 cm wide, cut from the ventral margin of a freshwater bivalve, the size reflecting the size of the shell. A hole was drilled in each end. Other pendants, also made from freshwater bivalve shells, are either rectangular with rounded corners or triangular, 4 to 10 cm in maximum dimension, with two perforations. One triangular pendant was cut from a much heavier shell, perhaps a Gulf Coast conch. The stem of such a conch shell, 5.5 cm long, had been drilled from either end to form a tubular bead. Shorter beads, up to 30 mm long and 24 mm in diameter, were probably also made from conch stems.

Olivella shells (21) with the spire cut off and drilled lengthwise were also recovered. Such shell beads occur in a variety of other complexes in the Plains, including Upper Republican and Dismal River. A rather unusual form of shell bead is represented by 8 specimens from the Woodruff ossuary. These are essentially cylindrical with one flat side, about 11 mm long and 6 mm in maximum diameter. A hole drilled into the flat side intersects, at a right angle, one drilled from an end. Strong (1935: 120) reports a single example from the Marshall ossuary.

Other ornaments found at the Woodruff ossuary are tubular bone beads, probably fashioned from bird bones. Most of these (28) are from 9 to 14 mm long and 3 to 6 mm in diameter; one is 30 mm long and 11 mm in diameter. Most have rounded ends and polished sides; none are decorated. A bone tube, 19 cm long, was made from a deer metapodial by removing the distal end, drilling a hole through the proximal articular surface and removing the cancellous portion. Three possible shaft wrenches were made by drilling a hole through the proximal end of deer metapodials from which the distal ends had been removed. One broken bone awl and several cylinders of antler were also recovered from the site. A large number of unmodified rabbit teeth were found in one area.

Chipped stone artifacts from the Woodruff ossuary were made from the locally available red to yellow jasper. Two complete large crude projectile points and three small delicately chipped ones were recovered. All have expanding stems and are shouldered and barbed. The small points are nearly triangular and have straight to slightly convex edges with concave to convex bases; the large points have markedly convex sides and bases. The edges of one broken point are finely serrated. Six end scrapers, six small crude celts, 35 flakes with retouched edges, two chipped knives and several knife fragments were recovered.

Elsewhere in Phillips County, Kansas, a burial was found washed out of what had once been a small Keith focus Woodland occupation site in the Kirwin Reservoir (Witty 1966). The site had been on a very low terrace along the North Fork of the Solomon River, so low in fact that layers of silt were directly on top of the occupation level. Also recovered from the site were sherds of Harlan Cord Roughened pottery, characteristic of the Keith focus. Chipped stone artifacts included: small, delicate, corner-notched triangular points with an expanding stem and convex or concave bases (one had serrated edges); small, unnotched triangular points with convex bases; blades or knives of various shapes, choppers, and used flakes. Ground stone artifacts included grooved abraders, milling slabs and mullers or grinding stones. A tubular bone bead and a section of an awl were also recovered. The limited human skeletal material, consisting of skull and bone fragments from at least two individuals, is described and discussed by Bass and Grubbs (1966). Another fragmentary burial, associated with a Keith focus occupation in a rock shelter in Lincoln County, Kansas, is also known (Witty 1962; Bass 1962).

A Woodland burial has been reported from Trego County, west-central Kansas, by Finnegan and Witty (1977). At the site (14 TO 301), a burial was found eroding out of a pit where it had been interred in a flexed sitting position. Associated was a limestone boatstone or atlatl weight. Similar artifacts have been found associated with Woodland burials elsewhere (Neuman 1967). The skeletal material is very similar to that of both Plains Woodland and Plains Archaic.

The Woodland occupation at the Pottorff site (14 LA 1) (Wedel 1959: 381-416), in the extreme northwest corner of Lane County in west-central Kansas, was separated by several centimeters of sterile fill from the overlying Upper Republican stratum. Although the latter contained the remains of two houses, the only structural feature attributable to the Woodland occupation was a small basin containing much charcoal and burned earth. Pottery from the Woodland component included mainly Harlan Cord Roughened sherds, with a few sherds very similar except that they were tempered with sand rather than calcite. One sherd closely resembles Hopewell pottery from the Kansas City area (Wedel 1943: 29-41) in that there was an area decorated by rocker stamping set off from the undecorated area by an incised line. Bone and shell artifacts

were rare and nondiagnostic. Chipped stone artifacts included projectile points with corner notches and well defined shoulders, an unnotched point and a point (probably intrusive) with a straight stem and backward-curving barbs. Two heavy stemmed points were found on the surface. Both end and side scrapers were recovered, but they, too, were uncommon.

In Scott County, west-central Kansas, Wedel (1959: 468-475) excavated five burials which he feels are probably Woodland, although no truly diagnostic artifacts were associated with them and no Woodland occupation site could be found in the vicinity. The burials were on a prominent ridge, known locally as Buzzard Knob, and the bones were for the most part poorly preserved. One flexed skeleton, accompanied by a piece of tortoise shell and two incomplete freshwater mussel shells, had been partially covered with boulders. A burial of an infant contained a fragmentary mussel shell pendant, 30 or more tubular bone beads, and toe bones of a dog or wolf. The third burial was that of an adult, loosely flexed; at the right elbow was the worked carapace of a terrapin. Underneath the skeleton, as though they had been contained in a bag, werea bone awl, 50 or 60 undecorated tubular bone beads, a large stemmed projectile point, several scraper-like flints and four spalls; at the left knee or elbow was another section of a terrapin carapace and a perforated mussel shell; a bone bead was at the left wrist. A second infant burial contained two broken freshwater mussel shells. The deepest burial was that of an adult female, flexed on clean white sand, and accompanied by three chipped stone artifacts: a drill, knife and scraper.

Other reported occurrences of Woodland occupation in Kansas include Coal-Oil Canyon (14 LO 1), a stratified rock shelter in Logan County, northwestern Kansas (Bowman 1959 a-c, 1960 a-c). In Morton and Stevens Counties, extreme southwest Kansas, one or two Woodland sherds were found at each of four sites during an archeological survey (Brown 1976). I have been taken to an extensive Woodland site about 3 km west of Larned, in Pawnee County, west-central Kansas, by Earl Monger.

Ash Hollow Focus

Champe (1946), in his report of excavations at Ash Hollow Cave (25 GD 2), a stratified site in Garden County in the southeast corner of the Nebraska Panhandle, indicated that Woodland pottery was lower in the fill than Upper Republican pottery. On rather tenuous interpretations of dendrochronological data, Champe (1946: 52) estimated the age of the Woodland occupation as A.D. 1000 to 1150, dates now considered too recent by perhaps several centuries. Although there was mixing between the various strata, stemmed, corner-notched points were shown to be associated with the Woodland pottery, and were replaced by small, side-notched triangular points in the later strata.

Kivett (1952: 63), in his review of various Woodland complexes in Nebraska, had the following to say about the Woodland pottery from Ash Hollow Cave:

> Certain thick cord roughened sherds from Lens D in Ash Hollow Cave have been described as similar to the ware of the Valley Focus. A reexamination of this material in the light of new data suggests that this pottery cannot be assigned to either the Valley Cord Roughened or Harlan Cord Roughened types but probably represents an unnamed variety which occurs rather commonly throughout the western Nebraska area, particularly in the Sandhills. In many respects this ware from Ash Hollow Cave compares more closely with the Harlan Cord Roughened type than with the Valley Cord Roughened type. The remainder of the complex, however, suggests that a different focus may be represented.

A detailed description of Ash Hollow Cord Roughened, is provided by Kivett (1952: 36-37).

The Kelso site (25 HO 23), located in Hooker County, west-central Nebraska (Kivett 1952: 33-40), is about 100 km north of what we have defined as the Central High Plains, and well toward its eastern limits. The occupation level, 18 to 64 cm thick, was overlain by 30 to 45 cm of sterile sand. Two concen trations of charcoal and burned earth were apparently the remains of hearths. Except for pottery, which was relatively abundant, artifacts were few and nondiagnostic. The pottery, however, including six restorable vessel sections and 13 rims from at least eight different vessels, provided the basis for Kivett's much more detailed type description of Ash Hollow Cord Roughened.

The Ash Hollow focus of the Plains Woodland pattern was formally proposed by Irwin and Irwin (1957: 30) following an earlier stuggestion by Kivett (1952: 66) that Woodland manifestations such as Ash Hollow Cave and the Kelso site were similar to one another but differed from previously established foci. The Irwins would also include components from sites at Agate Bluff, straight north of Denver, nearly to the Colorado-Wyoming border. J. Wood (1967: 610) endorses an Ash Hollow focus, to which he would also assign Component B at the Hatch site, in northeastern Colorado. Thus components he assigned to the Ash Hollow phase (focus) are listed in Table 6.

Other artifacts from the Woodland components at Agate Bluff (Irwin and Irwin 1957: 23) include numerous projectile points, predominantly of expanding stem varieties with straight bases and shoulders, some having barbs. Also present were triangular points with straight or concave bases, for the most part unnotched. Side-notched points, usually associated with Late Ceramic complexes, might have been intrusive into the Woodland deposits but they

Table 5. Components Assigned to Ash Hollow Phase (Focus), (Wood 1967).

Ash Hollow Cave, Lens D	(Champe 1946)	
Kelso site	(Kivett 1952: 33-40)	A.D. 800 ± 200
Agate Bluff, Site IV	(Irwin & Irwin 1957)	
Hatch site, Component B	(Wood 1967: 384-417)	

have been reported before (rarely) from Woodland sites (Kivett 1952: 18). There is the possibility that delicate triangular points with side notches and sometimes with a basal notch make their first appearance in Early Ceramic times, but I am inclined to consider them intrusive until they are clearly demonstrated to be in association with Woodland complexes. Other chipped stone artifacts from the Woodland components at Agate Bluff include side scrapers, end scrapers, ovoid knives, triangular knives and utilized flakes. Ground stone artifacts include milling slabs and grooved abraders. Bone artifacts include tubular beads made from small mammal bones, a bone disk bead, and splinter awls. Fragments of six arrow shafts ranging from 2 to 10 mm in diameter were recovered. Three had spiral impressions around them, presumably from sinew wrapping; the others had irregular longitudinal grooves. All had had the bark peeled off. A fragment of yucca fiber rope was also recovered.

Sherds of Agate Cord-marked, similar to and perhaps includable in Ash Hollow Cord Roughened, were found evenly divided (10 and 9 each) between the two levels at site IV. In the upper level were 11 sherds of what the Irwins called Owl Creek Fine Cord-marked, which is probably a Middle Ceramic period type. The fact that projectile points significantly outnumbered potsherds strongly suggests that Agate Bluff had been a hunting camp.

The Hatch site (5 WL 38) in Weld County, in the northern tier of northeastern Colorado counties, is also a stratified site, with two rock rings from a Historic occupation overlying an occupation represented primarily by cord-roughened sherds (J. Wood 1967: 284-417). In his general summary, J. Wood (1967: 610) concludes that the closest ceramic relationships of Hatch site pottery are with the Ash Hollow phase.

A sizeable ossuary, almost certainly Woodland, was found in 1932 at Scottsbluff in the extreme western part of the Nebraska panhandle. In the course of digging a potato cellar on the Henry Bisterfeldt property, workmen encountered human bones, some of which were salvaged by interested amateurs. In 1941 information from this excavation was recorded by personnel of the Scottsbluff National Monument and a resulting manuscript (Mattes 1965) was eventually published, along with comments by Breternitz and Wood (1965). The site, situated on a low ridge, contained the skeletons of 32 adults and five infants in four pits. Two of the adult burials were flexed, and one infant burial was probably also primary; the latter, in a pit by itself, had been wrapped with over 700 tubular bone beads from 12 to 25 mm long. One of the flexed adult skeletons, with an associated shell pendant, was in a pit with the skeletons of 19 other individuals, presumably secondary burials. The other flexed burials, accompanied by three shell ornaments, were in a pit with fragments of two charred skeletons and the disarticulated parts of four other adults. Another pit contained the other nine skeletons, presumably also disarticulated. Apparently a number of artifacts had been found in the various pits, but most of them were taken away by visitors. Artifacts recorded from the site include: three projectile points of Woodland types, an end scraper, two possible atlatl weights ("boatstones"), a flake knife, a bone awl and three shell ornaments.

Northeastern Colorado

Woodland occupation strategies for northern Colorado were discussed by Scott (1973) who considered only those sites that contained pottery identifiable as Colorado "Plains Woodland." Sites that were non-ceramic but otherwise typologically Woodland were excluded because of the strong possibility that they might represent late Archaic occupation. Scott (1973: 2) followed the definition of Woodland presented by Withers (1954) and J. Wood (1967: 603-604):

> In essence, the material culture of the Colorado Plains Woodland is described as follows: large to small triangular diagonal notched projectile points with serrated and unserrated blades, a few small lateral notched points, ovate blades, ovate scrapers, various forms of flakes with marginal retouch, hammerstones, bifacial and unifacial handstones and milling stones, expanded base flake drills, splinter awls made from deer metapodials, bone and shell beads, and shell pendants. The pottery is sand and grit tempered, 5-6 millimeters thick, about 4 on the Moh hardness scale; exteriors are cord impressed in parallel, vertical to diagonal rows with occasional overlapping of cord impressions. Rims are direct and unthickened.

In the northeastern quarter of Colorado, Scott (1973) identified 42 sites that conform to his criteria. He drew his data on three of these from published reports, on four from an unpublished M.A. thesis, and on the other 35 from collections and files at the University of Colorado, Denver University and Colorado State University. Some of these latter sites have since been reported in print. All of the Woodland sites included are in the drainage of the South Platte River and those on the plains are in the western two-thirds of the Colorado High Plains. This distribution probably reflects the paucity of survey activity in extreme eastern Colorado, for there are Woodland sites in south western Nebraska within a few kilometers of the Colorado line. In fact, Kivett (1947: 2-3) reported a Woodland site (5 YM 1) near Wray, Colorado, on the Republican River just a few kilometers from the Nebraska border. This he considered one of the most important sites in the area.

Scott (1973) notes that most of the 23 sites in the Plains and Foothills are located on south-facing slopes, or on or near the tops of hills or other eminences, situations probably selected for protec-

tion from the weather or a commanding view of surrounding hunting territories. The site 8 km west of Wray reported by Kivett (1947) is on a low terrace near the Republican River, in a position common for Woodland sites farther east where incipient horticulture may have been practiced. Elevations of Scott's Plains and Foothills sites range from 1200 to 1900 m.

The next most common location for Woodland sites in the area surveyed by Scott is in rock shelters, 13 in number, and ranging in elevation from 1200 to 2100 m. Most of these open to the south or southwest, presumably to take advantage of winter sun. Four Woodland manifestations are classified as Mountain sites, tend to be near travel routes or passes, and are at elevations from 2400 to 3500 m. The two Woodland burials described fit the open-site pattern. All of the sites are near water sources, but not on the main river (South Platte), and appear to be better situated for hunting or gathering than for horticulture.

Parker Focus

The Parker focus, a taxonomic unit that apparently still has validity, was defined by Withers (1954: 1):

> The earliest [horticultural and pottery-making peoples had a culture that] belonged to the Woodland Pattern. We have defined two foci of this Pattern, both belonging to the Late Woodland period of the Middle West. A small scattering of sherds has been found which may indicate an earlier Woodland occupation in eastern Colorado, but no definition of these materials seems possible at this time.
>
> One of these Woodland foci has been designated the Parker Focus. This focus is distinguished by cordmarked pottery vessels which have conoidal bases and straight or incurving rims. The associated projectile points are medium to large and usually corner-notched. The greatest concentration of Parker Focus materials is in the Denver Basin and along the South Platte River and its tributaries, but they extend south and west as far as the Rio Grande drainage in Alamosa County.

J. Wood (1967: 603-611) suggests that the components listed in Table 6, all in the Denver Basin, are assignable to, or closely related to, the Parker phase. Dates in Table 6 are from Breternitz (1969) and Wood (1967).

J. Wood (1967: 603) points out that Withers (1954), in his definition of the Parker focus, designated a larger geographical area for this focus than is represented by sites in the Denver Basin and northeast Colorado. It is unclear whether this reflects a lack of work in the remainder of Withers' area or whether the geographical limits need to be redefined.

J. Wood (1967: 604-611) provides us with a description of Parker phase (focus) pottery, represented by four known varieties. Although he does not name the type, the varieties are designated by letters.

Wood (1967: 603-604) summarizes the nonceramic artifacts of the Parker phase as follows:

> large to small triangular diagonal-notched projectile points with serrated and unserrated blades; a few triangular lateral-notched points; ovate blades; end scrapers; various forms of flakes with marginal retouch; hammerstones; unifacial and bifacial handstones and milling stones; expanded base flake drills; splinter awls made from deer metapodials; and bone beads. . .Most of these traits are shared in common with other Early Ceramic Period components in the Western and Central Plains. Pottery, however, exhibits some regional variations.

Evidence of corn from Woodland components is reported by Irwin and Irwin: a cob from a popcorn-like, sixteen-rowed maize from LoDaisKa, and dent corn from sites in the Morrison, Colorado, area (Galinat 1959: 103; Irwin and Irwin 1959: 112). They do not assign these sites to a particular focus or phase but Wood (1967: 605) indicates that they are Parker phase. Although there is the possibility of mixing between levels in a stratified site such as LoDaisKa, similar popcorn-like maize has also been found in a very definite Woodland context at the Lawson site (25 PT 12), in Platte County, east-central Nebraska, and the kernels, although charred, were independently identified as maize by George F. Will and Paul C. Mangelsdorf (Kivett 1952: 57-58).

Four of the sites with components assigned to the Parker focus (table 6) are of special interest. The Uhl site (5 WL 32) is an extensive stratified site in the Battle Canyon area in Weld County, northeastern Colorado (Wood 1967: 57-189). Zone D, the next to the bottom zone, is marked by the appearance of cord-roughened pottery in an artifact assemblage that otherwise is essentially the same as that found in the lowest level. Wood interprets this as evidence of cultural continuity. Charcoal from this zone gave a radiocarbon date of A.D. 195 ± 95 (sample GXO-319).

The Woodland component, Complex B, at the LoDaisKa site just southwest of Denver, Colorado, was seen by Irwin and Irwin (1959: 132-134) as being most closely related to the Ash Hollow focus but with some traits more closely resembling those of the Keith focus. Irwin-Williams and Irwin (1966: 210-211) point out similarities and differences between the Woodland manifestations at Magic Mountain and LoDaisKa, and seem to be suggesting Parker focus affiliation for both. Wood (1967: 603-611) assigns both to the Parker focus. At LoDaisKa, and several single-component sites of the same complex excavated, but not reported, Irwin and Irwin (1959: 132) report artifacts characteristic of the Parker focus. Four radiocarbon dates for the Wood-

Table 6. Radiocarbon dates for Parker Phase,
(from Breternitz (1969) and J. Wood (1967))

LoDaisKa, Zone B	(Irwin & Irwin 1959)	A.D. 690 ± 150, 800 ± 150, 800 ± 150, 980 ± 150
Willowbrook, Level 4	(Leach 1966)	A.D. 660 ± 100
Magic Mountain, Zone A	(Irwin-Williams & Irwin 1966)	
Hall-Woodland Cave	(Nelson 1967b)	
Uhl site, Zone D	(Wood 1967: 54-189)	A.D. 195 ± 95
Hackberry Canyon site	(Wood 1967: 189-213)	
McEndaffer Rock shelter, Complex A	(Wood 1967: 283-340)	
Biggs site, Stratum VI (Loc. II)	(Wood 1967: 340-383)	A.D. 550 ± 90
Biggs site, Stratum IIc (Loc. I)	(Wood 1967: 340-383)	
Kasper site, Complex A	(Wood 1967: 478-500)	
Michaud site	(Wood 1967: 611)	
A.D. 150 ± 110		
5 WL 43 ?	(Wood 1967: 417)	
5 WL 44 ?	(Wood 1967: 456-461)	
5 LO 7 ?	(Wood 1967: 474-477)	
5 LO 9 ?	(Wood 1967: 509)	
5 MR 1 ?	(Wood 1967: 509-510)	

Table 7.

Early and Middle Ceramic Period Radiocarbon Dates From

Northeastern and East-Central Colorado

(from Butler 1980)

Bayou Gulch (5DA 265)	800±50 BP (AD 1150) DIC-1503 Charcoal	Late Woodland	Gooding 1980a Feat 20, 40 cm b.s.
Bayou Gulch (5DA265)	870±55 BP (AD 1080) DIC-1507 Charcoal	Late Woodland	Gooding 1980a Feat 12
Spring Gulch (5LR252)	880±180 BP (AD 1070) UGa-1051 Charcoal	Middle Ceramic (Hog Back Phase)	Kainer 1976: 31,215ff Level II, Locality III
Jarre Creek Colo: K: 12: 9 (5DA541)	900±250 BP W-1018 Charcoal	Franktown Focus-Transitional Woodland to Upper Republican	Scott 1963: 48
T-W Diamond (4LR200)	930±230 BP (AD 1020) A-1273 Charcoal	Late Prehistoric	Flayharty & Morris 1974: 168
Spring Gulch (5LR200)	935±140 BP (AD 1015) UGa-1050 Charcoal	Middle Ceramic (Franktown Focus, Hog Back Phase)	Kainer 1976: 31, 215ff Level II, Upper Locality I
Boyou Gulch (5DA265)	950±60 BP (AD 1000) DIC-1440 Charcoal	Late Woodland	Gooding 1980a Feat 3, Fire basin
LoDaisKa (5JF142)	970±150 BP (AD 980) M-1003 Charcoal	LoDaisKa Complex B - "Woodland"	Irwin and Irwin 1961: 114
Murray Site (5BL65)	970±100 BP (AD 980) M-1542 Charcoal	Late Prehistoric (Hog Back Phase)	Benedict 1975: 16 High Altitude Game Drive

Table 7. (continued)

Van Bibber Creek (5JF10)	1050±250 BP (AD 900) W-616 Charcoal	Woodland (Parker Focus(?)	Rubin & Alexander 1960: 156; Nelson 1969: 105 Zone A
Bayou Gulch (5DA265)	1050±55 BP (AD 900) W-1438 Charcoal	Late Woodland	Gooding 1980a Feat 1
Spring Gulch (5LP252)	1075±135 BP (AD 875) UGa-664 Charcoal	Middle Ceramic (Franktown Focus, Hog Back Phase)	Kainer 1976: 31, 215ff Level II, Upper Locality I
Peavy Rock Shelter (5LO1)	1145±155 BP (AD 805) GX-0318 Charcoal	Upper Republican (Middle Ceramic)	Wood 1967: 226, 282 Fill of Feat 5
Parker-Hunt	1150±150 BP	Woodland	Hunt 1954: 114
LoDaisKa (5JF142)	1150±150 BP (AD 800) M-1008 Charcoal	LoDaisKa Complex B - Woodland	Irwin & Irwin 1961: 114 Intrusive from Complex B levels
LoDaisKa (5JF142)	1150±150 BP (AD 800) M-1005 Charcoal	LoDaisKa Complex B - Woodland	Irwin & Irwin 1961: 114
Uhl Site (5WL32)	1210±150 BP (AD 800) GX-0324 Mammal bone	Middle Ceramic (Upper Republican)	Wood 1967: 182
LoDaisKa (5JF142)	1260±150 BP (AD 690) M-1002 Charcoal	LoDaisKa Complex B - Woodland	Irwin & Irwin 1961: 114
Scratching Deer (5BL69)	1260±95 BP (AD 690) I-3265 Charcoal	Late Prehistoric (Hog Back Phase)	Benedict 1975: 272 High Altitude Camp
Bayou Gulch (5DA265)	1270±95 BP (AD 680) DIC-1439 Charcoal	Woodland	Gooding 1980a A/B Horizon (Stratigraphic level date)
Happy Hollow (5WL101)	1270±80 BP (AD 660) Gak-1303 Charcoal	Upper Republican	Steege 1967 Too early - see W. R. Wood 1971

Table 7. (continued)

Willobrook (5JF6)	1290±100 BP (AD 660) GX-0526 Charcoal	Upper Republican	Leach 1966: 46 Site called "L. B. Shelter" in Irwin & Irwin-Williams 1966
Hazeltine Heights (5AM3	1305±100 BP (AD 645) I-885 Human bone	Woodland	Buckles, et al. 1963: 27, 31 Burial 6
Spring Gulch (5LR252)	1315±135 BP[a] (AD 635) UGa-675 Charcoal	Early Ceramic (Franktown Focus)	Kainer 1976: 31, 215ff Level III, Upper Locality I
Bayou Gulch (5DA265)	1350±65 BP (AD 600) DIC-1505 Charcoal	Woodland	Gooding 1980a Feat 18
Bayou Gulch (5DA265)	1520±50 BP (AD 430) DIC-1504 Charcoal	Woodland	Gooding 1980a Feat 10
T-W Diamond (5LR200)	1550±340 BP (AD 400) A-1272 Charcoal	Late Prehistoric	Flayharty & Morris 1974: 168 Too early
Bayou Gulch (5DA265)	1660±55 BP (AD 290) DIC-1469 Charcoal	Woodland	Gooding 1980a Feat 5, 16S/2W
Lykins Valley (5LR263)	1675±85 BP (AD 275) UGa-818 Charcoal	Late Prehistoric?	Ohr, Kvamme & Morris 1979: 20, 52 Hearth B, 110 cm b.s.
Metate Cave (5LA211)	1680±95 BP (AD 270) GX-0718 Charcoal	Middle Woodland or Early Ceramic (Graneros Focus ?)	Campbell 1969: 188, 345
Spring Gulch (5LR252)	1705±70 BP (AD 245) UGa-673 Charcoal	Early Ceramic (Franktown Focus	Kainer 1976: 31, 215ff Level III, Middle Locality I
Uhl Site (5WL32)	1755±95 BP (AD 195) GX-0319 Charcoal	Early Ceramic (Woodland)	Wood 1967: 78, 178, 183 Fill of Feat 2

Table 7. (continued)

Krebs-Klein (5WL47)	1780±130 BP −150 (AD 170) I-188 Bone	Plains Woodland	Scott 1979 Secondary Burials
Michaud Site A (5AH2)	1800±110 BP (AD 150) GX-0529 Human Bone	"Woodland"	Wood 1967: 615 Burial 1
Rainbow Creek Colo: K: 12: 7 (5DA124)	1360±200 BP (AD 590) W-290 Charcoal	Woodland (Parker Focus)	Rubin & Suess 1954: 446 Scott 1963: 48
Lykins Valley (5LR263)	1370±175 BP (AD 580) UGa-812 Charcoal	Late Prehistoric (?)	Ohr, Kvamme & Morris 1979: 20, 52 Hearth A, 198 cm b.s.
Biggs Site (5WL27)	1400±90 BP (AD 550) GX-0565 Mammal bone	Early Ceramic (Woodland)	Wood 1967: 349, 381
Bayou Gulch (5DA265)	1440±55 BP (AD 510) DIC-1502 Charcoal	Woodland	Gooding 1980a Stained Area XU136N/50W 52–58 cm b.s.
Spring Gulch (5LP252)	1485±70 BP** (AD 465) UGa-1049 Charcoal	Early Ceramic (Franktown Focus)	Kainer 1976: 31, 215ff Level III, Upper Locality I
Helmer Ranch Colo I: 12: 6 (5DA123)	1490±160 BP (AD 460) W-289 Charcoal	Woodland (Parker Focus?)	Rubin & Suess 1954: 446 Scott 1963: 46
Belwood Site (5PE278)	1500±55 BP (AD 450) GX-0325 Charcoal	Woodland Graneros Focus	See Withers 1954: 1-2; Hunt 1975 Bell-shaped pit of dwelling. This is Graneros Canyon Z: 1: 11 of Withers 1954.
Hutcheson Burial (5LR97)	1805±105 BP (AD 145) GX-0531 Human bone	"Woodland"	Wade 1966: 80 Burial 3

* ± 70 (RC)
** ±130 (RC)

land occupation at the LoDaisKa site are: 980 ± 150 B.P. (A.D. 989), 1150 ± 150 B.P. (A.D. 800), 1150 ± 150 B.P. (A.D. 800), and 1260 ± 150 B.P. (A.D. 690)(samples M-1003, M-1008, M-1005, and M-1002).

At the Magic Mountain site, just west of Denver, the uppermost zone, A, contained evidence of a Woodland occupation much more extensive a really than any of the earlier components and unusually large as compared to other nearby Woodland sites (Irwin-Williams and Irwin 1966: 207-219). Although the excavators see similarities to both the Ash Hollow focus and the Keith focus, they conclude that Zone A should probably be assigned to the Parker focus. In addition to the characteristic cord-roughened pottery, other artifact types support this assignment, and distinguish the Woodland component from earlier ones at Magic Mountain. Burials assignable to the Woodland occupation at Magic Mountain are supine or flexed in shallow graves, or seated in a bell-shaped pit. The former were accompanied with mainly utilitarian grave offerings, occasionally with more exotic items such as shell ornaments or a big-horned sheep skull made into a headdress--the latter with minimal grave goods.

The Woodland component in the Willowbrook Rock shelter (5 JF 6), just south of Denver, lies above the stratum containing the Archaic component; the two deposits are stratigraphically as well as culturally different (Leach 1966). The diagnostic artifacts from the Woodland component are projectile points and ceramics. Since few good descriptions of Woodland pottery from the foothills are available. Five hearths are attributed to the Woodland occupation. All are excavated pits, 36 to 41 cm in maximum diameter and 25 to 36 cm deep; some are rock-filled.

Other Possible Parker Focus Sites

Several other sites in Colorado are reported in the literature for which a Woodland assignment is proposed, sometimes highly tentatively; in most of these cases no phase is suggested. In the area that is generally dominated by the Parker focus, several sites should be mentioned. The Wilbur Thomas shelter (5 WL 45) (Breternitz 1971; Gillio 1971; Luebbers 1971 and Zimmerman 1971) is located just south of the Wyoming border, straight south of Denver. Four levels are postulated, but clear stratigraphy could not be demonstrated. At site 5 JR 10, on Van Bibber Creek in the foothills west of Denver, C. Nelson (1969) reports both Woodland pottery and possible non-Woodland pottery, along with typical stone artifacts from the upper level. Stieghorst and Bennet (1973) suggest a possible Woodland affiliation for site 5 JF 12 in Golden, Colorado. An occupation in Bison Hump shelter (5 DA 198) 56 km southeast of Denver was attributed to Woodland peoples by Hollingsworth (1976). Two hearths at the Lykins Valley site (5 LR 263) were dated by radiocarbon at A.D. 580 ± 175 and A.D. 275 ± 85, but no diagnostic artifacts were associated (Ohr, Kyamme and Morris 1979).

Several burial sites which could be Early Ceramic or Archaic, but which lacked diagnostic artifacts have been reported from northeastern Colorado. These include the Grahagan-Lipe site (5 MR 3) located 80 km northeast of Denver (Scott and Birkedal 1972; Wood 1967: 612); the Hutchinson Burial site (5 LR 97) in Larimer County with a radiocarbon date of A.D. 145 ± 105 (Wade 1966, Breternitz and Wood 1965); a burial near Golden (Nickens 1977); and the Hazelton Heights site (5 AM 3), 19 km north of Denver, with a radiocarbon date of A.D. 645 (Buckles et al. 1963; Breternitz 1972).

Other possible Parker focus sites are located in southeast Colorado, well outside the area where such sites are concentrated, but not far out of the range originally defined for the focus by Withers (1954). On the Chaquaqua Plateau, about half way between the Rocky Mountains and the Kansas line and not far north of the New Mexico line, Campbell (1976: 51) sees evidence that the earliest Woodland complex evolved out of the local Archaic complex. At six sites, or components, there was evidence of Plains Woodland traits in addition to a high percentage of Archaic materials, *e.g.,* Woodland pottery associated with Archaic points. Campbell (1976: 51) states that "the cultural materials of this stage may approximate those defined by A.M. Withers as the Parker focus (1954: 3)." The dominant point type is the small triangular to leaf-shaped Catan point. Ellis and Yarbrough points continue. Kent points, which resemble crude Yarbrough points, and the small stemmed or side-notched Scallorn points are also found, the latter suggesting the bow and arrow for the first time. Other artifacts include:

> "bifacial triangular, ovate, blade, and asymmetrical flakes; a bifacial chopper; a unifacial chopper; unifacial asymmetrical flakes; gravers; utilized triangulate, ovate, and asymmetrical flakes; and small rectangular, triangular, and oval-shaped side scrapers . . . tapering flanged drill(s), . . . unifacial metates, one-hand, bifacial, loaf manos . . . [and] a two-handed, unifacial, loaf mano."

A few deeply cord-marked Woodland sherds occurred at two of the six sites. Hunting of both large and small mammals continued.

The earliest radiocarbon date that Campbell (1976: 45) obtained for a site with a Woodland component was A.D. 270 ± 95 from Metate Cave (LA 211), although it is not clear whether this component was one of those tentatively assigned to the Parker focus.

Hog Back Phase

C. Nelson (1971: 11) proposed a new Woodland

phase on the basis of data recovered from excavations at the George W. Lindsay Ranch site and other sites in the foothills near Denver. This, the Hog Back Phase, is characterized by:

> (1) seasonally occupied hunting camps are indicated; (2) the cultural affiliation is 'Woodland'; (3) the dates are approximately A.D. 600 to 1000 (see Breternitz 1969); (4) sites occupied include small rock shelters and overhangs and open sites on prominences; and (5) diagnostic artifacts that include small corner-notched projectile points with a high incidence of serration, ovoid knives or projectile point preforms/-blanks, cord-marked Woodland pottery, although not particularly abundant, and naturally 'polished stones' which are not indigenous to the area but do occur in cultural deposits.

For some reason the trait that distinguishes the Lindsay Ranch site most conspicuously from other Woodland manifestations, structures outlined with large irregular pieces of rock, is not included in the description. Other components that Nelson sees as representative of the Hog Back phase occur at Lo-DaisKa, Magic Mountain, Hall-Woodland Cave, Willowbrook, Van Bibber Creek and possibly the Rainbow Creek site. These components are generally assigned to the Parker phase and Nelson recognized the possibility that the Hog Back phase might be included within the Parker phase.

Benedict (1975a: 172) accepts the idea of a Hog Back phase but concludes:

> I am less certain than Irwin-Williams and Irwin (1966: 210), Nelson (1971: 11), and others, that the Hog Back Phase was a variant of the Plains Woodland Culture, although I do not doubt that it was influenced by contact with neighboring Woodland complexes. The distribution of Hog Back Phase components suggests a strong mountain orientation, and seasonal transhumance westward from the Front Range foothills. From an ecological perspective, it would have been easier for mountain-adapted Shoshonean people to acquire cord-marked ceramics by trade than for Plains Woodland potters to adapt to the unfamiliar environment and resources of the Rocky Mountain crest.

It remains to be seen how viable the concept of the Hog Back phase will be and how it will eventually be defined. This may be the first step in cutting out from the more inclusive "Woodland" taxon many of the Early Ceramic period sites found in eastern Colorado and even western Kansas. As mentioned earlier, to call these sites "Woodland" with the implied close cultural relationship to contemporaneous sites found throughout the eastern half of the United States, probably stretches the concept beyond a reasonable limit.

The George W. Lindsay Ranch site (5 JF 11), 11 km northwest of Denver, is situated on a rocky ridge at an elevation of 1900 m (Nelson 1971). The structures, each 3.8 m square, are 1.2 m apart. The walls, about 30 cm high, are made up of irregular pieces of rock up to 45 kg in size, crudely laid. A use-stained surface, 8 cm below ground level, had apparently been partially prepared by leveling. One room with walls on three sides, had a basin-shaped fire pit; the other room, completely enclosed, had three rock-filled fire pits and a possible storage basin 20 cm deep and 36 cm in diameter. There had probably been a superstructure of perishable materials. The artifacts included 27 Woodland pottery sherds; 44 projectile points, all small, triangular and corner-notched, -- many serrated, and 1.5 to 2 times as long as wide; seven ovoid knives or point preforms, three flake end scrapers, 19 utilized flakes, and one mano or metate fragment.

Two high-altitude sites northwest of Denver, Colorado, were investigated by Benedict (1975a, 1975b) who assigned them to the Early Ceramic period, Hog Back phase. The Murray site (5 BL 65) is a tundra game drive on the east slope, near the summit of Mount Albion in Boulder County at an altitude of 3,600 to 3,720 m. It consists of 13 dry-laid stone walls, 483 cairns, and 16 circular to oval rock-walled pits, used in conjunction with steep cliffs and natural corridors. Nearly all the artifacts and the dated charcoal came from the pits, which were 1.5 to 2.7 m in diameter and up to 1.1 m deep. Three of the pits yielded a total of 22 small corner-notched projectile points, one side-notched point, a multi-notched point, an ovate bifacial knife and a triangular side-and-end scraper plus 197 flakes. Radiocarbon dates from the site are: 970 ± 100 B.P. and 670 ± 150 B.P. (samples M-1532 and SI-301). The more recent date could be related to the occupation represented by the side-notched points. Primarily on the basis of the small, triangular, corner-notched points, many of which were delicately serrated, the site can be assigned to the Hog Back phase.

The second high-altitude site, the Scratching Deer site (5 BL 69) described by Benedict (1975b), is located at the upper fringes of the subalpine forest northwest of Denver, Colorado. The site, a single-component camp site, was probably occupied by hunters. Two unlined, shallow-basin hearths contained an abundance of charcoal. The six projectile points from the site were small, ovate to triangular, corner-notched and both unserrated and serrated. A preform, a biface fragment, chipping debris and fragments of a milling slab were also recovered. The points were somewhat larger than, but closely resembled, those from the Murray site, and on the basis of the points, both sites were assigned to the Hog Back phase. A radiocarbon date of 1260 ± 95 B.P. (sample I-3265) agrees well with other lines of evidence.

Rock alignments of unknown function occur in the Front Range of Colorado. Husted (1963), draw-

ing heavily on Moomaw (1954), describes one site in Rocky Mountain National Park where, at 3,500 m elevation, two lines nearly come together at a right angle. One arm is 73 m long and the other 155 m long. The walls are only about 30 cm high and would not appear to have been suitable for any sort of game drive. Perhaps some of these could be assignable to the Hog Back phase, but many are likely to be Archaic in age.

Graneros Focus

This focus was defined by Withers (1954) as follows:

> The other defined unit of Woodland materials has been called the Graneros Focus. The pottery of this focus is cordmarked. The bases of the vessels are conoidal and the rims are straight or slightly outcurved with sometimes a smoothed area around the rim. The projectile points are commonly corner-notched and range from very small to large. Two houses of the Graneros Focus have been excavated. One is a circular structure about eighteen feet [5.4 m] in diameter and had eight support posts set in the floor near the wall. Dry laid masonry extended around the base of the wall for about two thirds of the house. The hearth was centrally located, but the four central support posts characteristic of later plains earth lodges are lacking. The other structure is a small pithouse, roughly oval in shape, with a covered entrance passage to the east. Some of the ceramic and lithic traits of the Graneros Focus may indicate that it is slightly later in time than the Parker Focus, but it, too, must be placed in a Late Woodland horizon. So far Graneros focus materials have been found only along the Arkansas and its tributaries in Southern Colorado.

Unfortunately, there is very little information in the literature on sites attributable to this focus. Breternitz (1969: 118) published a radiocarbon date of A.D. 450 ± 55 for a Graneros Canyon site (Colo. Z: 1: 11) just southwest of Pueblo, Colorado, that is apparently the type site. Also, Wood (1967: 649) states that this date is for the site from which Withers (1954: 1-2) reports two structures.

Campbell (1976: 52) suggests that most Woodland sites on the Chaquaqua Plateau, 125 km southeast of Pueblo, Colorado, are local manifestations of the Graneros focus and divide the complex there into three unnamed temporal horizons. He dates the initial horizon, to which he assigns 20 sites, at A.D. 450 to 750 which fits well with the radiocarbon date for the type site. In the initial horizon arrow points and dart points are equally represented. Arrow points are usually corner-notched, but a few are unnotched and dart points were largely of the Catan type. Other chipped stone tools were primarily of types found in the earlier complexes, but small end scrapers occur in the later horizon. Uniface slab metates and one-hand loaf manos continue; manos may have either one or two faces. Cord-marked sherds, even though found in only three of the 20 sites, are more common than before. Large mammals were more important than small ones and there is indirect evidence of maize horticulture, perhaps the growing of Chapalote-Reventador. Many simple stone enclosures were constructed and occupied. Most consisted of single circular units 2.4 to 4.6 m in diameter, with low, horizontally placed, dry-laid slab foundations surrounding saucer-shaped floors. A few sites had three rooms and in one case a room was partitioned. Campbell comments on the similarity of these structures to those of the Los Pinos phase (A.D. 1-400) of the upper San Juan River valley, which were followed by Sambrito Phase Basketmaker III pithouses with antechambers (Dittert et al. 1963). Campbell feels that Los Pinos architecture could have inspired the partitioning of Graneros structures. There are perhaps even greater similarities between the Initial Graneros structures and those of the contemporaneous and much closer Vermejo phase of the Cimarron area (Glassow 1980: 71), which is discussed later.

The Middle Graneros horizon, represented at 20 sites on the Chaquaqua Plateau, is presumed to date at A.D. 750-1000. There were few major innovations during this period, but the cultural pattern became more varied. Arrow points are much more common than dart points, with Scallorn points dominating; unnotched points gained in frequency. A new race of maize entered the area and evidence of horticulture is certain. Both single-room and contiguous-room stone structures are present. In addition, barrier or defensive walls are found at many sites.

Late Graneros culture, the final stage of the Plains Woodland horizon (A.D. 900-1050) on the Chaquaqua Plateau is represented at 13 sites: campsites, rock shelters, and stone enclosures. Enclosures with vertically placed slabs may have appeared at this time, and pottery with shallow cord-marking that resembles Borger Cord-marked began appearing, in addition to Woodland pottery. Other traits continued much as before.

On the basis of rather minimal evidence J. Anderson (1976) assigns three additional sites from southeastern Colorado to a Woodland complex. These three, 5 PE 15, 5 PE 29 and 5 PE 79, are located on the Red Top Ranch about 55 km southeast of Pueblo, Colorado. The first, an open site, consisted of 10 stone enclosures at least some of which contained hearths. One unnotched triangular projectile point was recovered. The second site, a rock shelter, had been occupied twice, and contained a wall that had been built during the early occupation. Diagnostic artifacts recovered included small corner-notched projectile points and cord-marked pottery. There are petroglyphs of snakes and deer(?) on the east wall. The third site, an open site without structures,

yielded a fairly large corner-notched point and small, triangular, corner-notched or unnotched points. Much of Anderson's report is devoted to a detailed analysis of flaking technology.

Woodland Sites in Texas and Oklahoma

About 32 km northeast of Borger, Texas, in the north-central Panhandle, is the Lake Creek site, a Woodland site excavated by Hughes (1962). The occupation layer extended for 30 to 60 cm below the surface. From the limited excavation, two kinds of pottery were recovered, the more common being cord-roughened. For the most part the cord markings were indistinct, but in a few cases they were deep, coarse and widely spaced; on some the cord marks crossed, forming an open-mesh pattern. These predominantly gray sherds were tempered with coarse angular particles of limestone and quartz grains. The curvature of the sherds suggested a large vessel with a slightly constricting neck. Hughes suggests that this ware from Lake Creek belongs to the same general ceramic tradition as Borger Cord-marked, an Antelope Creek focus (Panhandle aspect) type, but that the Lake Creek sherds themselves probably belong to an earlier, unnamed Woodland type. A minority pottery type had a plain brown to black surface, abundant feldspar temper, compact homogeneous paste, and closely resembles Jornada brown ware (Jelinek 1967: 47-49) of the middle Pecos River valley in eastern New Mexico.

The association here of Jornada brown ware, a Pueblo type, with cord-roughened Woodland pottery is an interesting clue to Plains-Pueblo contact that should be investigated further. The occurrence of these types together in surface collections is common in the Panhandle according to Jack Hughes (personal communication). The fact that the chipped stone artifacts from Lake Creek are of local material led Hughes to conclude that the site represents an indigenous population, not a group that was passing through the area. Jornada brown ware, however, apparently has not been found at the later Panhandle aspect sites (Hughes 1962: 82); the Pueblo trade pottery from Panhandle aspect sites was apparently all from farther north from the general Santa Fe area (Krieger 1946: 47). On the basis of the very limited work done at Woodland sites in the Texas Panhandle, it is not yet obvious what influence resulted from contact with Pueblo peoples from southeastern New Mexico.

Most of the projectile points from the Lake Creek Woodland component are small and thin and considered to be arrow points. Included are ovate, triangular, side-notched and corner-notched forms. Two heavy corner-notched points, probably dart points, were recovered, as was a fragment of a corner-notched point of medium weight. A fragment of a diamond-shaped, alternate-bevel knife typical of later Panhandle aspect sites was recovered, as were parts of plain chipped knives and flake knives. Scrapers were common and included snub-nosed end scrapers, thin-bitted end scrapers, side scrapers and flake scrapers. Three gravers were found. Also common were manos:oval, rectanguloid, beveled and wedge-shaped. Thin grinding slabs from the site resemble ones from nonceramic sites in the area; all are of hard dolomite. Thick grinding slabs of Alibates dolomite resemble those of the Panhandle Aspect. Although the sample is small and some of the specimens were from the surface, Hughes concluded that the Lake Creek focus is probably a late Plains Woodland complex dating from well before A.D. 1300, primarily on the basis of the brown-ware trade sherds and similarities to Woodland manifestations farther north. Hughes (1962: 84) is probably correct when he says, "The general character of the pottery, the light triangular points, and certain other traits indicate that the Lake Creek Focus ultimately may be shown to have a place somewhere in the genealogy of the Panhandle Aspect."

From Texas County, the middle county in the Oklahoma Panhandle, Lintz (1978b: 131) reports a Plains Woodland stage at the Johnson-Cline site, in upland dunes. The Woodland occupation is represented by nine corner-notched Scallorn points and perhaps by 20 large corner-notched projectile points within the Marcos-Marshall series. These latter could just as easily be from a Late Archaic occupation at the site, which also shows evidence of Paleoindian, Early Archaic, and Middle Ceramic period occupations.

Although they are out of the area of the Central High Plains or are only minimally reported, several references to Woodland sites in western Oklahoma should be mentioned. Lintz (1976a: 9) indicates that there are numerous Plains Woodland sites and refers to the "Pruitt site (Barr 1966), Brewer site (Duffield 1953), Freeman and Hudsonpillar sites (Bastian 1969), Duncan-Wilson sites (Lawton 1968), and Von Elm site in Oklahoma (Hartley 1974)." Lintz (1978b: 114) tabulated the radiocarbon dates for Plains Woodland sites on the southern plains in Oklahoma (table 8).

Vermejo Phase

The foothills and canyons of the Sangre de Cristo Mountains in the vicinity of Cimarron, New Mexico, are archeologically peripheral to the Taos area and less extensively investigated. Nevertheless, sites that have been excavated near Cimarron include some that are apparently earlier than any dug in the Taos area. These sites are comparable to both early and late Basketmaker sites found elsewhere in the Southwest.

Glassow, who has reported some 300 sites on and near the large Philmont Scout Ranch which nearly surrounds Cimarron, New Mexico (1972, 1980), has

Table 8. Radiocarbon dates for Plains Woodland Sites in Oaklahoma
(Lintz 1978b: 114)

Site	Dates B.P.	AD/BC	Lab No.	Reference
Pruitt	1260±90	690 A.D.	(GaK-899)	Wyckoff 1968
	1140±90	810 A.D.	(GaK-900)	Wyckoff 1968
Von Elm	1360±60	590 A.D.	(Tx-1908)	Hartley 1974
	1750±80	200 A.D.	(Tx-1907)	Hartley 1974
	1740±60	210 A.D.	(Tx-1909)	Hartley 1974
	1470±50	480 A.D.	(Tx-1910)	Hartley 1974
Vickery	1520±80	430 A.D.	(Tx-1911)	Hartley 1974
Duncan-Wilson	1430±170	520 A.D.	(Sm-772)	Lawton 1968
	918±195	1032 A.D.	(Sm-693)	Lawton 1968
NCE3-RS1	1390±150	560 A.D.		Nowak n.d.

assigned 17 to 21 of these to a Vermejo phase which he dates from A.D. 400-700. He sees sites of the Vermejo phase as comparable to early Basketmaker components in the San Juan drainage.

Vermejo Phase sites are generally on high terraces or bluffs along canyons, and usually consist of one circular structure of horizontally laid masonry about 1 m high and rarely more than 5 m in diameter. In one structure excavated, there was evidence of upright support posts. Midden deposits are thin and contain no pottery. Remains of corn are found, but manos and metates are rare; shallow-depression milling slabs are more common than open-end trough metates. Points, of a small corner-notched type also found in later phases in the Cimarron area, are rare at Vermejo phase sites, as are other artifacts. Two excavated sites assigned to this phase were dated by radiocarbon: one at A.D. 510 and the other at A.D. 1095. Glassow (1980: 72) considers the later date too recent, but points out that the site is somewhat aberrant for the phase.

Pedregoso Phase

The next phase in the Cimarron, New Mexico area is labeled the Pedregoso, and is dated at A.D. 700-900 on the basis of radiocarbon. Glassow (1980: 72) describes one site included in this phase (NP 1E) as follows:

> The approximately 100-foot-square [30-meter-square] excavation of this component revealed a variety of structural features, including several varieties of firepits; bottle-shaped roasting and storage pits of varying sizes; dense scatters of fist-sized, fire-reddened hunks of sandstone; linear alignments of sandstone blocks; scattered post holes; two peculiar 18-inch-deep [46 cm] trenches; and a broad, flattened activity area, created by digging into the slope of the terrace, upon which several inches of gray, friable midden deposits were encountered. About a dozen sherds of very crude, thick, oxidized pottery came from this midden deposit. It also contained the densest concentration of most other classes of artifacts and faunal remains, including a few maize cob fragments (Glassow 1980: 72).

Kirkpatrick and Ford (1977: 260) confirmed that there were at least two shallow pit houses at this site, as Glassow suspected. Most metates were of the one-open-end trough type, but grinding slabs were also present. Botanical materials from this component (NP1E) and from site MP 4 (assigned to the earlier Basketmaker Vermejo phase), were analyzed by Kirkpatrick and Ford (1977: 262-264) and found to contain a wide variety of wild plant species, many of which were possible sources of food. Of even greater interest are their statements:

> Corn (a chapalote derivative of *Zea mays*) and beans (*Phaseolus vulgaris*) were recovered from MP 4 and NP 1E. Corn and bean size variability suggests a wide range of growing conditions and a lack of selection for specific seed type. The presence of a nubbin cob suggests that all growing corn, even tillers, may have been utilized . . . Five of the wild plants represented, lamb's-quarters, pigweed, Rocky Mountain beeweed, sunflowers, and marsh elder are common pioneer plants. Today they grow in farm fields, along roads, irrigation ditches, streambeds, and other areas disturbed by nature or man. Prehistorically the plants would have grown around houses, trash areas, fields, and naturally disturbed areas.

Summary

The Early Ceramic period on the Central High Plains was a millenium in which the transition took place from a strictly hunting and gathering life way into one in which the growing of plant foods provided a significant part of the diet. Other cultural innovations included the introduction of the bow and arrow, pottery, more substantial dwellings, and the beginning of semipermanent villages. The populations were apparently a continuation of the previous Archaic groups. The cultural innovations, however, most probably had their roots elsewhere. Throughout most of the Central High Plains the Early Ceramic complexes can be seen as an extension of Woodland traits and complexes from farther east, that became more and more attenuated as they moved west to and beyond the limits of simple horticulture. In the extreme southwestern corner of the Central High Plains, in the foothills of northeastern New Mexico, the Early Ceramic complexes appear to have had their roots in the Southwest with incipient horticulture possibly preceding pottery making in the area. The end of the Early Ceramic period, a thousand years ago, saw a relatively abrupt transition, probably triggered by innovations from the Southwest, to a horticultural, small village way of life, but with no significant movements of people.

Figure 1. The Red Smoke site (25 FT 42), western Nebraska. The main occupation levels were about a meter above the heads of the figures. University of Nebraska State Museum excavation. Photo by author.

Figure 2. The Lindenmeier site, northeastern Colorado, about 50 years after excavation by the Smithsonian Institution. The occupation level was buried in this terrace. Photo by author.

Figure 3. The Clary Ranch site (25 GD 106), western Nebraska. The occupation level, partly exposed just above creek level to the left, extends into the terrace to the right. University of Nebraska State Museum excavation and photograph.

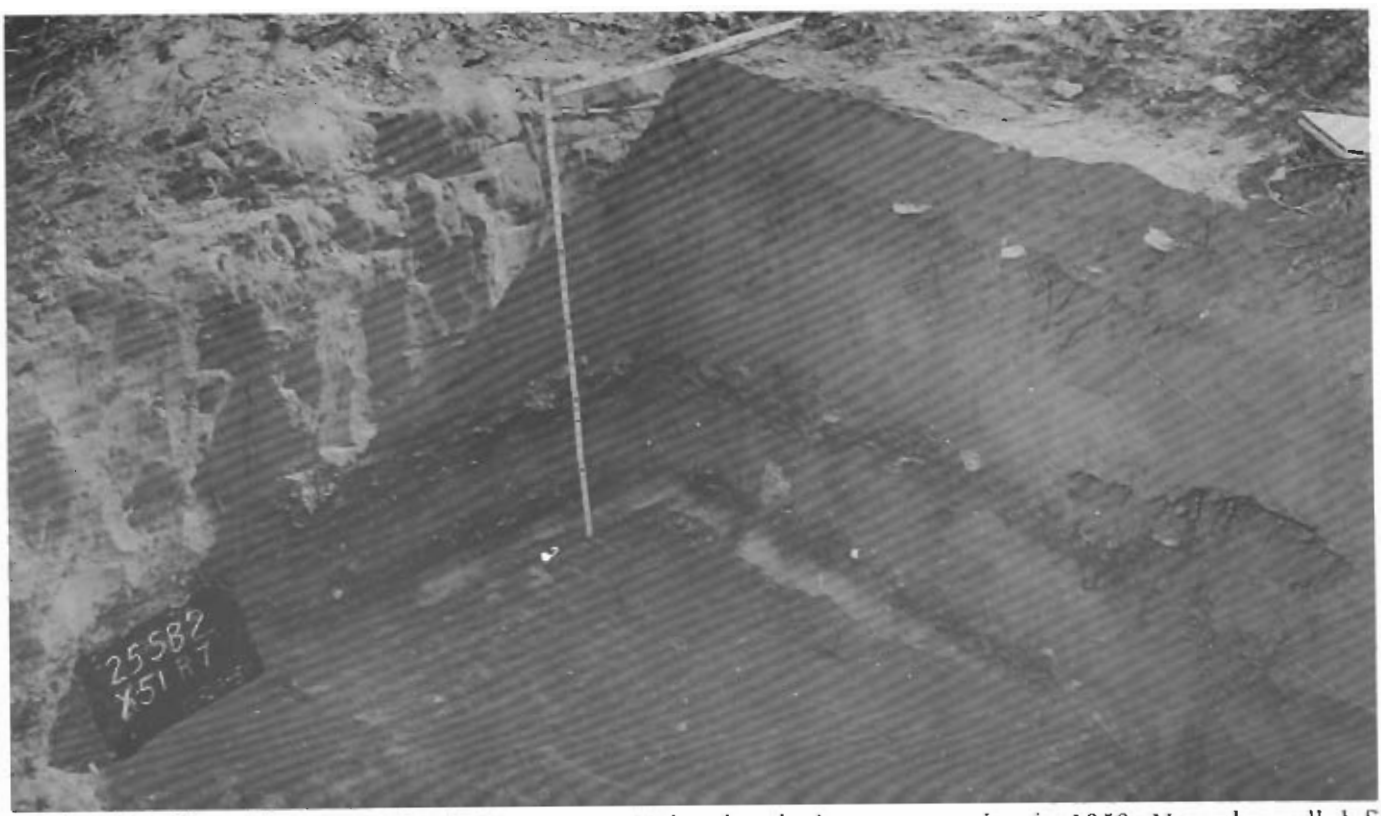


Figure 4. The Signal Butte site (25 SB 2), western Nebraska, during reexcavation in 1950. Note the well-defined cultural levels. John L. Champe photograph.

Figure 5. The Woodruff Ossuary (14 PH 4), northwestern Kansas. This heavily beaded adolescent skeleton was the principal burial in this Woodland ossuary. Nebraska State Historical Society photograph.

Figure 6. The Larned site (14 PA 307), western Kansas. Note the closely spaced occupational levels, each of which was associated with a Great Bend house floor. Excavation supervised by Earl Monger, in photograph. Photo by author.

Figure 7. Woodland pottery vessel from the Schultz site (25 VY 1), central Nebraska. The Valley focus, for which this is the type site, is the best known Plains Woodland complex. Nebraska State Historical Society excavation and photograph.

Figure 8. Upper Republican phase pottery vessel from the Reams Creek site (25 FR 8), southern Nebraska. Note the distinctive cord roughened surface. Nebraska State Historical Society excavation and photograph.

Figure 9. Upper Republican phase pottery vessel from the Rebecca Creek site (25 FR 6), southern Nebraska. The well-defined collared rim is characteristic of many Upper Republican vessels. Nebraska State Historical Society excavation, and photograph.

Figure 10. Pawnee pottery vessel from the Linwood site (25 BU 1), central Nebraska. The decoration on the shoulder area and tall rims and the multiple handles are common on Pawnee pottery. Nebraska State Historical Society excavation and photograph.

Figure 11. Dismal River Apache pottery vessel from the Lovitt site (25 CH 1), south-western Nebraska. The simple stamped surface treatment is characteristic of various protohistoric Plains complexes. Nebraska State Historical Society excavation, John L. Champe photograph.

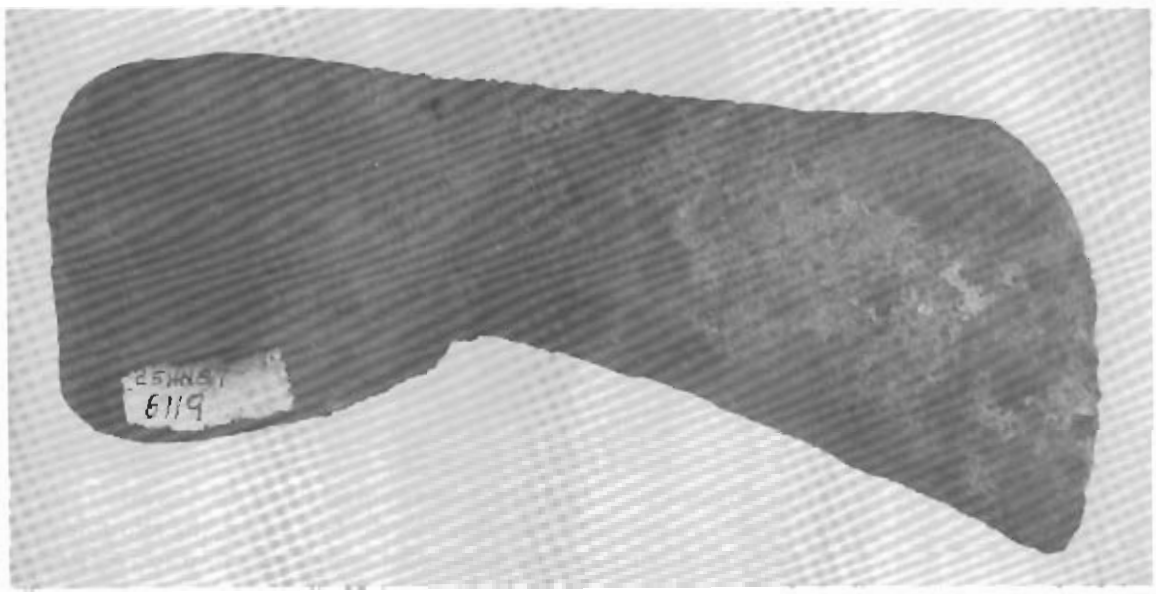


Figure 12. Iron trade axe from White Cat Village (25 HN 37), southern Nebraska. This was found driven into the hearth of a burned house which had been occupied near the end of the Dismal River aspect. University of Nebraska Laboratory of Anthropology excavation. Photo by author.

Figure 13L. Apishapa phase ruin at the Cramer site (5 PE 484), southeastern Colorado (panorama continued on opposite page). Note the massive walls of vertically set rock slabs. University of Nebraska excavation and photograph.

Figure 14. Apishapa phase ruins at the Juan Baca site (5 LA 1085), southeastern Colorado. The most common sites contain 2 to 4 circular rock structures. University of Nebraska State Museum survey and photograph.

Figure 13R. Apishapa phase ruin at the Cramer site (5 PE 484), southeastern Colorado (panorama continued from opposite page). Note the massive walls of vertically set rock slabs. University of Nebraska excavation and photograph.

Figure 15. Apishapa phase ruins at the Snake Blakesley site (5 LA 1247), southeastern Colorado. Note the variety of construction styles, including the stone pillars. University of Nebraska State Museum survey and photograph.

Figure 16. Upper Republican phase earth lodge at site 25 HN 44, southern Nebraska. University of Nebraska Laboratory of Anthropology excavation and photograph.

Figure 17. Upper Republican phase earth lodge at site 25 HN 44, southern Nebraska. This is the largest reported Upper Republican earth lodge and is also unusual in that it has six, unusually large center posts. University of Nebraska Laboratory of Anthropology excavation and photograph.

Figure 18. Pawnee earth lodge at the Hill site (25 WT 1), southern Nebraska. Note the circular shape and the eight center posts which distinguish Pawnee from prehistoric earth lodges. Nebraska State Historical Society excavation and photograph.

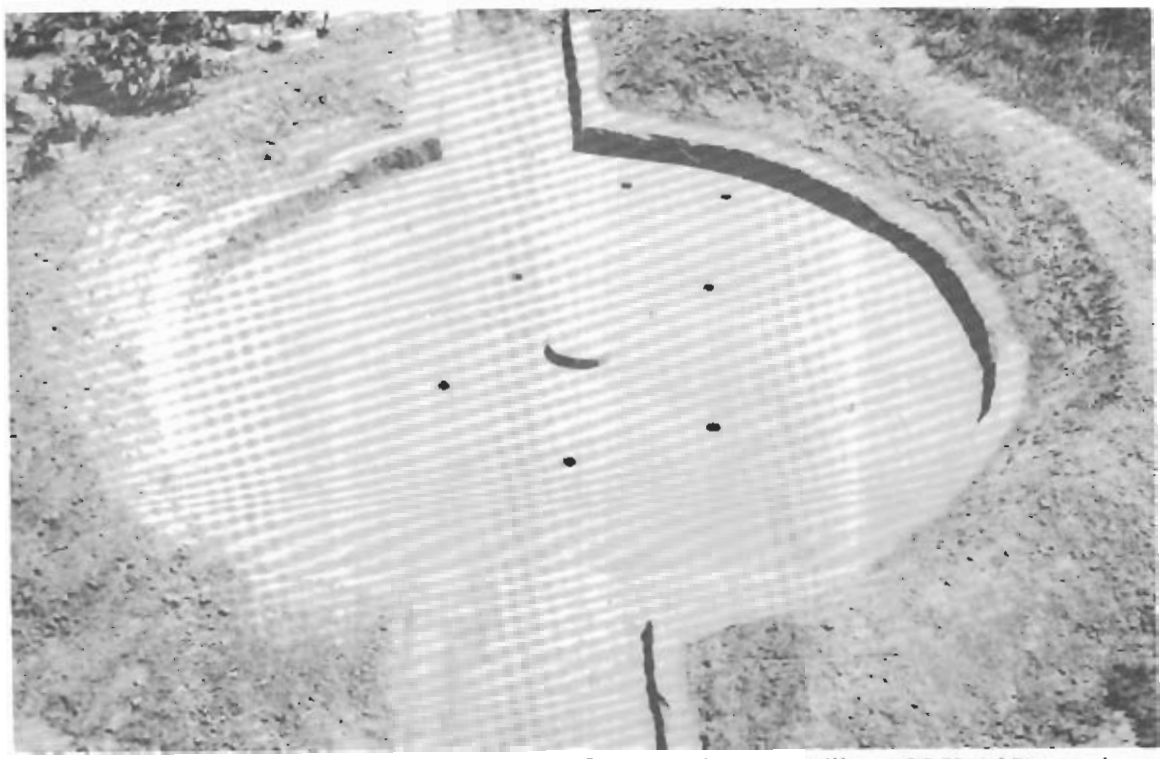


Figure 19. The Dismal River Apache house floor at White Cat Village (25 HN 37), southern Nebraska. Dismal River houses are distinctive on the Plains in that they have five main support posts plus two entrance posts. University of Nebraska Laboratory of Anthropology excavation and photograph.

Figure 20. Apache tipi ring, 17th century, at the Chapman site (29 SM 32), northeastern New Mexico. This site, with its more than 200 tipi rings, probably was a stopping place for Apaches going to Pecos pueblo to trade. Northern Illinois University Anthropology Museum excavation. Photo by author.

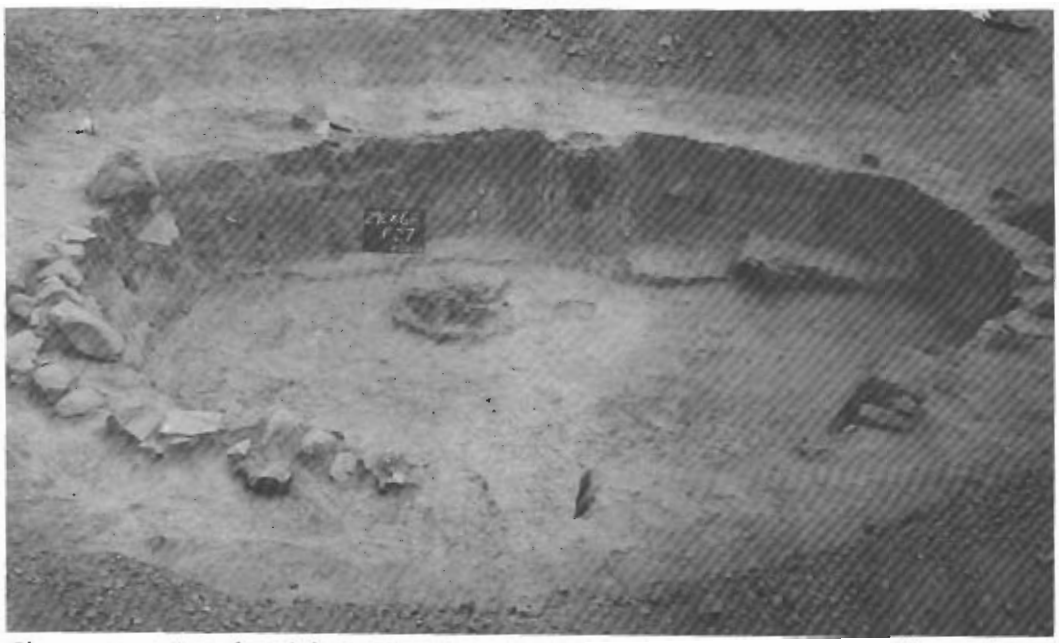


Figure 21. Apache pit house, ca. AD 1700, at the Sammis site (29 CX 68), northeastern New Mexico. This was one of several styles of houses reported by the Spanish for the ancestors of the Jicarilla at this period. Northern Illinois University Anthropology Museum excavation. Photo by author.

Figure 22. Apache pueblo, ca. AD 1700, at the Glassrock site (29 Mo 20), northeastern New Mexico. This style of architecture was obviously borrowed from the Pueblo Indians with whom the Apaches had extensive contact. Northern Illinois University Anthropology Museum excavation. Photo by author.

Figure 23. Ruins of a Jicarrilla Apache structure at the John Alden site (29 SM 72), northeastern New Mexico. This site was probably occupied only during the winter of 1849-1850 by Chacon's band. Northern Illinois University Anthropology Museum excavation. Photo by author.

Figure 24. Petroglyphs, probably Apishapa phase, on the terrace below the Cramer site (5 PE 484), southern Colorado. University of Nebraska State Museum survey and photograph.

Figure 25. Petroglyphs, probably Apishapa phase,near the mouth of the Apishapa Canyon, southeastern Colorado. University of Nebraska State Museum survey and photograph.

CHAPTER FOUR

THE MIDDLE CERAMIC PERIOD

At the beginning of the Middle Ceramic period marked changes appeared in the cultures of the plains Indians. Whereas people of the Early Ceramic period had only incipient horticulture and simple structures, Middle Ceramic people were producing substantial amounts of corn and living in well-constructed dwellings that conformed to set patterns. It seems highly probable that the Middle Ceramic archeological complexes of the Central High Plains represent development, in situ, from Early Ceramic complexes. The changes in subsistence economy and type of habitation may well reflect the introduction of a new race of maize with a low row number as postulated by Galinat and Gunnerson (1963). The new maize produced substantially higher yields than previous races and was easier to grind. The apparent population increase during the Middle Ceramic probably reflects this more abundant food. The idea of structures built over shallow pits with four-post roof supports probably diffused, along with the new maize, into the plains from the Southwest. In the extreme southwest corner of the Central High Plains there is a comparable and simultaneous cultural fluorescence, but with a definite Pueblo base and character.

Other cultural changes documented in the archeological record include the appearance of small triangular projectile points, commonly with side notches and sometimes with a basal notch as well. These are good time markers and may have evolved from the Avonlea point as suggested by Kehoe and McCorquodale (1961). However, the route(s) of diffusion is not clear. The small points were undoubtedly used on arrows propelled by bows, weaponry that seems to have appeared on the plains and in the Southwest during the Early Ceramic period.

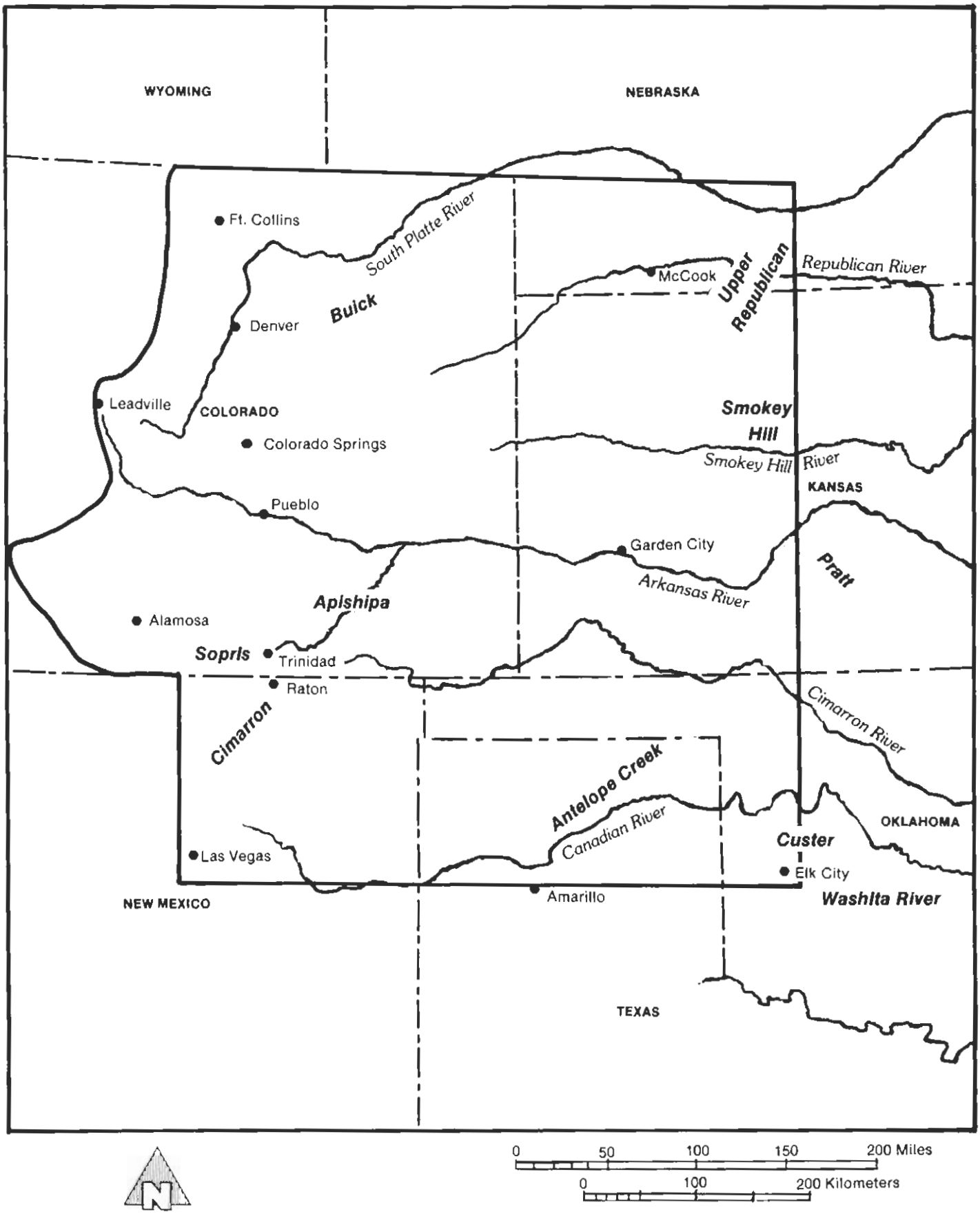
Excepting the clearly Pueblo manifestations, the Middle Ceramic complexes of the Central High Plains are affiliated with the plains village pattern; however, the farther west the site, the less complete the assemblage. Influence from the northeast is reflected in the elaboration of pottery decoration and diffusion from the southeast is evident in certain traits of the Southern (Death) Cult. The change in vessel shape from tall, pointed-bottom pots, to more nearly spherical forms could be attributed to influence from the East, but more probably came, along with the new maize, from the Southwest. Pottery transitional between the Early and Middle Ceramic periods is apparently represented in the Franktown and possibly the Apishapa phases of eastern Colorado, in the Custer Phase of western Oklahoma, in some of the most aberrant Upper Republican sites in southern Nebraska, in several unexcavated sites in west-central Kansas and possibly in the Smoky Hill phase of south-central Kansas.

During the Middle Ceramic period, there was climatic fluctuation, as demonstrated by tree rings, of a magnitude that would have jeopardized marginal horticulture. As drought hit one sub-area after another, there were apparently concomitant population shifts within the Central High Plains and at the end of the Middle Ceramic period there probably were especially severe droughts that resulted in marked depopulation of the region.

Upper Republican Aspect

The Upper Republican aspect, perhaps the most distinctive cultural climax in the Central High Plains, is best represented in its northeast corner. Here, between about A.D. 1000 and 1450, there developed a sedentary culture based on a combination of horticulture and hunting. It was characterized by distinctive cord-roughened pottery and semisubterranean earth lodges, located either singly or in small clusters. Initially, Strong (1935) was inclined to call this complex "Prehistoric Pawnee." His guess was probably correct, but Wedel's suggested designation, "Upper Republican" aspect, was more acceptable because it was free of interpretation and it soon became established. Many Upper Republican aspect (phase) sites have been excavated, but relatively little of this work has been reported in the literature. Enough information is available, however, to permit valid generalizations.

In spite of several efforts to define temporal and geographic subdivisions of Upper Republican, there is still no generally agreed-upon taxonomic scheme for classifying its manifestations. The various taxa mentioned in the literature include the term "Aksarben aspect," which has been proposed to subsume both the Upper Republican aspect and, to the east of the Central High Plainsthe Nebraska Culture (aspect). A slightly more inclusive taxon, the Central Plains phase (or tradition), would include the Smoky Hill phase of Kansas in addition. The "Plains Village pattern" would include all the above plus the Apishapa, Custer, Washita and Panhandle



SELECTED MIDDLE CERAMIC COMPLEXES

aspects to the south, and those Middle Ceramic period villages farther north along the Middle Missouri River. There is some resistance, however, to extending the Plains Village pattern west into the High Plains, where, at most, there are isolated earth lodges and not the clusters of dwellings that the name "village" brings to mind. Since these western manifesations are apparently peripheral expressions of the Central Plains phase and the Plains Village pattern, rather than independent cultural complexes, one can better understand the cultural dynamics involved by considering them along with those broad taxa.

Proposed divisions within the Upper Republican aspect (phase) are even less generally accepted. The assignment to the Smoky Hill aspect of sites in north-central Kansas once classified as Upper Republican, has gained support. The separation of the remaining Kansas and Nebraska sites into an early (Solomon River) phase; a middle (Classic Upper Republican) phase; and a late (Loup River) phase (which corresponds closely to what was once called the Sweetwater focus) shows promise but is less well accepted. Two foci have been proposed for Upper Republican aspect sites in Colorado:the Buick focus, in the drainages of the Republican and Platte Rivers, which appears to correspond to at least Classic Upper Republican, and the Franktown focus, southeast of Denver, which may be transitional between Early and Middle Ceramic complexes and, if so, might correspond to the Solomon River phase farther east. Unfortunately, very little work has been done at Middle Ceramic sites in Colorado north of the Arkansas River. As will be seen later, one of the big problems in establishing temporal divisions is the apparent inaccuracy of and inconsistency in radiocarbon dates for the past two millennia. Unfortunately there are very few dendrochronology dates from the plains.

This discussion of Middle Ceramic complexes in the northern Central High Plains will focus on the Classic Upper Republican phase, since that represents the sites for which the literature is richest. Much of what is presented will also be applicable to those other complexes in Nebraska and Kansas that were originally included in the Upper Republican aspect. Limited information on the Loup River, Solomon River and Smoky Hill phases will also be presented even though these taxa may eventually prove invalid. The Buick and Franktown phases of Colorado (if these are valid taxa) apparently represent quite different cultural activities than those going on in the Classic Upper Republican heartland; thus the generalizations do not extend to them. The Buick phase is used as something of a catchall for Middle Ceramic sites north of the Arkansas River in Colorado. The poorly known Pratt complex of south-central Kansas is dealt with separately even though is it apparently in some way related to the Upper Republican aspect.

History of Investigations

Strong (1933) originally defined the Upper Republican culture, later to be renamed the Upper Republican aspect, and presented a list of its distinctive traits. He suggested that it was prehistoric Pawnee and distinguished it from the "Nebraska Culture," which had been described by Gilder (1926) and most extensively investigated by Sterns (1915a, 1915b). Strong's brief article in the *American Anthropologist* (1933) presented a summary of two longer monographs then still unpublished by Wedel (1936) and Strong (1935).

In 1933, the Nebraska State Historical Society initiated an archeological survey of south-central Nebraska (Wedel 1934a,b,; 1935a,b) in the course of which excavation was carried out at a number of Upper Republican sites. A few of these lie just east of the present study area, but most are within it. In all, thirteen houses were excavated representing nine sites. Of these, nine were rectangular; the others were circular or oval. Most of the circular structures were at sites east of the present study area and the most anomalous houses had fewest diagnostic artifacts.

Also in 1933, the Nebraska State Historical Society excavated at three Upper Republican sites along Medicine Creek, a few kilometers south of Stockville, Nebraska (Wedel 1934b). Here, at the Gammill-Phillips site, one small, nearly round earth lodge with four center posts was excavated. The house found at the Thompson site was nearly square but again had four center posts. Remnants of two houses of uncertain shape, and of a square house with rounded corners were investigated at the Owens site. The latter is unusual in that there were 12 center posts forming essentially a circle; a well-defined entrance extended to the east.

Wedel (1935a) alludes to numerous Upper Republican villages in Franklin and Harlan Counties, Nebraska. Strong (1935: 74-103) reports two square earth lodges from the Lost Creek site in Franklin County. Hill and Metcalf (1942: 159) merely mention extensive tests in an Upper Republican site on the Frenchman River, presumably in Chase County, Nebraska.

As part of salvage operations prior to the construction of the Medicine Creek Dam in Frontier County, Nebraska, the Nebraska State Historical Society and the Missouri River Basin Survey excavated 42 earth lodges at 12 Upper Republican sites (Kivett 1949a). Kivett gives a good general summary of the data recovered, but does not provide a detailed house-by-house description; all houses, however, were reported as rectangular. More recently, an additional rectangular house from this same area was excavated and reported in detail (W.R. Wood 1969a).

As part of salvage operations in the late 1940s and early 1950s, the University of Nebraska

Laboratory of Anthropology excavated all or parts of five Upper Republican houses at three sites in the Harlan County (Nebraska) Reservoir area. One, at 25 HN 44, was unusual in that it was (and still is) the largest ever excavated; the rectangle formed by the outer posts was 11 by 14.6 m and contained six very large center posts. The other house at 25 HN 44, also with six foundation posts, was 10.7 x 11 m (Wedel 1953b: 92-93; Cooper 1955: 94-96; Roll 1968: 60-65).

In 1961-1962, the Nebraska State Historical Society conducted salvage archeology in the Red Willow Reservoir area, primarily in Frontier County, Nebraska. The one square Upper Republican house excavated was reported by Grange (1980: 49-70, 155). He states that most of the 30 Upper Republican sites in the Reservoir area were "earth lodge hamlet or village sites."

The one Upper Republican site within the present study area at which structures have been found and reported on is the Pottorff site in the extreme western part of Lane County, Kansas (Wedel 1959: 784-788). The structures here had four center posts but were small and poorly defined. Pottorff is considered by Witty (1978) to be the westernmost Upper Republican site with structures in Kansas, and by Wedel (1959: 569) to be the southernmost Upper Republican site.

Sites in western Kansas presumed to be camps rather than villages have also been assigned to the Upper Republican aspect. Bowman (1959a-c, 1960a-c) reports an Upper Republican component at the Coal Oil Canyon rock shelter (14 LO 1), located in extreme western Logan County, southeast of Wallace, Kansas. An Upper Republican occupation was also reported from site 14 SC 302, in the mouth of Timber Canyon at the north end of Scott County State Park (Witty 1975: 4). From site 14 SC 3 (Wedel 1959: 476), at the extreme southern edge of Scott County, have come Upper Republican sherds, along with various other types. Some of the sherds apparently resemble the orange cord-roughened pottery that Wedel attributes to the Smoky Hill aspect. Near this site, known as Pony Mound, are depressions or playas which may have been the attraction for the diverse groups that frequented the area. The Schmalzried site (14 LA 305) occupies a hilltop in Lane County, Kansas (Stein 1978); nearby is an undrained depression that becomes a playa in wet years. Another hilltop site (14 GL 417), this one in Greeley County, extreme western Kansas (Cheney 1977), has yielded pottery that is either Upper Republican or an unnamed type that appears to be intermediate between Upper Republican and Woodland. A wide variety of points apparently ranging in time from Archaic to Late Prehistoric have been found at the site.

The known distribution of Upper Republican villages almost certainly reflects a biased sample. Numerous sites have been excavated along the Republican River and its tributaries in south-central Nebraska, but apparently only one Upper Republican earth lodge site has been reported from that portion of Kansas which lies within the study area. Some 48 km east of the study area in northern Kansas another concentration of Upper Republican villages has been investigated and reported. Witty (1978) alludes to Upper Republican sites in northwestern Kansas, but apparently none has been excavated and reported in the literature. Although the aspect was defined on the basis of work done by the Nebraska State Historical Society and the University of Nebraska in the 1930s, most of the excavation of Upper Republican earth lodges in both Nebraska and Kansas has come about through later salvage projects prior to the construction of dams.

Subsistence

The Upper Republican subsistence pattern has long been recognized as about equally composed of cultivation (corn, beans and squash) and hunting and gathering, with an emphasis on bison but with a wide variety of plants and animals utilized. Grange (1980: 67) calculated that 98.3% of the meat consumed at 25 FT 32 was from bison with only five other species represented. Falk (1969), however, reports 33 species from 25 FT 35. He did not try to calculate the percentage of usable meat represented by each species, but bison was clearly the most abundant. Deer was also very well represented; rabbits were the most common small mammal. Remains of freshwater mussels and various game birds are frequently present, as are fish bones and fishhooks.

Of the vegetal materials recovered from Upper Republican sites, several are clearly cultigens. For the Medicine Creek area, Kivett (1949: 280-282) reports that "charred corn kernels were plentiful at all of the sites and some short cobs bearing 6 to 12 rows of kernels were found. Other charred materials include sunflower seeds, charred nuts, and squash or melon seeds." Cutler and Blake (1969: 61) report cobs with 10, 12 and 14 rows from Medicine Creek and corn grains from 8-, 10- and 12-row ears from Glen Elder (Kansas) Upper Republican sites. Sites excavated by Wedel (1935: 185) yielded quantities of charred corn, including a few six-row cobs, and at one site beans and fragments of squash rind and stem were recovered.

Without quantitative information, the importance of smaller animals in the diet of Upper Republican people is hard to assess. Nor does the presence of a particular animal in the inventory necessarily mean it was used for food. Table 9 lists species represented at various sites.

Settlement Pattern

The settlement pattern of the Upper Republican

Table 9. Upper Republican Subsistence Specimens from Various Sites

	25FT35 (Falk 1969: 43-51)	Lost Creek (Strong 1936: 100)	Various Nebr. (Wedel 1935: 185-203)	Pottorff (Wedel 1959: 37)	Red Willow reservoir (Grange 1980: 165-173	Glen Elder reservoir (Roll 1968: 135)	Harlan Co. reservoir (Roll 1968: 135)
Bison	x	x	x	x	x	x	x
Pronghorn	x	x	x	x	x	x	x
Deer	x	x	x	x	x	x	x
Elk (Wapiti)		x	x				
Canid	x	x	x	x	x	x	x
Fox					x		
Raccoon		x					x
Badger				x	x		x
Otter			x				
Beaver	x	x	x		x		x
Small Mammals (General)	x	x	x			x	x
Rats & Mice	x						
Muskrat					x		
Kangaroo Rat	x						
Rabbit (General)							
Jackrabbit	x	x	x		x		x
Cottontail	x	x			x	x	x
Pocket gopher	x				x		
Prairie Dog	x	x		x	x	x	x

Table 9, (continued)

	25FT35	Lost Creek	Various Nebr.	Pottorff	Red Willow reservoir	Glen Elder reservoir	Harlan Co. reservoir
Birds (General)	x	x	x		x	x	
Goose (General)		x			x		
Canada Goose	x						
Duck (General)		x			x		
Mallard	x						
Gadwall					x		
Hooded Merganser	x						
Teal	x						
Turkey							
Ruffled Grouse				x		x	
Prairie Chicken		x	x		x		
Hawk	x				x		
Owl	x				x		
Turtle	x		x		x	x	x
Snake	x					x	x
Lizard	x						
Frog	c						x
Fish (General)	x					x	
Catfish	x					x	
Crayfish	x						
Mollusca	x	x	x	x	x	x	x

aspect, particularly the Classic Upper Republican phase, is one of widely dispersed houses on terraces overlooking easily tillable bottom lands along small permanent streams. One or a few houses may occur within tens of meters of one another, but be separated by a few hundred meters from the next house or groups of houses. Houses found at the same site may or may not have been occupied at the same time; there is no clear evidence in the literature of contemporaneity in such situations. Sites are often on second or third terraces and may be several hundred meters from a stream. They are never in a location where they would be threatened by flood. There is no evidence of stockades or other defensive features and no suggestion that sites were selected for their defensibility. Krause (1970) has suggested that Upper Republican sites can be characterized as either "hamlets" or "homesteads," each type occupying a somewhat different kind of terrain and showing a chronological or evolutionary dimension that differentiates it from the other. However, this interpretation does not seem to be generally accepted.

At Upper Republican sites outside the classic area, one finds some differences in settlement pattern. In the Loup River drainage (Ludwickson 1978) sites also occupy ridge tops, reminiscent of some Nebraska aspect sites. At least one site, 25 HW 6, where 22 houses were excavated, was a much larger village reminiscent of the later nearby Lower Loup aspect and of Pawnee villages. Large villages are also found in central Kansas at the Minneapolis and Whiteford sites, which Wedel once considered Upper Republican, but has more recently (1959) placed in the Saline focus of the Smoky Hill aspect. There is still doubt as to whether Smoky Hill should be considered a separate aspect (phase) or be lumped with Upper Republican. In any case, within Classic Upper Republican, the most houses excavated or recorded at any one site is apparently eight, at 25 FT 13 (Wedel 1953a: 14).

Houses

Of more than 130 excavated houses assigned to Upper Republican or closely related complexes only 16 are described in print in any detail and of these 16, only two have been reported since 1935. The houses that remain undescribed have all been excavated since 1935; about half have been excavated since World War II.

Upper Republican houses were earth-covered, built on the surface or over shallow pits, rarely more than .5 m deep and up to 14 m across. These structures were square to rectangular, usually with all four corners square, but occasionally with the two back corners rounded. A long (up to 5 m) covered entrance extending from the middle of one of the sides was commonly oriented more or less to the south or east, away from the prevailing winter wind, and/or downhill if the site had a significant slope. In contrast to later Pawnee lodge floors, which were covered with puddled clay fired before the posts were set, Upper Republican floors were not thus prepared. In the center of the floor was an unlined fire basin or hearth, up to .3 m deep and 0.6 to 1.0 m in diameter. Rarely, two hearths are found in a house. A smoke hole was left in the roof directly over the hearth. Usually four center posts, but occasionally six and rarely more, stood about halfway between the hearth and the corners of the lodge and provided the main support for the roof. The walls and the entrance passage were defined by smaller and more closely spaced vertical posts. The center posts were joined by stringers which in turn supported rafters that extended to the walls. The roof consisted of small poles and grass, with a covering layer of earth or sod. Excavation of burned lodges has produced large quantities of pole-and-grass impressed burned daub. In addition to the basic four or six center posts and wall and entrance posts, one usually finds miscellaneous holes for posts whose function is not obvious. Occasionally posts were doubled, presumably to provide extra support for a heavy roof. Rebuilding of an old lodge, or the building of a new house where an earlier one has stood, leads to confusing post patterns.

Other common features found in Upper Republican earth lodges are storage pits dug into the floor. These are bell-shaped, up to 1.5 m in depth and maximum diameter, and occasionally have a second (secret?) pit dug into the bottom. The basic function of these "cache" pits was storage, presumably for corn and/or other foodstuffs, but they were sometimes used later for the disposal of trash. Cache pits are found between houses as well as inside them. Middens are commonly found just outside lodge entrances.

There have been attempts to correlate house size and/or shape with chronological status but none has been very successful. This may in part reflect the inaccuracy of radiocarbon dating, which has generally been used to provide time dimension. Furthermore, the time span for Upper Republican culture is probably less than 400 years, so that with standard deviations of up to 100 years on dates, radiocarbon dating is not really precise enough; it is not uncommon to have multiple dates from a single structure that differ by a few hundred years.

Upper Republican Pottery

The most thorough description of Upper Republican pottery is that by Sigstad (1969). Although based on pottery from a single site, his description can be considered representative because Upper Republican pottery is very homogeneous from site to site. Furthermore, for present purposes, it is fortunate that Sigstad's site, the Mowry Bluff site on Medicine Creek in southern Nebraska, is not only

within the limits of the present study area but is in that portion where by far the greatest concentration of Upper Republican sites occurs.

Other Artifacts

General descriptions of artifacts are presented by Wedel (1959: 95-97) for the aspect as a whole and by Kivett (1949: 280-282) for sites in the Medicine Creek Reservoir. More detailed descriptions of artifacts from specific sites can be found in Strong (1935), Wood (1969), and Grange (1980).

Upper Republican chipped stone artifacts show reasonable skill. The projectile points are small, thin and delicately chipped. Typically they are triangular, with straight to slightly convex edges and straight bases, and with side notches about ⅓ to ¼ of the length from the base. There may be, in addition, a single small basal notch. Some points have no notches; rarely, there are two notches on each side and one in the base. Occasionally, points toward the larger end of the size range have only small corner notches. Most projectile points measure between 1.5 to 4 cm in length. The length/width ratio ranges from little more than 1 for some of the shorter points to nearly 2.5 for some of the longer ones. The projectile points show a marked contrast to the deeply corner-notched (stemmed) points of roughly the same size and proportions found at Early Ceramic period sites, but Upper Republican points are indistinguishable from those of various protohistoric complexes.

The question of the chronological and cultural position of the small delicate triangular projectile points with straight to slightly concave bases is a significant one. Of special concern is the presence or absence of side and basal notches. These points were classified by Strong (1935: 88) as types NBa, NBa1, NBa2, NBa3, NBa4, NBb, NBb1, and NBb2, designations commonly found in the older literature. Points of these NB types are characteristic of the Middle Ceramic period where, in Upper Republican assemblages, for example, they showed greatest variety. Points of the Early Ceramic period are characteristically small to medium-sized expanding-stem or corner-notched varieties, but triangular unnotched or side-notched types may have made their first appearance then. Triangular side-notched points of small to medium size found in the northwest Plains have been named Avonlea points by Kehoe and McCorquodale (1961), who see them as time markers. They consider these points the earliest small points in the northwest Plains, appearing there by A.D. 460. Avonlea points are cruder, and tend to be larger and stubbier, than the delicate triangular points of the Middle Ceramic period of the Central Plains, but they could conceivably be the type out of which these later points evolved. Another, earlier, Archaic type of small side-notched point, in this case with basal notches also, is well represented in Signal Butte I (Strong 1935: 233, Plate 25-1-e). Such points seem out of place in this early context (1000-1500 B.C.) and appear to have no more than a coincidental resemblance in general outline to the Middle Ceramic period points.

Small, delicate, triangular points persist into the Late Ceramic period. Great Bend (protohistoric Wichita) points are commonly triangular and unnotched, secondarily side-notched. Occasionally a basal notch occurs with side notches (Wedel 1959: 265, 314, 576). In Lower Loup (protohistoric Pawnee), on the other hand, unnotched points are typical (Dunlevey 1936: 194). These persist as a minority type into historic Pawnee, where notched points become typical even as stone points become uncommon (Wedel 1936: 75, 1938). The Dismal River aspect (protohistoric Apache) had both unnotched and side-notched points, indistinguishable from those of Upper Republican and Great Bend (Gunnerson 1960, 1968; Wedel 1959; Hill and Metcalf 1942). Strong (1935: 90, citing A.T. Hill) attributes points with both side and basal notches to Dismal River, but this occurrence has yet to be confirmed.

One of the more distinctive chipped stone tools found in the Upper Republican complex is a diamond-shaped, alternately beveled knife also found in the Great Bend, Lower Loup, Custer, Washita River, Panhandle, and Pratt complexes. These are often referred to in earlier literature as "Harahey knives" (Harahey being a phonetic rendition of the Pawnee name for themselves). When first made they are commonly as much as 15 cm long and 8 cm wide. After repeated resharpening, and before being discarded, they are sometimes half their original length and so narrow that they resemble double-pointed drills. These knives, like those of a variety of less distinctive shapes (triangular, rectangular, oval) are relatively thin, well-made and bifacially chipped. Presumably also used for hide working were small plano-convex, snub-nosed end and side scrapers comparable to those found at Lower Loup and Great Bend sites. These are more carefully made and tend to be smaller than those found at Dismal River sites. Chipped stone drills are "T"-shaped, have expanded bases, or are made from the base portion of projectile points. Drills are not common at Upper Republican sites. Other chipped stone artifacts include chipped celts or axes and large, thick bifaces. Miscellaneous flakes show signs of retouch and/or use.

Ground stone artifacts commonly found at Upper Republican sites include shaft smoothers almost always made from Dakota (red) sandstone and presumably always used in pairs. These are rectangular, with somewhat convex sides and a longitudinal U-shaped groove in one face. Some are well-finished on all surfaces. At one time these were called "nail buffer" shaft smoothers because of similarity in shape to devices commonly used by women in the 1920s and 1930s for polishing fingernails. Also

commonly found are irregular pieces of sandstone or other gritty stone with grooves worn in them, presumably from sharpening, shaping or smoothing other artifacts of stone, bone, wood, antler, etc. Metates or milling slabs, with either a shallow basin or a trough open at one end, and manos, usually a conveniently shaped cobble, occur in the southwestern portion of the Upper Republican area, perhaps reflecting availability of suitable stone and/or proximity to the Pueblo Southwest. Upper Republican and related people to the northeast probably used wooden mortars and pestles for corn grinding: some "post holes" between the hearth and entrance of earth lodges have been interpreted as mortar holes. Battered river cobbles appear to have served as hammerstones. Ground and polished celts, grooved axes and grooved mauls were apparently not produced by Upper Republican people.

Among the more finely made ground stone artifacts are pipes, usually elbow. Sometimes the distal end of the stem or base portion extends beyond the bowl to form something of a pointed prow. Bowls and stems are round to rectangular in cross-section, and in some cases the outside diameter of the bowl is greater at the top than where it is attached to the stem portion. Occasionally pipes are decorated with incised lines; only rarely is the bowl in the form of an effigy, *e.g.*, a bird. Pipes made of clay, although not as common as ones of stone, are generally the same form (equal-armed elbow) and size (about 5 to 8 cm long).

Highly characteristic of the Upper Republican artifact assemblage is the bison scapula hoe with the spine and sometimes the glenoid cavity removed. Hoes made from a section of bison skull with part of the horn core attached, and bone tips for digging sticks, both found in contemporaneous complexes in the Southern Plains, are rare or missing in the Central Plains except at the southern edge. Other bone tools include various types of awls, eyed needles, fishhooks, shaft wrenches made from long bones or bison ribs, picks made from bison ulnae, sections of bison rib slotted to serve as handles for stone knife blades, perforated deer toe bones which presumably served as ornaments or plume holders, deer or antelope mandibles probably used as sickles or corn shellers, beamers or dehairing tools made from spines of bison vertebrae, and knives made from sections of scapulae. Tubular bone beads are also found.

Shell, presumably local, was made into biconically drilled disk beads. Such beads sometimes accompany Upper Republican burials but in nowhere near the number sometimes found with Woodland burials. Strong (1935: 111-114) reports pendants or ear ornaments made from Gulf Coast conch shells, cylindrical shell beads, presumably also from Gulf conch, and Olivella shell beads.

From the ossuary containing these ornaments of foreign shell, Strong (1935: 111) also recovered a bracelet or bow guard made from a flat section of a large antler. An outspread hand with a circle (eye?) on the palm was incised at each end. There were lines that could be interpreted as bracelets on the wrists. The "hand and eye" design on this bracelet clearly reflects influence from the Southern Death Cult; the bracelet and Gulf Conch ornaments together suggest that a complex of Southern Cult traits had diffused to Upper Republican.

Other antler artifacts more common in Upper Republican sites are cylinders, clubs, small flat pieces that may have been parts of bracelets, awls, possible handles for stone tools, possible stone flaking tools, and shaft wrenches.

Burials

Upper Republican people used at least two methods for disposal of the dead: individual primary (flesh) interments and ossuary burials. Various bits of information indicate that there were also ceremonies involving the dead that were related to the Southern Death Cult.

About 13 km southeast of Alma, Nebraska, Strong (1935: 103-114) excavated the Graham site, an Upper Republican ossuary. Here a pit of about 8 m square and 1.15 m deep had been dug into the top of a prominent hill overlooking the confluence of Prairie Dog Creek and the Republican River. Into it had been thrown the disarticulated skeletons of many individuals and a variety of artifacts. Many of the bones had been lightly burned, perhaps from having been exposed to prairie fires prior to burial. There was no evidence that the burning had taken place in the pit, although specks of charcoal were found throughout the fill. With the exception of two articulated infant skeletons, the bones revealed no indication of order, either anatomical or artificially imposed. Numerous rocks of various sizes were also found in the fill; these were foreign to the hilltop and their function in the ossuary was not obvious. More than 900 potsherds were recovered from the pit, nearly all of them matching the pottery from an Upper Republican house a few kilometers away. Other artifacts found included a small elbow pipe of white stone, broken sandstone shaft polishers, six small, delicate projectile points (five side-notched and one unnotched), two small well-made end scrapers, a bone shaft wrench, a well-made bone awl, and two bone beads. All of these are characteristic of Upper Republican sites in general. Several other specimens are of special interest in that they are rare or unique in this complex and indicate connections with the Southern Death Cult. Among them is an antler bracelet or bow guard, previously described, with the hand and eye motif. Ornaments of Gulf coast conch shell included two long pendants and 11 smaller pendants; 85 cylindrical beads were probably also made from conch shell. Another piece of worked conch shell may have been the bowl

of a spoon. Two perforated copper disks were apparently coverings from decayed wooden ear spools. Extensive trenching on this and a nearby hill failed to locate any additional pits.

Wedel (1935a: 174-175) reported five burial pits at the Holdrege 5 site a few kilometers from the Graham ossuary. Two of the pits had apparently contained two individuals each, whose remains had since been removed; two contained partial skeletons representing flexed burials, and the fifth, a small ossuary, contained the jumbled bones of several individuals and numerous shell beads. The pits were from 0.8 to 1.5 m in diameter and 0.5 to 1.1 m deep. Presumably the skeletons had been buried intact at time of death and later transferred, in a jumble, to the ossuary pit. The flexed primary burial of a young child was found at the Gammill-Phillips site on Medicine Creek (Wedel 1934b: 148).

In spite of extensive work carried out in the Medicine Creek Reservoir (Kivett 1949), only one skeleton probably attributable to the Upper Republican occupation was discovered. This, an extended flesh burial of an adult male on a hilltop, was accompanied by a few artifacts such as were found at a nearby Upper Republican village. Scattered human bones were occasionally found in houses, storage pits and middens.

Wedel (1961a: 96) makes the general statement concerning the Upper Republican aspect that in both the Republican and Loup valleys bodies were first exposed and then the bones were gathered up and placed in large communal pits on bluffs overlooking the village sites.

Loup River Phase

A concentration of Upper Republican village sites, centering along the Loup Rivers just to the northeast of the present study area, has been assigned by Krause (1969: 90-91) and by Ludwickson (1975, 1978) to the Loup River phase to distinguish these sites from those of the Classic Upper Republican phase and the Solomon River phase (Krause 1969: 90-91). The Loup River phase includes sites once assigned to the Sweetwater focus by Wedel (1935a: 252) and to the Loup River focus by Strong (1935: 2) and Champe (1936: 283). Although almost all of those Upper Republican aspect sites assigned to the Loup River phase lie just beyond the present study area, it is essential to take note of them in considering the overall Upper Republican problem. Ludwickson (1978: 96) summarizes data from 56 excavated houses representing 20 sites. Data on three of the earth lodges had been published previously (Champe 1936), 12 had been reported in an unpublished MA thesis (Ludwickson 1975), 33 had been described in an unpublished manuscript by the late George Metcalf (n.d.), one is mentioned by Kivett (1952: 44) and information on seven came from field notes. According to Ludwickson (1978) Loup River phase houses share with Classic Upper Republican houses the four-center-post pattern, but there is a higher incidence of round houses, and these tend to be smaller and deeper than those of Classic Upper Republican. He does not point out, however, that within the Classic Upper Republican area there are more round and deep houses in the eastern part than farther west.

Unfortunately, there are very few dates available for Loup River phase sites. A date of A.D. 1130 ± 200 years for a large structure on Coufal Ridge in the Davis Creek locality is rejected by Ludwickson because it was determined by the solid carbon method, has a large standard deviation, and comes from a structure that he does not consider assignable to the Loup River phase. Site 25 BF 210 on the Wood River in Buffalo County, Nebraska, considered by Ludwickson (1978: 102-103) to be archetypical of the Loup River phase, has three radiocarbon dates of A.D. 1330, 1480, and 1530, which he accepts, and one of A.D. 1060, which he does not; all are from a single house. A nearby house at 25 BF 145 he assigns to the Upper Republican phase. It has yielded two dates of A.D. 1150, which he accepts, and one of A.D. 690 which he rejects. Ludwickson suggests that the Loup River phase is transitional between Classic Upper Republican to the immediate south and the Lower Loup phase (protohistoric Pawnee) a little way down the Loup River to the east. This possibility had been recognized by Strong (1932, 1935), Wedel (1935a: 174) and Champe (1936: 282) although Wedel (1978: 160) emphasizes that the Loup River phase is much closer to Upper Republican than it is to Lower Loup.

Solomon River Phase

Another concentration of village sites related to Classic Upper Republican lies in a neighboring area. In north-central Kansas, in the Glen Elder Reservoir on the Solomon River, 15 Upper Republican houses were excavated in the mid-1960's by the University of Nebraska (Krause 1970; Lippincott 1978). Houses were the typical square earth lodges, built on the surface, or with only the sod removed from the area within. House floors ranged in size from 30 to 112 square meters. Entrances ranged from 0.5 to about 5 m in length.

Of these 15 Solomon River phase houses, 12 were described briefly by Carlson (1971) who was mainly concerned with ordering them chronologically by means of seriation. Lippincott (1978) presents additional information and points out that the houses, although varying considerably in size and detail of post arrangement, in general represent the standard square earth lodge, and that site location and settlement pattern are typical for Upper Republican sites. He, too, presents the results of site seriation, but on the basis of pottery rim form and lip-rim motifs (in this case computer assisted) as well as a series of

radiocarbon dates. Lippincott concludes that the sites were occupied from approximately A.D. 800-850 to A.D. 1200-1250, that there was not a shift in settlement pattern from hamlets to isolated houses, as Krause (1970) had suggested in a preliminary report of work at these sites. Rather, he notes that both patterns were found throughout the Upper Republican occupation of the Glen Elder area. Also, Lippincott found that house size was randomly distributed through time rather than decreasing in size through time, as suggested by A. Johnson (1973).

Two small Upper Republican houses of the Solomon River phase were excavated at site 14 JW 301, on Buffalo Creek in Jewell County, north-central Kansas, by the Kansas State Historical Society (Witty, personal communication). A radiocarbon date (GaK-593) for this site is A.D. 910 ± 100, making it one of the earliest dated Upper Republican sites, and supporting the idea that the Solomon River phase may be the earliest Upper Republican phase.

Excavation at the Root site (14 LC 301), on the Saline River in Russell County, central Kansas, yielded one house, square with rounded corners and about 7.3 m across. The site was originally recorded by Solecki (1952: 9) and its excavation is reported by Witty (1962). A radiocarbon date (sample I-509) for the site is A.D. 987 ± 100 (Witty 1962: 30). Witty identifies the pottery as a variety of Riley Cord Roughened described by Wedel (1959: 183-184) on the basis of pottery from the Griffing site (14 RY 21) in northeastern Kansas, which he assigns to the Smoky Hill aspect.

In the reservoir area containing the Root site, Witty (1962) excavated three other sites having Central Plains phase and Woodland occupations. One of these, 14 LC 302, was a rock shelter, and the Central Plains component was assigned to the Aksarben (Upper Republican?) aspect. The other two, 14 RU 302 and 14 RU 303, were open sites; post holes, hearths and pits were found but no houses could be detected.

From the Glen Elder Reservoir area Krause (1970: 107) reports one Upper Republican cemetery on the same terrace as one of the hamlets. Two clusters of burial pits, most of them devoid of bones except for toe and finger bones, were spread around a common burial chamber which contained the disarticulated skeletons of 50 to 60 individuals and two complete pottery vessels. One of the small pits contained the flexed skeleton of an elderly male.

Smoky Hill Aspect

Wedel (1959: 563-565), who defined the Smoky Hill aspect, included in it sites near Minneapolis and Salina, Kansas, which had once been assigned to the Upper Republican aspect. On the basis of admittedly limited data, he has suggested that the Smoky Hill aspect might be ancestral to the Upper Republican and Nebraska aspects and that it may have been influenced by Plains Woodland cultures. Much of his argument is based on the facts that Smoky Hill vessels are taller and less often decorated than classic Upper Republican pots. He notes the occurrence of distinctive orange-browncord-roughened pottery, which has a strong tendency to spalland occurs over southeastern Kansas and south into Oklahoma. He also reports Spiro focus pottery, presumably from eastern Oklahoma, associated with Smoky Hill burials, and notes similarities between Early and Middle Spiro component houses and Central Plains earth lodges. The possibility that Smoky Hill grew out of a local Woodland complex should be seriously considered.

On the Solomon River, in Ottawa County, Kansas, Wedel (1935: 218-225) excavated at Minneapolis 1, which he described as one of several large prehistoric villages in the area. The three houses uncovered were square, the largest being 16 m across with an entrance 5.2 m long and 1.2 m wide. Six cache pits had been dug through the floor. The floors of all three houses at Minneapolis 1 were at or just below the original surface.

A burial pattern quite different from that of Classic Upper Republican is found at a site near Salina, in central Kansas, about 160 km east of the present study area. This, the Whiteford site, has been excavated privately, leaving the burials in place, and developed as a tourist attraction. Here, a low mound, surrounded by the alluvial bottom land of the Smoky Hill River, has yielded some 140 human skeletons of all ages, both male and female. All apparently had been flesh burials, partially or completely flexed. Most had been placed on their right sides, heads to the south and facing east. Artifacts found in this mass burial parallel those from a nearby village where numerous earth lodges had probably once been present (Wedel 1959: 512-523).

The burials and the village complex, which closely resembles the Minneapolis 1 site about 30 km to the north (Wedel 1934: 218), have been assigned to the Smoky Hill aspect (Wedel 1959: 535).

The Larned site (14 PA 307), just within our study area at the confluence of Pawnee Creek and the Arkansas River in west central Kansas, had as its lowest component a Smoky Hill aspect camp (Monger 1970). It was overlain by Pratt focus, Great Bend aspect and Larned Fine-Line components, in that order, each well separated stratigraphically from the next. The Pratt and Great Bend occupations took place at times when there were repeated floodings, each represented by a silt lens, and followed by a reoccupation of the site. However, there is no indication of flooding during either the Smoky Hill occupation or the period immediately following when 60 cm of fill built up, but apparently not through alluviation. Monger's detailed description of the sedimentation suggests that the Smoky Hill component rested on a well-developed soil, and that

following this occupation, but prior to the Pratt occupation, there had been two stable periods when first a thin soil and then later a thick soil had formed. The Pratt occupation was on top of the thick soil. Although Monger does not so speculate, it seems very probable that we have reflected here two major droughts in the 1400s, perhaps ones recorded in the tree-ring history of Nebraska for A.D. 1439-1454 and 1459-1468 (H. Weakly 1946, 1962; W. Weakly 1961). The second indication of drought at the Larned site might date from the 1500s, but this seems highly unlikely since above it are the Pratt and Great Bend occupations, the latter of which, at least, dates from the 1500s and occurs in a context of wet years (repeated flooding).

A simple, unprepared hearth was found in the Smoky Hill zone at the Larned site, but no other structural features. Near the hearth were three areas of chert chips, identified as work areas, three bone concentrations, and a limited amount of other detritus. Artifacts are described by Monger (1970: 12) as follows:

> One pottery vessel, broken and scattered about the area, was gathered and restored. The vessel was completely cord-roughened. Some of the cord marks were obliterated on the bottom and lower sides, and a narrow band, on the shoulder where it joins the neck, had been smoothed and showed polish. The vessel is sherd tempered and the paste is compact and hard. The base of the vessel is almost pointed, the body straight to cone-shaped, the shoulder is rounded and flattens before it joins the neck. The rim is out-flaring and plain.

The pointed base and cone-shaped body suggest that this ware had recently evolved out of a Woodland ware, paralleling what appears to have happened in the Franktown focus farther west.

Other artifacts, not abundant, included small triangular side-notched projectile points, a fragment of a chipped knife, a fragment of a side scraper and a pointed section of a rib, possibly a piercing tool. All the evidence points to a small temporary Smoky Hill phase hunting camp, probably among trees that bordered Pawnee Creek.

Franktown Focus

The Franktown focus was defined by Withers (1954: 2) as follows:

> A third group of materials has been named the Franktown Focus. This focus seems to be concentrated in an area southwest of Denver in the timbered uplands along the southern Tributaries of the South Platte River. The commonest variety of Franktown pottery consists of wide-mouthed, cord-marked jars with conoidal bases and incurving rims. The cord markings are almost always partially smoothed. A few sherds show a slight thickening of the rim. The associated projectile points are usually side-notched and small to medium in size. The entire lithic complex of the Franktown Focus seems closely related to that described for the Upper Republican Aspect. The pottery, too, seems quite like Upper Republican in every characteristic except for the striking difference in vessel form. It may be possible to interpret the Franktown Focus as representing a transitional development from Woodland to Upper Republican in the western Plains.

Apparently the material from Cliff Swallow Cave, about 55 km southeast of Denver, is assignable to this focus (Morton 1954). An analysis of the projectile points from the Franktown Cave was carried out by Pustmueller (1977).

In addition to unquestionably Upper Republican pottery, other similar cord-roughened pottery has been found over much of the High Plains of Colorado and the panhandle of Nebraska. This seems to occur in small amounts, lacks the distinctive collared and braced Upper Republican rims, and in general resembles Woodland pottery as much as it does Upper Republican. There have apparently been no published reports of investigations of sites which yield this ware. Although the pottery could represent a marginal variant of Upper Republican, it more probably represents a transition from Woodland to Upper Republican. Such ware may also occur farther east but with the abundance of other cord-roughened potrery it could well have gone unnoticed. This ware, like that of the Franktown focus, has been tentatively called "transitional," and may be related to it. Any manifestations that show promise for bridging the apparent hiatus between Woodland and Upper Republican deserve close attention.

A possible Franktown focus component at the Spring Gulch site (5 LR 252) was suggested by Kainer (1976: 196). This site is located almost at the Wyoming border, approximately straight north of Denver, Colorado. Since the site is stratified, and there is some mixing between levels, it is not certain which other artifacts belong with this component, but both corner-notched and side-notched projectile points appear to be associated.

The Franktown focus may also be represented at the Jarre Creek site, just southwest of Denver, which has been dated by radiocarbon at A.D. 1050 ± 250 (G. Scott 1963: 48).

Buick Focus

The Buick focus, apparently a local manifestation of the Upper Republican aspect, was defined by Withers (1954: 2) as follows:

> Other materials related to the Upper Republican Aspect in eastern Colorado arrange themselves into two foci. In the South Platte and Republican River drainages occurs the

Buick Focus. These materials lap over into the Arkansas drainage in some localities. The commonest pottery is in the form of squat, round-bottomed jars which are cord-marked and have an out-curved rim. Frequently the rim is thickened to form a "collar," and incised geometric designs were placed on these. Plain bowl and "seed jar" forms occur more rarely. Small to medium side-notched projectile points are normally found on these sites. The only architectural remains so far discovered amount to little more than floor areas with hearths.

W.R. Wood (1971) described materials excavated from two Upper Republican sites near Limon in eastern Colorado and called attention to other Upper Republican sites in the High Plains west of the westernmost known Upper Republican earth lodge villages. These sites are in northeastern Colorado, southeastern Wyoming, the southern part of the Nebraska Panhandle, and the extreme southwest corner of Nebraska. Prior to Wood's article very few of these sites had been reported in the published literature, although seven of the Colorado sites had been described by J.J. Wood (1967) in his Ph.D. dissertation, and all (seven) of the Wyoming sites by Reher (1971) in his MA thesis. W.R. Wood (1971) in his study of collections at the University of Colorado, Denver University and the Nebraska State Historical Society, reported eight radiocarbon dates for Upper Republican occupations, having obtained his information from Breternitz (1969: 120-121), J.J. Wood (1967) and Steege (1967). These dates (corrected) range from A.D. 660 to A.D. 1260 with plus or minus factors. Because of the homogeneity of the Upper Republican materials recovered, W.R. Wood (1971) favors an occupation of the area between about A.D. 1200 and 1300.

The Smiley Rock shelter (5 EL 9) is located just east of the tip of Cedar Point, north of Limon in Elbert County, Colorado. In 1952 Herbert Dick directed excavation in this shelter which had apparently been occupied almost exclusively by Upper Republican people. W.R. Wood classified the majority of the pottery (four rim sherds from four vessels and 25 body sherds) as Cambridge and Frontier Ware, both of Upper Republican affiliation, after Sigstad (1969). Two sherds from the surface of the site resembled those excavated from the nearby Cedar Point village (5 EL 8), which can probably be assigned to plains Apaches. Other artifacts from Smiley Shelter are all typical of the Upper Republican complex: small triangular projectile points with lateral notches (2), end scrapers (2), triangular biface (1), alternate-bevel biface (1), retouched flakes, mano (1), bone awls (2), and bone beads (2). Field notes indicated that bone was common at the site.

The Buick Camp site (5 EL 1), located not far northeast of Smiley shelter, is the type site for the Buick focus of the Upper Republican aspect defined by Arnold Withers (1954). Withers dug at the site in 1949 and Herbert Dick in 1954. W.R. Wood (1971) reports only the material excavated by Dick and this apparently represents an Upper Republican occupation almost exclusively. The site is a midden about an 0.4 ha in extent and up to 30 cm thick, just under the escarpment of Cedar Point. The midden contained a large amount of bison bone, some of it burned, and Dick excavated a hearth at the base of the refuse. The pottery examined by Wood contained 31 rim sherds representing about 24 vessels, and 145 body sherds which he assigned to Upper Republican wares: predominantly Frontier Ware with one Cambridge Ware rim. Eight body sherds, some cord-roughened and some smooth, could not be identified and were considered as intrusive. The rest of the artifacts described are typical of Upper Republican complexes: small, triangular projectile points, unnotched, side-notched, side- and base-notched and two with corner notches; end scrapers; a graver; a drill; large beveled bifaces including diamond-shaped; various other forms of bifaces; manos; bone awls; and a bone bead. It is probably significant that at neither of these two sites in Elbert County were found bison scapula hoes, so common at Upper Republican earth lodge villages farther east. This strongly supports the probability that, rather than being horticultural villages, these western sites were temporary camps on a travel route from permanent villages to the east.

Upper Republican earth lodge villages are apparently all east of the hundred and first meridian, the westernmost being reported from the Red Willow Reservoir in Nebraska and the Pottorff site in Kansas. West of these villages, however, are camp sites and rock shelters which have yielded Upper Republican pottery. These are either erratically distributed in parts of Wyoming, Nebraska and Colorado, from the North Platte River south to the southern edge of the Republican River drainage, or discoveries have been erratic. Except along the extreme northern edge of Colorado and southeast Wyoming, these sites seem to be no closer than about 80 km to the foothills of the Rocky Mountains (W.R. Wood 1971).

It is generally assumed that these western Upper Republican sites served as temporary camps associated with some activity such as bison hunting. Whereas Upper Republican villages farther east are always in close proximity to good horticultural lands, no such relationship is noticeable to the west. Some of the sites, such as Signal Butte near Scottsbluff, Nebraska, would have served well as lookout points for detecting herds of game. Rock shelters, of course, were highly desirable temporary habitations for people traveling or exploiting some local resource over short periods of time. If these Upper Republican sites west of the one-hundred-first meridian were satellites of permanent villages in this western area, then such permanent villages have yet to be

found. Furthermore, this western High Plains area would not have been well suited for the riverine farming that constituted a significant portion of the subsistence activities of the Upper Republican people. Hence, permanent occupation of the area would have involved a subsistence pattern quite different from that found farther east and one would not expect in such cases the marked similarity in artifacts that is found.

Other Middle Ceramic Sites in Northern Colorado

The Middle Ceramic period in northeastern Colorado is known primarily from the survey and excavations carried out by J.J. Wood (1967). He found that evidence of occupation for this period came almost exclusively from rock shelters, with no instances of permanent habitations. Unfortunately, those rock shelters most used had also been most badly disturbed by several decades of vandalism. And the components yielding the largest collection of pottery (5 WL 37 and 5 WL 43) could not provide radiocarbon dates. The radiocarbon dates J.J. Wood (1967: 628) did get fall in the Middle Ceramic period, but the sites (Uhl, Peavy Rocky shelter, Biggs and Kasper) for the most part presented problems of interpretation. Diagnostic artifacts were lacking, or few, or mixed, and strata 82 were thin. Only at the Peavy Rock shelter was there reasonably clear association of the radiocarbon sample and diagnostic Middle Ceramic period artifacts. Some components were assigned to the Middle Ceramic period solely on the basis of the radiocarbon dates. Wood's data strongly suggest that northeastern Colorado was occupied by Middle Ceramic period people, but only sparsely and intermittently.

A stone ring site from northern Colorado apparently dates from the Middle Ceramic period, but does not suggest Upper Republican affiliation (Flayharty and Morris 1974). The T-W-Diamond site (4 LR 200) consists of 47 stone "tipi" rings, 4.3 to 5.8 m in diameter. Of these 17 were excavated or tested. The only diagnostic stone artifacts were small triangular projectile points, unnotched, side-notched or with side and basal notches. Sherds from one crude, flat-bottomed pottery vessel resembling modern Shoshone ware were also found. Three radiocarbon dates determined on charcoal were A.D. 1020 ± 230, 1170 ± 220, and 400 ± 340. The first two are compatible with the projectile point types but the latter should be rejected because it is much too early (Flayharty and Morris 1974).

The sites most comparable to the T-W-Diamond site thus far reported are two groups of tipi rings, the Piney Creek sites (48 JO 311 and 48 JO 312) in Johnson County, northeastern Wyoming (Frison 1967). These sites are considerably richer in artifacts than the T-W-Diamond site, which in turn is richer than most Plains tipi ring sites. Except for the difference in artifact yield, the inventories of the three sites are quite comparable. However, the limited amount of pottery from the Wyoming sites is thought to have Mandan-Hidatsa affiliations, whereas the best guess on the Colorado pottery is Shoshone. The buffalo butchering and camp sites on Piney Creek have been dated by radiocarbon at A.D. 1580 ± 100 and A.D. 1610 ± 100, dates entirely compatible with the chronological status of the small delicate triangular projectile points, most of which had side notches (half had basal notches also). Similar points were found by Frison (1970) in the upper level of the Kobold site (24 BH 406), a deeply stratified buffalo jump in southeastern Montana.

Upper Republican Discussion

Of the various Middle Ceramic Period complexes known in the Central High Plains, the most thoroughly investigated and reported is the Upper Republican phase. There is enough information available, especially if all of the excavated but still unpublished sites were included, for a thorough synthesis. The major questions not yet answered concern the external relationships of the Upper Republican phase to: the Nebraska phase, the Smoky Hill aspect, the Washita River phase, the Panhandle aspect and the various complexes in eastern Colorado that are apparently closely related. More and more it appears that these various complexes grade into one another and that even though their definitions are of use to archeologists, they do not necessarily reflect linguistic or cultural entities that would have been meaningful to the people themselves. All, most probably, were Caddoan speakers ancestral to modern Arikara, Pawnee and Wichita.

At one time, the Upper Republican aspect was interpreted as representing a new group of people who moved into the Central Plains and replaced the earlier Woodland people. The idea is now generally accepted that Upper Republican culture, along with that of the closely related taxa mentioned above, evolved, more or less *in situ*, from earlier local Woodland cultures. Some archeologists, especially Hughes (1974b), sees culture continuity starting at least as early as the Archaic period. It is perhaps significant that in the Upper Republican heartland there has not been a complex clearly identifiable as transitional between Woodland and Upper Republican, such as the Graneros focus in southeastern Colorado or the Custer Phase in western Oklahoma. The Smoky Hill aspect, just to the south of the Upper Republican territory, has been suggested by Wedel (1959: 565) as possibly ancestral to Upper Republican. The idea should be seriously considered that some of the traits that distinguish the Central Plains tradition from the earlier Woodland pattern entered the Central High Plains from the Southwest, were integrated first into the nearest

Middle Ceramic Period

Table 10. Eastern Colorado Radiocarbon Dates

(Butler 1980: Table 2)

Site	Dates B.P. (B.C./A.D.)	Sample Number	Type of Sample	Reference
Site 5 LO 6	545 ± 150 BP (AD 1405)	GX-0564	Charcoal	Wood 1967: 466
Kasper (5 LO 4)	655 ± 250 BP (AD 1295)	GX-0560	Charcoal	Wood 1967: 482, 501
Biggs (5 WL 27)	695 ± 110 BP (AD 1255)	GX-0566	Mammal bone	Wood 1967: 348, 356
Happy Hollow (5 WL 101)	780 ± 90 BP (AD 1170)	Gak-1304	Charcoal	Steege 1967
Biggs (5 WL 27)	735 ± 105 BP (AD 1215)	GX-0567	Mammal Bone	Wood 1967: 348-354
Peavy Rock Shelter (5 LO 1)	810 ± 125 BP (AD 1140)	GX-0317	Charcoal	Wood 1967: 225, 282
Jarre Creek Colo: K: 12: 9 (5 DA 541)	900 ± 250 BP (AD 1050)	W-1018	Charcoal	Scott 1963: 48
T-W Diamond (4 LR 200)	900 ± 230 BP (AD 1020)	A-1273	Charcoal	Flayharty & Morris 1974: 168
Spring Gulch (5 LR 252)	935 ± 140 BP (AD 1015)	UCa-1050	Charcoal	Kainer 1976: 31,215 ff.
Uhl (5 WL 32)	1210 ± 220 BP (AD 740)	GX-0324	Mammal bone	Wood 1967: 182

Table 11

Radiocarbon Dates from Upper Republican Sites

Site	Sample No.	Date (A.D.)	Comments
25 FT 80	UM 468	1445 ± 295	date on mussel shell
25 FT 17	SI 34	465 ± 65	
14 ML 5	GaK 810	540 ± 80	Solomon River Phase (Rejected Lippincott 1978)
25 FT 80	UM 467	570 ± 180	
14 ML 15	GaK 804	610 ± 90	Solomon River Phase (Rejected Loppincott 1978)
25 FT 35	GaK 1975	630 ± 210	
25 FT 70	SI 197	690 ± 80	perhaps from Woodland component
25 BF 145	GaK 6216	690 ± 100	Classic Upper Republican (Ludwickson 1978)
5 LO 1	GXO 318	805 ± 155	
14 ML 17	GaK 804	810 ± 100	Solomon River Phase (Lippincott 1978)
14 ML 371	GaK 1091	830 ± 80	Solomon River Phase (Lippincott 1978)
25 FT 70	SI 50	880 ± 70	
14 JW 301	GaK 593	910 ± 100	
25 FT 13	SI 88	1010 ± 60	
25 FT 16	SI 194	1020 ± 80	
25 FT 13	SI 87	1020 ± 60	
25 FT 35	WIS 324	1020 ± 60	
25 BF 210	GaK 6222	1060 ± 110	Loup River Phase (Ludwickson 1978)
25 FT 17	SI 36	1085 ± 65	

Table 11. (continued)

Site	Sample No.	Date (A.D.)	Comments
14 ML 15	GaK 1089	1090 ± 80	Solomon River Phase (Lippincott 1978)
25 FT 70	SI 53	1105 ± 65	
25 FT 17	SI 32	1120 ± 65	
25 FT 17	SI 73	1130 ± 50	
5 FT 1	GXO 317	1140 ± 125	
25 FT 36	SI 193	1150 ± 100	
25 FT 145	GaK 6215	1150 ± 100	Classic Upper Republican (Ludwickson 1978)
25 FT 145	GaK 6217	1150 ± 100	Classic Upper Republican (Ludwickson 1978)
25 FT 70	SI 47	1160 ± 65	
25 FT 35	WIS 318	1160 ± 55	
25 FT 17	I 585	1170 ± 125	
25 FT 35	WIS 319	1180 ± 55	
14 FT 16	GaK 638	1190 ± 90	Solomon River Phase (Lippincott 1978)
25 FT 36	SI 192	1200 ± 80	
25 FT 39	SI 56	1200 ± 65	
25 HN 36	I 642	1200 ± 100	
25 FT 16	I 583	1235 ± 125	
25 FT 17	SI 40	1240 ± 65	
5 WL 101	GaK 1304	1240 ± 90	
5 WL 27	GXO 566	1255 ± 110	
25 FT 39	SI 196	1280 ± 120	
5 FT 4	GXO 560	1290 ± 250	
25 FT 54	SI 70	1310 ± 50	

Table 11. (continued)

Site	Sample No.	Date (A.D.)	Comments
25 BF 210	GaK 6221	1330 ± 100	Loup River Phase (Ludwickson 1978)
14 ML 306	GaK 803	1330 ± 90	Solomon River Phase (Ludwickson 1978)
14 ML 306	GaK 803	1330 ± 90	Solomon River Phase (Ludwickson 1978)
14 ML 5	GaK 639	1340 ± 100	Solomon River Phase Rejected (Ludwickson 1978)
25 FT 32	M 1365	1385 ± 100	
5 FT 6	GXO 564	1405 ± 150	
25 FT 13	I 584	1440 ± 100	
25 FT 70	M 844	1450 ± 200	
25 FT 35	GaK 1676	1480 ± 120	
25 FT 210	GaK 6223	1480 ± 100	Loup River Phase (Ludwickson 1978)
14 FT 8	GaK 637	1495 ± 90	Solomon River Phase (Lippincott 1978)
25 FT 80	SI 72	1510 ± 40	
25 FT 210	GaK 6220	1530 ± 100	Loup River Phase (Ludwickson 1978)
25 FT 35	GaK 1674	1630 ± 90	
14 FT 5	GaK 640	1720 ± 90	Solomon River Phase (Rejected Lippincott 1978)
25 FT 16	SI 195	Modern	

complexes, such as the Franktown focus, and then spread rapidly into the Upper Republican heartland. Wedel (1978) suggests that the Central Plains Tradition started in the 8th century and apparently accepts Hofman's (1978) ca. A.D. 800 beginning date for the Custer Phase.

There appears to be some basis for dividing Upper Republican into three phases, with the earliest, called the Solomon River phase, being farthest south and having a suggested beginning date at A.D. 800 to 850 (Lippincott 1978). If the three phase division is valid, the second, called Classic Upper Republican, would have overlapped considerably with the Solomon River phase, beginning between A.D. 900 and 1000. The earlier dates (and latest) for Upper Republican sites (Table 11) have been rejected by various authors, to be discussed later. With as many radiocarbon dates as are now available, we can be reasonably certain that the Upper Republican occupation of southern Nebraska was vital from about A.D. 1000 to sometime between 1350 and 1450. Sites assigned to late Upper Republican, the Loup River phase in east central Nebraska (Ludwickson 1978), may have still been occupied after A.D. 1450. It is an open question as to whether these sites were directly transitional between Classic Upper Republican and Lower Loup (protohistoric Pawnee). In any case, there were almost certainly shifts in the centers of gravity of the Upper Republican population, along with fusion and fission involving other Central Plains Tradition complexes, during the A.D. 950-1450 period.

Ludwickson (1975: 148) tabulated 36 radiocarbon dates (with MASCA corrections) for Upper Republican sites. The statistical nature of such dates indicates that the true age of 11 of the 36 samples could fall outside the reported dates ± one standard deviation. Ludwickson (1975: 59-61) reasoned that the extreme dates are the most apt to be in error so he rejected the five earliest and the six latest. He also notes that "The number of dates rises rapidly between A.D. 1030 and 1110, levels off for 100 years, and falls less abruptly from A.D. 1220 to 1390. This pattern suggests that a reasonable estimate of the span of this phase would be from A.D. 1050 to 1350." Among the early dates rejected by Ludwickson are two from 25 FT 70, A.D. 720 ± 100 and 915 ± 85, although other dates from this site are A.D. 1130 ± 90, 1170 ± 75, and 1425 ± 180. Ludwickson notes that the two early samples:

> . . . .may have originated from a component reported to have a ceramic assemblage with up to 90 percent unthickened rims (Kivett 1961: 22). The true cultural affiliation may well be closer to the Solomon River Phase than the Classic Upper Republican Phase; and if this is true, only 34 of the 36 dates originate in the latter culture and two other dates, presumably early dates, should be chosen for statistical rejection.

This latter argument obviously hinges on the validity of dividing the Upper Republican aspect into three sequential phases: from early to late, the Solomon River phase, the Upper Republican phase and the Loup River phase. It should be noted that Kivett does not identify the site(s) in the Medicine Creek Reservoir where the high incidence of unthickened rims occur; 25 FT 70 was, however, one of the largest villages (nine house floors excavated) in the reservoir and did contain a small Woodland component (Wedel 1953a: 15; Kivett and Wedel 1948).

Another of the rejected dates is the A.D. 505 ± 85 date from site 25 FT 17 for which five other, accepted, dates are reported: A.D. 1110 ± 80, 1180 ± 120, 1140 ± 80, 1150 ± 70, and 1255 ± 55. Uncovered at this site was the major part of one entire village: eight house floors, 25 storage pits and five middens (Kivett and Wedel 1948: 1) so the span of dates, with the highly aberrant early one rejected, looks quite reasonable.

The early date of A.D. 440-880 for site 25FT 36 was also rejected by Wood (1969: 14), who excavated the single house at this site. Furthermore, Ludwickson (1975: 144) rejected two dates of A.D. 1425 ± 80 and 1535 ± 105 from this house as being too late; while Wood rejects only the most recent. This leaves three dates accepted by Ludwickson for this house: A.D. 1040 ± 60, 1160 ± 70, and 1175 ± 65. Comparison of the dates given by these two authors is somewhat confusing, since Ludwickson uses the MASCA correction of Ralph, Michael, and Han (1973).

The fifth date rejected by Ludwickson as being too early is one of A.D. 1050 ± 90 from site 25 FT 16, which was located on the same terrace as, and about 70 m from, 25 FT 17 (Kivett 1949a: 278-281), so close that they could reasonably have been considered one site. One other date from this small (three house) site (Kivett and Wedel 1948: 2) is an acceptable A.D. 1230 ± 120.

Also rejected by Ludwickson as being too recent is a date A.D. 1385 ± 60 for site 25 FT 13, a large site (eight excavated houses) a short distance upstream from sites 25 FT 16 and 17 (Kivett and Wedel 1948: 2). The two other dates from this site of A.D. 1030 ±

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Also rejected by Ludwickson as being too recent is a date A.D. 1385 ± 60 for site 25 FT 13, a large site (eight excavated houses) a short distance upstream from sites 25 FT 16 and 17 (Kivett and Wedel 1948: 2). The two other dates from this site of A.D. 1030 ± 60 and 1040 ± 60 are the two earliest dates *not* rejected by Ludwickson (1975: 143), and if he were to reject two more on the basis that two of the early dates might represent the Solomon River phase rather than the Upper Republican phase, he would be rejecting all radiocarbon dates for site 25 FT 13. It would be especially interesting to determine what ceramic complexes were associated with the samples that yielded these radiocarbon dates. The other dates rejected as being too late are single dates for sites: A.D. 1430 ± 20 for 25 FT 80, 1440 ± 60 for 14 ML 8, and 1340 ± 80 for 25 FT 13.

Lippincott (1978) presented 10 radiocarbon dates for Upper Republican sites in the Glen Elder Reservoir area. Of the ten dates, three were rejected, and on the basis of the others he provides corrected dates of A.D. 800-850 to 1200-1250 with the suggestion of a rapid decrease in population during the last 50 years. He also presents the results of two computer-assisted seriations of various sections of the 15 sites excavated. There is not good agreement between his two seriations and the radiocarbon dates. Furthermore, if one compares the sequence of all the units that Carlson (1971) included in his preferred seriation with all the units presented by Lippincott (1978) in his two seriations and radiocarbon sequence, the correspondence is very poor; in fact there would be a better match if Carlson's sequence were reversed. If, however, one compares the temporal orderings of the ten houses that both Lippin-

cott (1978: 91) and Carlson (1971: 92) use for interpretive graphs, the correspondence of the sequences is amazingly close for all but one site (14 ML 376). This strongly suggests that samples taken from specific houses are much more apt to represent a short time span than samples taken from other provenience units or features. It is not entirely clear, however, how Lippincott arrived at the overall ordering of the 16 houses, considering the inconsistencies in his three independent sequences.

Other radiocarbon dates of relevance include one of A.D. 910 ± 100 (presumably uncorrected) reported by Witty (1965: 9) from site 14 JW 301, "a small Upper Republican village located on Buffalo Creek, south of Mankato, Kansas. During the spring of 1964 the writer [Witty] excavated an earth lodge at this site." The charcoal dated came from a pit in the floor of House 1.

An unusual house at site 14 BT 420, Barton County, Kansas, assigned to the Smoky Hill aspect (Graves and Button 1964), had a prepared clay floor and lacked the usual center posts. A burned timber from the floor of this house yielded a date of A.D. 1480 ± 80, presumably uncorrected (Witty 1965: 9). The date is much too late if Smoky Hill is ancestral to Upper Republican. The prepared floor might reflect contact with Antelope Creek where plastered floors are the rule (Krieger 1946: 43) and the date would be appropriate.

Tree ring dates for Upper Republican sites are very rare. At Ash Hollow Cave, near the southeast corner of the panhandle of Nebraska, the tree ring sequence from the level associated with Upper Republican material extends for 205 years from A.D. 1313 to 1517 (H. Weakly 1946; W. Weakly 1961: 20-21), with the occupation taking place from about A.D. 1340 to 1517. The Dooley site, 25 FR 3, along the Republican River just east of the study area, yielded two datable samples with a terminal date of A.D. 1333 (W. Weakly 1961: 21, citing H. Weakly personal communication). Other dates from other Central Plains tradition sites are: A.D. 1473 from the Lynch site, 25 BD 1, in extreme northeast Nebraska; A.D. 1441 for the Wolfe Creek component of the Crow Creek site, 39 BF 11, in Buffalo County, South Dakota; and A.D. 1468 for the lower component at the Black Partizan site, 39 LM 218, in Lyman County, South Dakota (W. Weakly 1961: 21-22).

Although the evidence for dating Upper Republican and closely related sites is very limited, especially for sites outside the classic area, there seems to be a trend for these sites to become more recent as one moves from south to north, but with nearly all the dates falling between A.D. 800 and 1500.

Carlson (1971) attempted to provide a chronological ordering of 14 Upper Republican sites (Solomon River phase) from the Glen Elder, Kansas, area on the basis of pottery seriation, using a method that allowed for only three categories. He initially concerned himself with four primary categories based on rim form and decoration: undecorated collared, decorated collared, undecorated unthickened, and decorated unthickened. After considering the various combinations (taking three at a time) he found that he got the best results by disregarding the undecorated unthickened rims. He concluded that decoration became more common (and more elaborate) through time on both collared and unthickened rims, and that near the end of the sequence decorated unthickened rims had reached their peak and were losing popularity. In comparing Upper Republican sites from various localities, he found that the closer the localities, the greater the similarity. Thus it is not clear as to which is the most important variable: time, space, or other. There does seem to be some kind of break at about the South Platte-Platte River line, with sites north of this line contrasting with those south of it in terms of frequencies of pottery rim types. Unfortunately, as stated previously, the seriation method chosen by Carlson would allow for only three types. It might be informative, for broader comparisons, to also consider undecorated unthickened rims, which are probably most common as one moves toward the southwest across the area of the Plains Village pattern.

There is no doubt but that there was a very dry period immediately after the Upper Republican sites in southern Nebraska were abandoned, and Wedel (1941a: 25, 1959: 571) has argued convincingly that worsening (dryer) climatic conditions substantially contributed to, if they did not cause, the abandonment of Upper Republican sites. Major droughts in the area have been identified and dated from the tree ring record at A.D. 1439-1454 and A.D. 1539-1564, with a lesser, intermediate dry period at A.D. 1459-1468 (H. Weakly 1946, 1962; W. Weakly 1961). Wedel points out that abandonment as a result of the drought in the 1500s would not have given these people time to leave southern and central Nebraska, change their culture significantly and return to the Loup Valley as Lower Loup people. Grange (1980: 117-130), after careful consideration of various lines of evidence, places the beginning of the Lower Loup sequence at between A.D. 1500 and 1550. A termination of Upper Republican by the 1439-1454 drought, or this combined with the 1459-1468 drought, favored by Wedel (1959: 571), would better fit with Grange's dates, and would also provide time for the Upper Republican people to leave central and southern Nebraska and return to central Nebraska as Lower Loup people. Even if Ludwickson (1978) is correct that there was a transition *in situ* from the Loup River phase of Upper Republican to the Lower Loup phase, the earlier terminal date for at least the Classic Upper Republican phase would better fit the situation, since there are marked differences between the two complexes in such things as surface treatment of pottery, dominant house shape, and dominant burial pattern. These differences promp-

ted Wedel (1978: 160) to question Ludwickson's proposed reconstruction. If, as Ludwickson (1975: 59-60; 1978: 102) suggests, the western components of the Upper Republican phase, at least, terminated before A.D. 1350, then none of the three documented droughts in the 1400s and 1500s would have contributed to its demise. If Upper Republican ended in this area a century earlier, it is conceivable that the depressions left by the collapse of earth lodges did not fill in until the time of the droughts indicated by tree rings, so that the thick mantles of aeolian deposit generated by these could still conform to the concavities. As Wedel points out, however, the Loup River phase is typologically still much closer to the er Republican phase than to Lower Loup-Pawnee.

Ludwickson (1978) suggests a time-span for the Upper Republican phase (Classic Upper Republican) of A.D. 800-1350, and for the Loup River phase of A.D. 1250-1450 with the possibility that some Classic Upper Republican sites lower down on the Republican River, *e.g.*, in Webster County, might have survived later than A.D. 1350.

Grange (1968) in his painstaking study of Lower Loup and Pawnee pottery, apparently made comparisons with all ceramic complexes with which similarities could be expected. It becomes clear from his archeological comparisons (1968: 121-127) that there are indeed far more similarities between Lower Loup pottery and wares to the north, as far north as central South Dakota, at least, than to pottery occurring in any other direction. In general, his conclusions support the idea advanced as early as 1940 by Strong (1940: 382-383), championed later by Spaulding (1956: 110) and followed by many archeologists since, that the Arzberger site in central South Dakota would be a good candidate for a site transition between Upper Republican and Lower Loup. If there was continuous occupation of the Loup River drainage by the Upper Republican-related, Loup River-phase people into historic times, as Ludwickson (1978) proposes, then there would have been a marked and sudden change in ceramics, as well as house pattern, at the time that these people abandoned the Loup River phase sites and moved a few kilometers east to establish the early Lower Loup phase sites. Ludwickson notes that Loup River phase pottery shows a great deal more variation in decoration than does Classic Upper Republican, a change in the direction of Lower Loup, although there is apparently no appearance of simple stamping, a hallmark of Lower Loup pottery, on any Upper Republican ware. Also, Grange feels that the few cord-roughened sherds found at Lower Loup sites are intrusive. Ludwickson reports a larger proportion of round houses and smaller houses from Loup River phase sites than from Classic Upper Republican sites. Presumably, all Lower Loup houses are round. Also, the Loup River phase site with the largest number of houses (22) is significantly larger than the Classic Upper Republican site with the largest number of houses (10). Some Lower Loup sites have even more houses, *e.g.*, the Burkett site, with over 50. Although Wedel (1978) is reluctant to accept Ludwickson's hypothesis, I feel that it is too early to reject it out of hand, and concur with Ludwickson that it would be highly desirable to have detailed analyses and reports on the great number of excavated but unreported (in print) Central Plains tradition sites from along Medicine Creek and from the Loup River Drainage. Also, detailed comparison of Loup River phase pottery with that of complexes to the north and east would certainly be called for. A companion hypothesis that should be considered and tested is that Nebraska phase (culture) is ancestral to the Arikara, perhaps through an Arzberger phase transition. This relationship is suggested by the evidence from comparative human osteology according to Richard McWilliams (personal communication).

Thus, the typological, temporal and spatial distributions of Upper Republican sites can lead, and have led, to a variety of interpretations. Perhaps the most widely held is that the entire Upper Republican area was occupied more or less at the same time, and that with worsening climatic conditions in the 1400s, the Upper Republican people moved north to live along the Missouri River, where their culture changed before they returned to east-central Nebraska as Lower Loup people, that is, protohistoric Pawnee. A variation of this model would have the Upper Republican people abandoning at least the western part of their area more than once before withdrawing to the north to return as Lower Loup people. Another variation would have Upper Republican people abandoning sites farther southwest and moving into the Loup River drainage, staying there while they changed into protohistoric Pawnee. Yet another model, to be discussed later, would have the Upper Republican people moving into the panhandles of Oklahoma and Texas to become the Panhandle aspect people, and later returning to east-central Nebraska as protohistoric Pawnee.

I suggest a "fusion and fission" model combining various elements of the above. It would have various Plains village tradition local groups in the Central and Southern Plains evolving from indigenous Woodland local groups, along more or less parallel lines, but with local variations, while maintaining communication among themselves and with people to the east. As climatic conditions deteriorated in one limited area, there would be constriction of territory through dispersion and amalgamation; then as conditions improved in a particular area there would be expansion and reoccupation. During the A.D. 1000-1500 period there were numerous droughts of varying duration that could have triggered such changes in population centers. During the severe droughts of the 1400s, there was radical displacement of people, with the center of gravity of Upper Republican population shifting to the

north and east, with at least part of the Panhandle aspect people joining with Upper Republican groups to become protohistoric Pawnee in north-central and northeast Nebraska; at this time the Washita River aspect people also moved north to become the protohistoric Wichita.

Panhandle Aspect (Antelope Creek Focus)

The Panhandle aspect dominated the northern half of the Texas panhandle, the Oklahoma panhandle and west-central Oklahoma between A.D. 1200 to 1450, during the Middle Ceramic period. At one time two foci were defined with essentially those sites in the panhandles being assigned to the Antelope Creek focus and those in west-central Oklahoma to the Optima focus. Additional work led to dropping the Optima taxon and including its sites in the Antelope Creek focus. More recently Campbell (1976) assigned the Apishipa focus, found on the Chaquaqua Plateau in southeastern Colorado, to the Panhandle aspect. Lintz (1978c questioned this assignment and limited his discussion of the Panhandle aspect to those cultural manifestations included in the Antelope Creek focus. To save confusion and to beg the question of Apishipas taxonomic status, the term Panhandle aspect is here used essentially as a synonym for Antelope Creek focus. Although the Apishipa focus is probably related to the Antelope Creek focus, it appears to be peripheral to the development leading to the distinctive Antelope Creek culture and will be discussed separately.

The Panhandle aspect has attracted the attention of archeologists since the 1920s. Unfortunately, much of the work done on the Panhandle aspect has never been published; in fact, there is apparently no thorough published description of the results of a single major excavation. The selected and annotated bibliography of 150 items on the Antelope Creek focus by Lintz (1978d, revised 1980b) contains references, including a large number of unpublished manuscripts on 48 Antelope Creek focus sites out of an estimated several hundred sites. Hughes (1977b) also has prepared a useful chronological bibliography of Panhandle Archeology. In recent years there have been a number of articles reporting and interpreting radiocarbon dates, but the apparent discrepancies among the dates lead to quite different interpretations and create confusion. One still gets the impression, however, that Antelope Creek is a very extensive and intricate, with hundreds of sites, complex on which we have relatively little and very spotty basic information. This is not to fault the various early investigators, for their contributions are solid considering the state of the art and the resources available to them at the time. Because of extensive site destruction since the 1930s, much of the information they collected can probably not be duplicated today. Also, there is no way that archeologists could get the same amount of information for the same number of dollars, actual or effective. The early work, along with continuing research, has served to identify problems on which attention should be focused. The same applies to many other archeological complexes, but the status of Antelope Creek focus archeology is especially relevant for this study since it appears to be the most obvious climax culture in the Southern High Plains.

The sites of the Antelope Creek focus have been of special interest to archeologists because of its stone structures, some of which contained many rooms (Eyerly 1907a, 1907b, 1910; Moorehead 1921, 1931; Mason 1929; Haynes 1932; Holden 1929, 1933). This architecture, which superficially resembles that of the Southwestern Pueblos, led to the assumption that the sites were related to the Pueblos; an interpretation strengthened by the presence of some Pueblo potsherds at Antelope Creek sites. One early writer, Moorehead (1921), even suggested that the Panhandle culture was ancestral to Pueblo culture, an idea entirely without merit. Architecture aside, the artifact inventory closely resembles that of contemporaneous late prehistoric farmers and hunters who lived farther north.

A number of Antelope Creek sites are mentioned frequently in the literature and provide much of the basic information available on this complex. Apparently the first sites to be reported in the literature by an archeologist resulted from Moorehead's (1921) survey, which proceeded westward from Oklahoma. Thus, the first sites with stone ruins that he encountered were on Wolf Creek, in central Ochiltree County, Texas, whereas most Antelope Creek focus sites are located in the valley of the Canadian River. Along the Canadian, in the north-central Texas Panhandle, Moorehead reported other ruins on the Archie King Ranch, and on Cottonwood, Tarbox, Antelope and Dixon Creeks.

Tarbox Creek Ruin B was investigated by Holden (1929), who reported that it measured 21 by 11 m and consisted of 12 to 15 rooms of various shapes. He also noted that one wall was 41 cm thick and consisted of vertical-slab masonry plus horizontal coursing. Moorehead (1931: 106-113) presents additional observations on the Tarbox Ruin and quotes extensively from Holden.

The Alibates Ruin was visited by Mason (1929); he was taken there by Floyd Studer of Amarillo who had located many of the Antelope Creek ruins. This ruin, on a hill overlooking the Canadian nearly straight north of Amarillo, was characterized as having dozens of rings and a few rectangles made of stone laid flat or placed on edge. Several of the rooms were excavated and in some it was noted that the structure had been rebuilt several times, with one clay floor above another to a depth of 1 m. The rooms originally were semisubterranean.

The Antelope Creek Ruin, sometimes called "A-

C," was investigated in 1930 for Texas Tech by Holden (1931). This multiroom structure was 50 by 16 m with walls constructed in the style found at many Antelope Creek focus sites; stone slabs are set on edge in parallel rows about 1 m apart and the space between filled with earth. The walls, built of four or five successive courses, were about 1.5 m high, and tapered from about 1 m thick at their bases to about 30 cm at the top. Many of the corners were square and the structure had been quite regularly laid out. Evidence of an older occupation was found under this large multiroom structure. Additional work was done at the site under the WPA (Baker and Baker 1939, 1941a,b) and it was mentioned by C.S. Johnson (1939), Lowery (1932), and Moorehead (1921, 1931).

Saddle-Back Ruin continues to be referred to although there is no extensive report of work done there. Holden (1931, 1933) and Haynes (1932) described excavations at the site, which included a 33-room structure. Studer (1931b) provides the information that this site showed evidence of long occupation, with four superimposed floors in one room. Apparently also from this site came Southwestern sherds identified as Glaze I and Biscuit A.

Coetas Ruin (Ruin 55) was described by Studer (1934) in an article in which he proposed the name of "Texas Panhandle Culture Ruins." In this article he also described the great variety of architecture at sites assignable to this proposed complex.

The Handley Ruins (which include the Gould Ruin) are along Wolf Creek, in the northeastern corner of the Texas Panhandle, and hence away from the main concentration of Antelope Creek sites along the Canadian River. They were investigated by Moorehead (1931) and received further attention from Ellzey (1966). The Gould Ruin consisted of a large rectangular structure within which secondary burials were found.

A detailed summary of the results of investigations at various of the Antelope Creek focus sites is to be found in Krieger (1946). More recently Lintz (1978e) has presented an excellent synthesis including new data, primarily radiocarbon dates. The following summary of Antelope Creek focus archeology has drawn heavily on Lintz's descriptions.

Most of the excavated Antelope Creek focus sites are in the Stanford Reservoir area, on the Canadian River in the north-central Texas Panhandle, a very limited sample geographically that may be giving us a somewhat distorted picture. Sites are frequently on first or second terraces above broad flood plains. Some are on steep-sided mesas, suggesting concern for defensibility. Many of the sites are on small tributaries or near upland playas, but these have received little attention. In addition there are many even smaller outlying sites, probably hunting camps. Occasional sherds of Borger Cord-marked pottery, the type associated with the Antelope Creek focus, have been found here and there all over the plains of northeastern New Mexico and into the Pueblo area as far west as Santa Fe.

Antelope Creek focus sites have been dated by both radiocarbon and Southwestern trade sherds (Lintz 1978e: 42-43). Radiocarbon dates, corrected according to Damon et al. (1974), range from A.D. 1150 ± 70 to 1590 ± 150. In analyzing the dates Bryson, Baerreis and Wendlund (1970: 69) state that with considerable statistical certainty one can say that the people were not there (in the Panhandle) between A.D. 1180 and 1200, and were there by A.D. 1220. Baerreis and Bryson (1966) state that the dates for the Antelope Creek focus cluster between 1200 and 1450, dates that are generally accepted. The 10 Southwestern trade sherd types all fall within this 250-year period and essentially span it (Lintz 1978e: 43).

The Antelope Creek focus shares various artifact types with farming-hunting complexes of the Central Plains tradition: diamond-shaped alternate-bevel chipped stone knives (which after many resharpenings look like drills), commonly 13 cm long and 5 cm wide; various other types of stone knives; small side-notched, delicately chipped projectile points, 2.5 cm or so long; expanded-base drills; well-made end scrapers; sandstone arrow shaft smoothers; stone elbow pipes; bison scapula hoes or digging tools; bone shaft wrenches; bone awls and bone beads. The pottery at Antelope Creek focus sites is predominantly Borger Cord-marked. Lintz (1978e: 45) describes the ceramic complex as follows: "Ceramic items include perforated sherd discs, straight "cloud blower" pipes (rare), and a pottery type characterized almost exclusively by globular-shaped, cordmarked or smoothed-over cordmarked vessels." In addition, the Antelope Creek inventory includes bison tibia digging stick tips, manos and metates and notched bone rasps. Artifacts not found in the Antelope Creek inventory but present in Upper Republican (with which Antelope Creek is commonly compared) include bone beamers, bone gorgets, antler bow guards or bracelets, bone fishhooks and pottery elbow pipes. Most of these artifacts are not especially common in Upper Republican, and perhaps their absence in Antelope Creek represents a sampling error. The absence of manos and metates in Upper Republican could reflect, in part, the scarcity of suitable raw material.

The most distinctive feature of Antelope Creek focus sites is the architecture. Although highly variable, it is characterized by the utilization of stone slabs in the walls. Site size ranges from single isolated rooms to villages of up to 35 room-units. Large sites may be comprised of numerous single free-standing rooms and/or multiroom structures. In either case, rooms may be round or square, although as might be expected, multiroom structures with round rooms appear to be rare. Sites consisting entirely of isolated units are most common, and at them structures are divided about equally between

round and square rooms. Room sizes range from 9 to 130 square meters. The large square rooms frequently have a long low entrance or ventilator to the east, an east-west channel about a third of the width of the house in the floor, four or six major support posts at the edges of the channel and, at the west end of the channel, a massive clay altar either extending into the room or set in a niche in the wall. Sometimes small rooms flank the entrance. Walls, or wall bases, frequently consist of a single or double row of stone slabs set on edge in adobe, with higher rows set within lower rows so as to produce a progressively thinner wall. Occasionally, walls are rubble-filled, and some walls are of adobe with post reinforcements. Lintz was unable to establish any temporal or geographical boundaries for the variation in Antelope Creek focus architecture, except that in a few cases structures which incorporated stone in the walls were stratigraphically above structures without stone in the walls. The early dichotomy of foci (Antelope Creek focus and Optima focus) was based on apparent differences in architectural style between the sites in the central Panhandle of Texas and those in west-central Oklahoma. Lintz has demonstrated that this distinction is not valid, but the possibility that architectural variation represents differences in function between rooms and between sites needs to be further explored.

The many small sites that probably represent hunting camps or travel way stations are found not only well away from the major sites, but even far beyond the core area of the Panhandle aspect. Study of these small sites, often far from water sources, could well provide a better understanding of both the dynamics and history of the aspect.

The presence of Panhandle aspect sites in the vicinity of Las Vegas, New Mexico, was first reported by Holden (1931: 44) apparently on the basis of hearsay evidence and, I am certain, wishful thinking. He states, "A number of slab-stone ruins of the single room Panhandle type were found, some within ten miles [16 km] of Las Vegas. Mr. William Elfield [sic] of that place was instrumental in locating these. Time did not permit of the excavation of any of this type of ruin in the Las Vegas vicinity." There seems to be no evidence that Holden ever visited the sites and reports of later field work in the area have failed to confirm the presence of Panhandle sites there. On the basis of Holden's report Wendorf (1960), and Wedel (1961a: 149) citing Wendorf, have perpetuated the idea that the Panhandle aspect extended into the Las Vegas area. Incidentally, Wendorf incorrectly cites Holden (1930) instead of (1931) as the source. Occasional cord-roughened sherds have been found as far west as just south of Santa Fe where they were excavated from a large Pueblo site (S. Peckham, personal communication). Holden (1931) excavated at Tecolote Pueblo 16 km south-southwest of Las Vegas in hopes of finding a Pueblo ancestor for the Panhandle aspect but concluded "The present indications however do not establish any relationship between the slab-house culture of the Panhandle and the Pueblo Culture of New Mexico." (Holden 1931: 52-53).

Apishapa Focus

The Apishapa focus (A.D. 1000 to 1400), a localized manifestation of the Plains Village pattern, appears to have developed in situ in the broken canyon-land of the Chaquaqua Plateau. Of the nearly 1200 sites that Campbell (1976) recorded within some 5000 sq. km. on the Chaquaqua Plateau, he attributes 68 to the Apishapa horizon. Prior to Campbell's work in the 1960s this complex was known but had received little attention. The presence of cord-roughened pottery associated with stone structures had suggested a relationship between Chaquaqua Plateau sites, the Upper Republican aspect, and/or the Panhandle aspect. Campbell (1976: 96-97) has suggested that the Apishapa focus is ancestral to the Antelope Creek focus with some traits in the latter, however, coming from the Custer-Washita area. Lintz (1978: 36) convincingly refutes this possibility and even questions assigning the Apishapa focus to the Panhandle aspect; he does acknowledge a relationship between them.

Apishapa focus sites are usually located close to both water and canyon bottomland. Many are on isolated mesas or on walled-off, steep-sided points. A concern for defensibility seems obvious. Houses were either within or within sight of a defensible area. In one situation, a series of "forts" were so located that signals could be relayed from one to another for 11 km along a canyon. At those sites that had structures, the number of rooms ranged from one to 37. For the most part architectural units consisted of only a single room, usually circular. Some were oval or semi-circular; square rooms were very rare. Some sites had rows of contiguous rooms and one site had random clusters. Nineteen of the sites were rock shelters, and of these seven contained barrier walls. Walls and masonry structures were built almost entirely with vertical slabs. Structures were built on the surface of the ground and frequently there was so little fill over bedrock that excavation would have been impossible.

Apishapa focus artifacts generally resemble those of the Woodland complex that preceded it in the area. The bow and arrow was important, but darts, represented by both points and atlatl weights, were still present. Side-notched points were the dominant type and cane arrow foreshafts have been found. Bifacial and unifacial knives and cutting tools are common but distinctive alternate-bevel diamond-shaped knives are absent. Snub-nosed end scrapers are common but small side scrapers, flake scrapers, core scrapers and scraper knives are also found. Other stone tools include gravers, unifacial choppers, bifacial hand axes and several types of drills.

Manos, metates, and arrowshaft smooters were used. Bone artifacts included awls. Scapula hoes were not found even though maize was cultivated, apparently with digging sticks. Pottery, which was not abundant, is identified as Borger Cordmarked with a few sherds more deeply cord marked. Artifacts of vegetal material include twined basketry, probably coiled basketry, woven matting, yucca-fiber cordage and twined rabbit-fur cordage.

Campbell reports that beans and five varieties of maize were cultivated but that gathering wild plants and hunting small as well as large mammals continued to be important.

Emphasis on defense and large villages suggests that warfare was common. Campbell mentions the possibility of internecine conflict resulting from competition for farmland due to a great population explosion, and perhaps also to deteriorating climatic conditions. He also suggests the possibility of conflict with Pueblo people to the west or with Athapaskan invaders from the north, but it would be difficult to make a strong case for either. Evidence of trade can be seen in the occurrence of Alibates dolomite from the Panhandle of Texas and Medicine Creek jasper from southern Nebraska, obsidian (presumably from New Mexico), corrugated sherds from perhaps as close as Trinidad, Colorado, and Olivella shells presumably from the Pacific Ocean.

Burials were flexed, individual (rarely in pairs) and located in open areas, in rock shelters, or under house floors.

Campbell (1976: 62-63) sees no evidence of the Apishapa focus on the Chaquaqua Plateau after A.D. 1400, and notes a decrease in the occupation during the 1300s. During this terminal century, he notes a replacement of cord-roughened pottery resembling Borger Cordmarked with a smudged ware that most closely resembles the Upper Republican ware found in the Colorado Piedmont. The dominant projectile points were triangular and side-notched. He postulates that surviving Apishapa people finally moved outright to the east, but that a few may have returned occasionally to hunt. Two rock shelters and an open site suggest such sporadic use.

An Apishapa focus/Panhandle aspect affiliation for a site about 7 km south of Las Vegas, New Mexico, has been suggested by Wiseman (1972, 1975). This site, Sitio Creston (LA4939), is characterized by 12 rock enclosures roughly circular and 2 to 4 m in diameter on the inside, clustered on top of a narrow ridge or creston. The walls consist of irregular rock available locally, either roughly piled or dry-laid on surfaces which had been somewhat leveled or cleared of sand. The similarity of the structures to ones reported from the Chaquaqua Plateau (Campbell 1969) provides the main basis for suggesting their relationship to the Apishapa focus. The pottery from Sitio Creston, however, more closely resembles Taos Gray, with only one sherd out of 612 cord-roughened, whereas Apishapa focus pottery is predominantly cord-roughened. The projectile points from Sitio Creston are of a type called Scallorn, predominantly corner-notched. Only one point was assigned by Wiseman to the Washita type, the preponderant type in the Apishapa focus, and of the points illustrated from Sitio Creston, none conforms to the Washita type. Furthermore, the end scrapers so common at Apishapa sites are missing at Sitio Creston. A comparison of this material from near Las Vegas with that from Escritores and Ponil sites about 160 km to the northeast (Glassow 1980: 73-74) will probably show greater similarity to the latter than to the Apishapa focus or Panhandle aspect.

Custer Phase

The cultural position of the Custer phase, especially its relationship to the Washita River phase, has been subjected to much discussion. The various positions have been (1) that they had separate origins and that similarities represented borrowing; (2) that they were contemporaneous, should be considered as belonging to a single focus, and that differences reflected only geographical separation; and (3) that Washita River evolved out of Custer which, in turn, evolved out of local Woodland complexes. Hofman (1975, 1978b) has carefully reviewed the history of these various interpretations and has argued convincingly for the third interpretation. Previously, Bell (1973) had proposed the Custer-Washita River continuum and Richards (1971) the Woodland origin of Custer. The advent of radiocarbon dating provided the main impetus for the continuum interpretation. The Washita River phase is, in turn, a very likely ancestor of the Great Bend aspect which is generally accepted as protohistoric Wichita.

Custer phase sites, for the most part, are concentrated in or near Custer County, Oklahoma, which is located in the middle of the state north and south and about 80 km east of the western border of the non-panhandle portion of the state. Other Custer phase sites are located near the center of Oklahoma and in the North Canadian drainage; some may even occur in southern Kansas (Hofman 1978b: 15, 18). Most, however, are in the drainage of the Washita River.

Bell (1973: 185) and Hofman (1975: 47; 1978b: 17-18) report the following four uncorrected radiocarbon dates for Custer phase sites:

Site	Date (A.D.)	Sample No.
Edwards II (Bk 14)	810 + 70	Tx 807
Edwards II (Bk 14)	850 + 80	Wis 123
Mouse (Cu 25)	950 + 100	M 1091
Edwards II	970 + 70	Tx 808

The Mouse site is in Custer County, Oklahoma and the Edwards II site is in Beckman County, about 50 km southwest of the main concentration of Custer phase sites. These dates, from A.D. 810 to 970, fit nicely with the accepted dates from the Washita River phase which range from A.D. 1000 to 1375, all with ± figures, of course.

Among the sites assigned to the Custer phase, which can be viewed as transitional between a Plains Woodland lifeway and that of a fully developed Plains village complex, there are differences attributable to the cultural changes that were taking place. A comparison of artifacts that could be considered horticultural implements supports the idea that the Custer phase was becoming more dependent on horticulture. Woodland sites in the area produced few such artifacts and those found consisted of perforated shell hoes. Of the seven Custer phase sites considered by Hofman (1978b: 14) four produced scapula hoes and/or bone digging stick tips (a total of five each) and none yielded bison horn core hoes. On the other hand, the 13 Washita River phase sites he considered averaged 23 bison scapula hoes (0 to 117 per site), 12.8 bone digging stick tips (0 to 66 per site), and 3.5 bison horn core hoes (0 to 12 per site) with only two of the 13 sites yielding none of any type. Other bone and shell artifacts, neither common nor diagnostic, from Custer phase sites include: shaft wrenches, bone awls, scored ribs, shell disk beads, Olivella beads, and bone beads. The absence at Custer phase sites of deer mandible sickles and bone beamers is interesting and significant since both are rather common at many Washita River phase sites.

Custer Phase pottery (Hofman 1978b) is basically globular, without shoulders and with direct vertical to slightly flaring rims. The percentage of cordmarked pottery at Custer phase sites ranges from 25% to 100% and averages 66% of the total. Plains Woodland pottery is virtually all cord roughened, whereas most Custer phase sites have some smooth pottery. In contrast, only 3% of Washita River Phase pottery is cord marked and no site has as much as 15%. Decorated sherds from Custer Phase sites are very rare; handles are also rare and are restricted to smooth vessels. Flat bases are reported only for smooth vessels and pointed bases only for cordmarked vessels. The presence of calcite tempering was at one time thought to be useful in distinguishing between Washita River and Custer pottery, but it now appears to reflect availability of material.

Also of use in distinguishing Custer phase from Washita River phase sites are projectile points (Hofman 1978b: 18-19). Custer phase sites have an average of 28% corner-notched or stemmed, 35% side-notched and 37% triangular unnotched points whereas Washita River phase sites average only 7% corner-notched or stemmed, 41% side-notched and 52% triangular unnotched.

Detailed descriptions and/or tabulations of other artifacts from Custer phase sites are provided by Brighton (1951), Eighmy (1970), Gallaher (1951) and Hofman (1978b). Both snub-nosed end scrapers and side scrapers are common. Chipped knives are of various shapes including the alternately-beveled, diamond-shaped type. Chipped drills also occur. Ground stone artifacts include Plains-style sandstone arrow shaft smoothers and simple milling or grinding stones. Stone elbow pipes are rare and celts are absent.

Custer phase structures are poorly known. Bell and Baerreis (1951: 81) describe them as being square to rectangular, with four central support posts and a central fireplace. The abundance of burned clay suggested some sort of wattle and daub walls and/or roof. Cache pits, irregularly placed within the structures and scattered about the villages, are round to oval and 1 to 1.5 m deep. They were presumably intended for storage; however many were later filled with refuse. The few burials that have been found were flexed in round to oval pits. Hofman (1978b: 18) states that Custer phase villages "may have been composed of a small number of structures scattered along a section of river terrace" and that "Small hamlets and single house sites are apparently represented."

Washita River Phase

The Washita River focus was described in considerable detail in a functional or social-anthropological way by R. Bell (1973). Hofman (1975) compared the Washita River and Custer foci and later (1978b) defined and compared the Washita River and Custer phases. In the latter paper, he assigned four sites previously considered as Custer focus to the Washita River phase. His reason for doing so is sound and enables us to deal with the two complexes in a much more meaningful way. Since, except for geographical distribution, the addition of these four sites to the Washita River phase does not invalidate Bell's summary for that complex, one can view his summary as pertaining to the Washita River phase. Both Bell and Hofman had access to radiocarbon dates, none of which came from the reassigned sites. The reassignment affects the Custer phase in that it demonstrates more sharply the differences between it and Washita River.

As indicated above, the Washita River phase was very probably a direct outgrowth of the Custer phase with the Washita River people becoming more heavily committed to horticulture and participating fully in the Plains Village tradition. As would be expected, there is evidence of trade and cultural influence from Caddoan neighbors to the east.

The geographical distribution of the Washita River phase has not been fully determined, but is known to center along the Washita River in the wes-

tern half of Oklahoma with a few sites on the Canadian River (Bell 1973: 172; Hofman 1978b: 7). The area of the Washita River phase essentially includes that of the Custer phase, but, in addition, extends much farther east and perhaps north. Witty (1969) has suggested a Washita River assignment for one site in extreme south-central Kansas. Its location would not be surprising if at least some of the Great Bend (protohistoric Wichita) aspect stemmed from the Washita River phase. Much more work needs to be done in northern Oklahoma and southern Kansas on this problem.

The following six radiocarbon dates, all uncorrected, are from Washita River phase sites:

Site	Date (A.D.)	Sample No.	Comments
McLemore (Wa 5)	1000 + 150	C 1215	
Lacy (Gv 5)	1150 + 70	M 820	
Brown (Gd 1)	1250 + 70	Wis 125	
McLemore (Wa 5)	1320 + 55	R 829/2	
McLemore (Wa 5)	1375 + 50	R 829/2	
Lee (Gv 3)	1425 + 50	Tx 524	On corn, probably too recent

Hofman (1975: 47; 1978b: 17) considers all but the most recent one (A.D. 1425) reasonable, and it is suspect because it is based on corn. The earliest date (A.D. 1000) may be too early, since it is more than 300 years earlier than the other two dates from the McLemore site. However this, the earliest Washita River phase date (disregarding the standard deviations), is still slightly more recent than the most recent date of A.D. 970 for a Custer phase site, and is the only Washita River phase date for which the standard deviation overlaps with that of a Custer phase date. The number of dates for both phases is, of course, quite small. A reasonable estimate for the span of the Washita River phase would be A.D. 1000-1400.

As stated in the section on the Custer phase, the Washita River phase is distinguished from it primarily by differences in numbers or percentages of certain artifacts or attributes. Ceramic traits that are much more common at Washita River sites include: smooth surface finish (97%), flat bottoms, shoulders, handles, rim tabs and decoration, including appliques. Horticultural tools that are absent from or rare at Custer phase sites but common in the Washita River phase include: bison scapula hoes, bison tibia digging stick tips, bison frontal bone (horn core) hoes and milling stones or metates. Also, corn has been recovered from Washita River phase sites. Tools probably used in construction and found only at Washita River sites are celts (for cutting posts?) and deer mandible sickles (for cutting thatch?). Hunting and the processing of hides may have increased in the Washita River period, since bone beamers, absent at Custer sites, are common. Also, the average number of several other hunting and hide working tools increased from Custer to Washita times: scrapers from 43 to 125, bone awls from 2 to 19, shaft wrenches from .6 to 3.2 and arrow points from 24 to 78. A change in types of arrow points probably reflects the time dimension more than a functional dimension. The percentage of unnotched and side-notched triangular points increased from 39% to 56% and 32% to 36% respectively, while corner-notched or stemmed points decreased from 29% to 8%. The change in average number of artifacts per site could also reflect larger populations and/or longer occupation as well as increased hunting and hide working activity.

Washita River houses were substantial structures but few have been excavated (Bell 1973: 176; Hofman 1978b: 8-9). They were apparently rectangular or square, 6 to 9 m across, with a central hearth. The roof was supported by large center posts and the walls consisted of smaller posts set vertically .5 to 1 m apart. The spaces between were filled with smaller poles or canes and plastered with clay. The roofs were probably made of grass thatch placed over poles since burned grass has been found. Miscellaneous post holes and storage pits are found inside the structures. Apparently the entrance was not a simple aperture. Houses were grouped in twos or threes up to perhaps a dozen, in small villages or hamlets dispersed along streams, primarily the Washita River. Villages are sometimes several kilometers apart. Burials are found in the villages and are usually flexed, although a few are extended. The head is commonly oriented to the east. Grave goods are sometimes associated with the burials and a few individuals appear to have died violently.

Pratt Complex

The Pratt focus is of special interest since it appears to be transitional between middle ceramic village complexes centering in western Oklahoma and the late ceramic Great Bend aspect (protohistoric Wichita). The Pratt focus is best known from two sites in Kansas, but is represented at other sites as well. The Pratt site (14 PT 1) (Wedel 1959) is on the north bank of the Ninnescah River, just west of Pratt in south-central Kansas, and the Larned site (14 PA 307) (Monger 1970) is at the confluence of Pawnee Creek and the Arkansas River in the edge of Larned, central Kansas. The Larned site, the westernmost Pratt focus site known, is just barely within the area here defined as the Central High Plains, but is especially significant in that the Pratt component is clearly separated stratigraphically from both the earlier Smoky Hill component and the later Great Bend component. Also, the Larned site provides our only information on Pratt complex structures. Witty (1978: 63) mentions a probable Pratt complex site on Walnut Creek in Rush County, Kansas, perhaps the northwesternmost site of the complex.

Within the 12 by 12 m excavation at the Larned site (Monger 1970), the remains of six Pratt focus houses were found separated vertically from one another by layers of silt 2.5 to 7.5 cm thick, indicating that the site was occupied for more than a short time. Perhaps annual floods each left one silt layer, but flooding was probably much less frequent. The same pattern of rebuilding after floods is found in the higher Great Bend aspect zone where more than 30 complete or partial structures were represented in the same 12 by 12 m excavation. The Pratt and Great Bend houses were very much alike. The Pratt houses all had four center posts, each located about 1.5 m from the center of the house. The perimeter of one house which had burned was outlined by 51 posts forming almost a circle, perhaps better described as a square with rounded, braced corners and convex sides. In the center was a fire basin; four "cache basins" were found within the house perimeter. The basins contained artifacts, ash, and charcoal. Fire basins and burned areas were also found outside the houses. There was no suggestion that the houses were built over pits, or that they had had covered entrances. Some historic Wichita houses had center posts; others did not. The protohistoric Great-Bend Wichita houses at Larned had none. If the Pratt focus is proved to be ancestral to at least some manifestations of Great-Bend Wichita, the evidence from the Larned site will suggest that the trend was away from using center posts.

Information from the Pratt site is based primarily on collections and observations made by local informants and relayed to Wedel (1959: 503-512). There are suggestions that the site may have been occupied successively by groups with different artifact assemblages although one component, called the Pratt complex by Wedel, seems to be the major one. Dismal River potsherds (Ware D) could represent an Apache component (village or temporary camp) or trade with Dismal River people. The most abundant pottery (Ware A) is cord-roughened, moderately hard, and tempered with rounded sand. Medium-sized jars are suggested, with decoration restricted to incisions on rounded lips. Monger (1970: 9) found similar pottery in the Pratt Focus component at the Larned site and provided a more detailed description. Wedel's ware B from the Pratt site is like Ware A but lacks the cord roughening. Ware C is plain with a homogeneous, compact paste tempered with an abundance of fine sand; these sherds reminded Wedel of ones from Paint Creek, a Great Bend site in central Kansas. Ware E, represented by one sherd, about a third of the rim of a small vessel, is smooth, with a fine compact paste thickly tempered with flakes of shell. The lip has diagonal incisions and four pinched pellets are appliqued on the neck. This ware is comparable to Geneseo and Cowley (Great Bend) wares. Southwestern trade sherds include one Bandelier Black-on-gray, dated at ca. A.D. 1424-1550, and three Glaze C, dated at ca. 1450-1475. These dates are especially interesting in that they fall immediately after the suggested terminal date for the Washita River phase and just before the apparent beginning of the Great Bend aspect. Also, the pottery from the Pratt complex shows similarities to that of both Washita River and Great Bend. Wedel had previously suggested that the earlier of two components at the Pratt site had its ties to the south and a strong case can be made for a developmental sequence from the Custer phase through the Washita River and Pratt phases into the Great Bend aspect, which is generally accepted as protohistoric Wichita.

Chipped stone tools from the Pratt Site include projectile points, scrapers, drills and knives made from a variety of materials including, among others, obsidian (probably from New Mexico) and Alibates dolomite from just north of Amarillo, Texas. The points are small, bifacially chipped, and basically triangular with straight to concave bases and straight to convex edges. They are either unnotched or side-notched, with one of the latter having a basal notch as well. Scrapers are plano-convex. One pipe drill, with one pointed and one rounded end, and two expanded-base drills with unworked bases are described. Also included are two diamond-shaped, alternate-bevel knives and four knives with two beveled blades and variously shaped butts. Ground stone artifacts include shaft smoothers of Dakota sandstone and of limestone, a fragment of a (tubular?) pipe made from a fine-grained red stone, milling slabs, mullers, grooved mauls and five small pieces of worked turquoise.

Digging stick tips or points made from the distal portion of bison tibiae are common at the Pratt site. In the process of manufacture, the shaft had been cut diagonally so as to produce a beveled, chisel-like point that was ground down and smoothed but never serrated. From the distal articular surface a hole 20 to 25 mm in diameter was drilled into the cavity of the bone to provide a socket for hafting. Wedel knows of no other tools of this type from Kansas, although the method of hafting is similar to that for bison scapula hoes found in some Great Bend sites. Such bison-tibia digging-stick heads have been reported from Late Prehistoric and Protohistoric sites in Oklahoma and Texas, however, and two specimens are known from South Dakota. In general, the basic Plains agricultural tools used south of Kansas would appear to be bison scapula hoes, bison frontal hoes and bone tipped digging sticks, while the bison scapula hoe prevails in and north of Kansas.

According to Monger (1970), the chipped stone artifacts from the Pratt component at the Larned site resemble closely those found in the Great Bend component, but are better finished. The projectile points are small, triangular with straight or concave bases, and either unnotched or side-notched, with an occasional basal notch. Knives are oppositely

beveled with two or four edges; a few of the two-edged knives are stemmed. Both end scrapers and side scrapers (with either one or two scraping edges) are common. Drills, which have expanding bases, are either carefully worked or on unmodified flakes. Ground stone artifacts from the Pratt complex include sandstone shaft smoothers, a grooved maul, and a small turquoise bead. Bone artifacts include awls made from split long bones, ribs, or neural spines; transversely scored rib rasps, rib fragments with rounded ends, and rasps made from deer mandibles. Fragments of two clay pipes and pieces of worked shell were also found. Monger notes that none of the horticultural tools found at the Pratt site are represented in the Pratt component of the Larned site. This led him to interpret the latter as a hunting camp rather than as a permanent horticultural village, although he does note that the structures were reasonably substantial.

Elsewhere in the present volume, in the section on the Smoky Hill component at the Larned site, there is a discussion of what appears to be evidence of two drought periods (possibly corresponding to two droughts of the 1400s known elsewhere in the Plains) between the Smoky Hill zone and the Pratt focus zone. This evidence is in marked contrast with that for abundant moisture suggested by the Pratt and Great Bend zones showing repeated flooding of the site.

Sopris Phase

In the foothills of extreme southern Colorado near Trinidad, the Sopris phase, the only phase of the Upper Purgatoire complex, dates at A.D. 1000-1225 and appears to represent an indigenous population strongly influenced by Pueblo culture and trade from the Upper Rio Grande. Although these sites seem to be related to ones near Taos, a relationship to sites in the Piedra district of southwestern Colorado (Roberts 1930) might also be worth considering. There are also indications of a lesser influence from, or at least modest trade with, the Plains. Thus far, a transition to Sopris from the earlier Archaic, "Basketmaker," or Woodland complexes has not been demonstrated. Although Sopris sites contain substantial architecture and locally made pottery, C. Wood and Bair (1980: 227) see them as manifestations of a basically hunting and gathering subsistence economy, with only incipient horticulture. Sparse as direct evidence of Sopris horticulture is, however, I strongly suspect that there was essentially a balance between gardening and hunting/gathering.

Baker's (1964) earlier suggestion that the Upper Purgatoire complex contained another, earlier, phase, which he called the St. Thomas, has now been abandoned. However, the Sopris phase has been divided into three temporal subphases by C. Wood and Bair (1980: 227): Initial, Early and Late. The Initial phase, A.D. 1000-1100, "is characterized by the construction of semisubterranean pit houses, Jacal structures, and campsites which may or may not have been associated with a Jacal or brush superstructure." The ceramics are thought to consist of both Taos Gray and a locally made variety, Sopris Plain, which are virtually indistinguishable from one another. With regard to other artifacts, basin metates predominate over slab and trough metates, corner-notched points are slightly more abundant than side-notched and stemmed ones, and elbow pipes, which continue throughout the phase, are present. Dating is based on three archeomagnetic dates as well as dates attributed to Taos Gray at Pot Creek, near Taos, New Mexico.

The Early Sopris phase, A.D. 1100-1150, "is characterized by the construction of adobe houses. Jacal construction incorporated with the basic adobe structure appears to be transitional between Initial and Early phases" (Wood and Bair 1980: 229). According to Lang (1977: 6), adobe and jacal surface structures appear during late Pueblo II times on the Northern Rio Grande. At the earliest Sopris site with adobe construction, one structure has adobe footings to help hold posts for a jacal superstructure, apparently a transitional form. Ceramics continue to be predominantly Taos Gray-Sopris Plain, but incised wares, presumably both Taos Incised, traded from the Upper Rio Grande, and a locally made imitation, appear during Early Sopris. Some cordmarked pottery, polished wares, and corrugated wares are present, along with occasional Taos Black-on-White and Red Mesa Black-on-White. Other artifacts include trough metates -- which replace basin metates -- shell and stone disk beads, turquoise, and the other artifacts found in Initial Sopris. Maize is present but hunting and gathering apparently still predominated. Chronology is based on archeomagnetic dates and datable trade sherds.

The Late Sopris phase, A.D. 1150-1225±, is characterized by architecture consisting of unfaced, horizontally laid, unmortared sandstone slab masonry, which replaced adobe construction. Corners are curved and posts are occasionally incorporated in the walls, presumably as roof supports (Wood and Bair 1980: 231). During this phase Taos Gray Incised with herringbone motifs predominates, but Taos Gray-Sopris Plain is abundant. Cordmarked and polished wares are less common than in the previous phase. Red Mesa Black-on-white also decreases, while Taos Black-on-white increases. Reexamination of sherds originally identified as Santa Fe Black-on-white proved that identification to be in error. Since Santa Fe Black-on-white became common in the Upper Rio Grande area about A.D. 1250, essentially replacing Taos Black-on-white, it seems likely that this change would be reflected in the Trinidad area if the Pueblo-related complexes there had lasted much beyond A.D. 1225. Changes in other artifacts include the appearance of grooved

mauls and the replacement of trough metates by slab metates. One archeomagnetic date is available for Late Sopris.

No archeological complex in the Trinidad area dated between A.D. 1225 and the early 1500s has been linked archeologically and/or ethnohistorically with Apacheans. However, on the basis of a dental anomaly, three roots on the first mandibular permanent molar, Turner (1980) suggests the possibility that the Sopris phase people may have been Athabascans. Only three individuals out of 13 showed this trait. Its distribution in the plains is not known and it does occur, at a lower frequency, in southwestern and western groups. Therefore, the identification of the Upper Purgatoire complex as Athabascan should be considered with utmost caution.

The second oldest level at Trinchera Cave, about 100 km east of Trinidad, Colorado, is characterized by the presence of Taos Gray and Santa Fe Black-on-white sherds, and a higher percentage of corner-notched points than ocurs in the upper level (Wood-Simpson 1976). This second level could date from about A.D. 1100-1350, although if the two pottery types represent a single occupation, a date in the 1200s would be suggested. The other artifacts, including unnotched points, would not be out of place either in contemporaneous Southwestern complexes or in the Panhandle aspect, but in general the second level reflects ties to the Southwest, while the upper level has Panhandle relationships.

In the upper level was found the remains of a Jacal structure which may also have incorporated caliche slabs. On the basis of Stamper Cordmarked pottery (curiously unfired), and various artifacts characteristic of the Antelope Creek focus, occupation of the upper level was identified as Panhandle aspect.

Anasazi-Related Phases in Northeastern New Mexico

In prehistoric times there appear to have been movements of Pueblo culture and probably people into northeastern New Mexico from two centers farther west. The southern thrust, from the Santa Fe area, is well known from the lower levels at Pecos Pueblo and the nearby ancestral Forked Lightning site. This complex is also represented by numerous smaller sites along the Pecos River, between where it leaves the mountains near Anton Chico and Pecos and from the once-large and now nearly destroyed Tecolote site about 16 km south of Las Vegas. Other, mainly small, sites are found along the eastern foothills of the Sangre de Cristo mountains along streams that drain into the Pecos River, with at least one site near Watrous (Lister 1948) on the Mora River, a tributary of the Canadian. The Pueblo sites farther north along the foothills, all in the Canadian River drainage, have their closest relationship to sites in the Taos area.

Evidence of Anasazi occupation in northeastern New Mexico has long been noted (Bandelier 1890-1892, Moorehead 1931, Holden 1931, Mera 1935) but only in recent years has the large number of sites east of the Sangre de Cristos been realized, partly as a result of work done by Glassow (1972, 1980), who located some 300 sites in southwestern Colfax County and carried out extensive excavation of a limited number of these sites on the Philmont Boy Scout Ranch, as a part of its archeological program. Glassow has defined seven phases, three Anasazi-related, for the Cimarron, New Mexico area. He assigned about half the sites recorded to one or more of his temporal phases, and admits that most of the assignments are rather tentative, especially where he suspects two or more phases to be represented at a single site. I agree with Cordell (1978: 35) that the definition and dating of these phases is still open to question. It is based on an extension, through ceramic similarities and trade sherds, of the chronology from the Taos area, which is itself open to question. Although Glassow's phases can, at best, be considered tentative, they provide a beginning for the ordering of Anasazi prehistory in the area.

The dynamics of Pueblo culture development in the Upper Rio Grande area are far from being well understood, and the situation in the Cimarron area, which apparently has its strongest ties with the Taos area some 65 km to the west, is even more of a puzzle. In order to understand Cimarron area prehistory, there must be (1) extensive excavation at sites where each of the proposed phases is represented, (2) extension of dendrochronology into the area, and (3) a detailed analysis of the pottery found there to determine (a) which is locally made and (b) the source of trade sherds.

The earliest archeological complex in the Cimarron area with a well-defined ceramic tradition has been defined by Glassow (1980: 73) as the Escritores phase, for which he suggests a date of A.D. 900-1100 based on the presence of sherds identified as Kiatuthlanna and/or Red Mesa Black-on-White. This dating is seriously questioned by Cordell (1978). The associated utility ware is a "coarse sand-tempered, often neck-banded gray ware which is similar or identical to Kana's Gray." The only structure known for this phase is a deep circular pit house with four center posts, a collared fireplace, and a ventilator shaft toward the east.

Following the Escritores phase is the Ponil phase dated at A.D. 1100-1250 on the basis of associated Taos or Kwahe's Black-on-white, Taos Incised, and/or punctated sherds (Glassow 1980: 74). Although three of the four excavated sites assigned to this phase are rock shelters, the fourth included a three-room surface structure incorporating stone slabs in the walls. In addition to the pottery and stone artifacts found in thick middens at open sites, rock shelters have yielded yucca-leaf sandals, basketry, a rodent-skin bag, maize cobs and husks, and cucur-

bit seeds.

The final Anasazi phase in the Cimarron area has been designated the Cimarron phase and dated A.D. 1200-1300 (Glassow 1980: 74-75). Earlier, Baker (1964) had included these sites in the Ponil phase as he originally defined it. It is during this period that the largest sites in the area were occupied and the mouths of Cimarron and Ponil canyons densely settled. The ceramics of this phase continue to be dominated by plain gray ware, often with incised or punctated decorations on the upper half of the vessels. Glassow has proposed a new pottery type, Cimarron Plain, for the utility ware of the Cimarron phase, but the difference between this and the very similar preceding pottery, Taos Plain and Taos Incised, which are described as cruder, is not at all clear. In fact, the plain gray pottery of the still earlier Escritores phase, identified as Kana's Gray by Glassow, is also virtually the same if the neck-banded portion of a vessel does not happen to be in the sample. Another distinction made is that Black-on-white sherds with organic paint (Santa Fe Black-on-white) appear at sites of the Cimarron phase for the first time. Mineral paint types (*e.g.*, Taos Black-on-white) continue. Other pottery types, including indented corrugated and basketry impressed, appear in the Cimarron area in small numbers as well as in the Taos area (Wetherington 1968: 48; Herold 1968: 26).

The structures of the Cimarron phase are substantial. In the middle Ponil canyon one masonry structure measures 17 by 6 m, with a masonry partition lengthwise through the middle. One of the two rooms thus formed was excavated and found to be itself divided into four rooms with coursed adobe partitions (Glassow 1980). Along the Cimarron River, just below the mouth of the canyon, are stone wall bases of small multiroom structures on which adobe walls were presumably built. A 5 km section of the lower Ponil canyon apparently contained the most dense settlement of the phase. Limited excavation in three of seven closely spaced house mounds revealed coursed adobe walls forming rectangular surface rooms of varying sizes. One room can best be interpreted as a rectangular above-ground kiva. Another structure had been at least two stories high (Gunnerson n.d.). In the limited testing done no internal support posts, such as were found at Pot Creek Pueblo in the Taos area (Wetherington 1968), were found.

CHAPTER FIVE

THE LATE CERAMIC PERIOD

A date of ca. A.D. 1500 marks another change in the culture history of the plains. At about this date, there was a cultural adjustment to more normal climatic conditions after much of the Central High Plains had been subjected to severe droughts with a concomitant depopulation. Also, starting shortly after A.D. 1500, there are written documents that mention the Indians of the Plains and help identify archeological complexes with particular tribes. Athabascan speakers appeared from the north and for the next two centuries dominated the Central High Plains where Caddoan speakers had once been the only occupants. Not many years after the arrival of the Apaches from the north, Spaniards thrust from the south into New Mexico and then eastward into the Central Plains. There, beyond the Apache buffalo hunters, they found Caddoan villagers who continued to present a nearly solid block immediately to the east of the High Plains until it was penetrated by first Siouan and later Algonquin speakers from farther east. By the mid-1700s there was considerable turmoil throughout the plains with Shoshonean speakers coming in from the west as well. The next century saw accelerated decline of older Plains cultures and the rise of the pantribal, horse-oriented, culture that quickly vanished in the mid-1800s with White settlement of the plains. A date of about A.D. 1750 would be a reasonable terminal date for the period called "Late Ceramic" for soon after that date pottery-making started to decline as village complexes became decadent. What is here called the Late Ceramic period, also commonly referred to as the Protohistoric, is followed by a fully historic period.

Within the Late Ceramic period, we will be concerned with the limited evidence of Shoshonean archeology along the foothills of the Rockies, the Dismal River aspect (protohistoric Plains Apache) which dominated the Central High Plains, the White Rock aspect (probably Siouan) which is on the eastern edge of the Central High Plains later in the Late Ceramic period, the Great Bend aspect (protohistoric Wichita) immediately to the east and the Lower Loup aspect (protohistoric Pawnee) immediately to the northeast of the Central High Plains.

Shoshonean Archeology

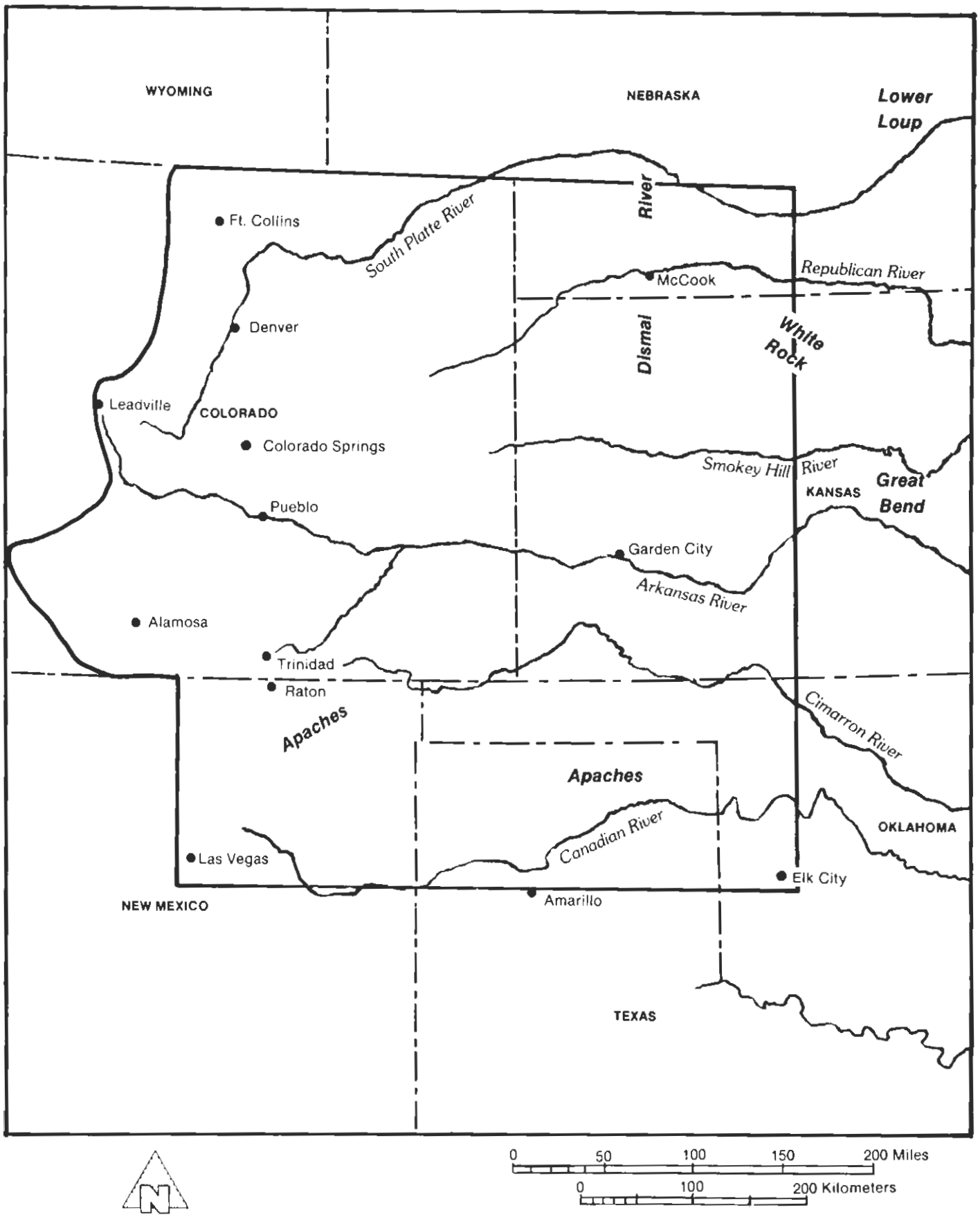
Shoshone occupation is demonstrated in the Colorado foothills at a site near Tiny Town, some 16 km southwest of Denver. Here a flat-bottomed ceramic vessel is reported from the Graeber Cave site, 5 JF 8 (Nelson and Graeber 1966). The cave, which opens to the south, overlooks Turkey Creek, which provides an easy route between the Denver basin and South Park. In the occupation level of the cave there was a rock-ringed hearth and a few chipped stone artifacts in addition to the sherds, apparently all from a single vessel. One point was triangular and unnotched, about 3 cm long. The other, also triangular and about the same size, was corner-notched leaving a parallel-sided stem about 0.8 cm wide; blade edges were serrated. Two point fragments and an end scraper were also recovered.

The pottery, the first Shoshone pottery vessel reported from Colorado, resembles Intermountain Tradition ware found in Wyoming which has been reported by Wedel (1954: 404), Mulloy (1958: 197) and Frison (1971, 1978: 64).

There is no direct dating of the flat-bottomed Shoshone ware, but the authors feel that it dates from about A.D. 1500. If this is the case, as they point out, the corner-notched point probably represents another, earlier occupation of the cave, since it is of a type that would predate A.D. 1000.

White Rock Aspect

The White Rock aspect, comprised of the Glen Elder and Blue Stone foci, has seemed something of an anomaly in plains archeology. This complex has been known and described in print for nearly 50 years, since Wedel (1935b: 227-229) reported his Beloit 2 site near Glen Elder, Kansas. He noted close similarities between the material from Beloit 2 and material from a site on nearby White Rock Creek, Jewell County, Kansas, that was in the A.T. Hill collection in the Hastings, Nebraska Museum. Perhaps this latter site is the Warne site (25 JW 1) referred to by Wedel (1959: 534-535). In 1937 a party from the Nebraska State Historical Society excavated two sites on White Rock Creek, Kansas, and carried out limited excavations at a site on the Solomon River at Glen Elder, Kansas (Hill and Cooper 1937: 245). This work was reported by Rusco (1960: 44-71) who, strangely, does not mention Wedel's 1935 work and does not cite the publication by Hill and Cooper (1937) whose work she reports. Smith (1949a) visited the Beloit 2 site, designating it 14 ML 1, and also noted a similar site



SELECTED LATE CERAMIC COMPLEXES

(14 JW 1) upon which a George Warne lived, near where Kansas Highway 14 crosses White Rock Creek. In 1951 and 1952 parties from the Missouri River Basin Survey visited these sites, but contributed no additional information regarding them.

In 1950-1952, the University of Nebraska Laboratory of Anthropology excavated at the Blue Stone (25 HN 44) and Green Plum (25 HN 39) sites that were to be flooded by the construction of the Harlan County, Nebraska dam. Mention of this work was made by Cummings (1953) and a full report was published by Rusco (1960). A tree ring date of A.D. 1614 from an outside ring (near bark) was arrived at by Harry Weakly (1962: 142). This is apparently the only tree ring date for any of the White Rock aspect sites.

Wedel (1935b: 229) recognized the Beloit 2 site as different from others in the area and suggested a relationship to some sites in central Kansas. Kiehl (1953) assigned sites 14 ML 1 and 14 JW 1 to the Glen Elder focus of the White Rock aspect. Stephenson (1954), reporting the consensus of a committee, agreed on these focus assignments and tentatively added site 14 JW 2 to the Glen Elder focus. The committee was undecided as to whether these foci should, in turn, be assigned to the Oneota aspect or to a new White Rock aspect. Wedel (1959: 534-535) was emphatic that these sites "are not Oneota, though they clearly share some traits with that aspect."

The following summary of the White Rock aspect is based on Rusco (1960) who describes and tabulates traits from four sites: two from the Glen Elder focus in north-central Kansas and two from the Blue Stone focus in south-central Nebraska. For the most part, artifacts from one of the Kansas sites were not accessible to her, but notes she cited indicated that they were similar to those from the other Glen Elder focus site.

The sites of the two foci apparently had different functions. Those in Kansas were situated on ridges well above stream bottoms, and showed evidence of semipermanent occupation in the form of houses and bell-shaped storage pits, not found at the Nebraska sites. The latter were situated on low land along a stream and one was subject to near annual flooding; the other was on a low terrace just above the flood plain. The remains of two houses were excavated at 14 JW 1:both were more or less square with rounded corners and measured 8 and 6.7 m across. The floor of one was about 30 cm deep and the other just below the plow zone. In the center of each was a shallow basin-shaped hearth surrounded by four post holes roughly forming a square. One had six additional post holes which formed no particular pattern and the other had one additional post hole and an inside storage pit. No evidence of entrances is reported. Site 14 ML 1 may also have had house structures, but this is not certain. Scattered about all four sites were shallow basin-shaped pits, containing a limited amount of detritus.

The artifact assemblages from the two foci were very much alike except that grooved mauls, boat-shaped shaft smoothers, scoria abraders, catlinite pipes and bone tools were reported from the Glen Elder focus and not from the Blue Stone focus. This may reflect, at least in part, the fact that the Kansas sites were semipermanent horticultural villages while the Nebraska sites were temporary camps, even though they did cover extensive areas.

Projectile points were predominantly small and triangular, with straight or concave bases and without notches; a few were side-notched. Stemmed (corner-notched) points were very rare. Knives were four-sided (diamond-shaped) with alternate-bevel edges, but a few oval and triangular specimens were also found. Plate jasper knives were common in Nebraska and absent in Kansas. Keeled and flat end scrapers, crude scrapers or choppers bifacially sharpened, and numerous modified flakes were found. Bone artifacts, found only in Kansas, included: bison scapula hoes with unmodified articular ends, bison scapula knives, a bone awl or flaker, a bird bone awl, a possible beamer made from a worked rib, worked cancellous bone, and shell beads. Faunal remains included bison (by far the most common), rabbit, elk(?), canid, turtle, mollusk and unidentified mammal. The nonceramic inventory would be compatible with that of almost any early historic or protohistoric plains complex; it is the pottery that is distinctive and diagnostic. Although the sample from the Blue Stone focus is smaller, the variation is slightly greater, so the description of Blue Stone pottery will suffice for the aspect. The vast majority of sherds from the aspect are classified as

"Walnut Decorated Lip" which was described by Rusco (1960: 30-33) A few aberrant sherds, including one with shell tempering and trailed-line decoration, are probably intrusive.

Although Wedel resisted assignment of the White Rock sites to the Oneota aspect, there are enough similarities for the idea to have been considered. The nearest Oneota site, the Fanning site in northeast Kansas (Wedel 1959: 131-170) and the Leary site in southeastern Nebraska (Hill and Wedel 1936), are located essentially straight east of the White Rock sites. The Oneota aspect, tentatively attributed to the Chiwere Siouans, is comparable in age to the White Rock aspect for which a Kansa (Dheghia Siouan) authorship has been suggested but not proven. Wedel (1959: 600-615) discusses this problem rather thoroughly.

Lower Loup Focus

No Lower Loup (protohistoric Pawnee) sites are known from the Central High Plains, but the very absence of these probable descendants of Upper Republican peoples is of interest for our reconstruction of High Plains culture history. Their sites, all substantial villages, lie in a very limited area near the

mouth of the Loup River in east-central Nebraska. In spite of repeated extensive excavations at various of these, there is no substantial site report or thorough overall synthesis. No attempt will be made here either to present such a synthesis or to provide an exhaustive bibliography for this key complex. By far the most thorough treatment of any part of the complex is Grange's (1968) *Pawnee and Lower Loup Pottery*. The most extensive general treatment of the complex is still that presented by Dunlevy (1936). Wedel (1961a: 108-111) provides a good brief summary and earlier did much to establish the relationship between Upper Republican, Lower Loup and Pawnee (Wedel 1936, 1938). Strong (1935: 55-68, 1940) also dealt with this relationship. There is general agreement that Lower Loup developed into at least some bands of Pawnee in the Lower Loup area. Most plains archeologists support the idea that Upper Republican people moved north to the Missouri River in southern South Dakota, perhaps to the Arzberger site, for example (Spaulding 1956), and returned to eastern Nebraska as proto historic Pawnee. As pointed out earlier, Ludwickson (1975, 1978) has suggested that the Loup River phase of Upper Republican is the immediate ancestor of the Lower Loup focus, an idea that has not yet gained general acceptance.

Lower Loup sites are particularly numerous along the north bank of the Loup River a few kilometers in either direction from Genoa, Nebraska. Villages of 6 to 40 ha occupy high terraces or bluffs overlooking. These communities consisted of many round earth lodges, 8 to 15 m in diameter, with floors 30 to 65 cm deep. Surrounding a central fire basin and about half way between it and the wall were four substantial center posts. A second series of 8 to 16 smaller posts was located about 1 m from the wall, and a third series of closely spaced small posts was set either at the edge of the floor or on the ground surface just beyond the edge of the house pit. A long covered entrance extended away from the prevailing wind, often to the east. Cache pits were dug into the house floors and there was commonly a raised altar against the wall opposite the entrance.

Pottery, very abundant at Lower Loup sites, is grit-tempered, well-made and varied in form. The most distinctive feature is the presence of many closely-spaced handles around the rim, giving a "cloistered" effect. The surface is usually simple stamped and incised decoration is common on the upper body. Designs are commonly a series of triangles filled in with parallel lines. The decoration suggests influence from complexes occurring on or near the Missouri River in South Dakota. Lower Loup pottery has been found at Great Bend sites in Kansas, and vice versa (Wedel 1959: 576, 586).

Other artifacts include small triangular projectile points, stone knives, scrapers, drills, L-shaped elkhorn scraper handles for stone blades, toothed bison metapodial fleshers, bison scapula digging tools, bone needles, bone paint brushes, and catlinite ornaments and pipes. These artifacts are all characteristic of various protohistoric plains complexes. Stone metates and manos are conspicuously scarce; corn was probably ground in wooden mortars.

Lower Loup subsistence was based on a combination of hunting and horticulture which, judging by the many large cache pits, must have been highly productive. Single flesh burials have been found in and near the villages. A few items of non-Indian manufacture occur at Lower Loup sites, but no Southwestern sherds or turquoise artifacts have been reported. On the basis of archeological and historical evidence Grange (1968: 127) dates the Lower Loup focus from A.D. 1500 or 1550 to 1750 or 1775. By 1775 historical documents permit the identification of individual sites as Pawnee.

Great Bend Aspect

One of the richest complexes in the Central Plains is the Great Bend aspect, representing the protohistoric Wichita. Known sites are almost entirely on those tributaries of the Arkansas River coming into it from the left (north or east side) in central and south-central Kansas. Only the two westernmost Great Bend sites, those at Larned, Kansas, are in the area we have defined as the Central High Plains, and these two only by about 4 km. As one would expect on the periphery of an area, these sites are very small by Great Bend standards, but one is especially important because of the information it has provided on houses. No Great Bend sites have been reported from north of the Smoky Hill River or from south of Kansas although it is probable that some will be found in northern Oklahoma.

Archeological investigation of the Great Bend complex began in the late 1800s with the work of Udden (1900). Since 1940, Wedel has furthered knowledge of the aspect greatly through systematic and repeated excavation at Great Bend sites for the Nebraska State Historical Society (Wedel 1935c) and for the Smithsonian Institution (Wedel 1940a, 1941b, 1942, 1949, 1950, 1959, 1961a, 1967, 1968a, 1968b, 1970b, 1970c, 1975, 1976, 1977; Wedel and Wedel 1976). The University of Kansas (Smith 1949a, 1949c) and the Kansas Anthropological Association (Monger 1970) have contributed important additional information. The most extensive and detailed treatment is to be found in Wedel (1959). It, along with the publications of Wedel in 1949 and Monger in 1970, provides the basis for this summary.

A very distinctive structural feature of the Little River focus of the Great Bend aspect is known from five nearby sites near the divide between the drainages of the Arkansas and Smoky Hill Rivers. These earthworks, generally called "council circles" are probably of a calendrical and/or ceremonial nature (Wedel 1959, 1967, 1968c, 1977). In general the pat-

tern consists of two concentric elliptical depressions 30 to 60 m in maximum diameter, surrounding a low central mound 18 to 27 m in diameter. The outer depression represents a broad continuous ditch whil the inner depression is made up of four elongate curved basins which had apparently been roofed over in some manner. Near the center of the circle is evidence of a substantial fire, and cache pits are sometimes associated. Usually the fill of the basins contains disarticulated and partially articulated human skeletons; an occasional articulated skeleton appears to be of a body that was thrown into the pit with no concern for position or orientation. Also in the fill is evidence of a superstructure, consisting of charred beams, fired pole-impressed clay, and pieces of sandstone up to 100 kg. Some of the detritus apparently represents material that was in the structures when they burned, as well as general village refuse. Numerous large (up to 2.5 m deep) cache pits are found at these sites but no evidence of domestic architecture. The alignment of some of these sites suggests solstice observation points, and Wedel suggests that the skeletons might represent human sacrificial victims, although many are clearly secondary burials. The bodies or skeletons were apparently not in the structures when they burned.

These "council circles" are in marked contrast to the dwellings of the Great Bend aspect. Archeological evidence of such structures has been reported by Monger (1970) from a site in the edge of Larned, Kansas, at the extreme western limit of Great Bend distribution and just barely within what we have defined as the Central High Plains. The Larned site (14 PA 307) is located at the confluence of Pawnee Creek and the Arkansas River, in an area that floods occasionally even now and that flooded repeatedly during the periods of occupation. After each flooding, which left a layer of silt, new houses were built. The lowest zone is assignable to the Smoky Hill aspect. The second zone from the bottom, attributed to the Pratt focus, was separated from the Smoky Hill occupation by 60 cm of nearly sterile fill. The third zone, representing the Great Bend aspect, was separated from the second by 45 cm of layered fill that contained artifacts and detritus but no structures. Within the 52 cm-thick Great Bend zone were three occupation levels, each with structures. In the upper 34 cm of fill was a fourth component, of unknown cultural affiliation, characterized by a pottery type called by Monger "Larned Fine Line".

Within the Great Bend zone Monger uncovered the remains of 5 structures in the upper layer, 3 in the middle layer and 3 in the lower level. In addition to these 11 complete patterns, he found sections of about 22 others that lay primarily in adjoining, unexcavated, portions of the site, of whichthe 12 by 12 m section excavated probably represents only a small portion. The three houses in the lower level had been only about a meter apart, and had burned, probably at the same time. All 11 Great Bend houses conform to much the same pattern. They are circular to slightly elliptical with maximum diameters of 3 to 5.5 m. The perimeters are represented by small conical post holes:49 in the case of a 5.5 m house; 21, 23, and 23 in the cases of 3, 4, and 5 m houses, respectively. Found in at least some of the houses were molds of small pegs which had been driven in beside the posts, presumably to lash the grass-covered structure to the ground. In the center of each house was a simple fire basin, to the east of which was often a post hole thought to represent a crane post. Other post holes were sometimes present, and in one case an apparently flimsy structure had been rebuilt or strengthened with additional posts. In one house, gaps in the post ring suggested entrances to the north and south.

There is little doubt that these structures correspond to the grass-covered domed structures described by Coronado (Hammond and Rey 1940) and Onate (Hammond and Rey 1953) in 1541 and 1601 for the Quivira Indians and known ethnographically for the historic Wichita (Bushnell 1922: 179-181; Fletcher 1907; Douglas 1932). Furthermore, their location in the bottomlands, which were subject to flooding, would put them in and among the gardens, the situation recorded by the sixteenth century Spanish explorers. The need to conserve precious bottomland could account for the houses being so close together. The artifact inventory from the Great Bend zone at the Larned site corresponds well with that described by Wedel for the complex as a whole, although no artifacts of non-Indian manufacture were recovered.

Pottery

Descriptions of the four major Great Bend pottery types, Cowley Plain, Geneseo Plain, Geneseo Red Filmed and Geneseo Simple Stamped (Wedel 1949) In addition to these types, there is a small but consistent occurrence of cord-roughened sherds described by Wedel (1959: 242) as thin, hard, and "characterized by a fine compact dark-gray paste, with somewhat coarser and less abundant gravel inclusions than are found in the non-cord impressed wares; the sherds are 3.5 to 7 mm thick, and hardness is 4.5 to 5.5. Medium to fine cord impressions, often much worn or rubbed down, cover exterior surfaces."Except for the cord roughening, the sherds are not easily distinguished from Geneseo gray wares.

Other Artifacts

Chipped stone tools are well made and abundant at Great Bend sites. Carefully fashioned small to medium-sized plano-convex end scrapers contrast markedly with the crude end scrapers of other contemporaneous cultures. Almost equally common are side scrapers, usually with a single scraping edge,

in a variety of forms. Projectile points are small, delicate and basically triangular. They are of the typical late prehistoric and protohistoric form except that unnotched points greatly outnumber side-notched. A few points of other, widely varied forms are also found. Bifacially chipped knives include alternately beveled forms with two or four edges and unbeveled forms in a variety of shapes; a few are notched for hafting. Some drills have expanding bases, others are medium to heavy plain-shafted forms, and some are stemmed. Large crudely flaked choppers, some with shallow notches for hafting, are found but not especially common.

Ground and pecked stone artifacts are also abundant. Grooved mauls occur in a wide variety of sizes and forms; some are very carefully fashioned, with flanged grooves, while others are partially grooved cobbles. Metates or milling slabs may have either elliptical depressions or troughs indicating to-and-fro grinding. Both one- and two-hand manos are found. There are grooved sandstone arrow-shaft smoothers of the type used in pairs, plus abraders of various shapes used for sharpening or shaping other artifacts. The typical stone pipe is L-shaped, with a tall cylindrical or bulbous bowl and a short stem. Other pipes have low bowls and still others are simple tubes. Some pipes are of catlinite, some are of another red stone, and a few are of steatite. Perforated and unperforated sandstone disks, up to 7.6 cm in diameter, are of unknown function. The catlinite documents trade connections to the Minnesota area, painted pottery and turquoise indicate contacts with the Southwest; a green stone of unknown source was made into celts, and quartzite apparently came from northeastern Kansas.

Bone artifacts include numerous bison scapula digging tools. In the Little River focus of central Kansas, the articular end (the glenoid fossa) is commonly removed, while in the Lower Walnut focus of south-central Kansas, it is commonly socketed, or a groove is cut into the dorsal surface for purposes of hafting. This socketing approach is reminiscent of the way bone tips are attached to digging sticks as well as to scapula digging tools in earlier Oklahoma and Texas complexes. Bone awls have flat, round, or triangular cross sections and are made from edges of bison ribs or neural spines. Arrow-shaft straighteners are made from bison ribs in the Little River area and deer tibia on the Lower Walnut. Other bone artifacts include transversely scored ribs ("musical rasps" or "tallies"), paint applicators and hide processors, both of cancellous bone, and tubular beads. The serrated bison metapodial flesher, common to most protohistoric complexes of the Central Plains, is known only from a single surface find at a Great Bend site near Larned, and that site is only 1.6 km from a site assignable to the Dismal River aspect, of which such fleshers are characteristic. Four-sided or cylindrical stemmed and pointed bone artifacts were probably projectile points. Additional bone artifacts of types not previously reported for the Little River focus came from the Tobias site (Wedel 1968b: 57). These include: deer leg-bone shaft wrenches, metapodial digging stick tips, deer mandible sickles or graters, incised mammal bone tubes, and single-stop bird bone whistles. The first four of these are well known from the Washita River, Custer and Antelope Creek complexes of Oklahoma and Texas. Antler artifacts include socketed, conical projectile points, scoop-like tines, grooved knife handles (?), and eyed needles (?). Shell artifacts include disk beads, pendants, and spoons or scrapers.

Artifacts of non-Indian manufacture from Little River focus sites include fragments of chain mail, an iron axe, a large iron knife blade, double-pointed iron awls, rolled sheet copper or brass beads, and glass beads. The beads, described in greater detail by Wedel (1968a: 373), are all of a single type: a "pea-sized blue or aquamarine bead, sometimes showing deep weathering in cross-section and often with tiny air bubbles present." Smaller glass beads have been found on the surface, but these pea-sized beads have been found at four sites, some *in situ*.

Larned Fine Line Complex

This material is reported from the topmost zone at the Larned (Kansas) site (14 PA 307). The complex is defined almost entirely on the basis of the pottery, called "Larned Fine Line," which was stratigraphically above, and not mixed with, the Great Bend aspect material at the site. Decoration includes incised lines on the shoulders, tool impressions on the lip, pinch marks on the lip, and pinch marks on the rim about halfway between the lip and neck. The exterior of the vessels shows well defined simple stamping, sometimes an unusually wide grooved paddle. Monger, who has handled a great deal of pottery from central Kansas, has seen this ware at only one other site, 14 PA 301 (located about 1 km southeast of the Larned site) where it was apparently associated with Geneseo Simple Stamped (Great Bend) pottery and "Rio Grande pottery which dated 1525 to 1575" (Monger 1970: 3, 15). Larned Fine Line bears some resemblance to Lower Loup pottery from Nebraska. The artifacts associated with this pottery at the Larned site are not described.

Dismal River Aspect

As will be discussed in the Ethnohistory section, Apacheans are known to have been on the Central Plains in the early 1500s, the probable time of their arrival from farther north as bison hunting, dog nomads. Although Apachean sites of the 1500s have not yet been identified, they are certain to exist. Thus far, sites identified as Apachean in the Central Plains are those assigned to the Dismal River aspect, which represents a semisedentary, horticultural, pottery using phase that apparently postdates the

time when the Apaches were friendly with Caddoan farmers and could live near them in the winter and trade for corn. Direct dating, based on dendrochronology and associated Southwestern trade pottery, places Dismal River at about 1675-1725 (J. Gunnerson 1960, 1968), although documentary evidence, to be discussed later, indicates that this way of life was probably established by about 1640.

The Dismal River aspect received its name from the Dismal River, a very pleasant stream in the Sand Hills of northwestern Nebraska, where distinctive artifacts of the complex were first found. During the early 1930s, W.D. Strong (1932, 1935), W.R. Wedel (1935) and A.T. Hill identified components of this aspect at various sites in western Nebraska and suggested an Apache authorship as one possibility. In 1939 the Nebraska State Historical Society excavated Ash Hollow Cave in west-central Nebraska and found Dismal River pottery in the uppermost layer, stratigraphically later than Upper Republican (Champe 1946). The same year, excavation was carried out in Chase County, southwestern Nebraska at the Lovitt site (25 CH 1), probably the largest of the known Dismal River villages, and at the nearby Nichols site (25 DN 1). This work (Hill and Metcalf 1942) greatly increased the Dismal River artifact inventory, especially with regard to structures. Also in 1939 Wedel(1940a; 1959: 422-468), of the U.S. National Museum, excavated at the Scott County Pueblo site in west-central Kansas and recognized that, except for the seven-room pueblo itself, most of the material could be assigned to the Dismal River aspect. The pueblo had been excavated previously, in 1898, by H.T. Martin, who had eventually concluded that it had been built by refugee Taos or Picuris Indians in the mid- or late 1600s (Williston 1899; Williston and Martin 1900; Martin 1909).

In 1948 the University of Nebraska started holding its summer archeological field schools at White Cat Village (25 HN 37), a Dismal River site in Harlan County, south-central Nebraska (Champe 1949; J. Gunnerson 1960). In 1949 the Nebraska State Historical Society excavated at three Dismal River sites, the Humphrey site (25 HO 21) and two smaller ones, in Hooker County, northern Nebraska not far from the original sites on the Dismal River (J. Gunnerson 1960). Dismal River pit houses were excavated in the 1950s by the University of Colorado at Cedar Point Village near Limon, Colorado (Wood 1971).

In 1964 Gunnerson conducted a reconnaissance in central and western Kansas and excavated at selected Dismal River sites the following year (J. Gunnerson 1968). The Wells site (14 BT 404) near Great Bend, previously tested by members of the Kansas Anthropological Association (Anonymous 1961), had been occupied mainly by Great Bend people but had a Dismal River component. A single, Dismal River house was uncovered at the Reed site (14 PA 304) near Larned. Testing around the Pueblo (14 SC 1) in Scott County failed to disclose any Apache structures, but, about 0.5 km to the north, one was excavated at the Ledbetter site (14 SC 111) and one at the Coffin site (14 SC 106). Witty (1971a, 1971b) re-excavated the Scott County Pueblo and reconstructed the original wall bases for the Kansas State Historical Society.

General discussions of the Dismal River aspect have been published by J. Gunnerson (1960, 1968) and by Wedel (1959: 589-599). D. Gunnerson (1974) established that ca. 1730 many of the Dismal River people eventually joined the Jicarilla Apache, to become their Llanero band, and suggested that others probably joined the Lipan. Gunnerson and Gunnerson (1971: 19) postulated that the northernmost Dismal River people, those of the Sand Hills and Badlands, probably represented by sites as far north as the Black Hills, became the so-called Kiowa Apaches. The end of the Apache domination of the Central Plains (and the end of the Dismal River aspect) in the late 1720s was brought about by hostile pressure, primarily from the Pawnee on the northeast, and Comanche to the west and southwest (D. Gunnerson 1974).

Distribution and Subsistence

Dismal River sites are found between the Rocky Mountains and the 99th meridian and from the Black Hills south to the Oklahoma Panhandle. The villages, however, are nearly all in the eastern half of this area, probably reflecting conditions more favorable for horticulture. However, the average rainfall is only about 50 cm per year even at the major villages. The western sites may have been occupied only temporarily, probably in connection with non-horticultural activities.

The main resource of the Dismal River area was grass pasture for the great herds of bison that the Apacheans utilized with such consummate skill. In the eastern half of the area bottomlands along small permanent streams provided garden plots, and it is in such places that Dismal River villages are situated. At the Scott County, Kansas Pueblo site, there was evidence of irrigation ditches, probably Apache, leading from an unusually productive spring.

Subsistence was based primarily on hunting, with horticulture a secondary, perhaps mainly gustatory, consideration. Bison was the main animal hunted, but deer, beaver, turtles and dogs are represented in the faunal assemblage and were presumably eaten. Bird bones and mollusk shells are rare and evidence of fish has yet to be found, perhaps reflecting the once-common Apache fish taboo. Seeds of wild plums and chokecherries as well as black walnut shells have been recovered. Corn and squash or gourds, represented by charred remains, were presumably cultivated. The apparent low row numbers of the limited corn samples (J. Gunnerson 1968: 185) suggests that it was probably of a plains rather

than southwestern origin (cf. Galinat and Gunnerson 1963).

Villages and Structures

Dismal River villages covered as much as 185 ha. Houses are scattered, perhaps tending to be grouped in small clusters, but with no apparent concern for defense. The typical Dismal River house consisted of an unprepared floor at or just below ground level, and some sort of pole and earth roof. The latter was supported by five center posts set vertically in a circle 3 to 4 m in diameter. These base posts were presumably joined by stringers against which small wall poles were leaned, enclosing an area with a diameter about twice that demarcated by the center posts. In some cases two additional posts set on this outer circle at the east side probably supported an entrance, perhaps dormer-like. The five base-post pattern was dominant at White Cat Village, was represented by one of two houses at the Lovitt site, and by the one house at the Ledbetter site. One house at White Cat had six center posts. The houses at the Reed and Coffin sites each had four center posts. The pattern of one house at the Lovitt site is uncertain, perhaps due to rebuilding.

The five base-post pattern, in Plains archeology unique to Dismal River, is probably related to the five-post pattern of the old style forked-stick Navajo hogan (Mindeleff 1898) although the structures were quite different. The Dismal River house was perhaps similar to the conical structures, such as the Mandan and Hidatsa eagle trapping lodges (Wilson 1934), found also at various Arikara sites (Lehmer 1971: 113). They may have been influenced by the Plains earth lodge such as that built by the contemporaneous Lower Loup Pawnee, or by the Wichita grass house, or both. In any case one might describe the Dismal River dwelling as a Navajo forked-stick hogan with the five religiously prescribed posts set vertically and used like the center posts of a plains earth lodge, thus giving more space inside.

Characteristic of most Dismal River villages, and especially common at the Lovitt site, are irregular trash-filled pits, perhaps originally borrow pits for earth to cover houses. Cache pits, used by all other plains village groups for storage of corn, have not been found at Dismal River sites.

Bell-shaped baking pits, in the plains diagnostic of Dismal River, are found at villages in southern Nebraska and Kansas and at a nonceramic site in southwest South Dakota. In the Southwest, however, they are found not only at Apache and Navajo sites, but at Pueblo sites as well (J. Gunnerson 1968: 175). They were used until recently by the Jicarilla Apaches for cooking green corn. These pits, heavily burned and about 1 m in depth and maximum diameter, constrict at the mouth. At one Dismal River site in Scott County, Kansas, a baking pit contained a burial (J. Gunnerson 1969a) as did one in southwestern South Dakota (Hughes 1949: 275) and others at a Navajo site in northern New Mexico (Carlson 1965: 24-25).

Except for the burials in baking pits, (which may not be those of Apaches) no skeletons have been found that can be attributed to Dismal River people. Isolated burials at a distance from villages would be in keeping with Apache fear of the dead.

Pottery

Although Dismal River pottery is nondescript, it is diagnostic. The earliest attempt at classification was that by Metcalf (1949) who described three types. The most common, Lovitt Plain and Lovitt Simple Stamped, are distinguished only on the basis of surface treatment and both can be found on a single vessel. Wedel's Scott Plain (Wedel 1959: 592) is apparently indistinguishable from these two types except by its very low incidence of simple stamping. As suggested elsewhere (Gunnerson and Gunnerson 1971), the surface treatment of Apachean pottery in general closely reflects that of their neighbors, and the pottery at Dismal River villages most closely resembles that of the nearest large-village tribe: Mandan, Arikara, Pawnee, or Wichita. Metcalf's third type, Lovitt Mica Tempered, is probably the same as Wedel's (1959: 593) Scott Micaceous. Micaceous sherds are definitely in the minority at Dismal River sites and most are probably trade sherds from northeastern New Mexico of a type called Ocate Micaceous and made by Jicarilla Apaches until c. 1750 (J. Gunnerson 1969b: 26-27).

The only other artifacts of clay are tubular smoking pipes which may have been patterned after the Pueblo "cloud blowers." In fact, one pipe from the Reed site certainly and some of the pipes recovered in Scott County by Wedel (1959: 488) probably were imports from New Mexico.

Stone Artifacts

Most of the stone artifacts found at Dismal River sites, although generally cruder, are much like those found at other protohistoric sites in the plains. Projectile points are mainly small, delicately chipped and triangular, either side-notched or unnotched, with concave to straight bases. Points of miscellaneous shapes and sizes found at Dismal River sites may have been picked up by the Apaches. Well-made knives are rare, but crude cutting tools are common. The latter include large flakes which required very little modification, pieces of tabular chalcedony (where available) upon which a cutting edge had been chipped, or, where there was an abundance of raw material, large crudely chipped bifacial choppers.

End scrapers and side scrapers are common, but rarely was an effort made to finish any part except the scraping edge. Some end scrapers also have

graver points and these are diagnostic of Dismal River. Other combination tools are end scraper-spokeshaves and end-side scrapers. A few flakes were made into gravers or spokeshaves with a minimum of work.

Expanded-base drills, with only the bit portion well worked, are common. Plain-shafted drills are less so. One uncommon but diagnostic Dismal River artifact is the so-called "double bitted drill." These resemble two plain-shafted drills joined base to base, with one, two, or four lugs (projections) near the middle. The function of these is not obvious since they are often made of stone too soft for use in drilling and are often found broken.

The most common ground stone tools are arrow shaft smoothers -- rectangular pieces of sandstone grooved along the long axis on one face and presumably used in pairs.

Metates of two types have been found. Small thin milling slabs, sometimes carefully shaped, with a shallow round to oval depression are the most widespread. Very distinctive specimens, known thus far in the plains only from Scott County, Kansas and Lincoln County, Colorado have been found at two Apache sites in northeastern New Mexico (J. Gunnerson 1969b) and are known ethnographically for the Jicarilla. They are about 30 cm long, two to three times as long as wide, relatively thin, and rectangular with rounded corners and convex sides. The grinding surface is concave along the long axis and slightly convex or flat along the short axis. Manos are the same shape as the metates except for being relatively thicker and considerably smaller.

Bone Artifacts

Awls were usually made from splinters of bone with only the point well finished, but some were triangular or square in cross section and carefully finished all over. Tools similar to the latter, but with a blunt end, have been called flakers or punches. Carefully made and well finished bone projectile points, square in cross section with a basal tang for hafting, and socketed antler projectile points have been found at the Humphrey site in Hooker County, Nebraska. Bison ribs with holes drilled through them presumably were used as wrenches for straightening arrow shafts. Serrated bison metapodial fleshers, a good time marker for the protohistoric period in the Plains, have been found at most Dismal River villages. Often the cluster of foot bones, including the calcaneum, was left attached to form a handle. Antler tine flakers are common; some from the Lovitt site have a flattened area at the top and were apparently handles for end scrapers. Bison scapula hoes or digging tools have been found at most Dismal River villages. All have had the spine removed and some have had the articular end removed also. Others have a groove cut across the lips of the articular surface, presumably to facilitate halting.

In addition to tools, bone was used for aesthetic expression. Tubular beads were made by cutting off the ends of small cylindrical bones. What appear to have been curved arm bands or wrist guards have been found in northern Nebraska and western Kansas. Bone whistles and scored ribs, possibly musical rasps, are the only musical instruments recovered. Paint was apparently applied with spatula-like bone tools and with sections of bones cut so as to expose the cancellous inner portion. Both have been found stained with red pigment.

Trade Items

Ocate Micaceous is the most common trade pottery. All the painted sherds identified from Dismal River sites have been Tewa Red-on-buff or Tewa Polychrome. A few sherds of a type tentatively called Mora Punctated, probably from New Mexico but of uncertain cultural affiliation, have been found at a number of Dismal River sites (J. Gunnerson 1968: 179). Obsidian, a few pieces of turquoise, a few Olivella shell beads and two Pueblo style shaft straighteners probably also came from New Mexico.

Items of European manufacture are rare. An iron trade ax found embedded in the fireplace of a burned house at White Cat Village may have been left there by a Pawnee raiding party. Two gun flints, one apparently homemade, came from the same site. A few scraps of sheet brass or copper, conical sheet metal jinglers, and rusted pieces of iron, some of which may have been awls, have also been found. The nature and amount of European trade material is compatible with the location and dating of the Dismal River aspect, and with the material poverty of its main source of European goods--Spanish New Mexico.

Identification

The identification of the Dismal River aspect with the Plains Apache was established by Champe (1949) and subsequent work has continued to support this position (Gunnerson and Gunnerson 1971, D. Gunnerson 1974). Documentary and cartographic evidence shows Plains Apaches to have occupied the area during the period covered by the Dismal River aspect, and written accounts suggest a culture such as that revealed by the archeology. Also, increasingly, archeological work in northeastern New Mexico (J. Gunnerson 1969b, Gunnerson and Gunnerson 1971) is showing connections and similarities between Apache sites there and Dismal River sites.

Of the various bands of Apaches, the Cuartelejos and Palomas are almost certainly represented by the Dismal River villages thus far excavated. The region of El Cuartelejo included much of what is now western Kansas, far eastern Colorado, and western Neb-

raska south of the Platte River. The Paloma most probably occupied the Dismal River villages farther noth in western Nebraska and extended into southwestern South Dakota. The Carlana Apaches, in contact with both the Jicarilla of northeastern New Mexico and the Cuartelejo, were probably responsible for the Dismal River sites in southeastern Colorado.

Semisedentary Apaches seem to have been established in the region called El Cuartelejo by about 1640. At that date Apaches living on the "frontier of Quivira" (Wichita villages) were described as "people of El Cuartelejo" (Hackett 1923-1937 III: 263-264; Forbes 1960: 268) and the term cuartelejo was used in the 1600s to refer to an area containing semisedentary, hut-dwelling western Apaches (Tyler and Taylor 1958: 306; Gunnerson and Gunnerson 1971: 11). Escalante, writing in 1778 about an event that probably took place in 1640, and using as his source of information New Mexico lore of his own time, provides an explanation of the origin of the name "El Cuartelejo":

> . . .in the middle of the last century some families of Christian Indians of the nation and pueblo of Taos rebelled, withdrew to the buffalo plains and fortified themselves at a place which afterwards on this account was called El Cuartelejo (Twitchell 1914 II: 268).

Apparently no contemporary detailed account has survived of this flight which probably followed the Taos rebellion of 1640, nor of the return of some of the Taos to New Mexico in about 1662 under orders of Governor Diego Penalosa (Hackett 1923-1937 II: 263-264). Escalante's account has probably done a great deal to lead later writers to think of El Cuartelejo as a place rather than as a region and the presumed main village, in Scott County, Kansas, continues to be called by the same name. None of the datable material, however, is as early at 1640.

Fortunately, there are first-hand descriptions of El Cuartelejo by members of Ulibarri's party which, in 1706, went to the Plains to bring back refugee Picuris and Tewa (mainly Santa Clara) Indians who had fled to the plains in 1696 (Thomas 1935: 59-77). Ulibarri stayed at the main Cuartelejo village, which he named Santo Domingo, but his men visited at least four others, the most remote of which was some 40 leagues (250 km) away. The Picuris living at Santo Domingo occupied "huts or little houses," the Apaches lived in "huts" arranged around a plaza, but Ulibarri did not mention a substantial multiroomed structure. Jose Naranjo, who was with the party, did, however, find "excellent quarters" at another Cuartelejo village called in Apachean "Sanasesli." Fourteen years later Tenorio,another of Ulibarri's men, testified that he had seen in the region of El Cuartelejo "some ruins, which, according to the reports, were made a long time ago by the Taos tribe."He did not, however, say where in the region he saw the ruins, nor even that they were at an Apache village (Thomas 1935: 158). Another of Ulibarri's men says the Picuris were living in "restored" Taos houses. An in an account attributed to Escalante by Espinosa, Ulibarri's party is said to have found Picuris living in a restored house or block of houses built originally by Taos Indians (Thomas 1935: 262-264). This statement should be considered with caution since Escalante would have been writing some 70 years after Ulibarri's expedition and he does include some erroneous information. Ulibarri did comment that the land was fertile, the climate good, and various crops were raised. There are apparently no first- hand accounts of visits to Paloma Apache villages which were "on the most remote borderlands of the Apaches" (Thomas 1935: 132).

One line of evidence used initially to support an Apache identification of the Dismal River aspect was the belief that the seven-room pueblo containing mainly Dismal River artifacts in Scott County, Kansas. It was assumed that the structure, being of Pueblo style, had been the one said to have been built by the Taos, or another built by Picuris and Tewa refugees, while they, lived among the Cuartelajo Apaches. Archeology done outside the structure by Wedel (1959: 424-468) yielded artifacts dating only from the late 1600s or early 1700s, compatible with a 1696-1706 occupation by Picuris and Tewa Indians. He found no material indicative of an earlier Taos occupation of the mid 1600s. Witty's (1971a, 1971b) re-excavation of the house block revealed that a pueblo wall had been built over a Dismal River baking pit, and hence that at least part of the Apache occupation was earlier. He also discovered that no previous excavation of the house block had been complete. The Tewa Polychrome sherds Witty recovered inside the house block were identified by Helene Warren of the Museum of New Mexico as dating from 1700-1720, and probably near the end of this period--too late for even the 1696 Picuris refugees to have left them there. Witty also discovered a row of post holes just to the south of the pueblo suggesting a "portal" or porch. Such a feature was apparently not used by Taos, Picuris or Tewa Indians of the period, but was common in Spanish (Mexican) architecture. This new evidence, along with the puzzling scarcity of Pueblo artifacts, even inside the rooms, suggests that the structure may have been built as a Spanish trading post *after* Ulibarri brought back the Picuris in 1706. Construction by Pueblo auxiliaries would account for Pueblo-style fireplaces, corn grinding bins and the Tewa sherds. That such a trading post, although illegal, may have existed in El Cuartelejo is hinted at by several Spanish documents (Thomas 1935: passim). This explanation better accounts for all of the evidence than does the one that it was built by seventeenth century Pueblo refugees. There is no doubt concerning the Scott County site's being a Cuartelejo Apache village, however, and it is still the best

candidate for the main village, called by Ulibarri Santo Domingo.

Southern Plains Apache Archeology

Relatively little work has been done in Texas at sites attributable to Apachean groups, although historical sources (Thomas 1935: 82) clearly indicate that Apaches called Faraons by the Spaniards once occupied what is now northwestern Texas. Surface collections in the Panhandle-Plains Museum at Canyon, Texas, suggest that small Apache sites are fairly common in the central part of the Texas Panhandle. At one site near Stinnett, Texas, probable Faraon Apache sherds were found around three rock circles suggestive of structures. Just south of the Panhandle, in Floyd County, Texas, the Southern Plains Archeological Society excavated the Montgomery site (Word 1965) which probably has some bearing on the Apache problem since most of the pottery was of Southwestern origin and some was dated as late as the 1600s. Micaceous pottery recovered might be of Jicarilla manufacture, and Apaches may have been responsible for bringing the later Pueblo (glaze) wares to the area. The majority of the stone and bone artifacts would not be out of place in a Plains Apache assemblage.

Burned rock middens from about 115 km east of Trinidad in southeastern Colorado were reported in Greer (1966). One excavated, the Louden site (CO-1), consisted of an accumulation of burned rock and ashy soil located on a very slight hill. It was roughly circular with diameters of 5.5 and 9.5 m. A shallow central depression, filled with ash, was 3.5 m in diameter. The outer ring was composed of fire-cracked rock with a maximum height of 34 cm. A cobble hearth about 1.2 m in diameter was found between the central depression and the outer ring. In the middle of the shallow central depression was a basin into bedrock up to 18 cm deep and 2.7 m in diameter. This was partially lined with rock slabs set at an angle to effectively "deepen" the basin. Presumably the basin had been used for pit cooking and the ring resulted from burned rock, ash, etc. being repeatedly cleaned out of the basin. Greer points out that elsewhere such pits are used for preparing mescal and sotol and suggests that cholla (cactus) buds or possibly meat might have been cooked at the Louden site. Associated artifacts include a small end scraper, a crude bifacial blade, several flakes, a metate fragment, and a mano; unfortunately none is diagnostic. A tipi ring, 4.3 m across and located 11 m from the midden ring, may have been associated. A radiocarbon date (sample TX-290) is 515 ± 65 B.P. or A.D. 1435. A possible Apache authorship is suggested for the site.

Greer (1965) discusses types and distribution of similar manifestations and finds that they occur sporadically throughout the Southwest but are most common in southeast New Mexico and west Texas. Ethnographically, they are attributed to various Apache bands and numerous other tribes.

On the Chaquaqua Plateau in southeast Colorado, the Apishapa focus is followed by sites with earth rings, sometimes surrounded by spaced rocks, suggesting habitations, perhaps the locations of earth banked tipis (Campbell 1976: 62-63). These average about 3.7 m in diameter, which would be a reasonable size for tipis small enough to have been transported by dogs. Cultural material associated with these rings is sparse and consists of a few corner-notched points, leaf-shaped and blade knives, gravers, large and small side scrapers, utilized flakes, slab metates and one-hand loaf manos. Chipped stone was almost entirely from local sources with a few flakes of Alibates but no obsidian. Pottery was absent. One of these sites yielded a radiocarbon date of A.D. 1435 ± 65 (Campbell 1976: 26, 64). Except for the presence of corner-notched, instead of triangular unnotched and side-notched points, these sites could represent early Apache occupation on the Chaquaqua Plateau, especially if the calendar date is closer to the more recent one-sigma range. By early in the 1500s Apaches would certainly have been in the area since Coronado's party in 1541 encountered them a little farther south where they had apparently arrived 16 years before (D. Gunnerson 1956).

Apache occupation of the 1600s and early 1700s on the Chaquaqua Plateau is thought to be represented at 10 sites that yielded thin micaceous pottery. Eight were open and two were rock shelters. Six were located on and the others near level flood plains with arable land. The most common projectile points are small elongate unnotched triangular points, but side-notched triangular points were also popular. Small and large side and end scrapers were found, as were various bifacial blades, utilized flakes and scraper knives. Unifacial metates and ground stone slabs were found so presumably manos were also used. Bones of a wide variety of large and small mammals were recovered. No structures were located for this period. Rings of spaced stones, presumably tipi rings, occur, and are thought to be of more recent historic age although associated artifacts are too meager to identify the rings with any particular complex. Metal points from some indicate a late historic date.

Jicarilla Apache micaceous sherds, both Ocate Micaceous (1600?-1750) and Cimarron Micaceous (1750-1900), have been found at sites along the Upper Purgatoire River west of Trinidad, Colorado, but no structures were associated (C. Wood and Bair 1980). Ocate Micaceous sherds were found in the upper level of Trinchera Cave, and a few thin sherds, similar to Perdido Plain (probably a Faraon Apache ware) were found at a site near Walsenburg. Dismal River-like, sherds were collected from a site on the Apishapa straight west of La Junta. Dismal River pottery has also been found at sites in the canyon of

the Dry Cimarron River south of Kim, Colorado, just barely over the state line into New Mexico (J. Gunnerson field notes). These sites are in territory occupied c. 1700 by Carlana Apache farmers and roamed over until the late 1800s by Jicarillas.

Northeastern New Mexico Apache Archeology

Many of the Apache sites in northeastern New Mexico can be attributed to the Jicarillas, or to groups known originally to the Spaniards under other names who eventually became part of the Jicarillas. Notable exceptions are a few sites provisionally assigned to the Faraon Apaches, who may have been assimilated c. 1800 by the Mescaleros.

The period for which we have the most data on Apache occupation is the late 1600s and early 1700s. Good documentary evidence (Thomas 1935), including references to Apache villages existing along the eastern edge of the Sangre de Cristos in the early 1700s, suggested this area as a logical starting point for Apache archeological studies(D. Gunnerson 1956; J. Gunnerson 1959, 1969b). Also, it was in this area and during this period that the Jicarillas and related Apacheans achieved a cultural climax as semi-horticulturists.

In 1599 Onate was told that Apaches lived in pueblos like those of the Tewas. However, there is as yet no archeological verification of this statement, unless by "pueblo" he meant "community" or "settlement" in general. Our best historical descriptions are those resulting from Ulibarri's journey of 1706 and Valverde's expedition of 1719 (Thomas 1935: 62-64, 110-133, 263). Both expeditions set out from Taos Pueblo, crossed the Sangre de Cristos and reached Apache villages in the foothills near Cimarron, New Mexico. Valverde's account is especially rich and describes small Apache settlements, of from one to eight adobe houses, and irrigated fields. In the mid-1700s pressure from hostile Indians, especially Comanches and Utes, forced these foothills Apaches to abandon their adobe-house villages. The Jicarillas shifted most of their farming activities westward over the mountains into the Rio Grande valley and into canyons between Taos and Picuris. However, they continued to frequent the country east of the mountain crests until they were placed on their reservation in 1887.

The remains of an Apache pueblo (the Glasscock site) about 57 km southwest of Cimarron have been excavated (J. Gunnerson 1969: 24-30). This site is located in the broad sheltered valley of Ocate Creek near its confluence with a major, dependable tributary. Although the elevation is about 2280 m, gardening and farming is currently successful in the area and was almost certainly practical when the site was occupied. Irrigation from the stream would have been easy, and the occupants had ready access to the resources of the mountains on the west and to those of the plains on the east. The only structure found at the site consisted of seven rectangular rooms, six forming a rectangle, with the seventh, attached to one side, forming an L. The overall dimensions were 7.3 by 9.8 m. Walls about 25 cm thick were made of layers of adobe apparently laid wet, since no evidence of adobe bricks could be detected. There was no evidence of doors or other openings through the walls, but only the wall bases remained. Charred wood and pieces of hard adobe with impressions of logs, probably vigas, were found within the structure. One room contained two partially superposed hearths, both D-shaped and built against an inside wall. A firepit was found in the sheltered area formed by the L of the building. Near the structure was a bell-shaped baking pit of the sort found at Plains Apache and Navajo sites.

The predominant pottery (96 percent) from the Glasscock site is Ocate Micaceous, a very thin hard ware with deep striations on the exterior surface. Thinning was apparently accomplished by using a corn cob both as a paddle and as a scraping tool, which left the striations. The paste contains a great deal of finely divided mica and angular grit, both apparently inclusions in the clay which was very probably taken from deposits near present-day Picuris Pueblo. Decoration is very rare and appendages are absent. The two known complete vessels of Ocate Micaceous, neither from this site, have heights significantly greater than the maximum diameter, rounded to somewhat pointed bottoms, slightly constricted necks, nearly vertical to moderately flaring rims, and simple lips. Association elsewhere with painted Pueblo pottery suggests a time span for Ocate Micaceous from perhaps the late 1500s to about 1750.

Other pottery at the Glasscock site includes Pecos glaze ware and plain Pueblo culinary ware similar to some from Pecos. Fragments of clay pipes, probably all tubular and undecorated, were also recovered. Sherds of blue and white Puebla (Mexico) majolica from the site were dated by E. Boyd as being from the early 1700s with two sherds possibly as late as the 1740s. The combined evidence for dating suggests that the Glasscock site was occupied in the first few decades of the 1700s, during which time, according to Spanish documents, Apaches were living in adobe structures in that general area. And there are no references to Indians other than Apaches living in the area at that time.

The chipped stone artifacts are limited but varied. Projectile points, small, delicate, and well made, are commonly triangular and either side-notched or unnotched. Other chipped stone tools include end scrapers, knives, and small crude "double bitted drills."

Most of the metates found at the Glasscock site are of a distinctive "Jicarilla" type also represented in the Jicarilla museum at Dulce, New Mexico by specimens relinquished only recently by Jicarillas. One complete metate representative of the type is about

30 cm long, 13 cm wide, and 5 cm thick. Such metates are quadrilateral with rounded corners and slightly convex sides and ends. They are distinctive in that the grinding surface is slightly concave along the long axis and straight to slightly convex along the short axis. The manos are similarly shaped, but smaller and relatively thicker. Neither the metates nor manos are well finished on the non-grinding surfaces. The site also yielded shallow basin metates as well as cobble manos that could have been used with them. Other ground stone artifacts included abraders and "Plains type" sandstone arrow shaft smoothers.

Bone artifacts, not numerous at the Glasscock site, consisted of tubular bone beads, awls, eagle wing bone whistles, a probable beamer (for working hide) and antler tine flakers (?).

The Sammis site, of approximately the same age as the Glasscock site but with a very different type of structure, is located about 8 km north of Cimarron, New Mexico (J. Gunnerson 1969: 30-31). The site is on the floor of Ponil Canyon above the reach of floods and about 5 km from the canyon mouth. Nearby farmland could be (and is) irrigated from Ponil Creek, which has permanent water. Elevation is 2000 m and the mountains to the north and west deflect cold winds. To the east of the Cimarron area lie the plains, and to the west are passes to Taos, Picuris, and the Rio Grande valley.

At the Sammis site an ovoid pit about 3 by 3.7 m and 60 cm deep had been surrounded by a ring or low wall of small rocks and roofed over with poles, bark, and probably earth, but no post holes could be found either in or around the pit. The superstructure had probably been conical and braced by the rocks, but no clue as to the nature of the entrance could be detected. Pieces of bark, presumably from the roof, occurred in the fill. There was a shallow basin-shaped hearth near the center of the floor.

The fill of the pit contained both Ocate Micaceous sherds and intrusive Pueblo sherds, presumably derived from nearby Pueblo structures dating from the 1100s or 1200s. Also in the fill was a turquoise bead, a "Plains-type," "snub nosed" end scraper, a drill fragment, and a broken "double bitted drill." From the floor of this pit structure came more Ocate Micaceous sherds, a bone awl, and a sherd of blue and white majolica dating from the early 1700s. The scraper is especially significant since it also had a chipped graver point. No evidence for contemporaneity of the Apache and Pueblo occupations was found during the excavation of all or part of four of the nearby Pueblo structures.

Apache sites of about A.D. 1700 (as well as later) were commonly located on benches or terraces 9 to 30 m above the floor of Ponil Canyon, but within a few hundred meters of the stream. Several of these sites were investigated in both the lower Ponil Canyon (Gunnerson 1969: 32-35) and on the Philmont Scout Ranch in the Upper Ponil Canyon (Glassow, 1980: 76). Structures were amorphous, built on the surface or over shallow depressions, sometimes surrounded by a few rocks, and often showing evidence of having been destroyed by fire. Cultural remains, consisting mainly of Ocate Micaceous sherds and stone chips, are sparse at these sites.

In the mouths of other canyons near Cimarron and on the plains for a few kilometers out from the Sangre de Cristo Mountains are other archeological sites (J. Gunnerson 1959; Schroeder 1959: 8, 33). Some, which could be of Apache authorship, are "tipi ring" sites without pottery, but other cultural material is so sparse that they cannot be dated, even roughly.

The Faraon Apaches were known under a variety of names and by the late 1600s and early 1700s roamed over a large area from the Sandia Mountains east well into the plains. Their villages, some with mud-plastered wood (jacal ?) houses, were reported to the Spaniards in 1715 (Thomas 1935: 24, 82). Precise locations were not given, but they were probably on the Canadian River in the panhandle of Texas, where probable Faraon sites have been found in the Palo Duro near Canyon and on the Canadian near Stinnett. These sites yield pottery similar to that from a large "tipi-ring" site on the plains about 50 km northeast of Las Vegas, New Mexico. This site, Ojo Perdido (Gunnerson and Gunnerson 1970: 3; 1971: 10), is unusual because of the large number of tipi rings (well over 200) and because pottery, although not abundant, is associated with many of the rings. The dominant pottery, Perdido Plain, is a thin undecorated ware that resembles a Pecos Plain ware of the 1600s and 1700s, although it is thinner. Associated glaze sherds from both Pecos and Picuris suggest a date in the mid-1600s for the site. Excavation in and around rings failed to reveal any subsurface evidence of occupation, not even evidence of hearths, but the site may have been deflated.

The function of the Ojo Perdido site is uncertain, although the presence of what had been a good spring was an obvious attraction. The paucity of cultural remains suggests temporary occupation or occupations. The most plausible explanation is that the place frequently served as a camp, perhaps only overnight, for Faraon Apaches are known to have traveled often between the plains and the pueblos of Pecos and Picuris, especially the former.

Pecos Pueblo was frequented not only by the Faraons, but also, especially in the mid-1700s, by allied Carlanas, Palomas, and Cuartelejos, as well as Jicarilla Apache groups. In some instances Apache visitors lived at (even in) the pueblo for periods up to several months (Thomas 1940: 124). Reconnaissance in the immediate vicinity of Pecos Pueblo disclosed several areas that may have been occupied by Apaches (Gunnerson and Gunnerson 1970). A burned pole and earth structure was excavated that had been about 3.7 m in diameter and built on the

surface of the ground or over a very shallow pit. Associated items were a small Ocate Micaceous pot, a plain black Pueblo olla, and a Pueblo red ware bowl, all crushed when the house fell in. Also on the floor were burned corn, burned beans, a tubular clay smoking pipe (Pecos style), a copper cone, triangular stone projectile points, the tip of what had probably been an iron awl and scraps of iron and brass. Of special interest was a sherd of blue and white Chinese porcelain probably dating, according to E. Boyd, from the mid-1600s. A similar date is suggested by the Pueblo vessels associated with the structure.

In summary, then, starting at about A.D. 1550, evidently soon after Apacheans appeared in the Southwest, the life-way of those settling in northeastern New Mexico began to change. They arrived as nomadic hunters, but eventually, probably gradually, adopted horticulture, semipermanent villages and pottery making. The association of Ocate Micaceous at a site on the North Ponil with a section of a Sankawi Black-on-cream bowl (Glassow 1980: 76), a type that was "developing by 1550" (Lang 1982: 183), suggests that Ocate Micaceous might have been made by the mid- or late 1500s. Other Pueblo trade sherds date from the early 1600s. A pre-1600 date for Apache pottery is not unreasonable, since in 1599 Onate (Hammond and Rey 1953: 245, 484) described some Apaches as "pueblo" dwellers, indicating at least semipermanent settlements. Other Apache sites yielding Ocate Micaceous and Perdido Plain pottery have been dated between about 1650 and 1750. These sites include a wide variety of structures: a multiroom adobe house, a rock-ringed pit structure, surface structures with brush roofs and walls (with or without encircling rocks), and "tipi rings." Settlements consisted of scattered camps and farmsteads, the latter situated near good irrigable farmland in the mouths of canyons. The resources of both the plains and the mountains could be exploited from such bases and hunting may have continued to be the main subsistence activity. The artifact inventory, especially items related to hunting, strongly resembles that of the Plains (Dismal River) Apaches (J. Gunnerson 1960; 1968). Included are the diagnostic "double bitted drills" and combination end scrapers-gravers. The "foothills" Apaches of the Sangre de Cristos possessed distinctive metates and manos also found archeologically at Apache sites in western Kansas and used until recent times by modern Jicarillas. Contact at c. 1700 with the Pueblos, especially Tewas, is indicated by the presence of Pueblo pottery at most sites. Limited amounts of Mexican majolica, Chinese porcelain, and metal attest to contacts with the Spaniards. The interaction of northeastern New Mexico Apaches with other Indians of the Plains and Southwest and with the Spaniards is also substantiated by the historical sources. During the second quarter of the 1700s, mounting pressure from other Indians, especially Comanches and southern Utes, made it useless for Apaches to attempt to maintain adobe villages, but they apparently continued to tend crops from less permanent structures, and certainly continued to live in the area or visit it frequently.

Edwards Complex

This complex, located in west-central Oklahoma just beyond the southeastern corner of the Central High Plains, may prove to be critical to an understanding of the Late Ceramic (Protohistoric) period of the Central and Southern Plains. At least three sites have been assigned to the complex but thus far it is represented in the literature almost entirely by the detailed description (Baugh 1982) of surface collections from the type site, Edwards I (34 BK 2). A date of A.D. 1550-1650 has been suggested for the complex. Except for the paucity, even the absence, of European trade goods in the Edwards complex, it is apparently nearly identical to the Wheeler Complex which is dated at A.D. 1650-1750 and includes limited amounts of trade goods. Baugh sees the Edwards Complex as essentially a continuation of the Washita River Phase except for differences in the pottery.

The most distinctive part of the Edwards inventory is the pottery, most of which closely resembles either Lovitt Plain or Perdido Plain, both types attributed to Plains Apaches. Also attributed to the complex is Little Deer ware, both plain and decorated, that is associated with the Wheeler complex and resembles Lindsay Plain, a Washita River Phase type, from which it may have evolved. Trade pottery of several southwestern and southeastern types provides the main basis for dating the Edwards complex as protohistoric; the paucity of European trade material is the basis for suggesting a pre-1650 date.

Baugh (1982: 186) summarizes the lithic and bone assemblage of the Edwards complex as follows:

> Lithic artifacts attest to a continuation from the Washita River phase with only minor changes. Unnotched triangular points (Fresno) are the most common form followed by side-notched and/or basally-notched points (Washita, Harrell, and Garza respectively). Other implements which increase in frequency include end scrapers, ensiform shaped pipe drills, and reamers. A greater variety of flake knives, scrapers, adzes, and expanding base drills may also be associated with the Edwards complex. Agatized dolomites from the Texas panhandle (Alibates and Tecovas) continue to be the predominate lithic material in use but the quantities of Edwards and Kay County chert as well as obsidian increase substantially.
>
> The most distinctive bone implement is the

serrated flesher. Bison scapula hoes may have continued into this period although in somewhat fewer numbers (Hofman 1979).

None of these artifacts is truly diagnostic of the Washita River Phase and all can be found in various other late prehistoric and/or protohistoric complexes of the Central and Southern Plains. There is a strong possibility for confusion as to what does comprise the Edwards complex, since at the type site there apparently was also a Washita River Phase component. There also appears to be a substantial Apache representation at the Edwards I site. Extensive interaction with Pueblo peoples, especially of the Upper Rio Grande, and peoples to the southeast is indicated by a wide variety of trade pottery.

One very interesting feature of the type site (34 Bk 2) is an encircling trench that can only be interpreted as defensive, and one other Edwards complex site had apparently been fortified. At Edwards I, the main concentration of detritus was apparently outside the area enclosed by the ditch. The site is also interesting in that it is unusually large and multicomponent, which can be explained by the presence of good sweet springs there and salt springs not far away. The wide variety of trade pottery, from both the Southeast and the Southwest, suggests the possibility that Edwards I was an important trading/rendezvous site. The publication of the results of the excavations there by the University of Oklahoma should help clarify the function(s) and affiliation(s) of this site and should make possible the definition of the Edwards Complex; as mentioned before, the Edwards complex is now defined primarily on the basis of surface material from this multicomponent site.

The ethnic affiliation of the Edwards complex presents an interesting problem. The similarity of the majority of the ceramics to pottery identified elsewhere as Apache supports such an identification for the complex. Baugh (1982: 217) favors an identification of Edwards with the "Teya", whom he considers ancestral to the Wichita, although a better case can be made for the Teya to have been Apache. Hofman (1978b), on the other hand, feels that the Wheeler complex, which is almost identical to the Edwards complex except for having more European trade material, is *not* protohistoric Wichita. The rest of the artifact assemblages would not be out of place as either Apache or Wichita.

Wheeler Complex

This complex has been defined primarily on the basis of surface collections from the Little Deer site (34 CU 10), located just beyond the southeastern corner of the Central High Plains (Hofman 1978b). The complex has been dated at A.D. 1650 to 1725 or 1750. It is apparently a continuation of the Edwards complex which is located in the same area and is dated at 1550-1650 (Baugh 1982). The two complexes appear to be essentially identical except that Wheeler has a small amount of European trade goods while the Edwards complex apparently has none. Also, Wheeler has a higher percentage of unnotched projectile points and a lower percentage of Alibates dolomite than does Edwards. Like the type site for the Edwards complex, Little Deer was multicomponent and contained evidence of a light use in the Archaic and a modest Custer or Washita River Phase occupation. This makes the precise definition of the Wheeler complex impossible. The artifact assemblages of the Edwards and Wheeler complexes are apparently much alike and differ little from that of Washita River except for the addition of toothed bone fleshers and, in the case of Wheeler, the presence of limited European material.

One interpretation of the Edwards and Wheeler complexes was that they represented a development out of the Washita River phase with a possible admixture from the Panhandle aspect. At one time it was thought that the Wheeler complex at the Little Deer site represented a Wichita occupation, an idea that Hofman (1978b) rejected, apparently because of differences between it and material found at the Deer Creek site which is a little later and well documented as Wichita. A possible Apache affiliation was suggested for the Little Deer site. Baugh (1982: 217), as mentioned before, favors a Teya identification for the Edwards complex and considers the Teya as ancestral to the Wichita. By extension, this would again suggest a Wichita or ancestral Wichita identification for the Wheeler complex. If the Tewa were Apaches, as seems more likely, the Edwards and Wheeler complexes could have Apache affiliation.

CHAPTER SIX

THE HISTORIC PERIOD

The division between the Protohistoric and the Historic periods in the plains is somewhat arbitrary. The first European contact with plains Indians for which we have written reports was that of the Coronado party in 1540-1542 (Hammond and Rey 1940; Winship 1896). The information from this expedition, a temporally isolated penetration of the Pueblo area and the Central Plains not to be equalled for sixty years, until Onate's entrada of 1598-1601, is useful in the interpretation of archeological manifestations and in the reconstruction of culture history. However, identifications of plains groups mentioned are interpretations in themselves. Not until about 1700 was enough information recorded so that one can be certain of the identification of some specific archeological sites with settlements described in the documents, and not until the mid- to late-1700s did enough information become available for the identification of other sites. Many later sites, especially the less substantial,mentioned in written records may never be located and identified with certainty. This is as true for sites attributable to occupations or events involving Europeans as for those related to Indians. Although the Historic period begins earlier in certain other sections of the United States, for the Central High Plains a date of ca. 1750 is reasonable. In the northern portion of this region, few of the known historic sites related to Indian activities have been investigated archeologically. Furthermore, we are not apt to find many such sites, for we can be reasonably certain, on the basis of historical documents, that there were no permanent villages in the area, and the temporary camps would not normally yield material diagnostic of particular groups.

Pawnee

For the Central High Plains, the Pawnee and their ancestors form a base line for chronology and a standard for comparison. During the protohistoric period the Pawnee, along with their close linguistic relatives, the Wichita to the south, provided a strong and stable bloc immediately to the east of the Central High Plains. In late protohistoric times the Wichita abandoned their homeland in central Kansas under pressure from Siouans, but the Pawnee continued to occupy permanent villages in east-central and south-central Nebraska and north-central Kansas. Their perimeters, however, were constricting before 1876, when they were moved to their reservation in Oklahoma. Pawnee archeology and history have been dealt with by Wedel (1936, 1938, 1956, 1959, 1961), Strong (1935), Witty (1967), Weltfish (1965), Grange (1968), and Hyde (1934a,b, 1951), to cite but a few authors.

The northeastern part of the Central High Plains was part of the Pawnee hunting territory, and within it one can expect to find their camps. If no pottery was left at these sites, however, it would be difficult to identify them as Pawnee. No historic Pawnee village existed as far west as the eastern edge of the Central High Plains.

The Carmody Site

The Carmody site (25 HK 7), located in Hitchcock County, extreme southwestern Nebraska, has two Woodland occupations and one attributed to Pawnee of ca. 1750 (Kivett 1952: 27-28; Grange 1968: 20). Although the site is near Massacre Canyon, where a crucial battle took place between some Sioux and Pawnee in 1873, the Pawnee component at the Carmody site is not related to the massacre and can best be interpreted as a hunting camp. The only artifacts from the site attributable to the Pawnee are 23 sherds, most of which were surface finds. However, one sherd appeared to be associated with a simple hearth and two were excavated. A few Pawnee sherds have also been found in the extreme northeast corner of Colorado (S. Sigstad, personal communication). For a much more complete description of Pawnee (and Lower Loup) pottery, see Grange (1968).

There is apparently a historic component at site 14 PA 301, at the edge of Larned, Kansas (Monger 1974), which in 1839 was identified by a traveler, Matthew C. Field, as a Pawnee hunting camp of the year before. The house remains described by Field, however, sound far less substantial than Pawnee earth lodges, and this historic component at the site has apparently never been isolated archeologically. The same site has yielded nineteenth century pueblo pottery, identified as Acoma and "Rio Grande," but since the site was a favorite camping place on the Santa Fe Trail, the chances are very good that the Pueblo pottery was carried by people using the trail. In any case, the presence of historic Pawnee sherds far from their villages at what appear to be hunting camps gives hope that additional hunting camps, if

found, can be identified on the basis of ceramics.

Cheyenne

One of the best documented Cheyenne sites investigated archeologically is in southeast Ness County, Kansas, on the south side of the Pawnee River (Creek), 52 km west of Fort Larned (Miller 1977: 82; Millbrook 1973; Earl Monger, personal communication). Here, in 1867, General Winfield S. Hancock, burned a large Cheyenne tipi village which the Indians had hastily abandoned, leaving most of their possessions behind. Limited excavation in a field thought to be the site of the Cheyenne village uncovered great amounts of burned material. Additional excavation would probably be rewarding even though much material was apparently salvaged after the destruction of the camp.

J. Wood (1967: 648) suggests that the most recent component, represented by tipi rings, at the Hatch site (5 WL 38) in Weld County, northeastern Colorado, may be Cheyenne or Arapaho, primarily because of a radiocarbon date of 160 B.P. (sample GXO-562).

Historic Jicarilla Apache Archeology

Thus far, no sites dated in the late 1700s or early 1800s and attributable to the Jicarillas have been thoroughly investigated. By about 1750, Jicarillas had moved to the Rio Grande valley and settled mainly near Ranchos de Taos, where they were reported in the mid-1700s by Bishop Tamaron (Adams 1953: 215) and others (D. Gunnerson 1974: 216-222, 238-239). In this area, now badly eroded, are a number of sites yielding Cimarron Micaceous (J. Gunnerson 1969), a pottery thicker than the earlier Ocate Micaceous. Jicarilla pottery in various museums, made and collected ethnographically in the late 1800s and early 1900s, could probably also be assigned to Cimarron Micaceous. Since the mid-1800s there developed a marked resemblance in the pottery of the Taos, Picuris and Jicarilla, all of whom used micaceous clay from the same or neighboring deposits and influenced one anothers' ceramics extensively. The outer and usually the surface of the pottery of all these groups still shows striations from smoothing with corn cobs, and encircling fillets on the rims are common. One diagnostic trait of Cimarron Micaceous is a marked thickening or splaying of the flattened lip of many ollas such as is found on some Plains (Dismal River) Apache pottery (J. Gunnerson 1960: 164) of about 1675-1725. Since the Jicarillas were first joined by some of the Dismal River people about 1730 (Adams 1953: 223-224; D. Gunnerson 1974: 212, 281-282, 290), and rejoined by these same groups (as the Llanero Band of the Jicarilla ca. 1798), these Plains Apaches could have introduced the flattened and thus thickened lip as a Jicarilla ceramic trait.

Reconnaissance along the Rio Grande in the Velarde-Pilar area has revealed sites that can be attributed to the Jicarillas of post 1750 (J. Gunnerson 1964 field notes). Again, historical documents summarized by D. Gunnerson (1974: 240-246) had indicated that there should be sites dating from the 1760s in this vicinity. The sites located through survey are situated on high benches along the river as if they had been selected with concealment or defense in mind. One of the largest, however, is on a low flat near a good spring. Apache sites, probably camp sites of visiting Jicarillas, have also been found near Picuris Pueblo (J. Gunnerson 1969: 35-36).

Jicarillas were still living and hunting in the Cimarron area during the mid- and late-1800s (Keleher 1964: 45-64) and their sites of this period can be identified by the presence of Cimarron Micaceous pottery. Two such sites have been excavated. At one of these, the Chase Bench site (J. Gunnerson 1969: 32-35), a vantage point which also had an earlier Apache occupation (supra), there were seven rock rings 3.7 to 5.5 m in diameter. In the middle of each ring was a burned area or hearth. In addition to sherds of Cimarron Micaceous, the site yielded a little evidence of stone flaking and moderate amounts of metal and glass. Metal items include barrel hoop fragments (one made into a serrated fleshing tool blade), a spoon, parts of a harmonica, square nails, a conical jingle, and what was probably a tin can lid. The glass included bottle fragments and small beads. The Clinging Cactus site (Kuhman 1968), located about 1.6 km north of Cimarron, yielded Cimarron Micaceous sherds, a glass bead, metal and glass fragments, and a U.S. military button that was too badly deteriorated for exact dating. A burned area and a possible use surface were the only indications of a structure.

Surface reconnaissance has located various other sites with similar artifact inventories along the eastern foothills of the Sangre de Cristos from near Raton south to about Anton Chico. In some cases it is difficult to distinguish Jicarilla sites from those of Spanish Americans, since the Jicarillas deliberately camped near Spanish villages and the Hispanos traded for Jicarilla pots. At many of these Jicarilla and/or Spanish American sites of the 1800s, there are sherds of polished Tewa red and/or black pottery.

The John Alden site (Gunnerson 1979: 168), *a.c.* 1850 Jicarilla Apache community, is located on a mesa east of San Miguel and north of Villanueva, New Mexico; within sight to the east is Starvation Peak. The north edge of the mesa drops steeply and overlooks the old Santa Fe trail. Five crude dry-laid rock structures were excavated out of a hundred reported to be on this 40 km^2 mesa top. Walls about 1 m high, to judge by the amount of fallen rock, had been laid around slight depressions. Most structures tended to be round, about 3 m in diameter, with evidence of a hearth in the middle. One ap-

peared to have had three small irregular rooms. The best preserved structure was L-shaped, with the main portion 0.9 by 2.7 m and the extension 0.6 by 0.9 m. A Spanish-style corner fireplace was near the entrance at the top of the L. Trash was sparse, suggesting a brief occupation. The dominant pottery from the site, a previously unreported type, is undecorated and tempered with crushed micaceous schist. It is like Cimarron Micaceous except that it is not made from the micaceous clay characteristic of the latter. Associated with this pottery were a number of sherds of Powhoge Polychrome from Nambe Pueblo and dated at 1760-1850 (Harlow 1970: 8). Also of interest for dating is a U.S. Dragoon uniform button, of a type made only from 1840 until 1849, that probably did not arrive in New Mexico before 1846, when the U.S. Army took over. Thus a date of close to 1850 is indicated for the site.

Stone artifacts and animal bones were present but not common. Other items of European or American manufacture included a fine-tooth-comb of bone, fragments of yellow and white English china, also representing a ca. 1850 date, a steel arrowhead, part of an iron spoon, scraps of metal and two other less easily datable buttons.

Considering (1) the presence of a majority ware closely resembling Jicarilla Apache pottery found elsewhere, (2) the presence of trade pottery from Nambe, a pueblo with which the Jicarillas had much contact (Bandelier 1890: 261), (3) the ca. 1850 date, and (4) the site's location near the town of San Miguel, there is little doubt that it can be attributed to the Jicarilla band that James C. Calhoun (Abel 1915: 350) said was in that specific area in 1851 under the leadership of Chief Chacon. Also, no other Indian groups were mentioned in Calhoun's detailed reports as being near San Miguel at that time.

Thus, although gaps remain in the Jicarilla archeological record, excavations reported represent a sampling of the historical continuum from as early as perhaps 1550 to at least 1887, when the Jicarillas were moved to their present reservation. The year 1887 did not mark the end of Jicarilla use of northeastern New Mexico, however, for a group left the reservation at Dulce and lived briefly in the general vicinity of Mora, New Mexico (Russell 1898). Hunting parties continued to visit the Cimarron area until well after 1900.

CHAPTER SEVEN

CULTURAL SUMMARY OF THE HIGH PLAINS

The following summary looks at cultural developments within ten subareas of the Central High Plains. At no time was any one of these subareas completely isolated from its neighbors so the boundaries are somewhat arbitrary. Each of the subareas, however, does have a separate cultural identity, especially during the Middle Ceramic period when there was the greatest cultural diversity and intensity in the Central High Plains. The subareas also tend to have environmental differences which have helped shape political and cultural disparity, even to the establishing of some of the modern state lines. Defining the subareas in terms of state lines is convenient for quick reference and also reflects the fact that much of the archeological work has been done by institutions who have at least implicit obligations to their own states. This provincialism has led to the possibility that manifestations of the same complex in adjoining states may have been assigned to different phases. More serious, it has led to distortions in descriptions of areal distribution of complexes in that the amount of field work done in adjoining states or even different parts of the same state varies widely. Since the perimeters of the area here called the Central High Plains were rather arbitrarily drawn, several of the complexes mentioned in this work are represented only by peripheral sites, which can best be understood by drawing on information from their core areas published elsewhere.

Within the Central High Plains we see on the Paleoindian and Archaic levels as much cultural diversity as one could find in any other area of comparable size in North America. Even so, the Clovis, Folsom and Firstview complexes have distributions covering the entire area. Starting with Late Paleoindian, there is a pattern of ever-increasing diversitywith more and more local complexes emerging until a maximum is reached at the end of the Middle Ceramic period. Before most of the Late Ceramic period complexes were really well established, indigenous cultural developments were truncated by European exploration and settlement, first indirectly and later directly. In spite of the diversity mentioned above, there is a basic cultural unity throughout the entire Central High Plains except for the southwest corner where there was a strong Pueblo influence during the Middle Ceramic Period, which was a period of culture climax in both the plains and Southwest. The Pueblo influence, although not conspicuous, was probably also basic to some of the marked changes that distinguish the Middle from the Early Ceramic complexes throughout the Central High Plains. Even though much of the Central and Southern Plains was apparently dominated by Caddoan-speaking peoples from at least Archaic times onward, significant cultural changes marked the beginning of each of the Periods.

For the most part, the summaries of the ten subareas of the Central High Plains are not documented since each is described in greater detail elsewhere in this volume. The order in which the summaries are presented is generally northeast to southwest with an attempt to have each subarea followed by the neighbor with which it has the most similarities. Since we are dealing with two-dimensional data in a one-dimension presentation, this arrangement is not completely satisfactory. For example, northeastern Colorado has much in common with southwestern Nebraska, but the two summaries are separated. Within the summary for each subarea, the arrangement is chronological.

SOUTHWESTERN NEBRASKA

This 30,000 square kilometer subarea, forming the northeast corner of the Central High Plains, is bounded on the south and west by Kansas and Colorado, respectively; on the north essentially by the Platte River; and on the east by a north-south line through Kearney, Nebraska. The rolling short-grass plains are drained primarily by the Republican River and its tributaries, along which were modest stands of deciduous trees in the bottom-lands. There has been more archeological work done here than in any other part of the Central High Plains of comparable size. Even so, information is not even with regard to quantity or quality, and additional work needs to be done. Much of the additional work, however, should consist of the analysis and publishing of unreported field work done in the past.

Localities explored in Southwestern Nebraska have been determined largely by need for salvage behind dams constructed in the Republican drainage in the 1940s and 1950s rather than chosen as a result of problem-oriented planning. An earlier survey carried out in the Republican drainage in the 1930s by the Nebraska State Historical Society, while productive, reflected to a large extent the interests of A.T. Hill, the Society's Museum Director.

The differences in the number of sites excavated

in the various localities probably also reflects real differences in the number of large or conspicuous sites, all of which are related to horticulture. The eastern edge of the area, the 99th meridian, is essentially the eastern border of the High Plains and the western limits of dependable dry farming. The limiting factor is rainfall, especially effective precipitation, and this has fluctuated markedly during the Holocene. There have apparently been shifts in rainfall patterns throughout the plains that would either favor or preclude horticulture in particular sections of this marginal area.

Paleoindian sites dating from essentially the full time range can be expected in Southwest Nebraska, even though few have been excavated. Probable pre-Clovis occupation has been reported from two sites near Wray, just over the boundary in Colorado, and there is no obvious reason why such sites should not be found farther east. A major problem will be the detection of human activity at such sites, since inconspicuous expediency bone tools were commonly used in butchering and, although stone tools were probably also used, no diagnostic stone artifacts have been identified as part of the complex. Any concentrations of late Pleistocene faunal remains should be carefully scrutinized for subtle evidence of human activity.

Clovis (Llano) complex sites can also be expected, since distinctive fluted Clovis points are known from chance finds. The remains of mammoths, which were common prey for Clovis hunters, have been found widely scattered over Nebraska. Thus any mammoth remains found should be carefully examined for evidence of human activity, or artifacts, especially if the bones are found in a context suggesting boggy conditions or shallow lakes at the time the bones were deposited or if the bones appear to have been stacked in some orderly manner. Of special importance would be the locating and excavation of Clovis camp sites, since our knowledge of the culture of Clovis people thus far comes almost entirely from kill and butchering sites.

Apparently evolving from Clovis was the Folsom complex that immediately succeeded it. The fluted points diagnostic of Folsom are much more finely chipped than Clovis points. Unfluted specimens called Midland points, which otherwise closely resemble Folsom points, are commonly found in association with Folsom and may represent the same complex. At kill and butchering sites, these points are found with the remains of bison *antiquus*, an extinct species that was considerably larger than modern bison. No site with a Folsom component has been professionally excavated in southwest Nebraska, but the presence of Folsom is documented by chance finds of points, and Folsom sites have been excavated to both the south and west. Although the complex is named for a kill site near the town of Folsom in northeastern New Mexico, the most information comes from the Lindenmeier site near the foothills of northern Colorado, where both a living area and a kill/butchering area were excavated. Here the artifact inventory, including scrapers, cutting tools and ornaments, was much more complete. It would be highly desirable to find and excavate another occupation/camp site to provide an even broader basis for the description of the complex.

For some three millennia following Folsom times, we have on the Plains several cultural complexes such as the Cody, Agate Basin, Kersey, Hell Gap, Firstview and Fredrick complexes that are probably all represented in Southwestern Nebraska. Each has diagnostic spear or dart points with some types grading into one another. The points all tend to be lanceolate and unnotched, but some have shoulders. Chipping is frequently excellent and very well controlled. At the end of the late Paleoindian period there is a marked decline in the craftsmanship as seen, for example, in the points of the Frontier complex. Other artifacts include end and side scrapers and cutting tools of several forms. Projectile points were often reused as cutting or butchering tools and repeated sharpening markedly changed their outline.

Bison continued to be the predominant animal hunted: species range from the large, extinct, bison *antiquus* into modern bison *bison*. Remains of various other animals are found. Sites tend to be located along streams and are sometimes buried under substantial alluvial and/or aeolian deposits. Occasionally evidence such as post holes, apparently representing simple structures, is found. Within these late Paleoindian complexes there appear to be regional variations that meet in the western Kansas/eastern Colorado/southwestern Nebraska area.

The Archaic period in Southwestern Nebraska is perhaps the most poorly known, although sites are probably numerous. Archaic complexes are nonceramic and only modern species of animals are present in the faunal remains. The most common diagnostic artifacts are large, notched dart or spear points of several types; however, some of the points are as small as some arrow points. Many of the Archaic point types continue into the Early Ceramic or Woodland period. Less common, but perhaps more diagnostic, are atlatl (spear thrower) weights commonly called "boat stones" because of their general resemblance to canoes; these, too, continue into the Early Ceramic period. Ground stone artifacts, such as milling slabs and hand stones, are more common in the Archaic period than before and continue into later periods. Archaic complexes in Southwestern Nebraska have their closest affiliations with complexes to the east and southeast. However, these complexes extend west essentially to the foothills of the Rocky Mountains, where they apparently meet other complexes that have affiliations to the southwest, west, and northwest. Subsistence was based on hunting and gathering, but people apparently utilized a much broader spectrum of resources than did the Paleoindians. This latter distinction may be more

apparent than real, reflecting more complete and better preserved samples.

The Early Ceramic complexes of Southwestern Nebraska apparently evolved out of indigenous Archaic complexes with the introduction, from farther east, of pottery making, and possibly horticulture. For nearly a millenium this way of life did not change significantly. Then, about a thousand years ago, the Early Ceramic complexes evolved, apparently in situ, into Middle Ceramic complexes with the introduction of new traits, probably from the Pueblo Southwest. A diligent search should be made for sites dating from the transitional periods at the beginning and end of the Early Ceramic period in an attempt to test this postulated version of High Plains culture process.

The Early Ceramic period in southwestern Nebraska is known from several excavations there. The hallmark of complexes of this period is the thick, cord-roughened, tall, pointed-bottom pottery vessels showing marked similarities to Woodland pottery found throughout most of the eastern United States, where it is usually associated with evidence of incipient horticulture. The artifact assemblage is essentially a continuation of that of the Late Archaic period, with the addition of pottery and small stemmed or corner notched projectile points that probably tipped arrows propelled by a bow. Structures are represented by irregular shallow pits that had apparently been roofed over with perishable material; storage pits are also found. Burial practices, more elaborate than in earlier periods, involve both primary and ossuary interment. Bodies are often accompanied by shell ornaments and beads, sometimes in great numbers. There is no question about the eastern Woodland influence in early ceramic complexes in most of Southeastern Nebraska, but by the time one reaches the western boundary of the state the complexes are so attenuated that calling them "Woodland" is perhaps not justified. Subsistence continued to be based primarily on gathering and hunting, especially of animals smaller than bison, and there could have been modest attempts at plant cultivation. Some of the sites show prolonged occupation, probably year around, but there is little direct evidence of horticulture. The most common location for villages is on low terraces along small, permanent streams, although ridges were also utilized, especially for burials. Occupation levels, especially on low terraces, are frequently buried a few centimeters to a meter or so under alluvium and sometimes also under aeolian deposits dating from subsequent drought periods.

What is here called the Middle Ceramic Period is included by some authors in the Late Ceramic Period, a designation here reserved for what is also called Protohistoric. Sites of the Ceramic period in Southwestern Nebraska belong to the Upper Republican Aspect, a western manifestation of the Plains Village pattern which, with regional variations, is found in the eastern halves of South Dakota, Nebraska, and Kansas, in western Oklahoma and in the Texas Panhandle. In Nebraska, complexes of this pattern are commonly assigned to the Central Plains tradition to distinguish them from the Middle Missouri tradition to the north.

Upper Republican villages or hamlets are characterized by one to a few earthlodges which, for the most part, conform to a common pattern. Square to rectangular pits, sometimes with two or four rounded corners, were excavated 30 to 60 cm into the ground and were up to about 15 m across. A ramped entrance extended for a few meters from the middle of one side, usually to the south or to the east, or down hill, or away from the prevailing wind. In the middle of the floor, which was not specially prepared, was a simple pit that served as a hearth. About midway between the hearth and each of the four corners was set a substantial roof support post. Around the perimeter of the floor were smaller, more closely spaced support posts which also flanked the entrance ramp. The whole structure was covered with poles, grass, and earth, leaving a central smoke hole. Storage or cache pits are commonly found both inside and outside the structures. Villages are located on high terraces or ridges near bottom land easy to farm. Both primary burials and secondary (ossuary) burials are found, often on even higher terraces or ridges.

Upper Republican pottery vessels were cord roughened with some smoothing, and globular with a constricted neck. A significant proportion of the rims were thickened (braced) and commonly decorated with incised or cord impressed lines forming simple geometric patterns. Projectile points are predominantly small, delicate and triangular with no notches, or with side notches, or with side notches and a basal notch. The bow and arrow apparently had completely replaced the atlatl and dart. Other chipped stone artifacts include various forms of knives, including the alternately beveled diamond shaped variety, numerous well made end and side scrapers, drills with expanding bases, gravers and spokeshaves. Common bone artifacts include bison scapula hoes, shaft wrenches, awls of various forms, and tubular beads. A rare but culturally significant antler artifact is a broad, thin bracelet or bow guard decorated with an incised hand-and-eye motif distinctive of the Southern Death Cult. Other Death Cult traits include copper ear spools, bird effigy stone pipes, worked human bone and possibly cannibalism.

Subsistence was based on a combination of corn-bean-squash horticulture plus hunting a great variety of animals, fishing, and gathering. It seems likely that much of the cultural fluorescence in the plains during this period, as in the Southwest, reflects the introduction, via Mesoamerica, of a new kind of low-row-number maize which gave good yields and was easily milled. The idea of globular

pottery vessels and earth-covered pit structures probably also entered the plains from the Southwest at this time. Surface manipulation as a technique of pottery decoration more likely entered the plains from the east, and certain ceremonial traits are an expression of the Death Cult of the Southeast. Other ceremonial traits that are known ethnographically and appear to have come from the Southwest may also have entered the plains at this time, but without leaving any conspicuous archeological evidence.

The end of the Middle Ceramic period on the high plains was marked by extensive and substantial population displacement, apparently brought about by worsening climatic conditions--droughts disastrous for horticulture in this marginal environment. At least some of the people from southwestern Nebraska moved to the northeast and some may have moved south before moving east.

An interesting climatological/archeological picture is emerging for the Middle Ceramic period. There appear to be marked shifts of population centers-of-gravity in the Central High Plains in response to changes in the patterns of precipitation postulated by Reid Bryson and coworkers. But instead of a model of major migrations, as has been suggested before, a pattern of fusion and fission with rather fluid boundaries between social groups, such as bands, would probably be closer to reality. This would also have been accompanied by changes in utilization of large areas, for example, a shift from emphasis on horticulture to hunting, as climate and centers of gravity of populations changed. Areas would have been used more or less intensively, rather than being abandoned, until about A.D. 1400 when severe drought apparently forced virtually complete abandonment of the Central High Plains west of the 99th meridian. There is obviously a need for locating and testing a large sample of Middle Ceramic sites and for the development of dating techniques as precise as dendrochronology to test and refine this "fusion and fission" model.

The late Ceramic Period, also called the Protohistoric, started at about the time of first Spanish contact with the plains in 1541 and lasted until about 1775 when enemy pressures and disease, brought about primarily by western movement of the frontier of European settlement, led to cultural disintegration. Indian tribes from farther east were pushed into the plains ahead of actual white settlement and tribes from the Great Basin, once they acquired horses, moved onto the plains to hunt buffalo. Just before the Late Ceramic period, Athabascan speaking hunters moved south along the plains as the region was recovering from the severe drought that had essentially depopulated it, and before the former inhabitants returned. During the 1500s, 1600s and early 1700s the tall-grass prairie area immediately to the east and northeast of Southwestern Nebraska saw a return to lifeways not too unlike those of the Middle Ceramic period, with the development of the Lower Loup (protohistoric Pawnee) complex. Subsistence still depended on a combination of hunting, gathering and horticulture. Settlement pattern changed to clusters of dwellings in moderately large villages. Pawnee houses continued to be earth lodges but were round instead of square as previously. Artifacts were much as before with the most obvious change being in the surface treatment of pottery where cord roughening gave over to simple stamping with a fair amount of smoothing, plus subtle differences in rimform, decoration and appendages.

Southwestern Nebraska was dominated by Plains Apaches from the early 1500s through the first quarter of the 1700s. Sometime during this period, probably in the early 1600s, the Apaches, who had arrived from Canada as hunters, took up limited horticulture and started building semipermanent dwellings clustered in small to medium-sized villages. The archeological complex representing this semisedentery phase of Plains Apache culture history is called the Dismal River aspect. Tree-ring dates from Dismal River components extend from the late 1600s through 1728, but there is documentary evidence suggesting that the complex was in existence by 1640.

Dismal River houses are distinctive in that they typically had five center posts forming a circle about 4 m in diameter, surrounded by a circle of leaning poles about 6 m in diameter forming the wall. Often there were two posts on this outer circle opposite one side of the pentagon, apparently part of the entrance. A simple hearth was centrally located. Storage (cache) pits are absent but bell-shaped baking pits are found. Shallow trash-filled pits are also common.

Pottery, although not unusually distinctive, is one of the more diagnostic artifacts. It is tempered with fine grit or mica. Vessels are globular or have slightly pointed bottoms with slightly flaring, straight rims. Surfaces are either smooth or simple stamped, and decoration, when present, is restricted to tooling of the lip. Hemispherical bowls also occur. Diagnostic, but rare, are double-pointed, drill-shaped artifacts with one to four lateral projections centrally located. End scrapers, usually very crude, frequently have graver points or spokeshaves somewhere on them. Side scrapers and side-end scrapers are crude and common. Points are small and delicately made: they are triangular, with or without side notches. Crude choppers, knives, drills, and gravers are also found. Ground stone artifacts include paired sandstone shaft smoothers, a diagnostic milling slab, handstones and balls of caliche.

Bone and antler artifacts include various forms of awls, serrated bison metapodial fleshers, bison scapula hoes, stemmed and socketed projectile points, arm bands, tubular beads, flakers, scraper handles, "punches," "spatulas" and shaft wrenches. Turquoise ornaments, painted Tewa Polychrome pot-

tery, and Pueblo clay pipes, all rare, are trade items from the Southwest. European trade goods, also rare, include an iron axe, awls (?), sheet metal cones and gunflints.

Dismal River pottery in Nebraska, and perhaps also Apache houses, show influence, but not direct borrowing, from cultures to the east, probably Arikara and Pawnee. Although the artifact assemblage is much like that of these contemporary Caddoan tribes, the Dismal River complex had a distinctive character, probably reflecting a different cultural tradition and a lesser dependence on horticulture.

After the Apaches, most probably Cuartelejo Apaches, were forced out of southwestern Nebraska, the area saw mainly Comanche and Pawnee hunting parties until about 1800. During the first half of the 1800s, the center of Comanche activity moved farther south and the valley of the Republican River, which drains essentially all of southwestern Nebraska, became a favorite hunting territory of the Kiowa, Kiowa Apache, Arapaho and Cheyenne, as well as Pawnee. By the middle of the 1800s Sioux were coming into the area from the north and the Kiowa and Kiowa Apaches were centering their hunting farther south.

WESTERN KANSAS

This subarea comprises the western 40% of the state of Kansas and includes 90,000 square kilometers of virtually flat short grass high plains west of the 99th meridian. The north half of the area is drained by the Republican and Smoky Hill Rivers, the south half by the Arkansas and Dry Cimarron Rivers. By comparison to the areas to the immediate north, east and south, western Kansas is very poorly known archeologically which may well reflect, at least in part, a paucity of conspicuous sites in much of this area. Fortunately, a systematic archeological survey of western Kansas has recently been started by the Kansas State Historical Society.

Although western Kansas was subjected to climatic fluctuations, it should have supported substantial numbers of large herbivores during much of the Paleoindian Period. The flat land is dotted with numerous playas that are now dry most of the time but fill during wet years. Immediately to the west, where similar playas were deepened to collect irrigation water, is found some of the best evidence for pre-Clovis occupation in the Central High Plains. Apparently mammoths as well as other large animals were attracted to these water holes, which have since been nearly filled with loess. Perhaps mammoths were deliberately driven into these marshy areas by hunters who could then more easily kill them. Since western Kansas should have been at least as lush as eastern Colorado, any occurrence of bones of Pleistocene animals should be carefully examined for evidence of human activity that might suggest pre-Clovis or later complexes. One should not only watch for obvious stone and bone tools but also expediency bone tools, evidence of butchering on bones and arrangements of skeletal elements that would be unlikely to occur naturally.

Following the extinction of mammoths about 11,000 years ago, the large herbivore most commonly hunted was bison *antiquus*, considerably larger than modern bison. The people who hunted them made distinctive fluted points of much finer workmanship than before; their points and culture were named after the discovery site near Folsom, New Mexico. Interestingly, in 1902 the association of bison bones with a point, probably either Folsom or Clovis, was reported from near the middle of western Kansas. Although the site has been relocated, the point disappeared soon after it was found and only a drawing survives. Apparently no other Folsom site has been excavated professionally in western Kansas although there are points from the area in private collections.

The best information on the Folsom complex as a whole comes from the Lindenmeier site just east of the mountains in northern Colorado. Included in the inventory there were a variety of stone cutting and scraping tools, including distinctive end scrapers with graver spurs on them; channel flakes removed when the flutes were formed are also diagnostic. Frequently points identical to the typical Folsom points but without flutes, and called Midland points, are found associated; some points are fluted on only one side. That various animals in addition to bison were hunted is attested by the presence of their bones at the Lindenmeier site and milling slabs found there indicate the use of plant foods, probably seeds.

Following the Folsom complex and perhaps evolving out of it were a number of complexes characterized by lanceolate points, with basal grinding and sometimes with shoulders. Most were carefully flaked. Some complexes had more than one type of point and all had a variety of other scraping and cutting tools. Frequently the projectile points were repeatedly resharpened as they were being used as butchering and cutting tools. Various of these complexes, known from areas to the northwest, west, and southwest of western Kansas, can be expected to occur there as well. The Firstview complex, characterized by Firstview and San Jon points, is one of the more widespread. Plainview, Milnesand, and Agate Basin points may be part of this complex or may represent distinct complexes. Diagnostic of the Cody complex, which centers farther north than the Firstview but may also be represented in western Kansas, are: Scottsbluff I, II, and III and Eden points, plus Cody knives. The Hell Gap complex, known from Wyoming and the extreme northeast corner of Colorado, is less apt to be found at sites in Kansas. There is a good chance that the Frontier and Fredrick complexes will be found there.

Archaic complex sites, with large, notched pro-

jectile points, spear thrower weights and seed grinding stones, are certain to be found over most of western Kansas. The Archaic people hunted a wide variety of animals, all of modern species, and utilized most available wild plant foods. Except where local situations were especially attractive, they apparently seldom reused camps. Therefore their sites are not likely to be rich. Bison kill sites, however, may be found. Unfortunately, this critical period at the end of glacial times has received very little attention throughout the Central High Plains, and western Kansas is no exception.

Early Ceramic Period sites, according to one well-informed amateur, are abundant in at least the east-central part of western Kansas. Also, the most spectacular Woodland burial from the entire Central High Plains was excavated in the extreme northeast corner of western Kansas, just a few feet south of the Nebraska border. Here, at the Woodruff Ossuary, the disarticulated skeletons of many individuals were found in over-lapping pits along with the articulated skeleton of an adolescent covered with alignments of thousands of shell beads, obviously once strung. Various ornaments made from Gulf conch shells were also included. It seems highly probable that additional ossuaries and Woodland hamlets will be found in Kansas along the Prairie Dog Creek and other southern tributaries of the Republican River in northwestern Kansas. A few other Woodland sites and burials which may be either Woodland or Archaic have been found in various parts of the region. There has been a tendency to assign all of these to the Keith focus, but as additional work is done the manifestations in the southern part may prove to be distinctive. Contact with Woodland peoples farther east is documented by the rare occurrence of Hopewell sherds at sites in western Kansas.

This area is especially crucial to an understanding of the Middle Ceramic Period in the Central High Plains, but unfortunately very little work has been done there. It has been postulated that some of the traits that distinguish the Upper Republican culture from the earlier Plains Woodland culture came from the Southwest and, if so, they would probably have crossed western Kansas. Second, dates for Upper Republican sites in Kansas apparently cluster earlier than those in Nebraska and it has been suggested that the Smoky Hill Phase is ancestral to Upper Republican. And finally, there is a strong possibility that at least some of the Middle Ceramic period Panhandle aspect and Washita River phase peoples moved north and east when their respective occupations in Texas and western Oklahoma came to an end. There is also a general feeling that a few Panhandle, Custer and Washita River sites do occur in the southernmost part of western Kansas.

Along the eastern edge of central and northern western Kansas are sites that have been variously classified as Smoky Hill, Upper Republican and Solomon River phase of Upper Republican. The sites are small permanent or semipermanent earth lodge villages on terraces close to tillable bottomlands along streams. Subsistence was based on a combination of hunting, gathering and horticulture with surpluses, presumably primarily of maize, stored in bell-shaped cache pits. Pottery is cord-roughened, sometimes partially smoothed over; vessels were globular, with decoration, when present, restricted to the lips, rims, or collars. Projectile points are small and triangular without notches, or with side notches, or with side notches and a basal notch. Cutting tools include various forms with the alternately beveled diamond-shaped knives the most distinctive. End scrapers and chipped drills are common. Bison scapula hoes were apparently the main horticultural implement.

One site, in the edge of Larned, Kansas, is of special significance in that the lowest component, assignable to Smoky Hill, is overlain by a Pratt Focus component in turn covered by several Great Bend house floors, all separated from one another by alluvium deposited by the Arkansas River at the mouth of Pawnee Creek. In the lower levels of this very important stratified site are two strata which probably reflect major drought periods during the Middle Ceramic Period. Additional work at the Larned site, and at similar sites if they can be located, should be undertaken to learn more from these climatic clues as well as more about the apparent developmental sequence from Smoky Hill through Pratt to Great Bend. It has also been suggested that the Pratt Focus, which is best represented along the southern part of the eastern border of western Kansas, evolved out of the Washita River phase of western Oklahoma. On the basis of very limited data, the Pratt focus appears to be a very reasonable transition between Washita River and Great Bend (protohistoric Wichita).

During the Late Ceramic or protohistoric period in western Kansas, the Great Bend Aspect dominated the south half of the extreme eastern edge and the Dismal River aspect dominated most, if not all, of the rest of this subarea. In fact, the Larned site just mentioned might be the only Great Bend site west of the 99th meridian, and it by only 8 km. Contemporary Dismal River sites extend only 25 km east of the 99th meridian.

The Great Bend Aspect (protohistoric Wichita) is perhaps the richest complex of the Central Plains as evidenced both by archeology and by descriptions of Spanish explorers of the 1500s and 1600s. The Great Bend people were first called people of Quivira by the Spanish and later Jumanos. They lived in grass-covered houses situated among their bottomland fields which produced abundant crops of corn, beans and squash. So-called "council circles" on higher ground were apparently ceremonial structures located so as to serve as solstice registers. Pottery was globular with smooth or simple stamped surface treatment and tempered with either shell or

grit. The rest of the artifacts continued much as in the past, consisting of small triangular projectile points, diamond-shaped knives, bison scapula hoes, etc. In addition, painted pottery documents trade with the Pueblo Southwest and limited metal, including fragments of chain mail, was of European origin. Subsistence continued to be based on hunting, gathering and horticulture.

Virtually all of western Kansas was dominated by Plains Apaches during the Late Ceramic period. They arrived from Western Canada around A.D. 1500 as bison-hunting dog-nomads at a time when the high plains were apparently unpopulated. Their 16th-century lifeway in western Kansas is known from ethnohistorical sources, but the earliest archeological sites attributable to them date from the mid-1600s. By then, the Apaches had acquired from their neighbors to the east, primarily Caddoan speakers, the rudiments of horticulture and pottery making, as well as the idea of semi-sedentary villages. Archeologically, the Plains Apache complex of western Kansas in the late 1600s and early 1700s is known as the Dismal River Aspect, which extends into Colorado and western Nebraska. The main known concentration of Dismal River sites in Kansas is in Scott County, near the middle of western Kansas. Most of the Dismal River artifact inventory resembles that of their neighbors to the east. Pottery is globular with a rounded to pointed bottom, slightly constricted necks and simple rims sometimes decorated on the lip and with no appendages. Surface treatment is sometimes simple stamped but more commonly smoothed. Other diagnostic artifacts are end scrapers with spoke shaves and/or graver points and/or side scrapers present, and so-called double-bitted drills. Structures are distinctive in that they most commonly have five support posts; bell-shaped baking pits occur. Subsistence was based on hunting, gathering and horticulture. Micaceous sherds represent contact with their Jicarilla relatives, and painted sherds attest trade with the Tewa Pueblos, both in New Mexico. In the 1730s the Dismal River people were forced to leave the Central Plains by pressure from other tribes; some ultimately settled in Texas and others in New Mexico.

After the Cuartelejo Apaches were forced to leave western Kansas in about 1730, the Comanches dominated the area for the rest of the century, although the Pawnee and Wichita continued to hunt there. After about 1800 the Comanches centered their activities farther south and the Arapahos and Cheyennes dominated western Kansas, with the Kiowa and Kiowa Apaches not infrequently getting into the area. In the early 1800s the Kansa and Osage, who had permanent villages farther east, also hunted in western Kansas. In the mid-1800s, the Santa Fe Trail, which cut diagonally across the southwestern quarter of Kansas, and such military installations as Fort Zarah, Fort Larned and Fort Atkinson, near the Trail, attracted many bands of Indians since the military had to deal officially with them. In the mid-1800s reservations in eastern Kansas had been established by the government for members of such diverse tribes as the "Oto, Missouri, Iowa, Sac, Fox, Kickapoo, Delaware, Shawnee, Chippewa, Ottawa, Peoria, Kaskaskia, Weas, Piankeshaw, Pottawatomi, Miami, Wyandot, Cherokee, and New York Iroquois" (Wedel 1959: 47). Some of these Indians were occasionally represented in hunting parties in western Kansas. By the late 1800s the last of the Indians that had frequented western Kansas had been put on reservations, none of which were within the area.

NORTHWESTERN OKLAHOMA

The portion of the Central High Plains here called northwestern Oklahoma includes a strip 80 km east-west by 200 km north-south adjoining the panhandle of Texas to the west and Kansas to the north but excludes the Panhandle of Oklahoma. The greatest amount of available archeological information comes from the southern portion which is drained by the Washita River and by tributaries of the Red. Even here much of the culture history, for the preceramic periods, especially, must be inferred from surrounding areas. The panhandle of Oklahoma is dealt with along with the panhandle of Texas.

There is no reason why one should not expect to find important Paleoindian sites in Northwestern Oklahoma since chance finds of diagnostic points have been made there and a wide range of Paleoindian sites have been investigated in neighboring areas. Just east of northwestern Oklahoma a possible Preclovis site has been excavated. Sites including Clovis, Folsom, Firstview, Plainview and other Paleoindian complexes have been investigated within a radius of 250 km, for the most part to the west. Since climatic conditions in Northwestern Oklahoma during the Paleoindian period should have been as favorable as in the adjoining areas for the large herbivores, the lack of reported sites probably reflects the limited work done. In the course of the Paleoindian period, the kinds of animals hunted did change with particular species apparently being favored. During the Clovis and, presumably, pre-Clovis periods the mammoth was the most conspicuous animal hunted although there is evidence that other now extinct species such as the horse, camel and sloth were also hunted. Starting with the Folsom people and extending on into the Archaic periods, bison were the main animals hunted, first the large extinct Bison *antiquus* followed by progressively smaller forms until, at the end of the Paleoindian period, the bison were strictly of the modern species. All through the Paleoindian period smaller animals and various plant foods were certainly also eaten, but these are less conspicuous in the archeological record since a large proportion of the investigated sites are kill sites where the hunting of large animals required the cooperation of several individuals. The

smaller animals are known from remains found in the rare camp sites that have beenany more such habitation sites need to be found and excavated. By the end of Paleoindian times, the animals of the Central High Plains were all of modern species. It is still an open question as to what part man played in the extinction of various late Pleistocene forms.

In northwestern Oklahoma, the Archaic period is known primarily from chance finds of diagnostic artifacts and by extension of what is known from surrounding areas. The picture emerging is that Early Archaic sites are far more numerous than are Middle or Late Archaic sites. Since this subarea was apparently subjected to the hot, dry conditions of the Altithermal during the Middle Archaic period, it is not surprising that sites from that period should be sparse here. In any case, the Archaic period was one of adjustment to modern conditions, even if changes did not progress smoothly. Perhaps the stress produced by the environment helped precondition the people for horticulture by making them more dependent on seeds and other plant foods. This would be compatible with the idea that there was population continuity of Caddoan-speaking peoples in the Central Plains starting with late Archaic peoples. It is not certain, however, that there are any terminal Archaic sites in Northeastern Oklahoma.

It is perhaps significant that no Woodland sites have been reported in the western half of Oklahoma, but more likely this reflects the paucity of work. Farther west, in the Panhandle of Texas, the earliest pottery was apparently Jornado brown ware from south-central New Mexico, which is found at some sites with Woodland pottery. To the east, in central Oklahoma, are found Woodland sites with cord-roughened pottery similar to that found even farther east in the Mississippi valley. Since the Custer phase of western Oklahoma and the Panhandle aspect of Texas apparently developed out of indigenous Woodland complexes with eastern roots, one would expect such complexes to exist in northwestern Oklahoma also.

With cultural continuity from Custer Phase through Washita River into Great Bend (protohistoric Wichita) highly plausible, the Woodland antecedents of the Custer phase become an enigma. Perhaps the complex, once it is identified, will resemble the Keith focus found to the north in a comparable environment that is also marginal to horticulture. Considering the geographical closeness between the Custer-Washita River area and the Panhandle Aspect area, these complexes could be expected to share a common Woodland ancestor. The differences in architecture of these middle ceramic complexes probably masks basic and extensive similarities.

Crucial to the understanding of the development of sedentary, semi-horticultural societies in the southern Plains is the Custer Phase, known primarily from a restricted area in west-central Oklahoma. The Custer phase, dated by radiocarbon at ca. A.D. 800-1100, appears to be transitional between Plains Woodand and Plains Village lifeways and there is general agreement that it is ancestral to the Washita River phase which is found in the same general area. The idea should be seriously considered that it is also ancestral to the Panhandle aspect of the panhandles of Texas and Oklahoma even though, on the basis of published information, the areas of distribution do not overlap. Custer phase sites are small with simple wattle and daub structures, refuse pits and occasional burials. Subsistence was based in part on horticulture as evidenced by bison tibia digging stick tips and bison scapula hoes. Distinctive of the complex is the predominance of cordmarked pottery (Lindsay Cordmarked), and corner-notched projectile points. Other artifacts include: various forms of chipped stone knives, end scrapers, side scrapers, arrowshaft smoothers, grinding stones, stone L-shaped pipes, bone and shell beads and bone awls.

The Washita River Phase was more dedicated to a sedentary, horticultural lifeway. Sites were larger, more varied and more numerous than before. In addition to substantial wattle and daub structures, sites contain numerous storage pits, small burial plots and large cemeteries. Charred remains of corn, beans and gourds have been found in addition to bones of various hunted animals; gathering also continued. Most of the Washita River pottery was smooth with a small percentage cordmarked (Lindsay Plain and Cordmarked). Projectile points were triangular, either unnotched, side notched or side and basal notched traits useful in distinguishing Washita River from Custer sites. Also, Washita River phase pottery was often tempered with crushed shell. Other artifacts were much like those found in the earlier Custer phase sites. Pottery, stone ear spools and marine shells were apparently traded in from Mississippian sites to the east.

The fate of the Washita River phase people is not entirely clear, although a commonly held idea is that they were probably ancestral to at least some of the Great Bend aspect people (protohistoric Wichita). If there are Great Bend Aspect sites in western Oklahoma, they have not been reported in the literature. The movement of people from western Oklahoma to south-central Kansas, where the closest reported Great Bend sites are located, would not have been one of great distance. In fact, the cultural inventories of Washita River and Great Bend are quite similar and there would seem to be less than a hundred year gap between them. The Pratt complex of south-central Kansas would fit nicely as transitional. Furthermore, a movement of Plains village people to the northeast at the end of the Middle Ceramic period in the southern plains would follow the pattern postulated for the rest of the Central Plains.

The question of Late Ceramic period occupation in western Oklahoma has received attention in re-

cent years (Bell and Bastian 1967; Hofman 1978; Baugh 1982). Just beyond the southeastern corner of what is here called Northwestern Oklahoma are the Wheeler and Edwards complexes that apparently form a continuum from about A.D. 1550 to 1750. Both have been defined primarily on the basis of surface collections from two multicomponent sites and have been attributed variously to a continuation of the Washita River phase, to the protohistoric Wichita, to some non-Wichita group, to Apaches, to the Teya (identified both as Protohistoric Wichita and as Apaches). Some of the Edwards complex sites are large with a fortification ditch and have yielded a substantial amount of trade pottery from both the Southwest and the Southeast, suggesting that they were trading or rendezvous sites.

Further excavation at these sites is badly needed. There is the unlikely possibility that historic Wichita villages may be found in Northwestern Oklahoma.

In western Oklahoma, the Comanches essentially replaced the Apaches before the middle of the 1700s and continued to frequent the area until they were put on a reservation. The area also continued to be included in the hunting territory of the Wichita. Early in the 1800s there was an influx of tribes from farther north, especially Kiowa and Kiowa Apaches, although the Arapaho and Cheyenne received the most attention in the mid-1800s. With the establishment of "Indian Territory" and reservations in Oklahoma for many diverse tribes, as in Kansas, hunting parties from these assorted tribes were occasionally found in the western part of the state. One of the major attacks by U.S. troops on Indians was the battle of the Washita River in 1868, where primarily Cheyennes, but also many Arapahos, Kiowas and others were killed. The Cheyennes were under the leadership of Black Kettle, the Kiowas under Satanta and the Arapahos under Little Raven.

TEXAS/OKLAHOMA PANHANDLES

This high plains area, essentially a northward continuation of the Llano Estacado, or Staked Plain, is drained by the Canadian proper and the North Fork of the Canadian river. Included are the panhandle of Oklahoma and the northern half of the Texas panhandle. For convenience, it will be referred to as the Panhandles Area. Culturally, it was most distinctive during the Middle Ceramic period when it was dominated by the Panhandle Aspect (Antelope Creek Focus).

Although relatively few Paleoindian sites have been excavated in the Panhandles, the area was probably as heavily populated then as any other part of the Central High Plains. The type site for the Clovis complex is located less than 100 km south of the southwest corner and the Folsom type site is less than 100 km to the west. To the south are the Plainview, Lubbock Lake and San Jon sites. In the northeast corner of the Texas Panhandle are the inadequately reported excavations at the Lipscomb Site, a Folsom bison kill. Surface finds of distinctive Paleoindian projectile points attest to the presence in the Panhandles of essentially the full range of paleo-complexes found in the Southern Plains.

During the lush times 11,000 years ago, the Panhandles were much wetter and had enough vegetation to support substantial numbers of mammoth. Hunters using spears or darts tipped with distinctive fluted points pursued these large beasts. The most common approach, apparently, was to maneuver the animals into marshy areas, perhaps at the edge of lakes, where they were less able to move and defend themselves. Sometimes Clovis points are found associated with mammoth bones and sometimes the bones are found stacked in a way that would indicate human agency.

The Panhandles area is in the heart of Folsom country. These hunters specialized in the hunting of large, now extinct, Bison *antiquus* although they also hunted various other animals and gathered wild plant foods. The Folsom complex, which almost certainly evolved out of Clovis, is characterized by points much better made than the latter. Folsom points, also fluted, are the most distinctive of all Paleoindian points. Frequently associated are points identical but unfluted (called Milnesand points). Other Folsom artifacts include end scrapers, often with a spur or graver point, and various cutting and piercing tools. Seeds were ground on simple milling stones and ornaments were made of bone. Much of our information about the non-hunting aspects of Folsom culture comes from the extensive excavated Lindenmeier site in northeastern Colorado. It would be highly desirable to locate and excavate similar sites in the Panhandles.

Following Folsom, and probably evolving out of it, were a number of different Paleoindian complexes, each with diagnostic projectile points. The Firstview complex, as defined by Wheat, should be well represented in the Panhandles since it centers just to the southwest in the Blackwater Draw/Clovis area, is strong in eastern Colorado and at least part of the complex extends on into Canada. It is dated at about 9,000 to 10,000 years ago, has as its distinctive point types Plainview, Milnesand, Firstview, and San Jon, the first two of which Wheat (1972) would consider variants of Firstview points. Firstview is essentially what Sellards called the Portales complex. Some sites have yielded only Plainview points. In any case, one can expect to find sites in the Panhandles yielding well-chipped lanceolate points with edge grinding and basal thinning as well as other less diagnostic scraping and cutting tools.

The Golondrina complex, with Plainview-like points, may also occur in the area; it apparently centers to the southeast One would also expect to find Cody sites in the Panhandles. In addition to Cody knives, this complex is characterized by Scottsbluff and Eden points, which Wormington would sub-

sume under Cody points. The rest of the complex does not differ greatly from that called Firstview.

The Archaic period in the Panhandles is poorly known, as it is in the rest of the Central High Plains. Sites are very numerous but, perhaps because many are small and artifacts are not abundant, few have been thoroughly investigated. This is an important period for the understanding of Plains culture history, however, since it is a time when plants and animals of only modern kinds were present. Forced to exploit a wide range of food resources, Archaic people were being preadapted for a dependence on cultigens. Also, the Archaic period was a time of marked climatic changes which caused substantial population displacements in the High Plains.

Hughes summarized the information available on the Archaic of the Texas panhandle, including a great deal of unpublished survey data. He noted that sites occur mainly on the rims and terraces of playas, valleys, and canyons and that some of the canyon sites near water sources are deep and rich. Sites may be open camps, rock shelters, bison kills, flint quarries, rock art or burials. Many camps have large quantities of burned rocks. Artifacts include various forms of dart points, many corner notched and broad bladed; Clear Fork gouges, and various forms of knives, choppers, hammerstones and milling slabs. Two Archaic sites have been excavated in the Texas panhandle just south of our study area. On the basis of his work at one of these, Hughes described what he calls the Little Sunday complex.

The Early Ceramic Period in the Panhandles is as poorly known as the Archaic. Much of what is known is based on unpublished survey information (Hughes, personal communication).Apparently the earliest pottery found is Jornada brown ware from the middle Rio Grande area of southeast New Mexico. This is sometimes found alone and sometimes with cordmarked pottery. On the basis of his work at the Lake Creek site, near the center of the Panhandles, Hughes defined the Lake Creek focus. Both kinds of pottery were recovered and he suggested that the cordmarked pottery was in the general tradition of Borger Cordmarked, the dominant ware of the Panhandle aspect, but somewhat earlier. The projectile points were slim, small corner notched forms suitable for use on arrows. Two larger corner-notched dart points and several forms of knives, including the distinctive diamond-shaped, alternate beveled variety, were also recovered. Scrapers were common. Grinding was done on stone slabs with any of a variety of shapes of manos. Hughes suggests that this complex might be ancestral to the Panhandle aspect, an idea that sounds reasonable and deserves testing with additional work.

The Middle Ceramic is the best known period in the Panhandles. At the sites, conspicuous stone wall bases of structures are concentrated along the Canadian River in the middle of the north half of the Texas Panhandle and on the North Fork of the Canadian in the eastern Oklahoma panhandle. Rooms are round or square, isolated or in blocks of contiguous rooms. A common pattern is a large living room with two attached storage(?) rooms flanking the entrance. Often the floor has a broad east-west trough through the center, leaving something of a bench on either side. There was a central hearth, and four center posts supported the roof; a raised altar against the west wall was a common feature. Walls were commonly constructed of double rows of vertical slabs with the space between filled with earth. Higher rows of wall stones were similarly placed on top of the lower ones with the space between the rows of slabs getting progressively smaller. There is no obvious correlation between detail of structure and either time or geographical location. The use of stone in the structures gives the Panhandle aspect a Southwestern Pueblo flavor but there is no obvious donor complex for the specific architectural techniques involved. The most probable explanation is that we have here a local development utilizing available materials in what is basically a Plains Village Pattern complex. Perhaps the idea of masonry construction and contiguous rooms did come from the Southwest, but the complex can not be considered an extension of Pueblo culture onto the Plains. Repeated rebuilding of structures at some sites indicates successful adaptation to the area.

The artifact inventory of the Panhandle aspect is clearly comparable to other late plains ceramic complexes that were dependent jointly on horticulture, hunting and gathering. Noteworthy among horticultural tools are bison scapula hoes and bison tibiae digging stick tips, which are more common than the hoes. Projectile points are small and triangular, either side notched or unnotched. Other bone and stone artifacts are less diagnostic and include various forms of awls, beads, scrapers, knives and drills. Pottery (Borger cordmarked) is globular with the cordmarked exteriors sometimes partially smoothed over. Decoration is restricted almost entirely to the lip and rim areas which are usually simple and direct. Cambered and collared rims occur in small numbers and are much less common than at Upper Republican sites. Unfortunately, very little numerical information is available on ceramic traits. There is more evidence of trade, especially in pottery, with Southwest Pueblo groups than is found in other complexes of the Central Plains Tradition. Burials are most commonly in hilltop cemeteries, but some are found in the villages. A few skeletons have been found in houses, suggesting violence.

There are apparently no complexes in the Panhandles of Texas and Oklahoma that can be attributed to the descendants of the Panhandle aspect or the Washita River phase people. Presumably, at the end of the Middle Ceramic period, the population migrated or dispersed to the northeast or east to

become, along with others, one or more of the Wichita bands known in historic times. There could have been virtually a depopulation of the area for a half century or more. By 1541, however, the Panhandles were occupied by nomadic bison hunters known to Coronado's party as Teyas and Querechos, identifiable as Apaches. No archeological sites have been definitely assigned to these Apaches, but likely candidates are sites in the area that have painted Pueblo sherds from the 1500s or early 1600s, little or no utility pottery, a generalized plains artifact inventory and tipi rings. By the mid to late 1600s some Apaches were living in more permanent structures, practicing a little horticulture and making thin, plain gray pottery. Sites of this sort are known from the Texas Panhandle on the basis of surveys.

By the mid-1700s the Panhandles of Oklahoma and Texas became the domain of the Comanches who forced the Apaches out. The Comanches took over the trade in bison products to Pueblo people and Spanish villagers. Eventually there emerged traders called Comancheros, who had Pueblo Indian guides. By the early 1800s Kiowas and Kiowa Apaches were also frequently in the panhandles and occasionally Cheyennes and Arapahos would venture into the area on raids, although their territory was generally north of the Arkansas river.

Since various tribes hunted bison in the Panhandles in historic times, there must be evidence of their camp sites, but at present, there is apparently no way to assign the meager evidence at any site to a particular tribe. Presumably some tipi rings date from the Historic period, but artifacts providing such a date are rare. The Panhandle Plains Museum has excavated the ruins of Adobe Walls, near the Canadian River north of Amarillo, Texas. This trading post was visited by Indians in the 1800s but can not be considered an Indian archeological site.

The Alibates flint, or dolomite, quarries deserve special mention. This distinctive material with its numerous shades of red, purple and white was used by many different groups during most of the archeological sequence. The quarries are in a limited area along the Canadian River in about the middle of the Texas panhandle, but flakes and chunks, as well as artifacts made from this material, have been found widely in the Central High Plains. The distribution probably represents a combination of intertribal trade and visits to the quarries by diverse groups. The Alibates quarries have been made into a National Monument.

NORTHEASTERN NEW MEXICO

This area is bounded on the north and east by Colorado, Oklahoma and Texas, on the south by an arbitrary line at the southern border of San Miguel County, and on the west by the foothills of the Sangre de Cristos, but does not include the foothills. The area, essentially a square 200 km on a side, is nearly all high plains broken by occasional mesas and by the canyon of the Canadian River which is deeply entrenched by the time it reaches the middle of this square. Unfortunately, very little archeology has been done in most of the plains of northeast New Mexico. The archeology of the foothills of the Sangre de Cristos will be treated separately.

There should be many Paleoindian sites in Northeastern New Mexico and some are known to amateur collectors. Blackwater Draw, well known especially as the type locality for the Clovis complex, is less than 100 km south of the southeast corner of the area. Also found at this site, and stratigraphically higher, is a Firstview occupation level for which the name "Portales" was originally suggested. Included in it are San Jon points, named for the nearby town, and Firstview points. In the northcentral part of Northeastern New Mexico is the Folsom complex type site near the town of the same name. Sandia Cave is about 100 km west of the southwest corner of the area, while sites yielding Plainview points are found in the northeast corner as well as just to the southeast. In brief, virtually every Paleoindian complex known in the Central and Southern plains is known from, or very close to, northeast New Mexico.

In addition, pre-Clovis sites are as likely to occur in northeastern New Mexico as elsewhere on the High Plains. Such occupation could be indicated by subtle evidence of human activity such as bone expediency tools for butchering, unnatural arrangements of skeletal elements and butchering marks on the bones. The Clovis complex is known primarily from mammoth kill sites. These often appear to have been marshy areas where large animals were driven to partially immobilize them, making them easier to kill. The distinctive fluted Clovis points would have been hafted on spears or darts. Hopefully, Clovis camp or occupation sites will be found so that more can be learned of the complex.

Folsom, which followed and probably evolved out of Clovis, is also known primarily from kill sites where the finely made fluted points are found associated with the skeletons of the large ancestor (bison *antiquus*) to modern bison. Fortunately, a great deal was learned about the rest of the complex from the excavation of the Lindenmeier site in northern Colorado. There, near a kill site, was an extensive occupation area from which were secured various cutting, scraping and piercing tools, stones for grinding seeds and a few ornaments. The Elida site, just south of northeastern New Mexico, had been a similar Folsom camp. After it was defalted, an amateur collected the artifacts and made them available for study. It would be highly desirable for archeologists to find and excavate additional Folsom camp sites to learn more about other artifacts used and other food resources exploited.

Late Paleoindian sites of the Firstview, Cody, and perhaps other complexes can be expected to yield

variants of lanceolate points with broad parallel-sided stems, basal grinding and very well controlled chipping. Associated tools do not differ markedly from those of the Folsom complex. The main animals hunted were bison, somewhat larger than modern bison, and various other animals of modern size. Again, most of our information comes only from kill sites.

The Archaic period in northeastern New Mexico and surrounding areas is poorly known. It seems likely that the region was virtually depopulated at least once during the Archaic at a time when climatic conditions were very hot and dry. On the basis of limited information, the Archaic sites appear to be most closely related to complexes on the east and southeast rather than to the Picosa phase to the west, for example. An examination of private collections would be a good way to quickly test this impression. Also, there may still be undisturbed deposits with Archaic components in some of the caves or rock shelters along the Canadian River where it is deeply entrenched. In the extreme northeastern corner of New Mexico, dry cave deposits were excavated by Renaud some 50 years ago. These have generally been considered of Archaic age, but the dating is poor. Hopefully, additional caves can be found there and investigated under controlled conditions.

The Early Ceramic period is even less well known than the Archaic in northeastern New Mexico. Small sites have yielded a few sherds of either smooth or cordmarked pottery that might be from this period but are probably of Middle Ceramic age. Apparently these represent temporary camps rather than anything approaching permanent settlement. The lack of significant reconnaissance, however, makes speculation fruitless.

The few sherds resembling Taos gray and Borger cordmarked found suggest limited use of the area in Middle Ceramic times. One small site in Harding County on a mesa near Ute Creek appears to be a pit house village of this period, and there is probably a later occupation present as well. One would expect other small villages near permanent water; for example, in the canyon of the Canadian River.

Late Ceramic sites have been found in the canyon of the Dry Cimarron River in the extreme northern part of northeastern New Mexico and at places within sight of the Sangre de Cristos, but a few miles out onto the plains. It seems certain that other Late Ceramic (protohistoric) sites are distributed over northeast New Mexico:there is ample documentary evidence that Apaches and, later, other tribes such as the Comanches frequently hunted on the plains. Many "tipi ring" sites, most of them without pottery, are reported by local collectors and ranchers. These probably date from either the Late Ceramic or Historic period, and most will probably show evidence of only brief, but perhaps repeated, occupation. In well-watered localities, there should be semipermanent Apache villages, since Spanish documents of the early 1700s mention Carlana Apaches farming in the area. Unexcavated sites along the Dry Cimarron have yielded what appears to be both Jicarilla and Dismal River pottery, the most southwesterly occurrence known of the latter.

By the middle of the 1700s the Comanches had essentially taken over the plains of northeastern New Mexico. Jicarilla and Pueblo hunters continued to venture out into the area until the late 1800s. The late 1700s and early 1800s saw a new phenomenon--the Comancheros. These were Spaniards and/or Pueblo Indians who went to the plains with crude carts carrying bread and other items to trade to the Comanches for products of the bison. Later in the 1800s much of this trade was replaced by Ciboleros, Spanish buffalo hunters, often with Pueblo auxiliaries. In the mid-1800s, Kiowa and Kiowa Apaches were also commonly found in northeastern New Mexico and Indians from as far away as the upper Missouri River would cross the area on their way to trade in Taos and Santa Fe. The Old North Trail, which followed the eastern foothills of the Rockies, was used by such Indians as the Crow and Blackfeet on trips as far south as Mexico.

SOUTHEASTERN COLORADO

This area is bounded on the south and east by New Mexico and Kansas, on the north by the north side of the Arkansas River valley and on the west by the foothills of the Sangre de Cristos, which are essentially a southern extension of the Rocky Mountains. Except for the southeast part of this area, with nearly level plains, the terrain is dissected by the Purgatoire River and its tributaries. Between the deep canyons are level plains or plateaus. Along the New Mexico border are Raton Mesa, including Johnson Mesa and Mesa de Maya, which form a continuous east-west series that still presents a formidable barrier to north-south travel. Much of our information on the archeology of this area comes from the published work of Robert Campbell. Parties from Trinidad Junior College and Colorado College have worked in the western and eastern parts of the area respectively. However, there is still much to be learned.

Published reports of Paleoindian sites in southeastern Colorado are surprisingly few. Clovis and Folsom points have been reported, but often from sites that have at least one other component, so it is always possible that they were carried in by later Indians. Such points did occur at open grassland rather than canyon localities, however. Late Paleoindian points are somewhat more common and do occur also at sites in canyons suggesting the exploitation of a greater variety of resources. One would expect at least a moderate number of sites assignable to Firstivew/Plainview/Milnesand complexes,

and probably some of the Cody complex. Although there are deep canyons in the northern part of this area, there are no natural barriers that would keep bison from entering the plateau country from the east.

Archaic sites, early to late, are relatively common in southeastern Colorado and include both open sites and components in rock shelters. Many of the Archaic sites are located in or near canyons, presumably to facilitate the exploitation of varied resources. Hunting was done with spears or darts tipped with points of types suggesting affiliation with Archaic complexes to the southeast. The presence of milling slabs and manos attest to a utilization of vegetal foods as well. Faunal remains represented primarily small mammals. Various cutting, scraping and piercing tools are included in the artifact assemblages as well as bone and sbell beads.

Campbell interprets the evidence from the Chaquaqua Plateau as demonstrating an *in situ* development from Late Archaic into Early Ceramic complexes with the selective acceptance of Woodland traits, (primarily cord-roughened pottery, shallow round houses with crude dry-laid masonry walls, and small stemmed projectile points) while retaining most Archaic traits. Animals hunted included more large mammals than was characteristic in Archaic times. He assigns the Early Ceramic sites to the Graneros focus, with three temporal divisions.

Campbell considers the most numerous and conspicuous sites as belonging to the Apishapa focus, a Middle Ceramic complex that presumably evolved *in situ*. His assignment of the Apishapa focus to the Panhandle aspect, however, is not generally accepted in spite of their many similarities. On the other hand, there is little doubt that the Apishapa focus is assignable to the Central Plains Tradition because of its cord-roughened pottery, small triangular projectile points, practice of both hunting and [presumably] horticulture, and small settlements that are considered at least semipermanent.

Apishapa focus houses were characteristically stone slab enclosures, usually round or oval, and built on the surface of the ground or on bed rock. No clues have been found as to the nature of the entrance, and hearths were usually outside. Some structures had several contiguous rooms, but single rooms were far more common. Settlements included up to 37 rooms; many sites were on steep-sided buttes or mesa points and fortified (?) by means of a wall across the point. All sites were near potential farm land. Rock shelters continued to be utilized. Petroglyphs are common in areas with a concentration of Apishapa focus sites. Contact with other areas is documented by the presence of flint from the Texas panhandle and southwest Nebraska, obsidian from New Mexico and Pueblo-like sherds, presumably from near Trinidad, Colorado. The style of many of the artifacts is that found in contemporary plains sites to the east, although the alternately-beveled diamond-shaped knives and bison scapula hoes have not been found.

Occupation of southeastern Colorado during the Late Ceramic period was apparently far less intensive than in the Middle Ceramic (Apishapa focus) which came to an end before A.D. 1400. Earth rings, and circles of spaced rocks may date from the 1400s, but artifacts and evidence for dating are minimal. On the basis of documentary evidence, Apaches could have been in the area by about A.D. 1500. Some tipi rings, especially the smaller ones, may date from this time, but they could also date from as late as the 1800s. Artifacts, especially diagnostic ones, are consistently lacking or very rare. Limited amounts of pottery have been found in southeast Colorado that support the ethnohistorical evidence for settlements of Apaches engaged in limited horticulture. Other artifacts, such as small triangular projectile points, end scrapers, side scrapers and crude cutting and chopping tools recovered from some of the small, sparse sites can reasonably be attributed to Apaches.

Southeastern Colorado was the home of various bands of Apaches in the 1500s, 1600s and early 1700s. During the latter part of this period, the principal bands were the Penxayes and Carlanas, also called Sierra Blancas. When the Cuartelejos were forced to leave western Kansas and southwestern Nebraska, they joined the Carlanas briefly before the combined group was forced to abandon the area, some joining the Jicarillas in foothills of the Sangre de Cristos in northeastern New Mexico and others joining the Lipan Apaches in western Texas. During the 1700s the Comanches took over southeastern Colorado and were frequently joined there by their Ute relatives. By the 1790s Indians from the north began to appear and in the early 1800s they became more numerous. Although the Kiowas came first, with the Kiowa Apaches, the Arapahos, under chief Bear's Tooth, became a dominant group. Soon they were joined by Cheyennes. Crows, Shoshonis and Blackfeet were also seen. After the Louisiana Purchase in 1804, there was a marked increase in American exploration and travel along the Arkansas River, following what was to become the Santa Fe Trail. Charles Bent built a substantial fort near Las Animas, Colorado and was licensed to trade with the Indians of the area. It was the concentration of Indians there that had attracted Bent and his fort attracted more and more Indians. The Arkansas River was established as the boundary between New Mexico and the United States and well before the mid-1800s it was more or less the "boundary" between the Comanches, Kiowa and Kiowa Apaches to the south and the Cheyennes and Arapahos to the north. Large rendezvous along the Arkansas River, both below and above Bents Fort, attracted large numbers of Indians from diverse tribes as well as Spanish, French and Anglo traders.

NORTHEASTERN COLORADO

This section of high, rolling, short-grass plains consists of 80,000 square kilometers bounded on the north by Wyoming and Nebraska, on the east by Nebraska and Kansas, on the west by the foothills of the Rocky Mountains and on the south by the north side of the Arkansas River valley. The northern part is drained by the South Platte River, the middle by the Republican and Smoky Hill, and the south by the Arkansas. Archeological work has been very spotty, and concentrated, mainly in the northern part except for a far-ranging reconnaissance nearly fifty years ago by E.B. Renaud of Denver University.

In northeastern Colorado, Paleoindian complexes are better known than are later complexes. This could represent the great abundance of such sites in the area, but it probably also reflects other factors. During the drought years of the 1930s there was much wind erosion resulting in many blowouts. These rewarded the efforts of numerous artifact collectors who were especially interested in Paleoindian points. During the same period gullies were being cut, exposing other buried occupation levels. Since then, the population has been keenly aware of the possibility of Paleoindian sites in the area and local people have brought a number of important sites to the attention of professional archeologists in time for them to be scientifically investigated.

The best evidence for pre-Clovis occupation in the Central High Plains came to the attention of the Smithsonian Institution in just such a way when, in the process of deepening two playas in northeastern Colorado, bones were uncovered and reported. The two components thus discovered, at the Dutton and Selby sites, could be as old as 29,000 B.P. Retouch flakes, apparently from a pre-Clovis occupation, suggest the use of flaked stone artifacts although none was found. The presence of bone butchering tools, however, is indicated by specimens which show convincing evidence of use. These were found with the bones of various now extinct animals which showed evidence of butchering. Geological evidence shows that the levels containing detritus represent ancient playas, or at least wet conditions. Hopefully, other pre-Clovis sites will be found that include camp or living areas with a more complete artifact inventory.

Clovis fluted points have been found widely scattered over eastern Colorado, primarily on the surface. At the Dutton site, just mentioned, a Clovis occupation occurs stratigraphically above the earlier, bone-tool, occupation. The Dent site, about 50 km northeast of Denver, Colorado, is important in the history of archeology since it was here that the first generally accepted find of projectile points (Clovis) with mammoth bones was made. Relatively little has been learned about the culture of the Clovis people other than that they hunted mammoths with spears or darts tipped with rather crude fluted points, and that the favorite hunting technique was to attack the mammoths when they were at least partially mired down in boggy areas. Several Clovis components have been dated by radiocarbon; their ages fall within an amazingly short span of about 500 years, 11,000 to 11,500 years ago. The Clovis complex has no obvious ancestor in North America, and archeologists are coming more and more to believe that it came from Siberia some 11,500 years ago and spread rapidly over much of North America. Not only should localities producing mammoth bones be carefully investigated for evidence of Clovis occupation, but Clovis sites should be tested for possible earlier components, and northeastern Colorado is a likely area for both.

Following Clovis, and probably evolving fror it, is the Folsom Complex, noted for its well made fluted projectile points with which large, now extinct, bison were hunted. The Folsom complex is known from surface finds of the distinctive points over much of northeastern Colorado. Furthemore, the Lindenmeier site, which has given us more information on the Folsom complex than any other, is located at the western edge of the plains in extreme northern Colorado. Many of the dart or spear points found at Folsom sites have long, broad flutes expertly produced by the removal of a single flake from each side of the point; other flaking on the points is equally well controlled. Some points were fluted on only one side, and others, of the same shape, but left unfluted, are called Midland points and probably should be assigned to the Folsom complex. Equally diagnostic of this complex are the channel flakes, often broken, that were removed from the points and sometimes used as cutting tools. Other chipped stone artifacts include a variety of cutting, scraping and perforating tools. Of special interest are end scrapers with a graver point somewhere on the artifact. These do not appear in ceramic period sites excepting those of the Dismal River aspect (protohistoric Plains Apache), where they are also common. The best explanation for this similarity is that they represent a similar response to shared problems.

During the three millennia (ca. 10,500 to 7,500 years ago) following the Folsom period, there was a proliferation of complexes and a divergence of point types in the high plains. Some of these complexes are widespread, and others, on the basis of present evidence, appear to be limited to a small area. There appears to have been an especially large number of complexes in northeastern Colorado and southeastern Wyoming during this period. Their presence may reflect concentrated

field work in the area, or the convergence there of eastern and western traditions, and possibly northern and southern traditions as well. Projectile points of late Paleoindian complexes, without flutes and without notches, tend to be lanceolate in shape: stems, when present, are parallel-sided with ground edges, and workmanship is generally of high quality. Points were commonly used not only on darts or spears, but as butchering and cutting tools. The basic shapes of the latter were markedly altered by progressive resharpening. Broken points were commonly reworked either for reuse as projectiles or for use as tools of some other kind. Other chipped stone tools included various forms for cutting, scraping and perforating. Sandstone abraders were apparently used for shaping or sharpening bone and wooden artifacts, and milling slabs and hand stones were presumably used for grinding seeds. Bison were commonly hunted, with bison *antiquus* giving way through transitional forms to modern bison *bison*. Post-Folsom Paleoindian complexes reported from northeastern Colorado or nearby areas include: Agate Basin, Hell Gap, Alberta, Cody, Kersey, Firstview (including Milnesand and Plainview), Frederick, and Frontier. Some of these include a number of different named point types. Not surprisingly, there is no general agreement on the definitions of all late Paleoindian complexes.

The Archaic Period in northeastern Colorado is only sketchily known, and here again there is general lack of agreement both on the definition of complexes and the assignment of sites to the complexes that have been proposed. Most of the archaic sites investigated in Colorado are in either the Denver Basin or the mountains to the west and north of Denver. Investigation of high altitude sites north and west of Denver supports the concept of an Altithermal in early Archaic times, with two periods of increased occupation in the mountains at times when there was a decrease in population on the plains. Presumably, during these periods there was more effective precipitation and hence more abundant game at higher altitudes than on the plains. Low altitude sites in northeastern Colorado tend to provide minimal information.

The Archaic peoples depended more heavily on gathering than did the Paleoindians but hunting was still very important. There is no evidence of the hunting of any but modern forms of animals although species not in the immediate area today are represented at some sites. The main hunting weapons were spears and darts used with atlatls. Points range from large to medium-small with notched forms becoming common toward the end of the Archaic. Various cutting, scraping, piercing and grinding tools are also found. Many of the artifact types continued into the Early Ceramic period, making it difficult to assign some sites, such as burials, to either the Archaic or Early Ceramic. A great deal of additional work needs to be done at Archaic sites, since it was then that cultures were adjusting to modern climate, plants, and animals while at the same time responding to marked climatic fluctuations. Furthermore, during the late Archaic period we see the beginnings of specific cultural traditions that lead to historically known tribes.

In northeastern Colorado complexes of the Early Ceramic period are not much better known than those of the Archaic. Early Ceramic (Woodland) complexes farther east closely resemble those of the late Archaic, with pottery and minimal horticulture added. It is not surprising that people in the process of developing a semi-sedentary life way are poorly represented west of the limit for effective dry-land farming. In northeastern Colorado cord-roughened pottery resembling Woodland pottery from Nebraska and Kansas is occasionally found, but thus far no sites suggest permanent or long-term occupation. A few possible exceptions are sites in the foothills of the Rockies, where gardening might have been possible along streams rising in the mountains. Most Early Ceramic sites, however, can best be interpreted as camps of people from farther east who were in or going through the area for hunting, trading or other purposes. The diagnostic artifacts for this period are thick, cord-roughened pottery with simple rims and long pointed bodies, and small to medium-sized triangular projectile points with a stem or corner notches. The rest of the inventory is essentially that of the archaic, although many of the other artifacts also closely resemble those found in later complexes. Some burials have been assigned to this period because the mortuary practices seem to resemble, in an attenuated form, ones found to the east, such as placing several burials in a very limited area and the inclusion of shell beads.

Middle Ceramic complexes in northeastern Colorado are also poorly known but could prove to be very important in the interpretation of plains culture history. Much of the rather meager sample of cord-roughened pottery from the area is not clearly of either Woodland or Central Plains affiliation and could possibly be transitional. There is convincing evidence that a new race of maize entered the plains from the Southwest at the beginning of the Middle Ceramic period, possibly, even probably, accompanied by the ideas of globular pottery vessels and earth-covered shallow pit structures. A deliberate effort should be made to find and carefully excavate sites that could be transitional. Accurate tree-ring chronology is badly needed, since other methods of dating are not sufficiently precise. Radiocarbon dating seems to be especially erratic during this period. As for typological differentiation, where pottery is not highly diagnostic, the assignment of sites to periods can also be based on projectile point types. Small stemmed or corner-notched points occur in the Early Ceramic period and small triangular

points without notches or with side notches and a basal notch are diagnostic of the Middle and Late Ceramic periods. By Late Ceramic times cord-roughened pottery was apparently no longer being made.

One Middle Ceramic site near Limon in the middle of the eastern half of Colorado is especially interesting in that the pottery is identical to that found at Upper Republican sites in southwestern Nebraska. The rims, many of which are braced and decorated, contrast markedly with the much plainer rims found at other Middle Ceramic sites in eastern Colorado. It is perhaps significant that this site near Limon is at the head of a major branch of the Republican River which could have served as a convenient travel route from the Upper Republican aspect heartland. Even here, however, there is no indication that the site contained horticultural tools or the substantial earth lodges found farther east. Except for possibly a few sites near the foothills of the Rocky Mountains, the Middle Ceramic period sites of northeastern Colorado, like Woodland sites, can be best interpreted as temporary camps occupied by people from farther east while crossing the area for hunting or trading. Other than pottery and projectile points, few if any of the artifacts found at these sites are diagnostic.

During the Late Ceramic period, northeastern Colorado was dominated by Plains Apaches who probably arrived about A.D. 1500 and were forced out by the mid-1700s. By the middle of this two-and-a-half century occupation, the Apaches in the eastern part of the Central High Plains had adopted pottery making, limited horticulture and villages of semi-permanent dwellings; archeologically this complex is known as the Dismal River aspect. Dismal River pottery, distinguished by its general plainness, with occasional sherds containing finely divided mica and/or having a simple-stamped (grooved) surface treatment, occurs sparsely over Colorado east of the Rocky Mountains. Apparently only one Dismal River village, with small pit houses, is known in eastern Colorado, and that occurs as a second component at the anomalous sites near Limon in the middle of the eastern half of Colorado. Twentieth century climatic maps show greater precipitation here than to the north, west, or south, a circumstance that, if true earlier, could account for the village. Stone artifacts of the Dismal River component, other than the very well-made small projectile points, are quite crude, but basically resemble those of other Late and Middle Ceramic Plains complexes. Apache end scrapers are interesting in that many have graver points and/or other scraping edges as well as the snub-nose; traits also found in some Paleoindian complexes. Another diagnostic stone artifact is "cigar" shaped, resembles a double-pointed drill, and has one to four centrally-located projections; these objects, however, have not yet been reported from Colorado. One small, well-made, portable metate, of a type known only from Dismal River and Jicarilla archeological sites and ethnographically from the Jicarilla Apaches, is known from near the middle of eastern Colorado. Dismal River houses, with a distinctive five-center-post pattern are also unreported from Colorado. Plains Apache complexes of the 1500s have not yet been identified. Throughout their occupation the Apaches remained primarily hunters.

From the 1500s until about 1730, northeastern Colorado was the hunting territory of Paloma and Cuartelejo Apaches who may have had a few semi-permanent villages there. A few Shoshonis probably got into the area also. The Comanches (and possibly Shoshonis) forced the Apaches out of the area about 1730 and became the dominant group there until the end of the 1700s, although the Pawnees and, to a lesser extent, Wichita, went on hunting expeditions into northeastern Colorado. Shortly after 1800 the balance of power in that area had shifted to the Arapahos, Cheyennes, Kiowas and Kiowa Apaches, with the Comanches centering their activities farther south. Other tribes from the north, such as the Shoshoni, Blackfeet, Crow and Sioux, also hunted over much of northeastern Colorado. By the mid-1800s the Kiowa and Kiowa Apaches had also shifted their activities farther south, but they and the Comanches continued to be observed north of the Arkansas River as well, until all were placed on reservations. There were no well-defined boundaries between the hunting territories of these various nomadic tribes. Many Indians and whites crossed northeastern Colorado on their way to major rendezvous in the foothills of the Rockies. One of the most notorious attacks by American troops, the Sandy Creek Massacre, took place on the Big Sandy near its big bend.

NORTHERN COLORADO FOOTHILLS

The area here called the northern Colorado Foothills extends north from Colorado Springs to the Wyoming border and is drained primarily by the South Platte River. The plains abruptly meet the mountains, which can be seen from many miles to the east. Preceramic complexes have received the most archeological attention in the area, which probably reflects the greater abundance of preceramic.

During the Paleoindian period, there were apparently as many different complexes to the east of the foothills in the plains of northeastern Colorado as anywhere else in the Central High Plains. Essentially meeting there were complexes that had their centers to the north, south, east and west. One could expect to find sites of any of these up to the Front Range, but since they all specialized in hunting large plains herbivores, sites of Paleoindians are probably quite rare in the rough country at higher elevations. Included in the plains just to the east of the mountains are Preclovis (?), Clovis, Goshen (?), Folsom, Mid-

land, Firstview (including Plainview and Milnesand), Hell Gap, Kersey, Cody, and Fredrick (?). Each was characterized by particular types of spear or dart points, some of which graded into one another to form a continuum. All had a variety of cutting and scraping tools and the points were often used as knives for butchering and were resharpened repeatedly. Large animals constituted a major part of the diet and were probably hunted cooperatively. First mammoth, probably plus camel and horse, then the large Bison *antiquus* and, later, progressively smaller bison, but ones still larger than the modern form.

Two Paleoindian sites in the northern Colorado foothills are of special significance. Just south of Denver is the Lamb Spring site which may have had a Preclovis occupation, although additional work at the site has made this questionable. There was clearly an assemblage of extinct fauna dating from Preclovis times at the site, but evidence of associated human activity is unclear. There was, however, a later Cody Complex occupation at Lamb Spring, and the site did demonstrate that conditions were right in the Denver Basin for various species of now extinct mammals during Clovis times and probably for several millenia before. Thus, this would be a likely locality for very early Paleoindian occupation and any manifestation of late Pleistocene age that yields faunal materials should be carefully examined for tools, especially inconspicuous expediency tools made from broken bones, and for butchering marks on the bones, as well asany other evidence that suggests human activity.

The Lindenmeier site, located essentially in the Colorado Foothills just south of the Wyoming border, has provided us with more information on the Folsom Complex than has any other. The site, excavated in the 1930s primarily by the Smithsonian Institution, consisted of both a bison kill area and a large living or camp area. This is still the only large Folsom habitation site to be professionally excavated.

Faunal remains from the Lindenmeier site included not only bones of Bison *antiquus* but also of a large variety of smaller animals. Milling slabs suggested that seeds played a significant part in the diet. The carefully made fluted points diagnostic of the complex were abundant and identical, but unfluted specimens, called Midland points, were also recovered; some points were fluted on only one side. Numerous flakes removed from the points in the fluting process were recovered and showed evidence of having been used as knives. Given the large sample, and points at various stages of manufacture, much was learned about the flint knapping techniques employed. In addition to stone and bone tools, several beads or ornaments were also found.

In contrast to the general situation, the Archaic is the period most thoroughly investigated in the northern Colorado foothills. Most notable has been the work at the Magic Mountain and LoDaisKa sites near Denver and at various high altitude sites north and west of Denver. It is fortunate that interest has developed here since several different Archaic complexes, with their centers to the southeast, southwest, west and north, appear to meet or at least occur here. Also, the high altitude sites appear to represent population movements to climatically more favorable spots when the hot, dry Altithermal periods resulted in depopulation of the plains.

The Logan Creek complex is apparently present but poorly represented in the Foothills. The Mount Albion complex, which is known primarily from high altitude sites, has been more completely described than any other Early Archaic complex in northern Colorado. The more spectacular and informative of the many sites attributed to this complex are extensive game drives at 3500 m elevation, well above timberline almost to the continental divide. These sites have long dry-laid rock walls, numerous cairns, concealment pits, and camp/butchering areas. In addition to the diagnostic Mount Albion projectile points, the artifact inventory includes various cutting, scraping and piercing tools. Radiocarbon dates cluster around 5700 years ago, during the Altithermal period. Other similar but more recent Early Archaic complexes are the Albion Boarding House and the Fourth of July Valley complexes.

The deeply stratified Magic Mountain site, just west of Denver, was interpreted by Irwin-Williams and Irwin as having been occupied sporadically by two groups of Archaic people who had quite different artifact assemblages. The earlier of the two they called the Magic Mountain complex and the later, Middle Archaic, complex which overlapped considerably in time with it, the Apex complex. In spite of the overlap, they suggested little interaction between the two groups, whose artifact assemblages were sorted out on the basis of typology. The Magic Mountain complex, distinctive in that many of the tools were apparently composite, utilizing small prismatic flakes, has a distribution along the foothills from Denver north to the Wyoming line. Benedict interprets the oldest material at the Magic Mountain site as a mixture of Mount Albion artifacts with those of some other complex. One burial from the foothills is of Early Archaic age but none of the associated artifacts were diagnostic.

As for the Middle Archaic period, at least three different complexes have been proposed for the northern Colorado foothills. The McKean complex, with its highly variable points, probably extended this far south. The validity or uniqueness of the other two, Apex and LoDaisKa D, has been questioned on the basis of later work in the area. It has been suggested that the Apex complex is the northernmost manifestation of the Picosa or Elementary Southwestern Culture considered to be ancestral to Pueblo cultures. Another interpretation is that

there was a single complex centering in the Foothills that lasted through both the Early and Middle Archaic periods. Other sites of probable Middle Archaic age have been reported from the Foothills but not assigned to particular complexes; included are Archaic components at the Lindenmeier and Lamb Spring Paleoindian sites.

The Late Archaic period is characterized by the appearance of large corner-notched or broad expanding stem points. The number of Archaic sites on the plains apparently increased while the occupation of the foothills of northern Colorado decreased, at least relatively. At the Magic Mountain site this period is represented by Complex B which is above the late Apex material and is dated at about 2000 years ago. A few other sites in the Denver Basin and along the Foothills are also of Late Archaic age, but in general they have contributed little additional information.

Sites, or more commonly components at sites, attributed to the Early Ceramic period are moderately common in the northern Colorado foothills. Nearly all, however, appear to have been occupied only briefly. Assignment is based on a few cord-roughened sherds, small corner notched or stemmed projectile points, or on radiocarbon dates. Most of the sites are rock shelters where the evidence is found in the upper layer if the deposit was stratified. Three phases have been suggested although many sites are unassigned. In the northern Foothills and extending on into the plains, the sites are most commonly assigned to the Ash Hollow Phase which is best known from the panhandle of Nebraska. In the northern foothills in general, sites are most commonly seen as having Parker Phase affiliation. Both of these phases would seem to be western extensions, perhaps temporary camps related to Woodland complexes centering much farther east; similarities to Keith focus have been mentioned. The third phase, to which the name Hog Back has been applied, is of special interest in that it seems to be mountain rather than plains oriented and sites range in elevation up to the tundra zone. It has been suggested that the Hog Back phase might represent Shoshonean peoples who secured a little cordmarked pottery from Woodland affiliated people to the east. One of the sites contained two structures with crude rock walls or wall bases. Some of the high altitude sites assigned to this phase have game drive features consisting of stone walls and cairns. A Hog Back phase affiliation has been proposed for several sites once considered to be Parker phase.

Middle Ceramic period sites in the northern Colorado foothills appear to be neither large nor numerous. Withers suggested that the Franktown focus, which he defined, could be transitional between the Woodland (Parker focus) and Upper Republican (Buick focus), an idea that should not be discarded. Unfortunately, there is very little in the literature on the Franktown focus which presumably occurs all along the northern foothills of Colorado; it is unclear how far east it extends. Except along the Wyoming border, there are apparently no known Upper Republican sites closer than 80 km from the foothills. Even the sites farther out appear to be small temporary camps, often in rock shelters. Some sites lacking diagnostic artifacts have been assigned to the Middle Ceramic period solely on the basis of radiocarbon dates.

During the Late Ceramic (protohistoric) period, the northern Colorado foothills were utilized by both Apachean and Shoshonean peoples for hunting and gathering. No indication of even semi-permanent settlements has been reported for either. Dismal River (Plains Apache) sherds have been found at various sites, probably left there by parties from farther east during the late 1600s and early 1700s, but earlier nonceramic Apache sites have almost certainly gone unidentified. Flat-bottomed pottery of a type associated with Shoshonean people farther west and north has been found in one cave just southwest of Denver.

During the historic period and probably long before, the foothills of the Rocky Mountains provided a major north-south travel route extending from Mexico north into Canada. This was "The Old North Trail" of the Blackfeet which later became the route of cattle drives and is now followed for much of its distance by Interstate Highway 25. Rivers from the east and mountain passes from the west provided feeders to this corridor. Three major rendezvous locations existed in the foothills of northeastern Colorado. One was on Cherry Creek where Denver is now located. Not far north of Denver, Ceran St. Vrain established a trading post, essentially a satellite of Bent's Fort on the Arkansas, which served as a second rendezvous. A third was near the Platte a little farther north. From the 1500s until near the middle of the 1700s plains Apaches were the main Indians in the foothills, but they were replaced by Comanches. Shoshones and Utes also got into the area. Starting with the very early 1800s the Arapahos and Cheyennes became numerous, along with Kiowas and Kiowa Apaches. Blackfeet, Crows and Sioux were probably the next most common.

SOUTHCENTRAL COLORADO

This area includes the eastern foothills of the Rocky Mountains that are drained by the Arkansas River plus all of Colorado drained by the Rio Grande. It extends from Colorado Springs south to the New Mexico border and west to the continental divide; the San Luis Valley makes up much of the area. South-central Colorado can be best characterized archeologically as showing unquestionable influence from the Pueblo Southwest. Except for the Trinidad area, however, there is relatively little information in the literature about the archeology of this area of some 40,000 sq. km. although work is

continuing there.

The only Paleoindian site that has attracted much attention is the Linger site, a Folsom manifestation in the San Luis Valley, and very little has been published on it. There is no obvious reason why Clovis or even Preclovis sites and additional Folsom sites should not be found there. Certainly, any occurrences of bones of late Pleistocene fauna should be carefully examined for evidence of human activity. On the Late Paleoindian level, one would also expect to find Firstview/Plainview/Milnesand complex sites and probably Cody complex sites as well. Each complex has diagnostic projectile points plus a variety of other cutting and scraping tools which are not diagnostic. Bison were the large herbivores hunted by each group, but smaller animals also apparently contributed to the diet as did various plants. Hunting was probably a communal or joint effort for each group.

Both Early Archaic and Middle Archaic sites have been reported from northwest of Trinidad, Colorado on the basis of survey data. The evidence, however, is very sparse, averaging less than one point per site. The Picosa complex, presumed to be ancestral to the Pueblo cultures, extends at least into the San Luis Valley. Since high altitude Archaic sites have been reported from both north and south of southcentral Colorado, one would expect them to occur there as well. More research is needed on the Archaic of this area since it is here that the plains and the Southwest culture areas meet. Also, it is the beginning of essentially modern environmental times.

An Early Ceramic complex, the Graneros focus, could prove to be very important in the reconstruction of plains culture history. Graneros sites are known only from the Arkansas drainage in southern Colorado, with the type site occurring at the edge of the foothills. Pottery from the complex is pointed bottomed with simple rims and a cord-roughened surface treatment, reminiscent of Woodland pottery from the eastern High Plains. The projectile points are small and corner notched or stemmed, also like Woodland points. One of the two known structures is a small oval pithouse with a covered entrance way. The other is round with eight support posts set near the wall and partially surrounded by dry-laid masonry.

Along the Purgatoire River in the foothills of extreme southern Colorado, the Late Ceramic period is represented by the Sopris Phase. This can best be interpreted as part of an indigenous tradition which was strongly influenced by Pueblo culture of the Upper Rio Grande in New Mexico, especially in ceramics and architecture. The structures are of adobe but without a set style. Some of the pottery seems to be a local imitation of Pueblo pottery, which occurs as trade material. Subsistence was apparently based on a combination of hunting, gathering and horticulture. The relationship of the Sopris phase to other indigenous complexes needs to be worked out. The occurrence of Pueblo pottery in the San Luis Valley has been noted, but the nature of the occupation has not been established in the literature.

The only Late Ceramic complex identified in southcentral Colorado can be attributed to Plains Apaches, probably representing the western thrust of the Dismal River aspect from western Kansas and Nebraska. At some of these sites, Jicarilla pottery from northeastern New Mexico has been recovered. Perhaps there are semipermanent villages along the foothills, but this has not yet been demonstrated. Earlier identification of sherds from the San Luis Valley as Dismal River was in error.

The intermontane area of south-central Colorado was Ute territory. It is essentially the area drained by the Rio Grande, plus the parks farther north drained by tributaries of the Arkansas. By 1706 Comanches were getting into the area from their homeland in Wyoming. Jicarilla Apaches and Navajos also entered the area but apparently not frequently or in large numbers. Passes from the Plains to the San Luis Valley provided access to the Upper Rio Grande, which, in turn, provided routes for Indians and whites who were going to and from Taos and Santa Fe in New Mexico. In the eastern foothills of the southern Colorado Rockies, semisedentary Apaches were early (c. 1720) displaced by Comanches, who by the late 1700s essentially had a stronghold there. Their flamboyant chief, Greenhorn, was an effective leader who was finally crushed by New Mexico's even more effective governor, Juan Bautista De Anza, who, in a very short-lived endeavor, tried to settle the Yupe Comanches in a permanent village at San Carlos, on the Arkansas. The Old North Trail, as stated elsewhere, followed the foothills here and the main branch of the Santa Fe Trail went over Raton Pass. One important rendezvous area was near Pueblo, Colorado where the Arkansas River leaves the foothills. The most famous, however, was at Manitou Springs or Boiling Springs on Fountain Creek just west of Colorado Springs, probably because of the unusual nature of the springs. The vicinity was essentially held sacred by the tribes that came here to trade with one another as well as with French, Anglo and Spanish traders. The Arapaho was the tribe that apparently felt most attached to the Manitou Springs area in the mid-1800s.

NEW MEXICO FOOTHILLS

The area here dealt with includes a narrow band some 200 km north and south where the short-grass plains abruptly meet the Sangre de Cristos. It extends from Raton, New Mexico, just south of the Colorado border, to the southern edge of the Central High Plains, some 50 km south of Las Vegas, New Mexico. Archeologically, the most conspicuous difference between the New Mexico foot-

hills and northeastern New Mexico is the presence in the foothills of permanent villages that have unmistakable affiliations with the Pueblo occupations to the west. Canyon mouths are fertile and well-watered by streams that head in the Sangre de Cristos. They are also close to the diverse natural resources provided by both the mountains and the plains. Although the elevation is about 2100 m, limited horticulture is possible and still commonly practiced.

In the Cimarron, New Mexico, area Glassow has defined a series of archeological phases on the basis of extensive survey and limited excavation. Evidence of Paleoindian and Archaic occupation is very scant. Corn horticulture appears to have come in about 400 to 700 A D along with simple circular surface structures outlined with horizontal rock slabs. After an apparently very sparse earlier population, sites with pithouses and pottery similar to Pueblo I pottery elsewhere in the Southwest are reported. During the 1100 to 1250 period, especially after the midpoint, there was a marked population increase with multiroomed surface structures, some including rectangular kivas, and ceramics that show similarities to contemporary wares in the Taos area, with many of the culinary vessels showing broad-line incised decoration. Throughout the development of the Pueblo occupation, corrugated ware was rare and painted trade sherds were varied but not common. The Cimarron manifestations differ enough from those in the Taos area that they should be considered separately and not just an extension over the mountains from the Taos area. Strangely enough, there is little or no evidence of plains contact at the Pueblo sites in the Cimarron area even though they were the Pueblo sites closest to the major plains populations. By about A.D. 1300 the Cimarron area appears to have been completely depopulated until the appearance of Apaches in the early or mid-1500s.

Farther south along the foothills, near Las Vegas, New Mexico, a wide variety of Paleoindian points and a few archaic points are represented in private collections, most from badly deflated sites. No published reports of professionally excavated sites, however, are available. There are numerous Pueblo sites a little way back into the foothills along the Pecos River and its tributaries which have broad valleys. All of these have their cultural ties with the Santa Fe-Galisteo Area. Especially rich in ruins is the Pecos valley itself, from Pecos Pueblo to a little way below Anton Chico and along Tecolote creek from a little way above Tecolote to the mouth of the creek. Along the foothills north of Las Vegas, however, the number and size of the sites are greatly reduced, the largest being at Watrous, New Mexico. This latter is anomolous in that it is in the drainage of the Canadian but has ties to the Santa Fe-Galisteo Area. Apparently all other foothill Pueblo sites in the Canadian drainage have their cultural ties with the Taos area. There are probably earlier Pueblo sites in the Las Vegas area but the ones noted thus far apparently date from after about 1000 or 1100. Excepting Pecos Pueblo, ruins which date from after about 1250 or 1300 are rare.

Apache archeology is well represented in the foothills of northeastern New Mexico. Sites that may be Apache of the late 1500s and early 1600s have been located in both the Las Vegas and Cimarron areas. These have a few glaze-paint sherds, apparently all from Pecos, but little or no utility ware. Lithics include a substantial proportion of Alibates dolomite from the panhandle of Texas, as well as obsidian. A site near Anton Chico has several small tipi rings with associated glaze waxes of the mid-1500s.

A large tipi ring site near Las Vegas has an abundance of utility ware, probably Apache, and glaze sherds from both Pecos and Picuris that date it in the mid to late-1600s. Most numerous, especially in the Cimarron area, are sites of circa 1700 with distinctive thin Ocate Micaceous pottery of Apache manufacture, a Plains-like artifact assemblage, and limited amounts of white trade material and painted Tewa sherds. Structures excavated include a seven-room adobe walled pueblo, a small pit house, a rectangular structure with adobe and pole wall construction, baking pits and storage or cache pits. Spanish accounts of ca. 1700 report numerous Jicarilla sites in the area with a variety of house types, irrigation and abundant crops. Apache sites of the last half of the 1700s and early 1800s, after the Comanches drove the Jicarillas from the east side of the mountains, have not been found. Sites with tipi rings or small crude stone structures, thick micaceous pottery, more abundant white trade goods and Pueblo pottery have been identified as Apache sites of the mid- to late 1800s.

Ethnohistorical information is relatively rich for the foothills of northeastern New Mexico. We learn from the Coronado documents that Apaches (Teyas and Querechos) had reached the southern plains and the pueblo area at about 1525 and from the Onate documents that Apaches were living in "pueblos" northeast of Taos circa 1600. Detailed accounts of 1706 and 1719 by Ulibari and Valverde describe Apache villages near Cimarron. The Faraon Apaches were frequenting the Las Vegas area and Pecos Pueblo. Increasing Comanche pressure, starting in the early 1700s, forced the Jicarillas to move west to the Rio Grande valley by 1750. For the last half of the 1700s Comanches dominated the foothills. In the early 1800s Arapahos, Cheyennes, Kiowas and Kiowa Apaches moved south into the Upper Arkansas River area, where Spaniards went to trade with them. The Comanches by then were centering their activities in western Texas. Throughout most of the 1800s both bands of Jicarillas, often in the company of Southern Utes, were still venturing into the foothills area to hunt. Starting by at least the early 1700s, the Spanish and later the Americans

were using several well-established trails from the Rio Grande valley across the Sangre de Cristos into the foothills. These fed into what was to become the best known of all, the Santa Fe Trail, the mountain route of which followed the foothills from Raton to Las Vegas and on to Pecos pueblo and Santa Fe.

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APPENDIX I
POINT TYPES

Culture History of the Central High Plains

(Highly Speculative)

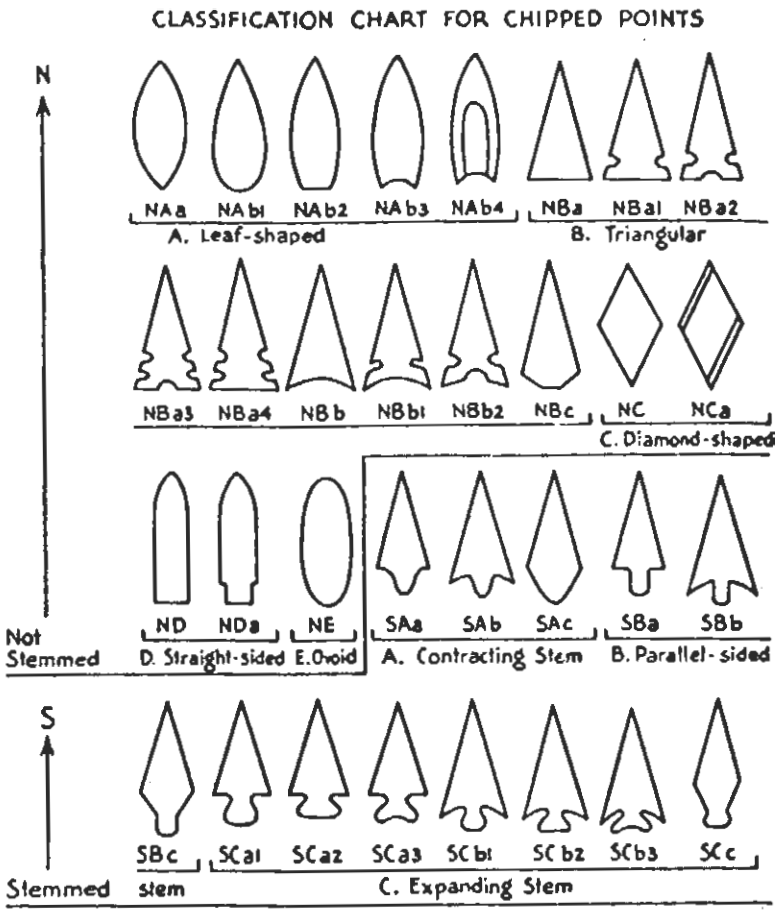

FIG. 7.—Form classification for chipped points

(Strong 1935:88)

ABASOLO

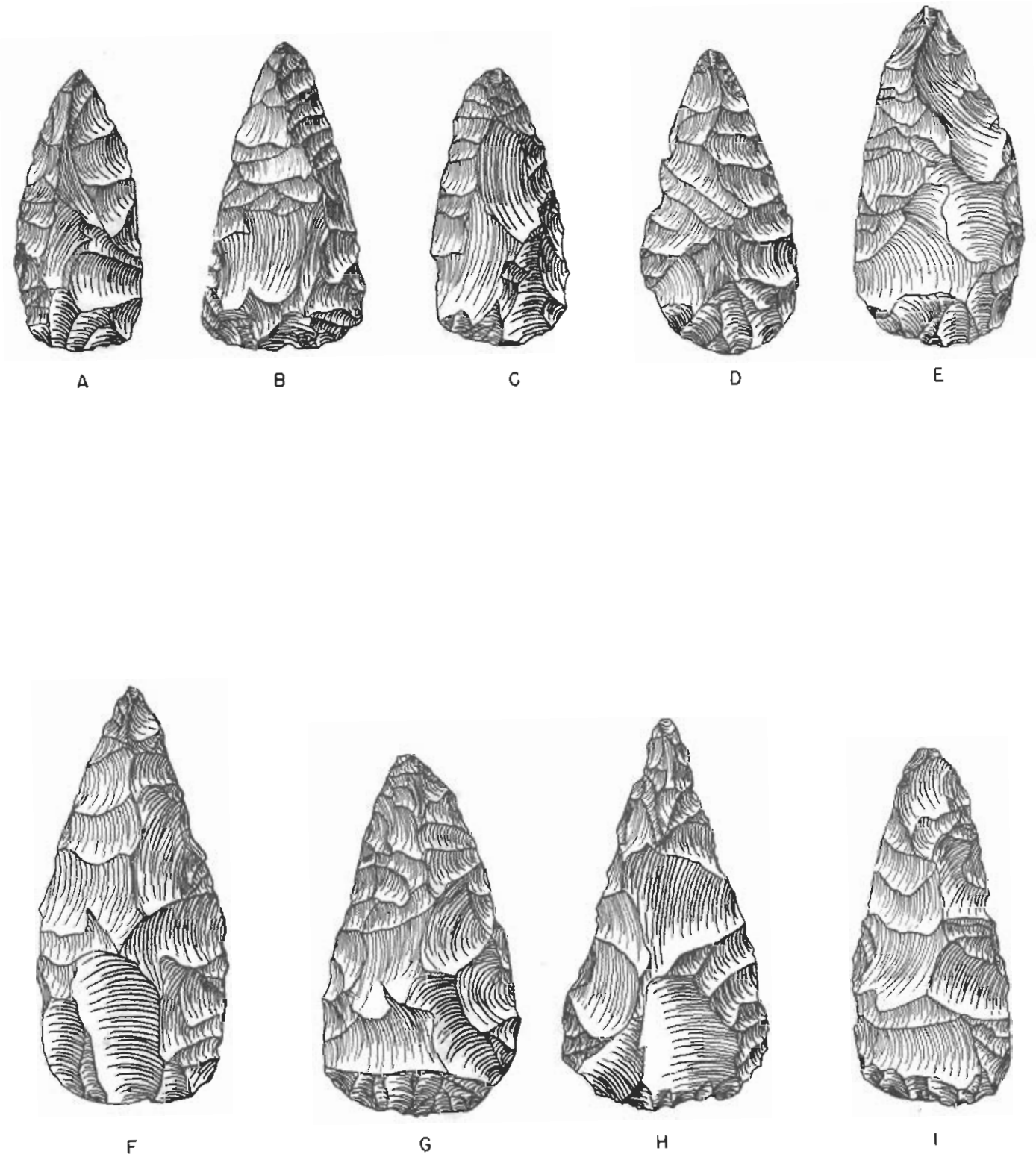

Plate 1

From: Bell (1958) Courtesy: Oklahoma Anthropological Society

AGATE BASIN

A

B

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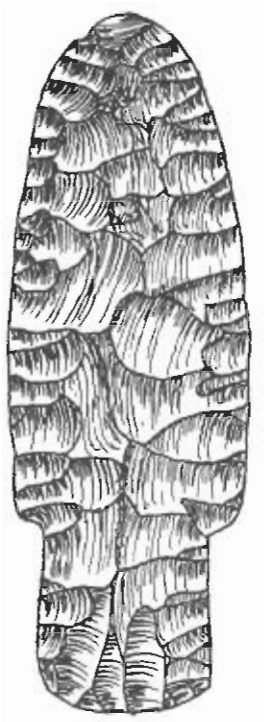
Plate 1

From: Perino (1968) Courtesy: Oklahoma Anthropological Society

ALBERTA



A

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D

Plate 1

From: Bell (1960) Courtesy: Oklahoma Anthropological Society

ALLEN

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F

Courtesy: Oklahoma Anthropological Society (Perino 1971:3)

AVONLEA

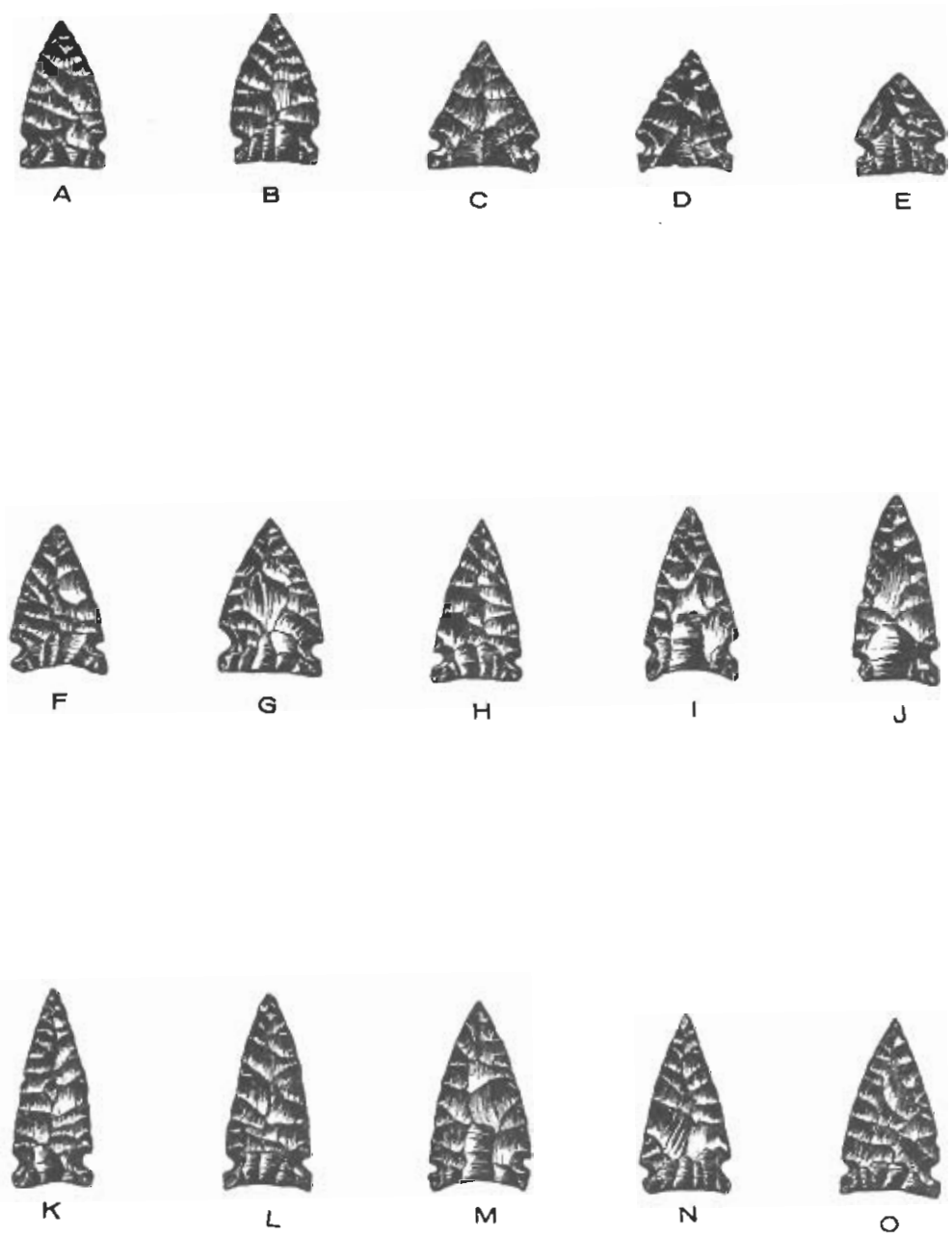

Plate 3

From: Perino (1968) Courtesy: Oklahoma Anthropological Society

CLOVIS

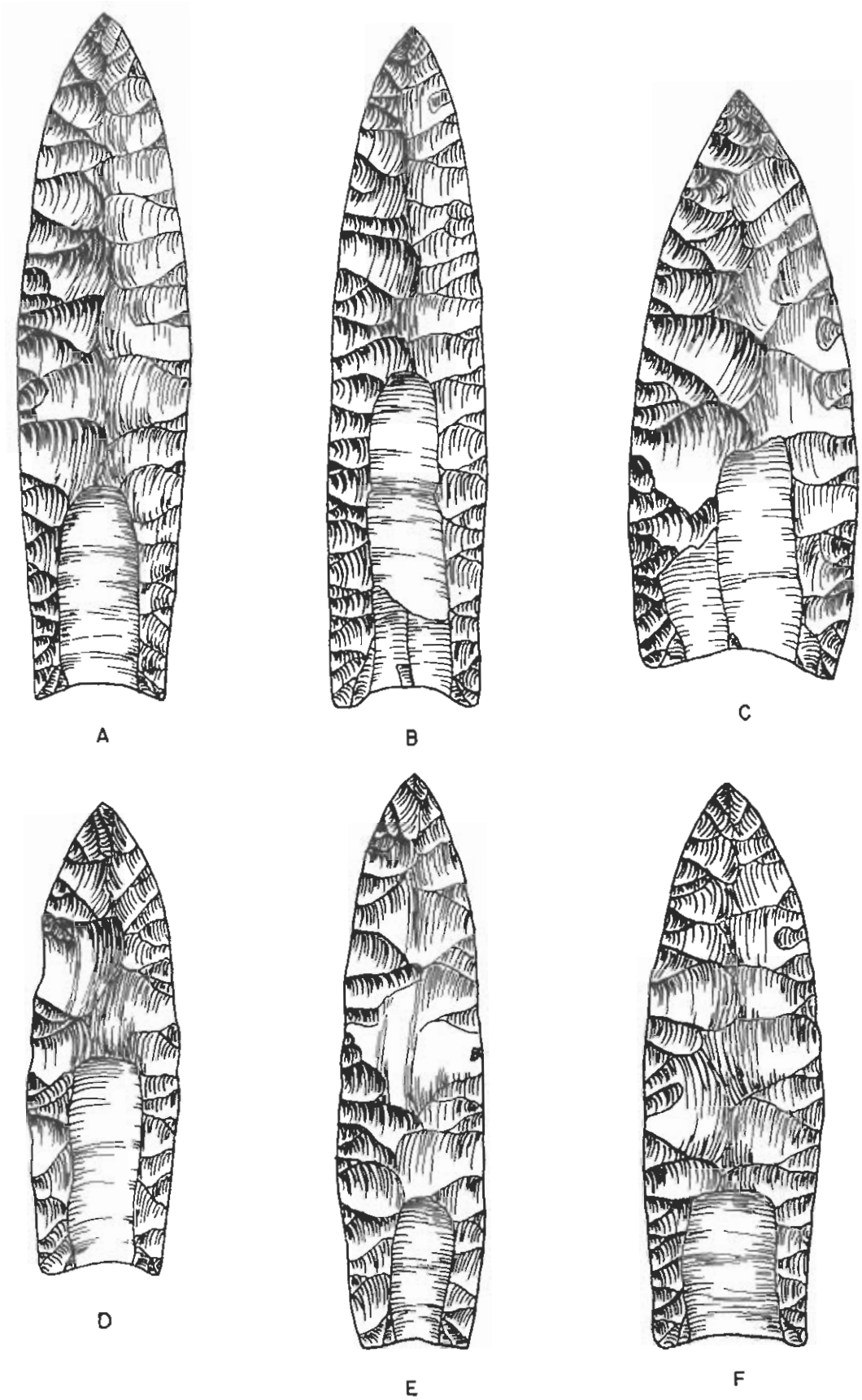

Plate 8

From: Bell (1958) Courtesy: Oklahoma Anthropological Society

DALTON

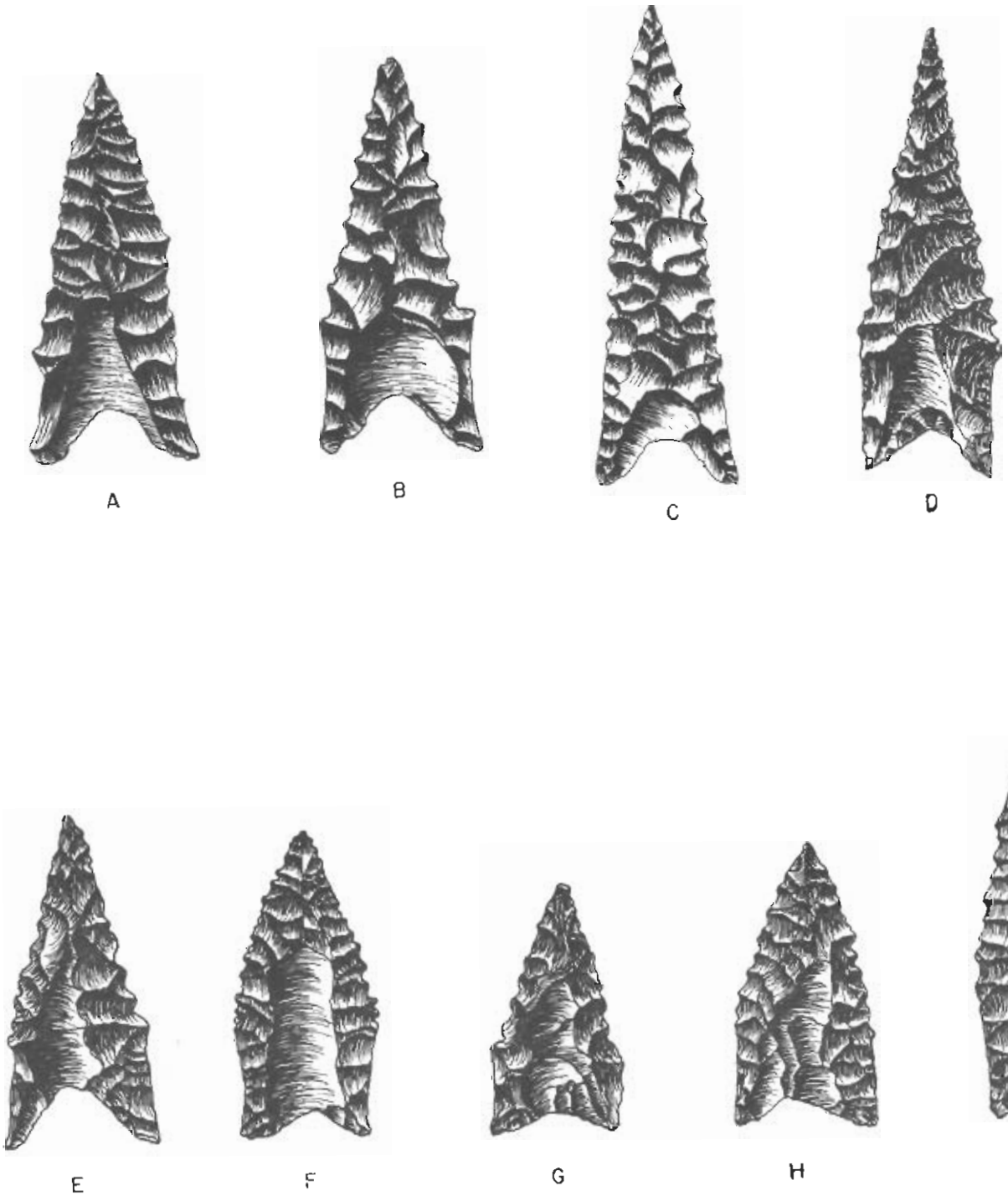

Plate 9

From: Bell (1958) Courtesy: Oklahoma Anthropological Society

DUNCAN

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Courtesy: Oklahoma Anthropological Society (Perino 1971:27)

EDEN

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C

D

E

F

Courtesy: Oklahoma Anthropological Society

(Perino 1971:31)

EDGEWOOD

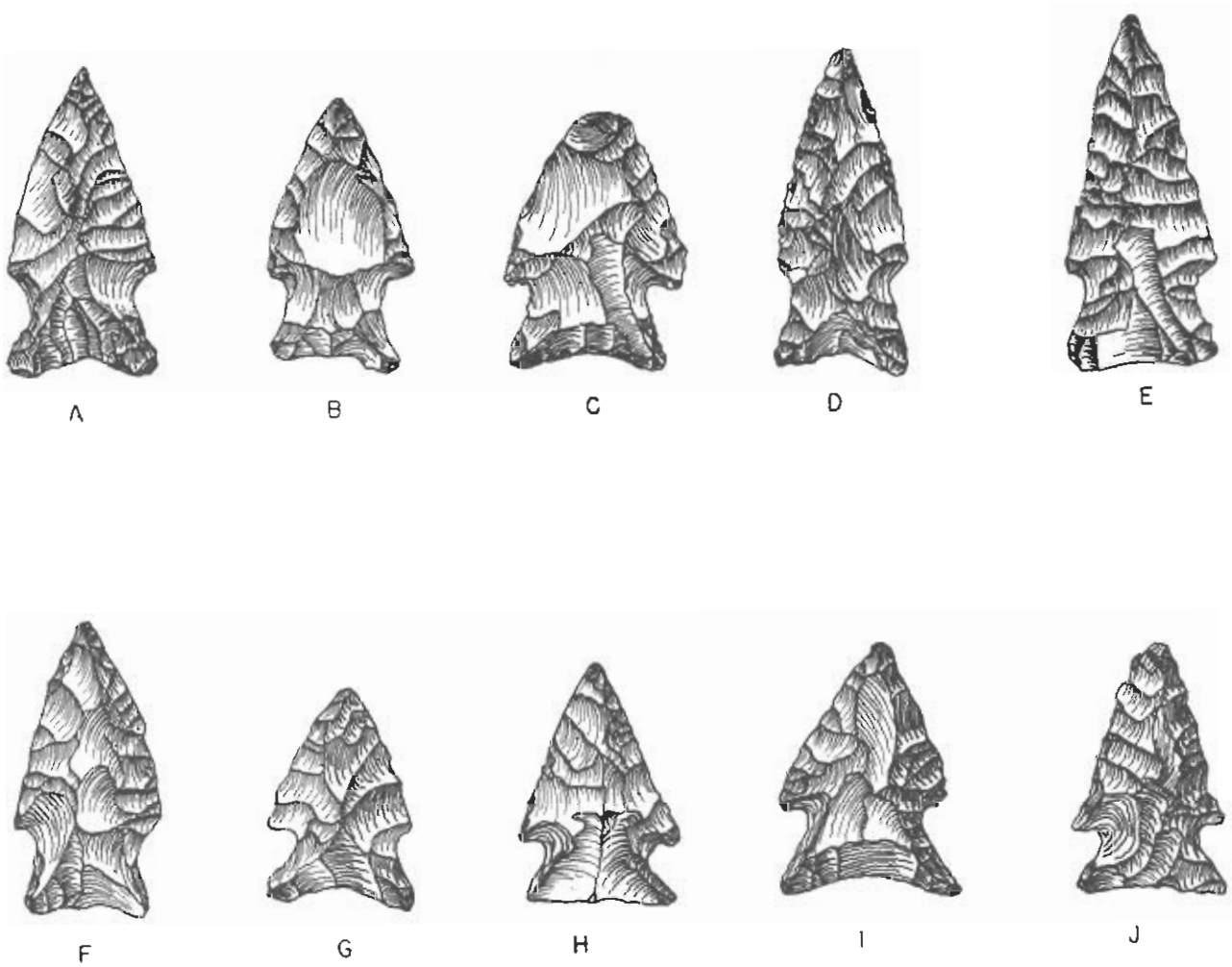

Plate 10

From: Bell (1958) Courtesy: Oklahoma Anthropological Society

ELLIS

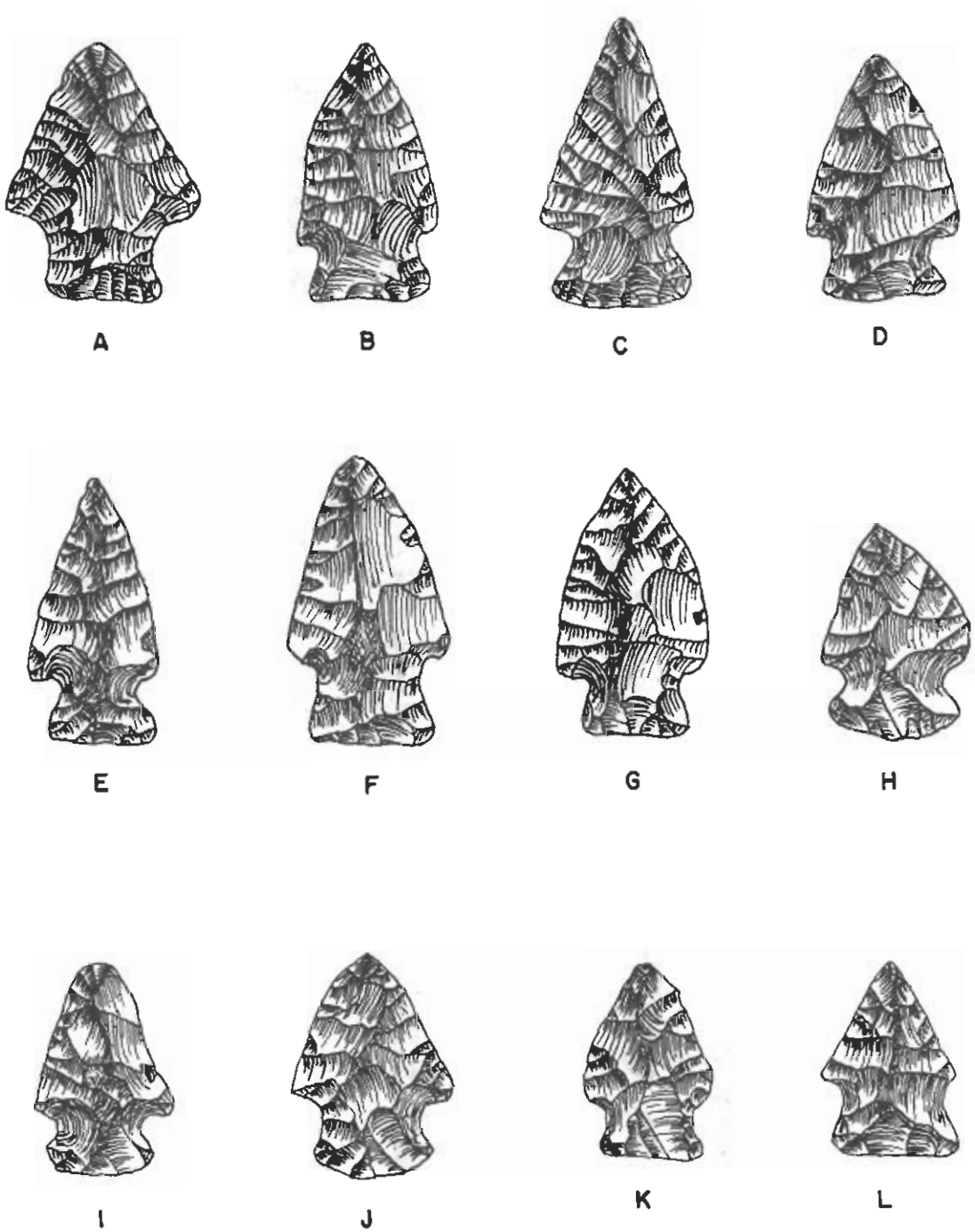

Plate 16

From: Bell (1960) Courtesy: Oklahoma Anthropological Society

FOLSOM

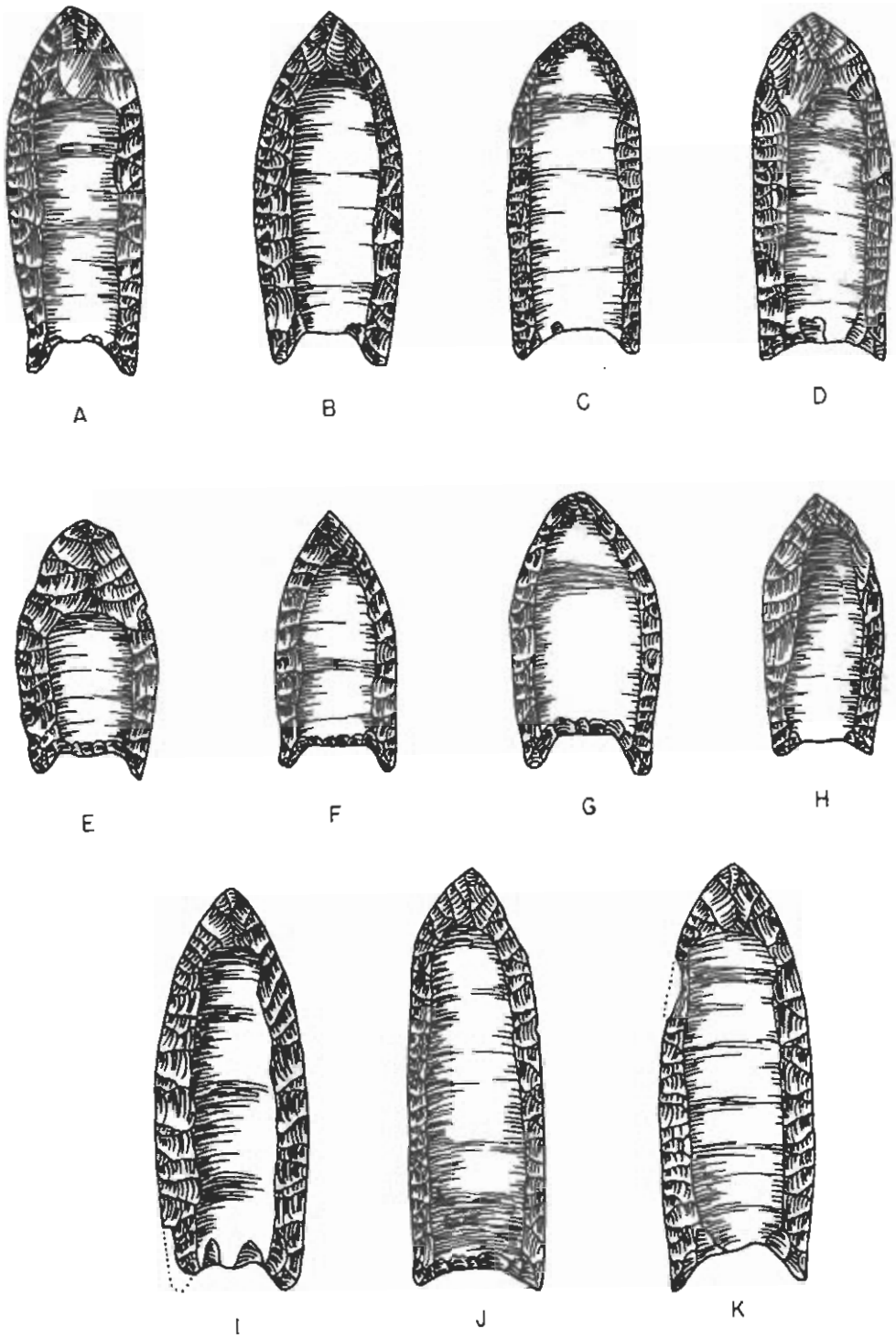

Plate 13

From: Bell (1958) Courtesy: Oklahoma Anthropological Society

FRESNO

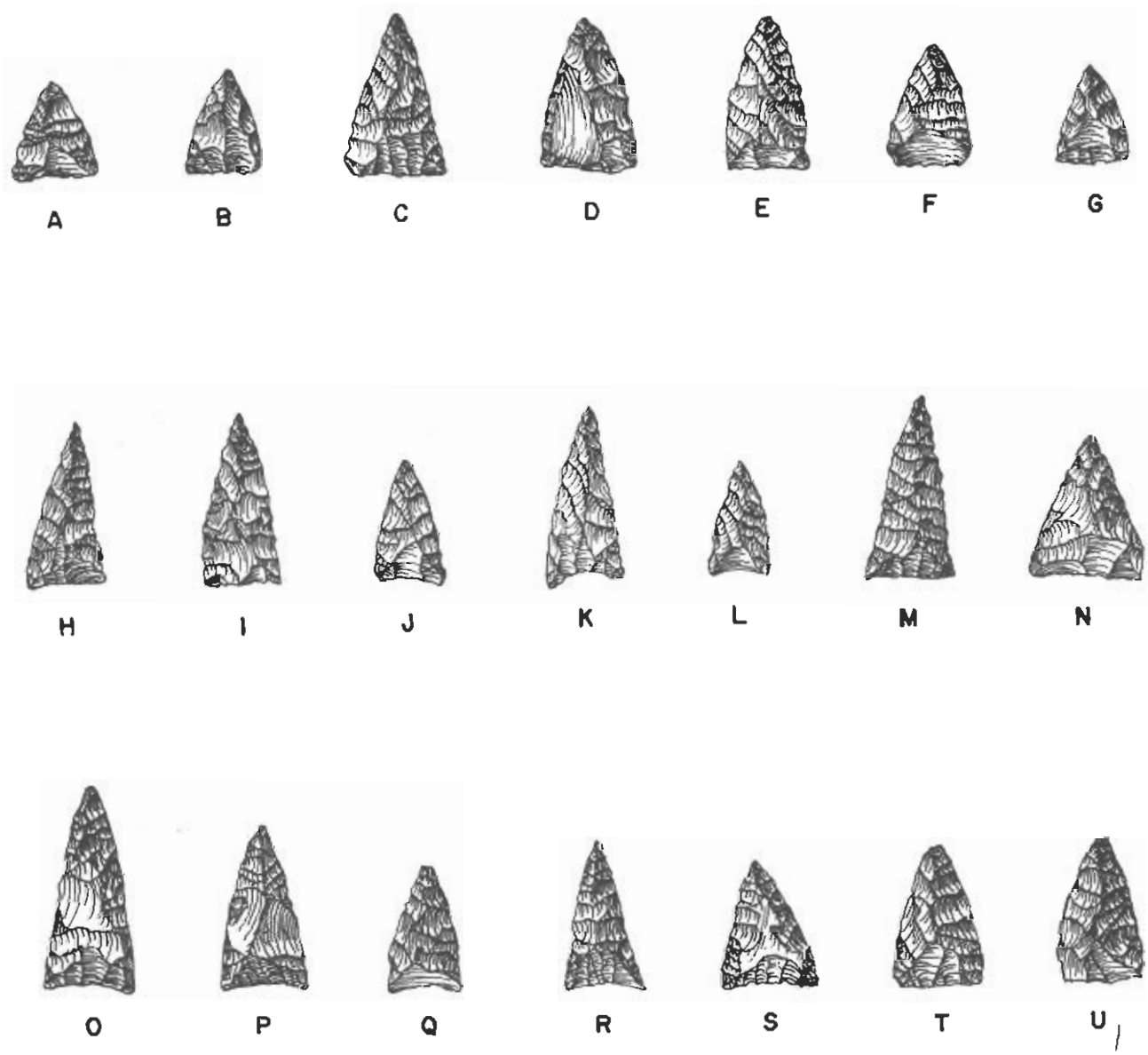

Plate 22

From: Bell (1960) Courtesy: Oklahoma Anthropological Society

GARZA

Plate 11

From: Perino (1968) Courtesy: Oklahoma Anthropological Societ

GOLONDRINA

A

B

C

D

E

F

Courtesy: Oklahoma Anthropological Society (Perino 1971:41)

HANNA

A

B

C

D

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F

G

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Courtesy: Oklahoma Anthropological Society

HELL GAP

A

B

C

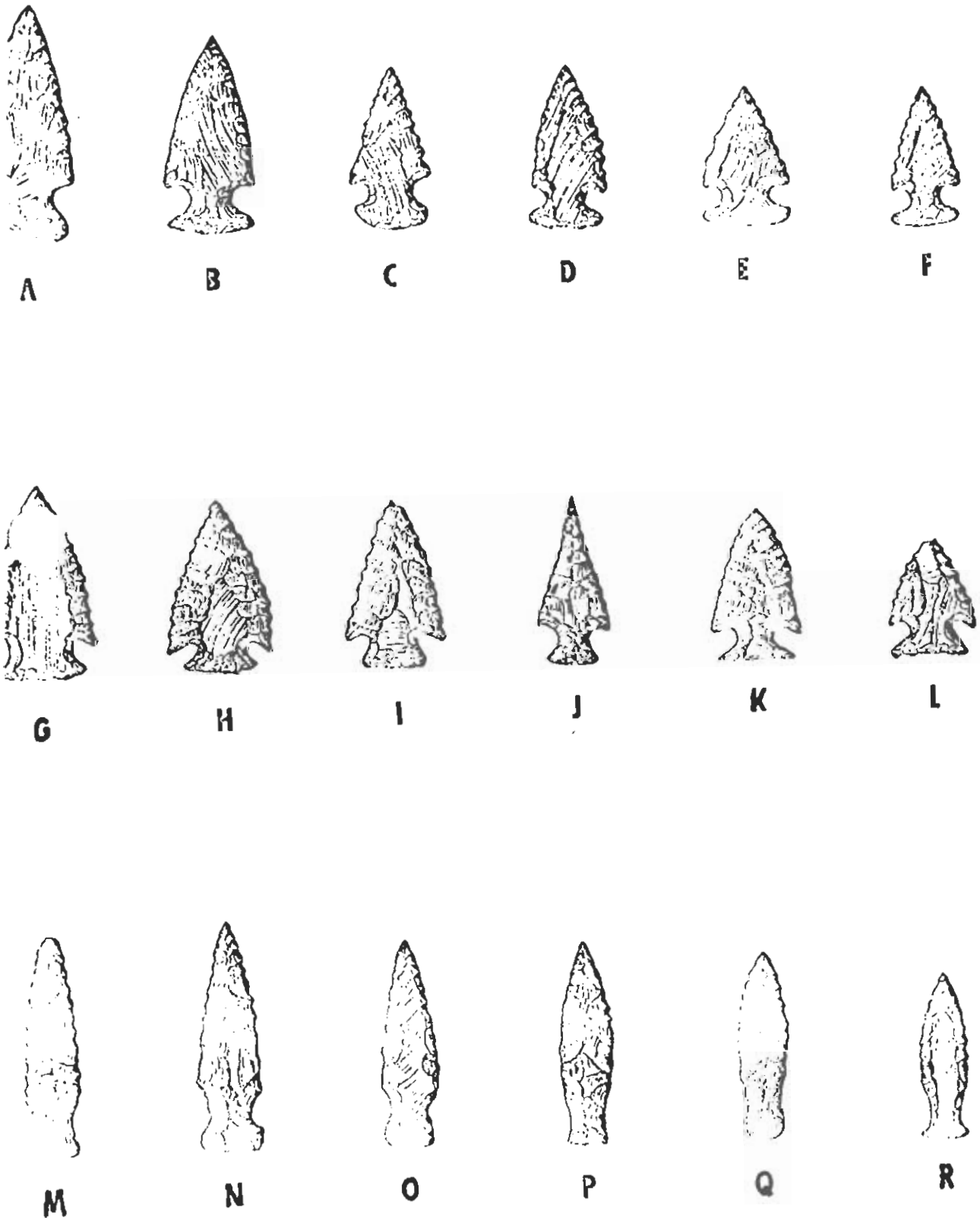
D

E

F

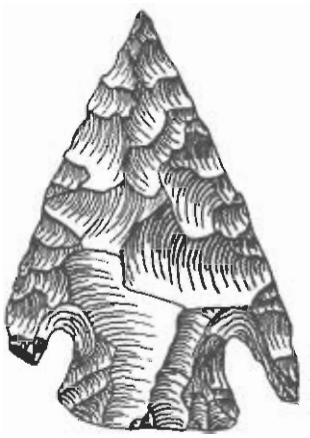
Courtesy: Oklahoma Anthropological Society (Perino 1971:49)

LATE WOODLAND

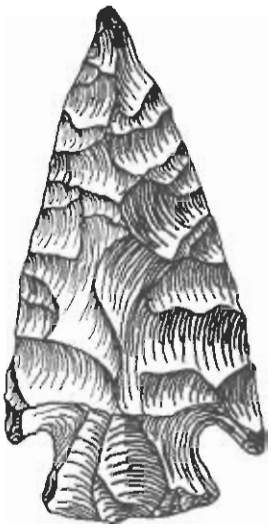


Courtesy: Oklahoma Anthropological Society

MARCOS



A



B

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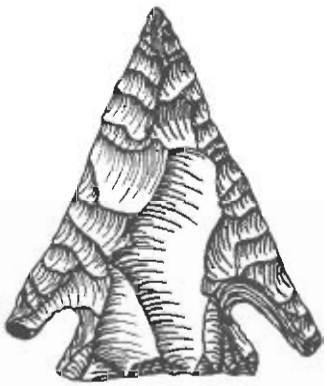

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Plate 21

From: Bell (1958) Courtesy: Oklahoma Anthropological Society

McKEAN

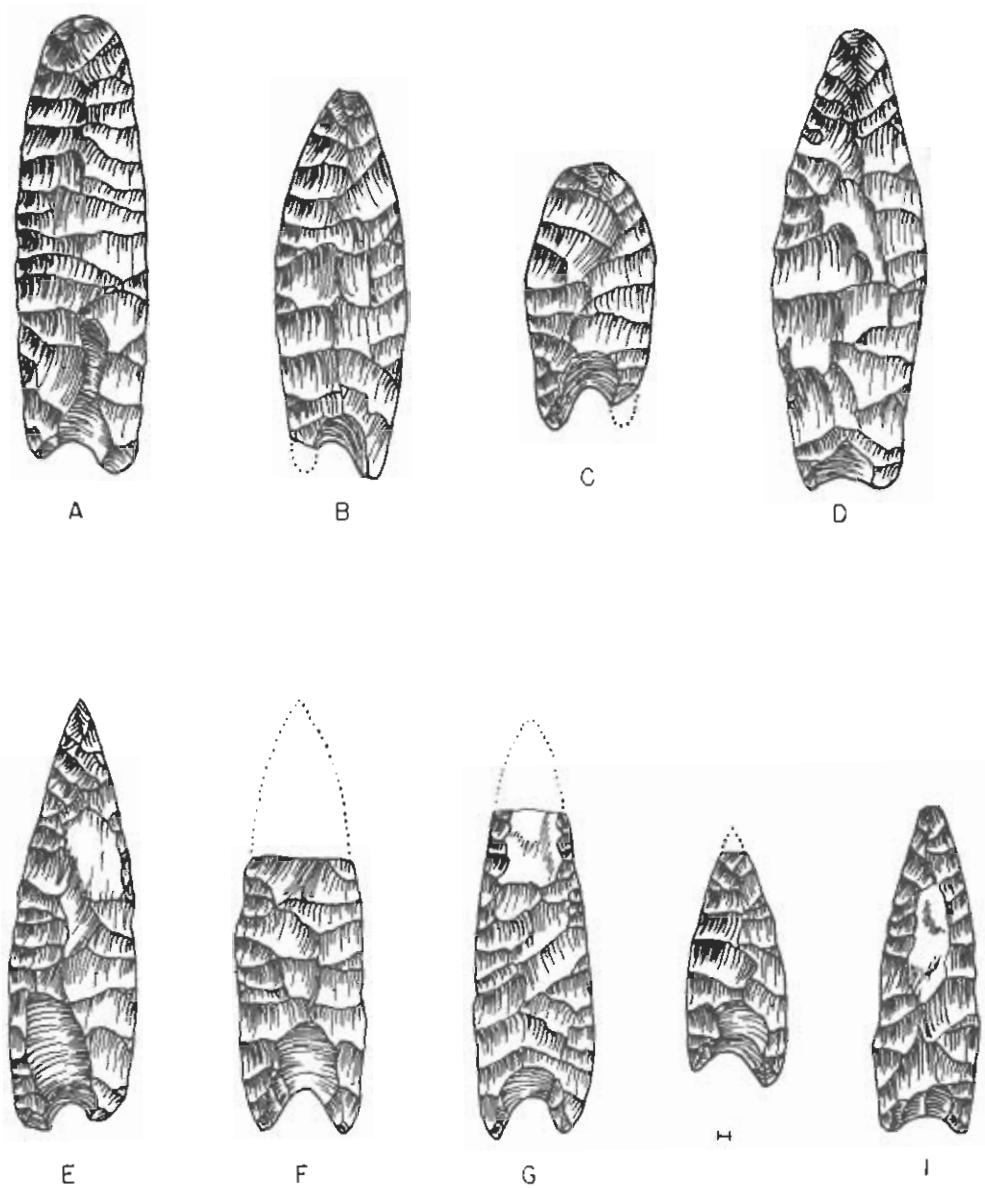


Plate 25

From: Bell (1958) Courtesy: Oklahoma Anthropological Society

MESERVE

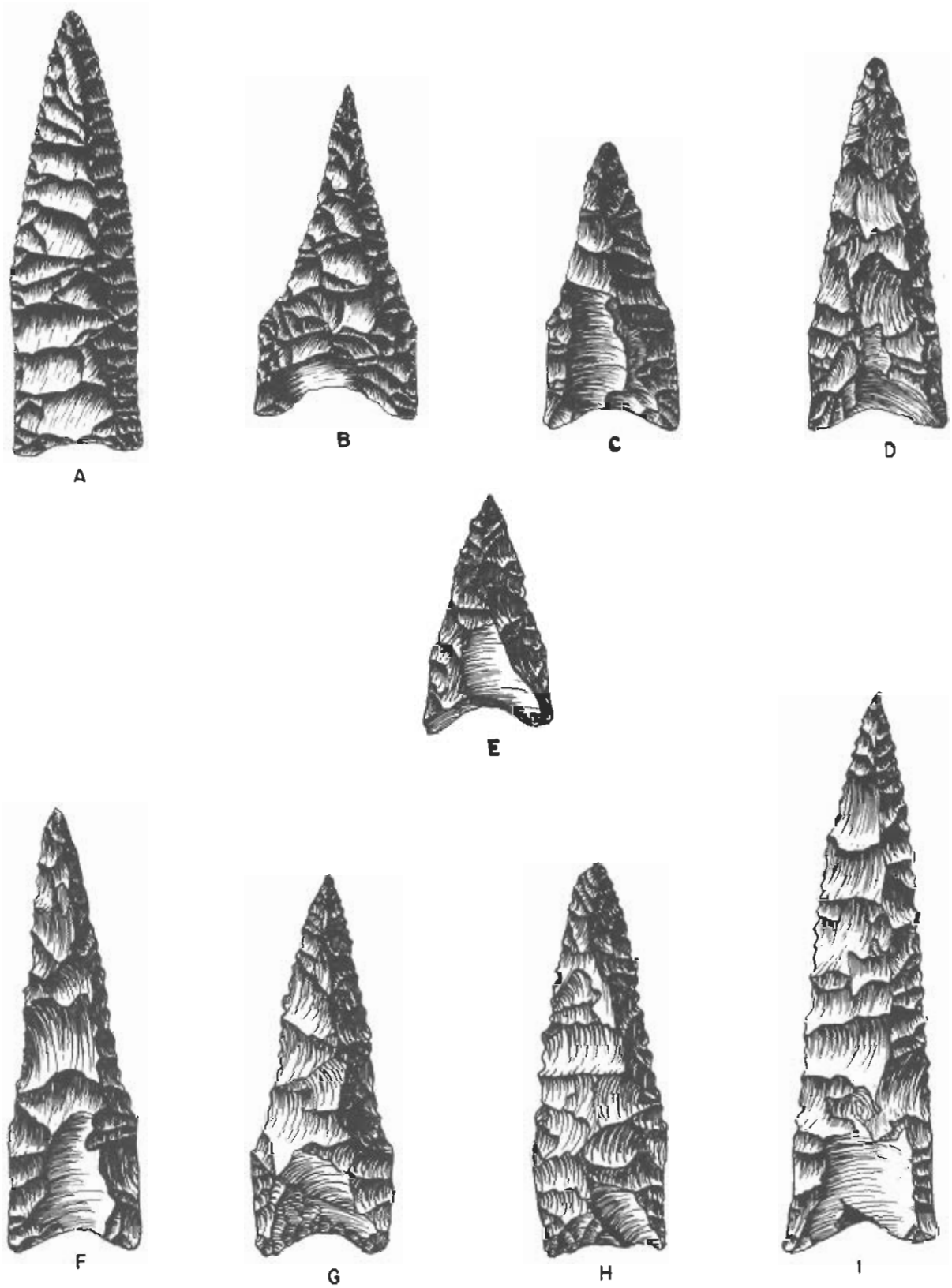
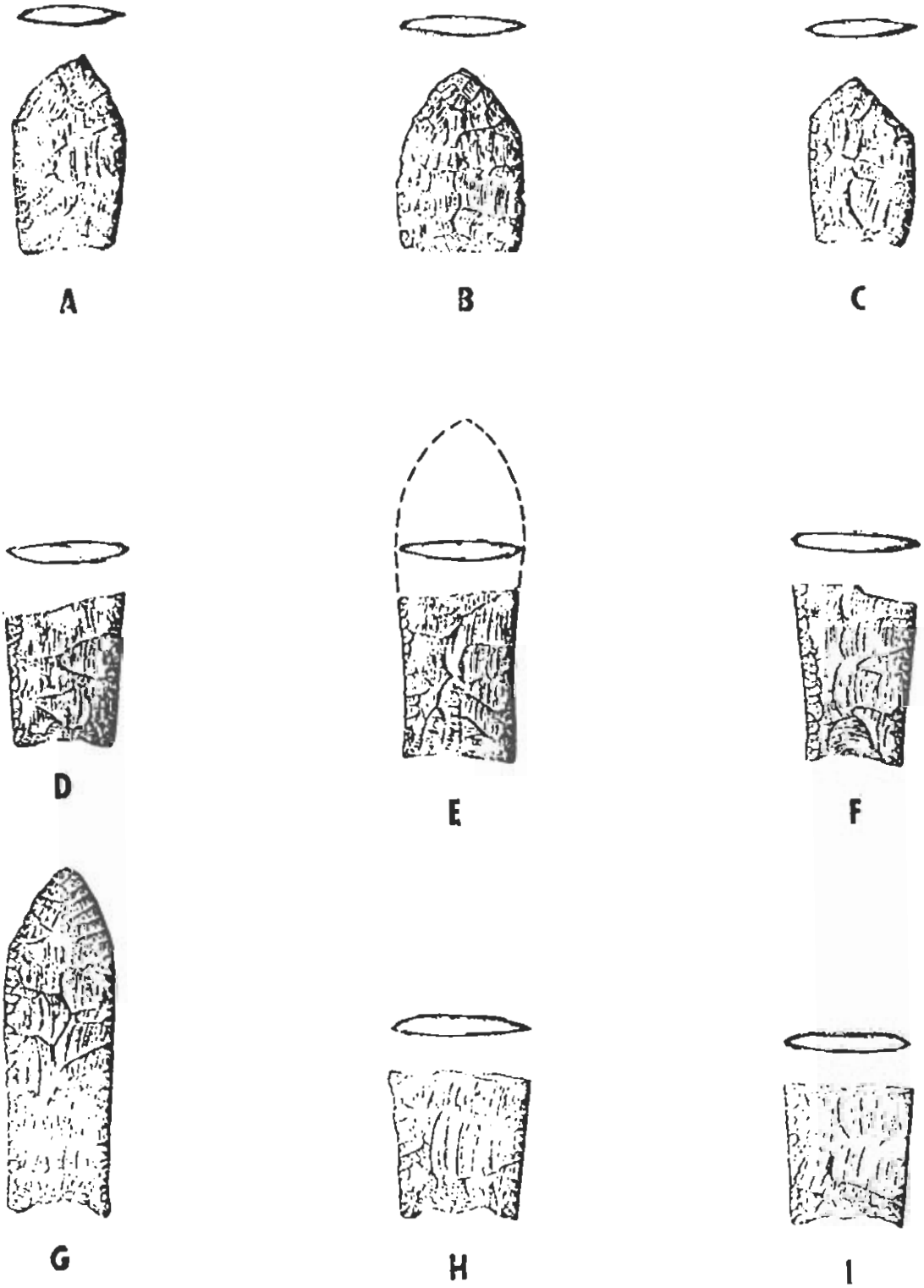


Plate 26

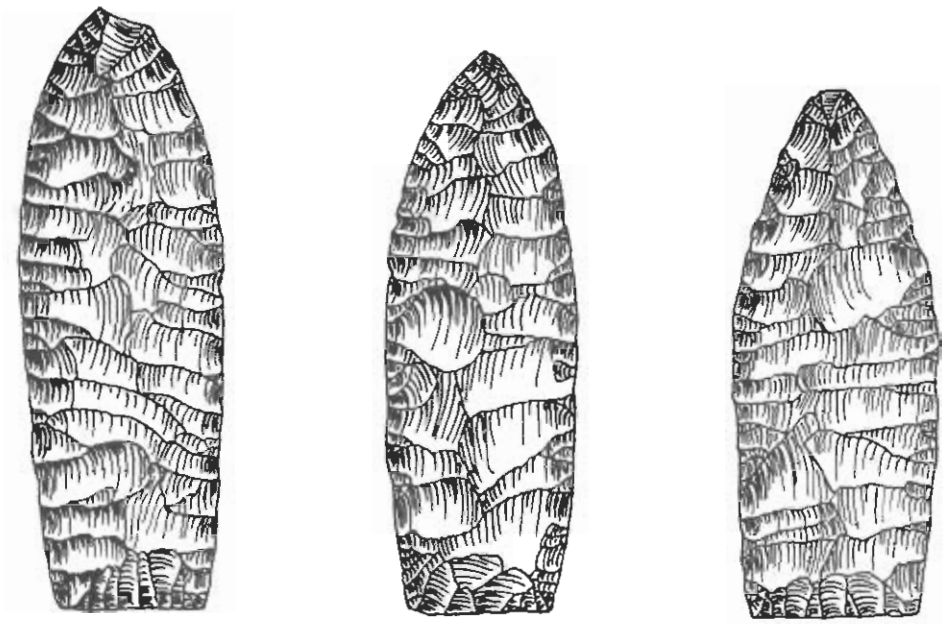
From: Bell (1958) Courtesy: Oklahoma Anthropological Society

MIDLAND

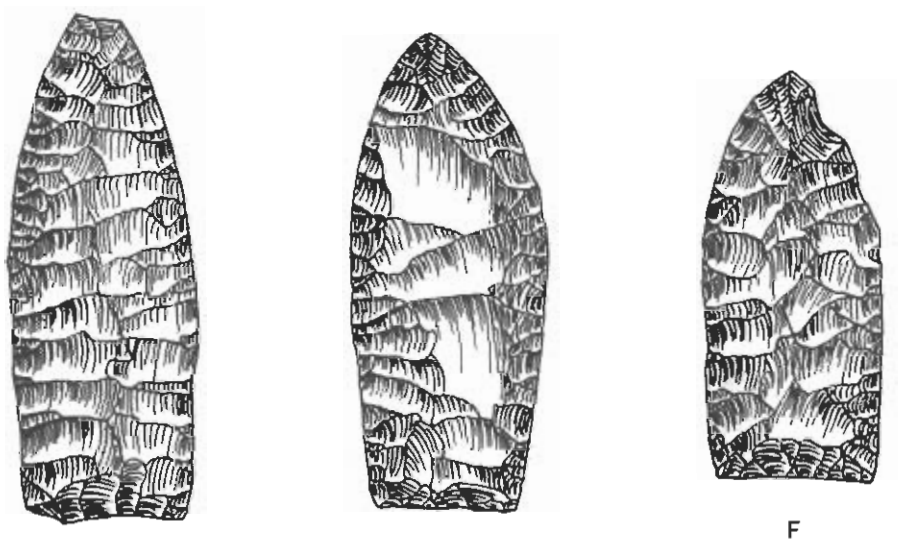


Courtesy: Oklahoma Anthropological Society (Perino 1971:63)

MILNESAND



A B C



D E F

Plate 27

From: Bell (1958) Courtesy: Oklahoma Anthropological Society

PALMILLAS

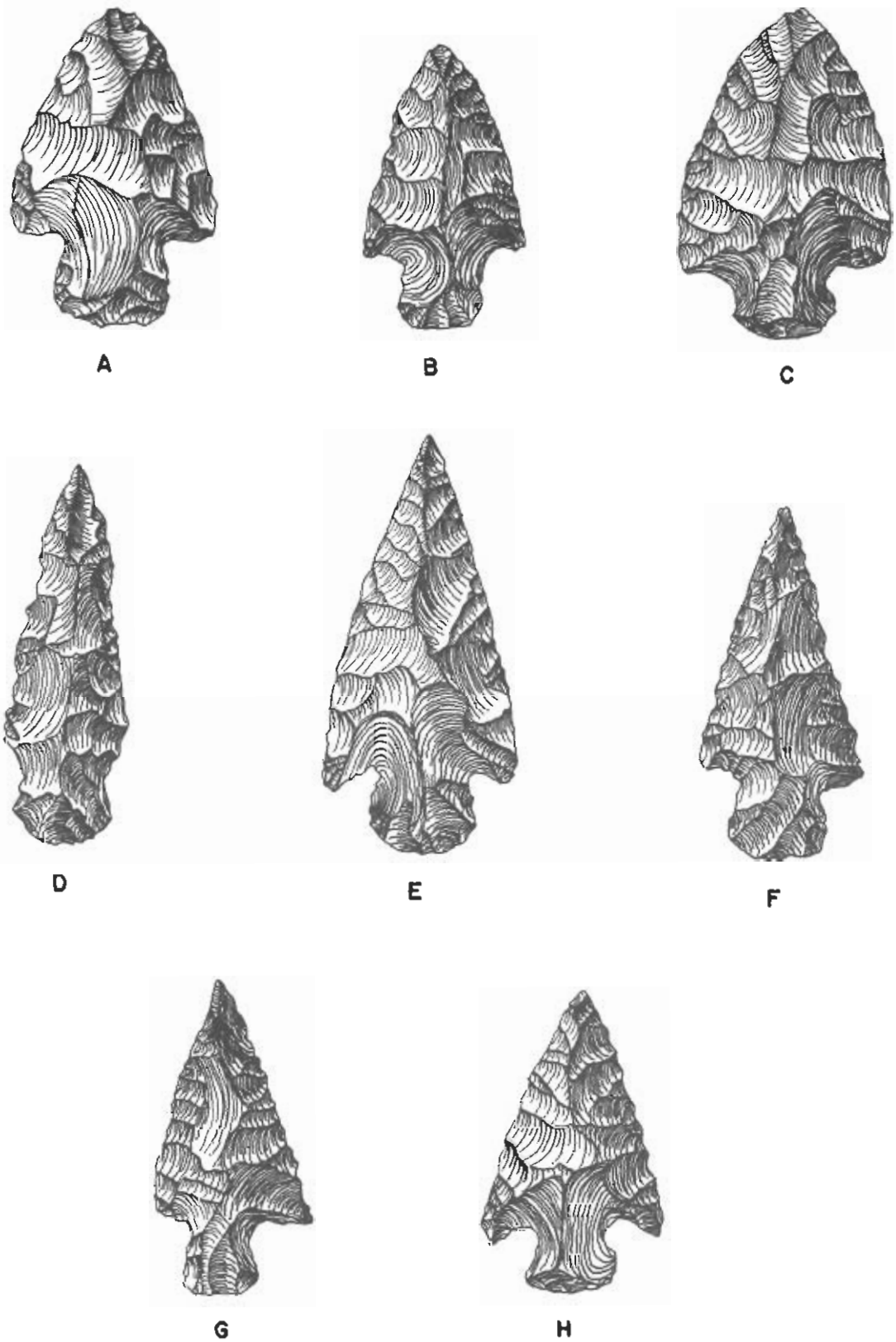
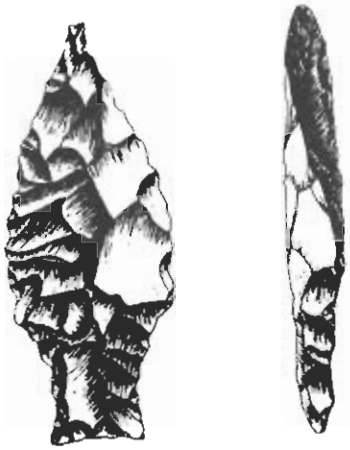


Plate 37

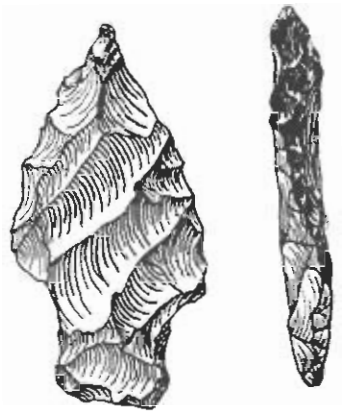
From: Bell (1960) Courtesy: Oklahoma Anthropological Society

PANDALE



A

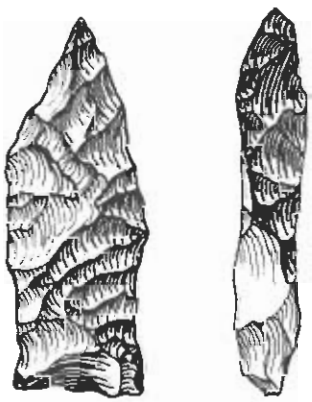
B



C

D

E



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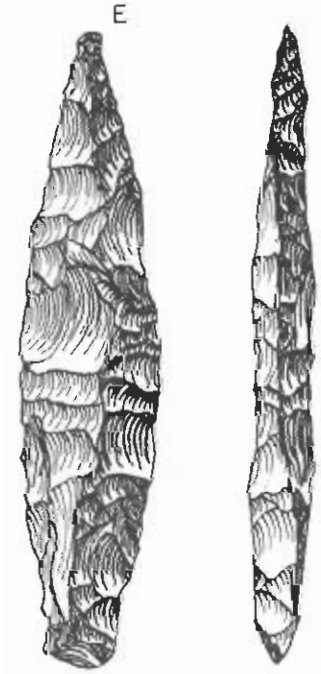

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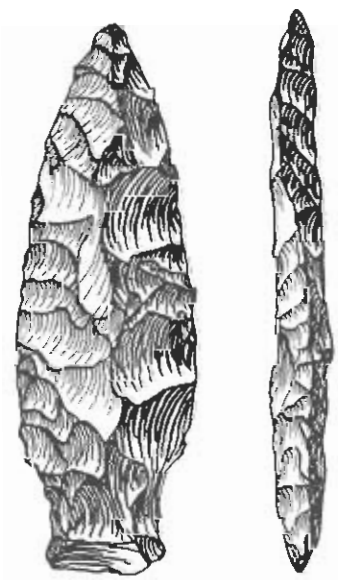


I

Plate 35

From: Bell (1958) Courtesy: Oklahoma Anthropological Society

PEDERNALES

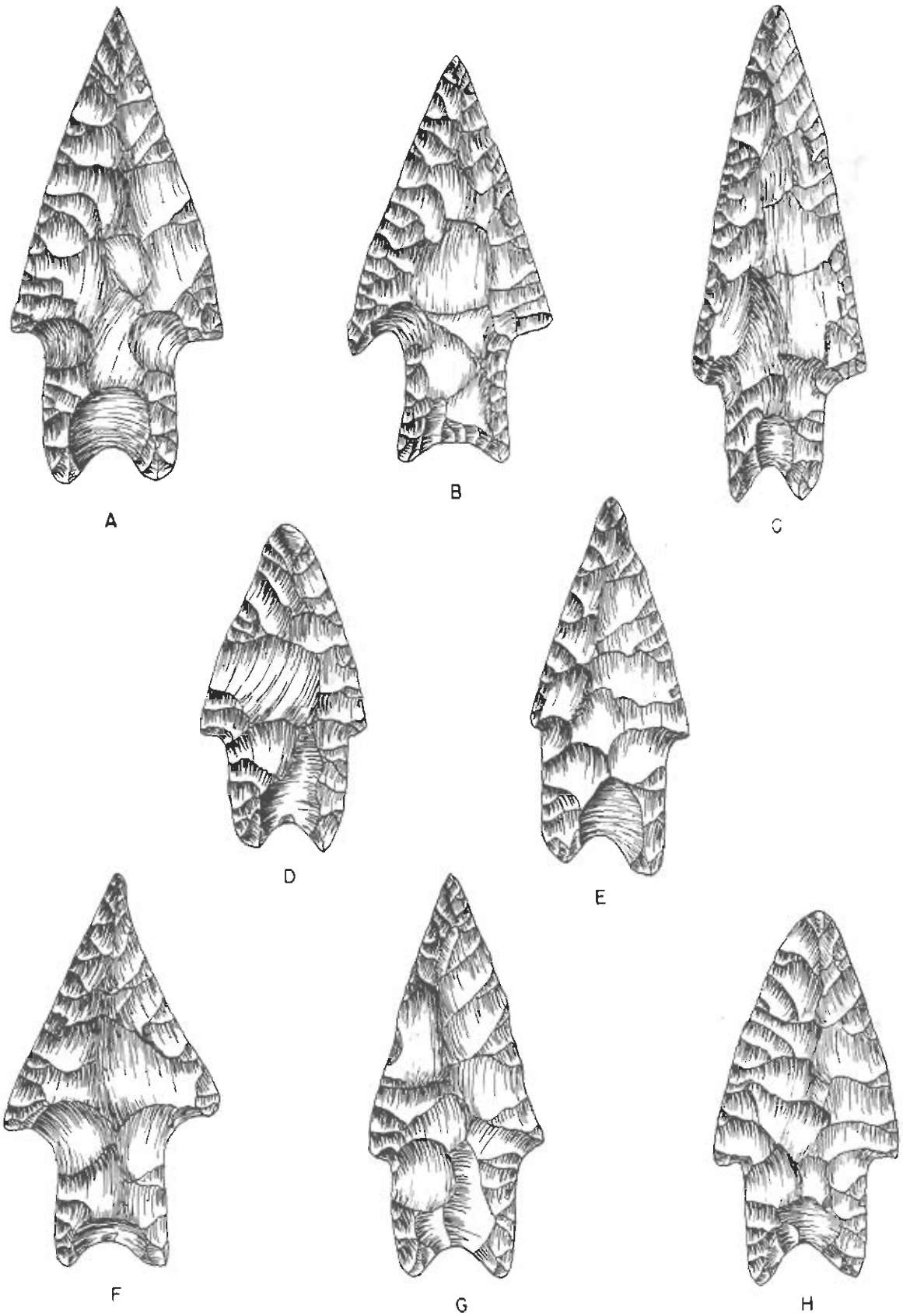


Plate 36

From: Bell (1958) Courtesy: Oklahoma Anthropological Society

PLAINVIEW

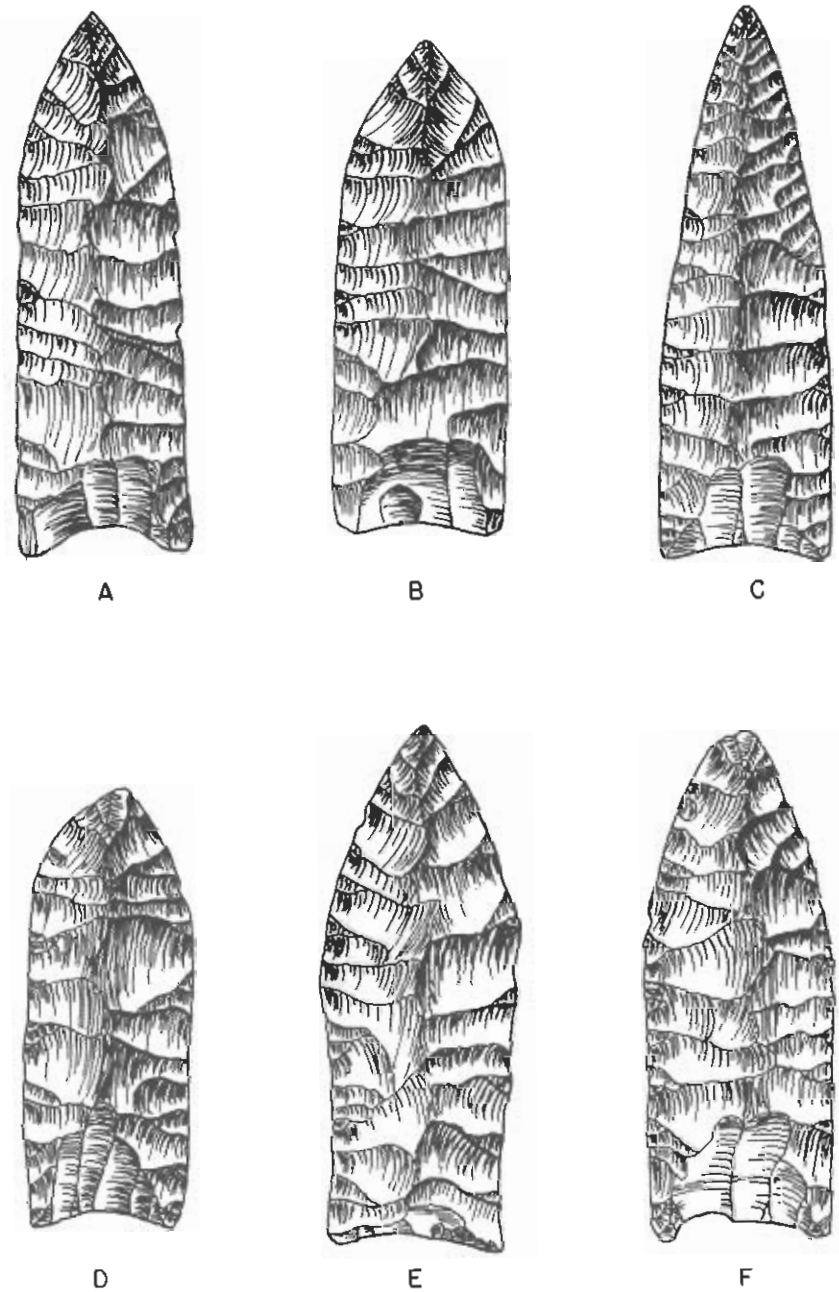


Plate 37

From: Bell (1958) Courtesy: Oklahoma Anthropological Society

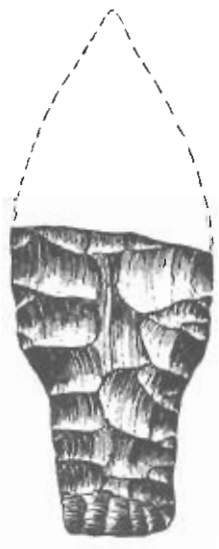
RIO GRANDE

A

B

C

D



E

Plate 39

From: Perino (1968) Courtesy: Oklahoma Anthropological Society

SANDIA I

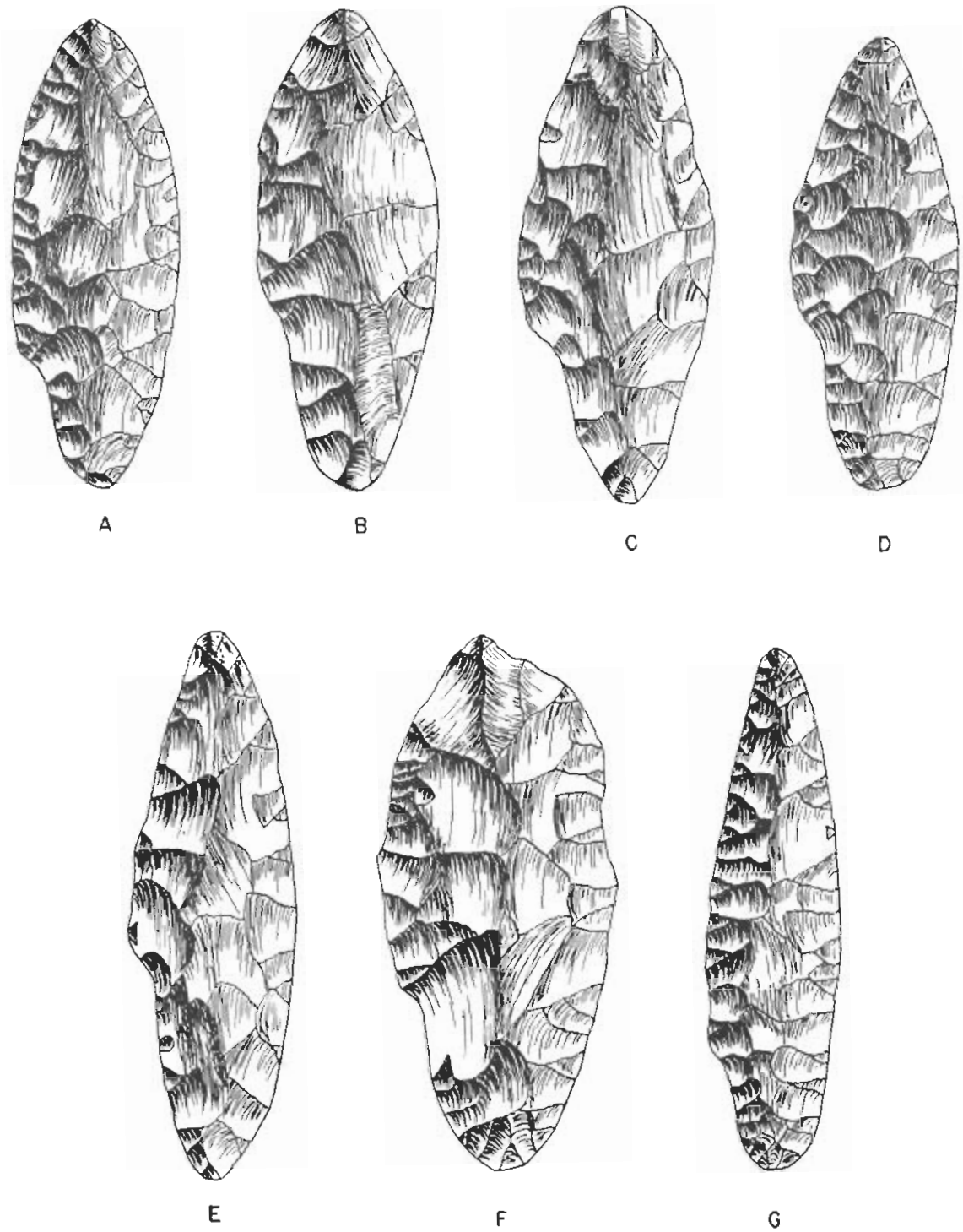


Plate 40

From: Bell (1958) Courtesy: Oklahoma Anthropological Society

SANDIA II

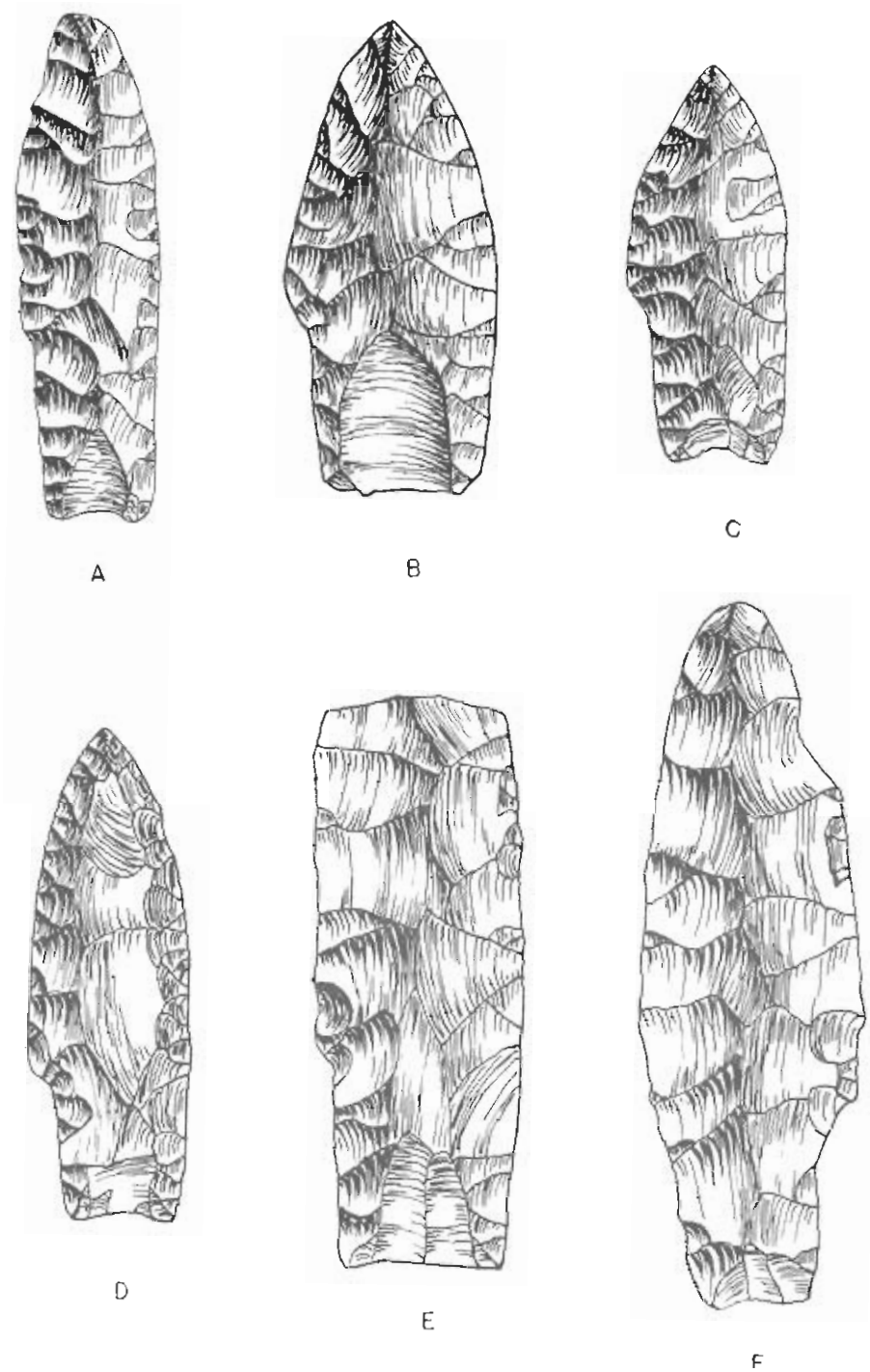


Plate 41

From: Bell (1958) Courtesy: Oklahoma Anthropological Society

SCALLORN

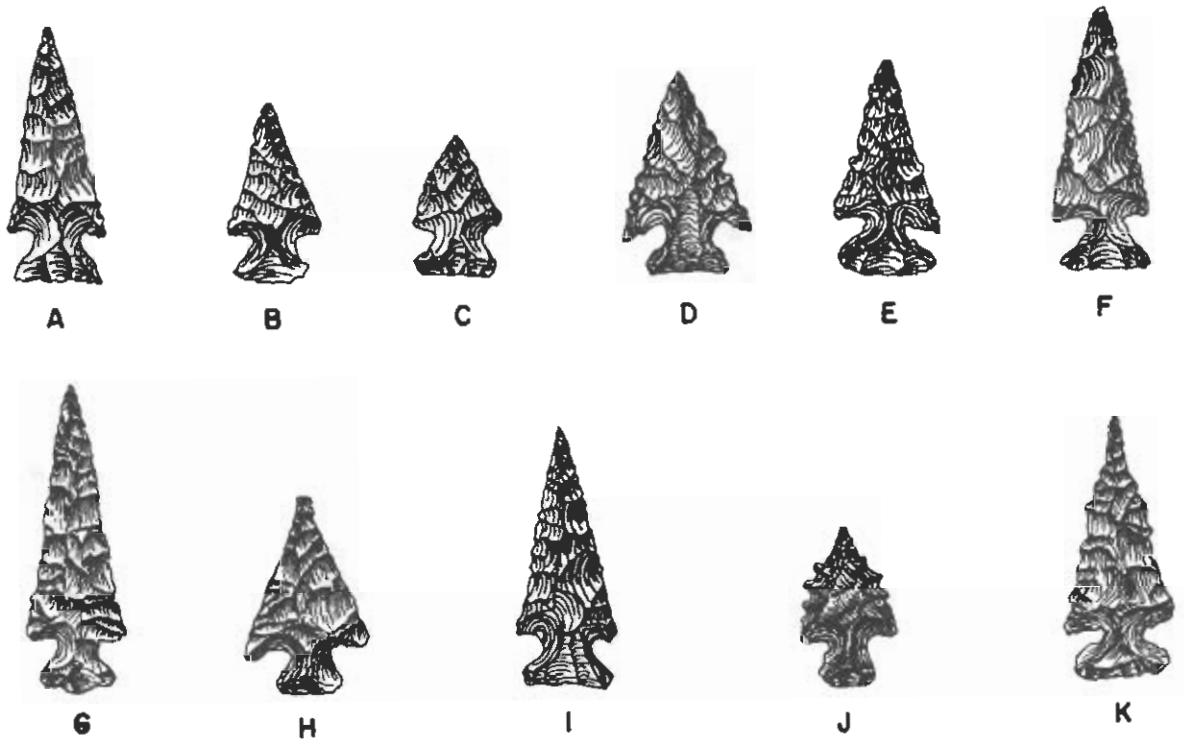


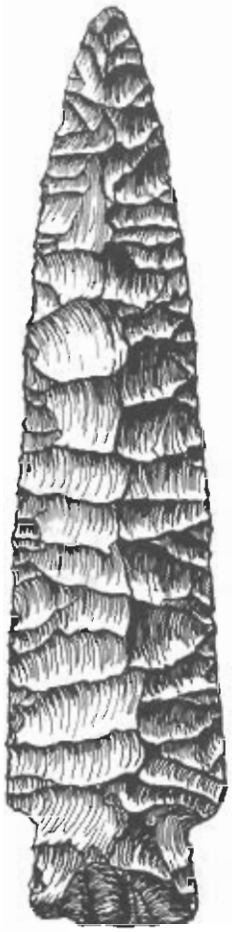
Plate 42

From: Bell (1960) Courtesy: Oklahoma Anthropological Society

SCOTTSBLUFF

A

B



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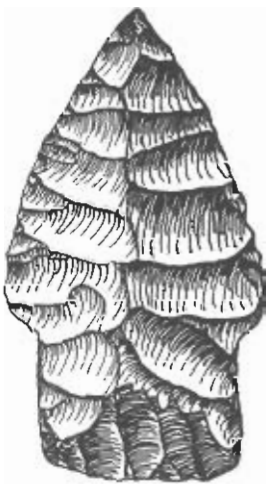

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Plate 43

From: Bell (1958) Courtesy: Oklahoma Anthropological Society

TRAVIS

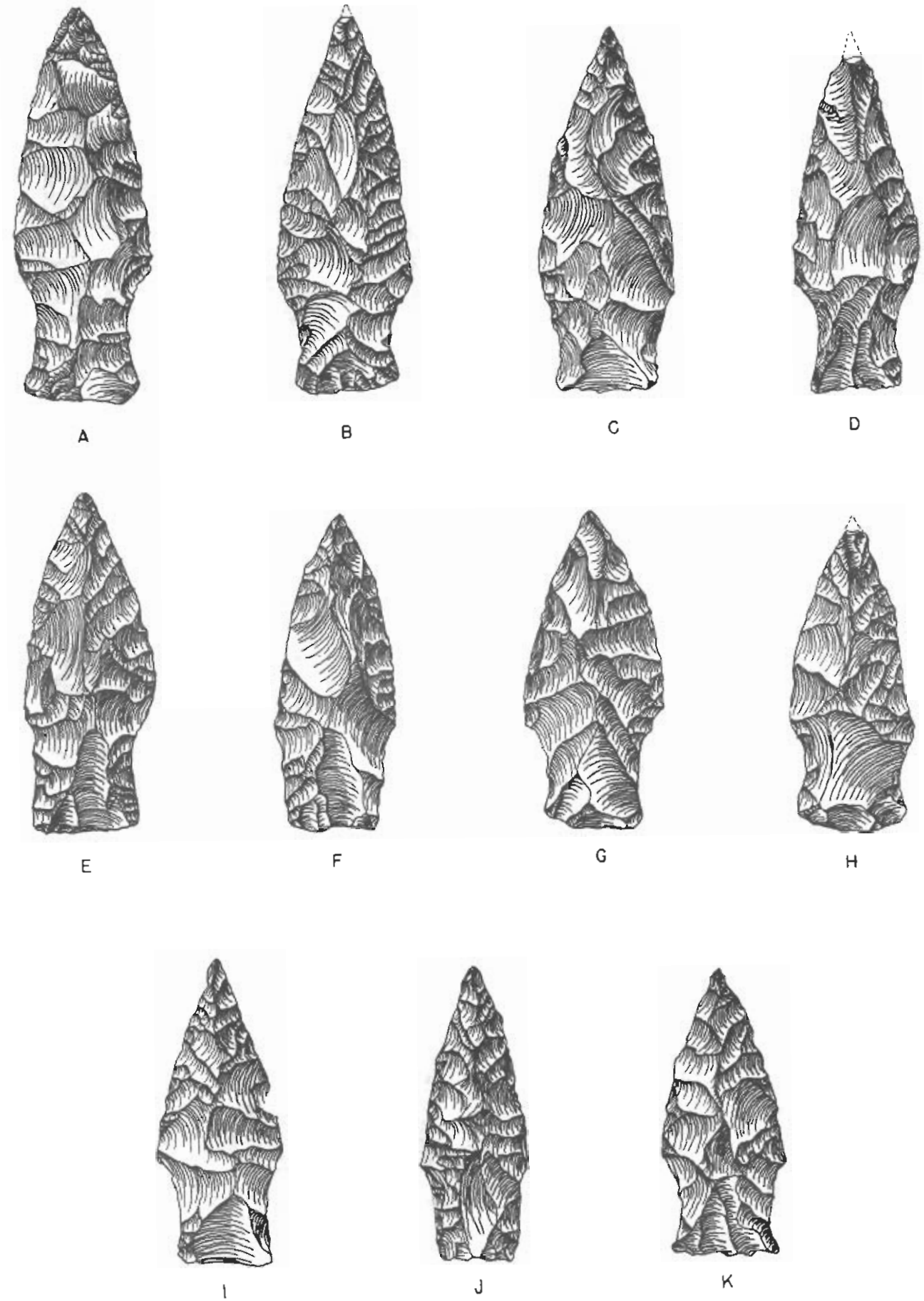

Plate 47

From: Bell (1958) Courtesy: Oklahoma Anthropological Society

TRINITY

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Plate 48

From: Bell (1958) Courtesy: Oklahoma Anthropological Society

WASHITA

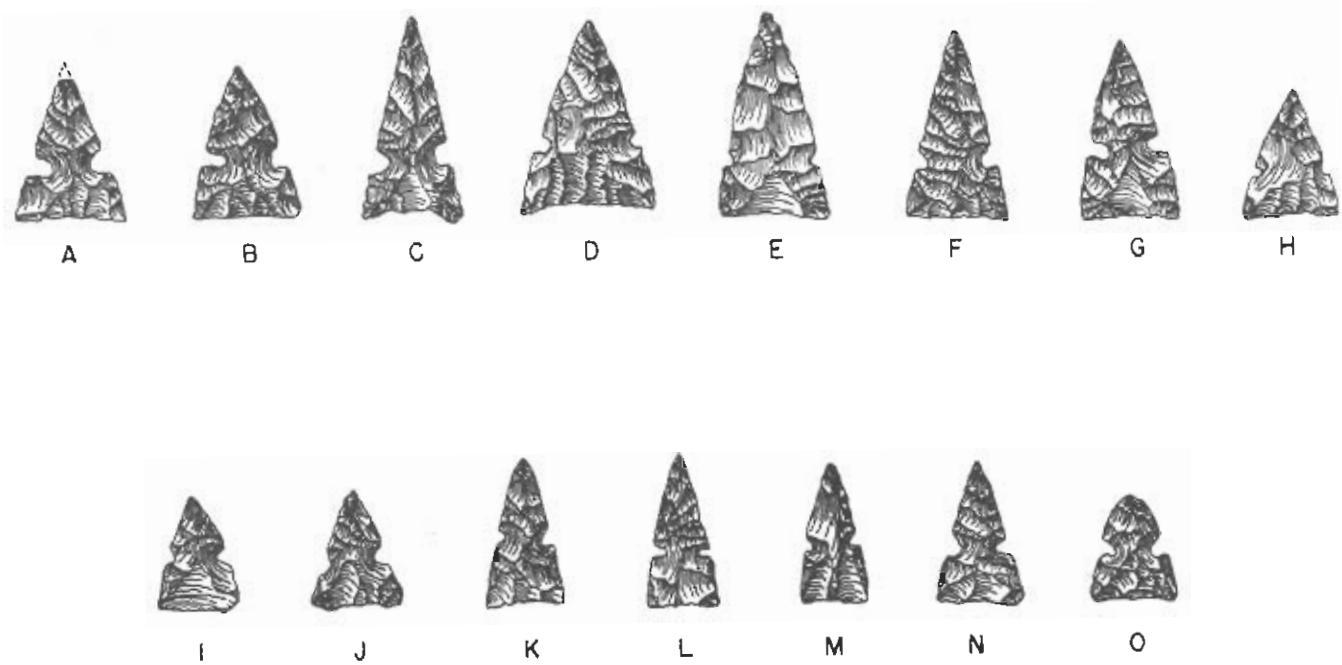
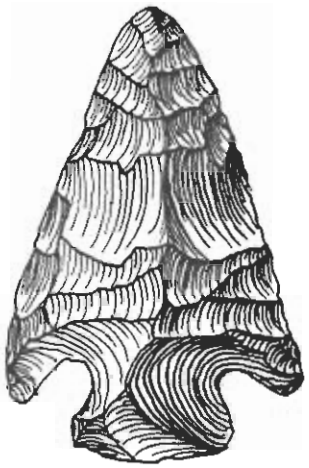


Plate 49

From: Bell (1958) Courtesy: Oklahoma Anthropological Society

WILLIAMS



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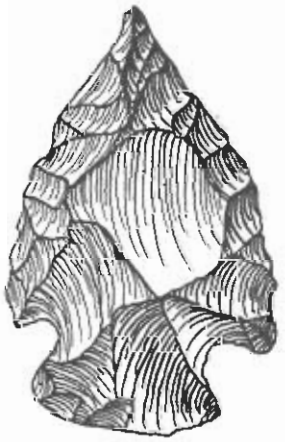

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Plate 48

From: Bell (1960) Courtesy: Oklahoma Anthropological Society

YARBROUGH

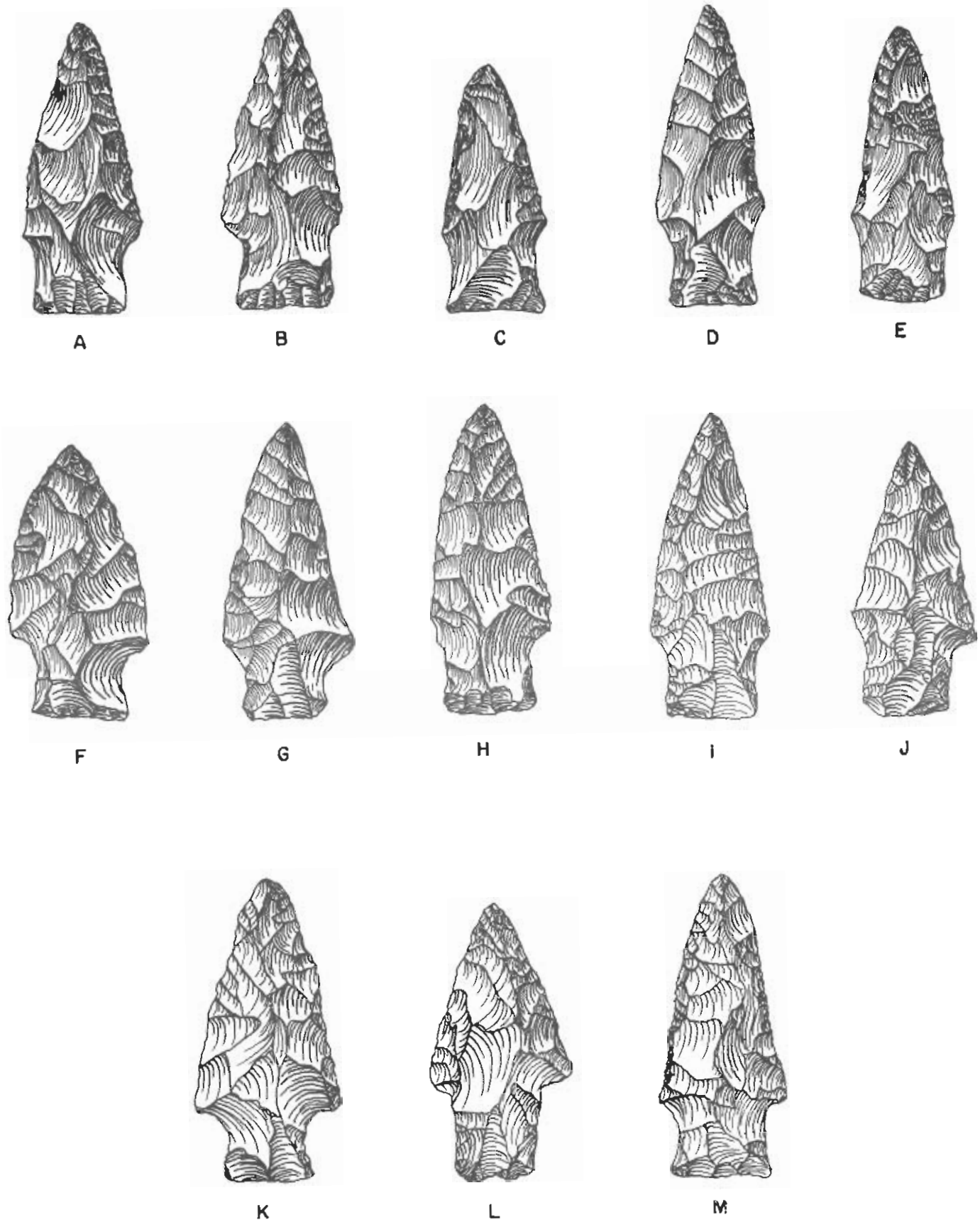

Plate 49

From: Bell (1960) Courtesy: Oklahoma Anthropological Society

ABOUT THE AUTHOR

James H. Gunnerson was born in Nebraska where he was exposed early to archeology and to anthropology in general. After completing his undergraduate degree in Chemistry at the University of Nebraska in 1949, and his Masters degree in Anthropology there the following year, he went to Harvard University where he earned his Ph.D in Anthropology in 1963. He has been professionally employed at the University of Utah, Northern Illinois University, and the University of Nebraska, Lincoln. Since 1974 he has been Professor and Curator of Anthropology in the University of Nebraska State Museum, of which he was a director from 1974 to 1982. During this entire period, he has also been a Professor in the Anthropology Department. His research interests have centered in the Plains, the Southwest, and Great Basin with special concern for the interactions of cultures between these areas during the past thousand years. Although from time to time he has done research on other problems, he has continued to return to the archeology and ethnohistory of the Apaches of the plains, a research interest which he shares with his wife, Dr. Dolores A. Gunnerson. His research has resulted in numerous professional publications in journals and monograph series.