COLORADO COUNCIL OF PROFESSIONAL ARCHAEOLOGISTS

ARCHAEOLOGICAL POTTERY OF COLORADO: CERAMIC CLUES TO THE PREHISTORIC AND PROTOHISTORIC LIVES OF THE STATE'S NATIVE PEOPLES

Robert H. Brunswig, Jr.-General and Eastern Slope Editor
Bruce Bradley and Susan M. Chandler- Western Slope Editors

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FOREWORD

by Alan D. Reed

Because of its large size and variety of environmental settings, Colorado has been the home of a number of distinct cultural traditions. Many of the Formative stage and post-Formative stage traditions - that is, Native American cultures post-dating approximately A.D. 500 - manufactured or acquired pottery. Archaeologists working throughout the state can, therefore, expect to encounter a wide range of ceramic types, representing diverse ceramic traditions.

To aid my colleagues and me in learning more about Colorado's prehistoric ceramics, I organized a ceramics symposium held in conjunction with the March 1991 Annual Meeting of the Colorado Council of Professional Archaeologists (CCPA). Experts in ceramic analysis and archaeologists with expertise in certain regional archaeological data bases were requested to make presentations on the major ceramic traditions evident within the state boundaries. They were encouraged to bring vessels and sherds for hands-on inspection, and were asked to summarize their presentation in short papers to be distributed to all those in attendance.

Shortly after the ceramic symposium, there were requests that the results be published. A CCPA Publications Committee was formed to pursue publication, composed of Bruce Bradley, Robert Brunswig, and Susan Chandler. They requested that symposium presenters refine the literature that they had prepared for distribution at the symposium, and conducted a major editing effort. This volume is the result of the symposium presenters' and editorial committee's efforts. With one exception, all of the symposium presenters submitted papers for inclusion in this volume. Mark Stiger of Western State College made a presentation on Ute ceramics at the symposium, but was unable to submit a final version of his paper for inclusion herein because of scheduling conflicts. I have prepared a replacement paper so that some coverage is given to this important ceramic tradition.

The resulting volume constitutes the second Occasional Paper published by the Colorado Council of Professional Archaeologists. It compiles a wide range of ceramic data into a single volume that will be a handy reference for Colorado archaeologists.

SECTION I

INTRODUCTION

PRINCIPAL CONCEPTS AND TERMINOLOGIES OF PREHISTORIC AND HISTORIC CERAMIC TECHNOLOGY

By William A. Lucius
Boulder, Colorado

INTRODUCTION

As an independent scholar with a broad background as a potter and an archaeological ceramic specialist, I have ongoing concerns with glaze technology and replications and have done analyses of ceramic assemblages from Western Samoa, the Fremont culture of Utah, and the Northern Anasazi of the American Southwest. In 1988, I completed my doctoral research (University of Toronto) which utilized ceramic data garnered from my tenure as ceramic task specialist at the Dolores Archaeological Program (the DAP) in Southwestern Colorado (Breternitz, Bye, James, Kane, and Knudsen 1980). That investigation of the subject of village formation during the Pueblo I period involved detailed technological analysis of ceramics allowing for sourcing of ceramics to local, regional, and interregional locales. Using the presence of non-local ceramics in DAP sites as evidence of social relationships, it was possible to support the hypothesis that interaction increases with the appearance of villages (Lucius 1988).

I was invited to be the introductory speaker at the ceramics workshop in order to outline the technological framework of ceramic analysis, to present a discussion of the technological approach to ceramic typology, and to outline their use in type distinctions. The following approach is the one developed for use by the DAP, and the majority of the following examples derive from various large and varied Anasazi ceramic analyses performed by the author. However, it is important to note that the approach was designed to be general enough to be applicable to any ceramic tradition. Thus it has been effective in the analysis of Fremont, Ute, Navajo, and Yugoslavian ceramics and should be found applicable to any of the prehistoric ceramic traditions of Colorado.

THE IDEALS OF CERAMIC ANALYSIS

The analysis of archaeological ceramics constitutes a broad field of study that ideally can be divided into three major approaches: 1) sourcing analysis, 2) stylistic analysis, and 3) functional analysis. *Sourcing analysis* focuses on the materials selected for ceramic production. In particular, the variables of temper type and clay type are used to document the locale of manufacture, given a regional perspective and application of various ceramic sourcing theorems (Lucius 1988). If available, paint type may also be useful in determination of ceramic production locales. Alternatively, stylistic analysis documents decorative treatments of ceramics that can be demonstrated to change through time. *Stylistic analyses* focus on vessel shapes, plastic decorations (such as fillets, punctuates, cord marks, corrugations, and rim forms), and painted design elements, placing their combinations into design fields. In the Anasazi Southwest, for instance,

stylistic analysis and correlation of specific constellations of decorative elements with tree-ring dated sites or strata, allows for the assignment of broad dates of ceramic manufacture and use (see Breternitz 1966 for the Anasazi area). *Functional analysis* focuses on the variables of firing atmosphere (color), decoration type (plain, polished and /or painted, and various surface manipulations), and the effects of vessel use in order to assign ceramics into ware categories-categories that imply use regularities, given parallel ethnographic and contextual studies.

When combined into an analysis system that also documents provenance and quantities, the above three forms of analysis allow for the assignment of ceramic categories (types) that contain basic information concerning space, time, and function. Appendix A, at the conclusion of this chapter, provides a broad sampling of the literature of type definition and their descriptions. Harold Colton, who is responsible for many of the rules of Southwestern ceramic analysis, was by training a biologist. Therefore, his Southwest type classification system proposed the use of type names which use a binomial classification system, i.e. the type Cortez Black-on-White. The first half of a type name, according to the Colton system, must be a geographic place name from within the region where the type was initially recognized - in this case the modern city of Cortez in the Mesa Verde Anasazi region. The second half of the name reflects the primary surface colors - the type consistently reveals a black paint on a white surface, which is often slipped. Wares are named by region and color and consist of those types within a region with the same functional attributes (i.e. Mesa Verde White Ware subsumes all Black-on white types within the Mesa Verde region, which are assumed to reflect serving and ceremonial uses). Types may be further grouped into series, which is an ordering from early to late periods of development within a ware (see type sheets, Appendix B).

THE REALITY OF CERAMIC ANALYSIS

Ideals of archaeological typology are rarely achieved, and ceramic analysis has often suffered from a certain confusion concerning the unity of the typological process. Examples include Obelisk Gray, which is a polished but unpainted white ware, Lino Black-on gray, which is in reality a white ware, and San Juan Red Ware, which is more properly termed Mesa Verde Red Ware. More disturbing, however is an overwhelming and continuing culture historical emphasis, which has strongly influenced the actuality of ceramic analysis. Because determination of temporal placement (telling time) of sites is of ultimate interest, types are sometimes improperly assigned based on stylistic criteria alone. Undecorated or untypeable sherds (which comprise the overwhelming majority of many assemblages) are ignored, and it is (incorrectly) assumed that most ceramics were manufactured locally. Indeed, it is also often further assumed that each family or village produced its own ceramics. One reason for this problem is that most field workers today are generally not being trained in the basics of ceramic analysis, and have little or no knowledge of how to distinguish temper, clay, and paint type variations.

In the Northern Anasazi area,

archaeologists have access to a useful field guide for the identification of temporally diagnostic stylistic categories for use when confronted with non-collection strategies (See Lucius and Breternitz 1993), but such guides are seldom available for other Colorado regions with their respective ceramic traditions. Such a lack of standardized guides often precludes the proper use of type names, for which sourcing analysis is necessary. Since the ceramic field guide is a relatively recent innovation in many Colorado regions, it constitutes an important weakness in Colorado's archaeological ceramic studies. It is, in part, the purpose of this volume to begin addressing that problem.

At the same time, a strange and indefensible concept of the nature of ceramic exchange also has been developing. For instance, because only very obvious exotics (such as Kayenta polychrome types) are easily recognized in the Southwest, a low level trade in highly valued painted vessels (primarily bowls) is assumed. The exchange of gray wares remains a heresy (Judd 1954:235). Such a position ignores a growing anthropological database which suggests that reciprocity between kin is likely to have been responsible for local, regional, and interregional ceramic movements in small-scale egalitarian societies such as the Fremont and Northern Anasazi (Gregory 1982).

The application of formal sourcing analysis on ceramic assemblages (Lucius, 1980, 1982, 1988) has provided some impressive revelations in recent years. First of all, among the Anasazi, ceramic exchange appears to have been the norm, with gray, white, and red ware vessels of all shapes being moved locally, regionally, and interregionally. Also, detailed temper type analysis of large assemblages from various Anasazi regions, and correlation with temper types to local geology, reveals that there is no one-to-one correlation between temper type and arbitrarily imposed regions of culture history. Instead, various temper types occur within any region and their selection for use changes through time.

Ceramic analysis at the DAP, supported by additional analyses across the Northern Southwest, has demonstrated that temper type variation reflects subregional areas of temper type availability and use-termed tracts. Tracts are interpreted as representing closely interacting communities of patterns with geographical continuity. The ability to "map" the location of various manufacturing tracts allows for close control of the amount and types of ceramic movements, and allowing for insight into the structure of prehistoric interaction, whether we are dealing with Anasazi, Fremont, or Plains Woodland areas. Within each tract are multiple zones of manufacture that reflect the consistent selection of a specific range of clay sources for ceramic production. Refiring analyses of sherd fragments have demonstrated not only that numerous distinct clay sources were selected within any tract, but also that specific types of clay were being selected to produce red wares, whereas white and gray wares required the use of different clays.

CRITICAL EVALUATION OF COMMON TECHNOLOGICAL VARIABLES USED IN TYPE DESCRIPTIONS

From a technological viewpoint, the following variables, generally cited in type

descriptions, are of questionable utility, primarily because they are not necessary for determination of type affiliations. What they do appear to measure is the range of variation within production locales within archaeologically defined regions. However, since their use has become customary in type descriptions, I will review them as technological concepts commonly used in Colorado ceramic typologies.

Temper Size

Temper size is measured with an optical device attached to a binocular microscope. As a variable, temper size is complex and difficult to interpret since size is in part related to the original source material (such as small versus large grain sandstone), the processing technology (grinding and/or sifting), as well as cultural selection for desired paste properties (porosity or smooth surfaces). I doubt that there is any consistent relationship between temper size and types, however, decorated ceramics in general exhibit smaller temper size than do utility wares.

Temper Shape

Temper shape also reflects the source material as well as the processing technology. Angular temper is technologically desirable since it weakens the paste less than does a temper composed of round grains such as sand. More so-called sand tempers are in actuality crushed sandstones that have a significant angular fraction. I am not sure how angularity would be quantified in applications of ceramic analysis.

Temper Percentage

A potter adds temper in order to reduce shrinkage, warpage, and heat shock, and the amount added is directly related to the clay type. Determination of temper percentage requires sophisticated and time-consuming counting procedures that are difficult to justify given the questionable relationship between temper density and types.

Fracture

The type of fracture (brittle, friable, etc.) is dependent on the combination of various factors, especially clay type, temper type, firing atmosphere, and temperature of firing. Therefore, different vessels within any type would have individualistic fracture characteristics. In general, however, wares do have distinctive fracture characteristics.

Vessel Wall Thickness

In Southwest Colorado, the majority of Anasazi ceramics were manufactured using either fillet or coil construction techniques, both of which result in relatively thin-walled vessels. Although generally there is an increase in wall thickness through time, the variability in thickness within each vessel can be greater than the temporal variability. Plains ceramics, on the other hand, appear to exhibit a *possible* non-time dependent range of vessel wall thickness resulting from use of the paddle and anvil construction technique.

[*Editor's Note*: This is also true of some vessel forms such as Plains Woodland pointed base, biconical pots and the recently identified use of slab-construction in some Plains types]

Core Color

Core refers to a darker sherd cross-section center that is indicative of the relative duration of the firing process. The faster the firing the greater the chance that the included carbon will not have time to be burned out. Because the presence of a core reflects the complex interaction of firing temperature, duration, carbon content of the clay, and atmosphere, its presence, absence, or characteristics are poor criteria for ware or type definitions. Care must be taken not to confuse a core with sooting resulting from use of vessels over a fire.

Slip Color

Slips are clay slurries added to the surface(s) of vessels in order to create a medium for painted decoration and to change surface color. They are usually polished to ensure mechanical adherence to the paste. By definition, a slip is a different clay than the body, and will necessarily reveal a different refired color than the body paste. White wares are slipped if the body clay is too dark to create a white surface or to hold organic paints. Red wares are variously unslipped (improperly termed orange ware) or slipped (red ware). Within some types, vessels may or may not be slipped.

TECHNOLOGICAL ANALYSES REQUIRED FOR TYPE DEFINITION

Technological analysis requires a *three-step process involving characterization and verification, followed by interpretation.* Characterization is accomplished by ceramics analysis and represents the organization and description of the variable values seen within a ceramic assemblage. Verification often requires the aid of non-archaeological specialists and specialized procedures and equipment. Of course, interpretations are made after combination of the two data sets. The following technological variables are discussed initially by definition of the variable, the methods of characterization, and verification, and finally interpretation of the resultant data. Appendix C presents a sampling of literature dealing with technological analysis for further investigation.

Temper Type

Temper is a general term used to refer to those aplastic inclusions within the ceramic paste. However, not all inclusions may have been intentionally added to the clay by the potter, since clays often contain naturally occurring sand or silt sized particles. Ceramics with various types of mineral tempers are best suited for temper characterization. Temper type characterization is done by viewing a fresh fracture under binocular microscopic magnification (usually 20X) -you cannot do it with a hand lens. Temper characterization is accomplished in terms of its geological class (igneous rock, mica, etc.), size, angularity, and color. Petrographic analysis is the primary verification technique for temper type characterization (for references to this technique, see Appendix C). Interpretation of temper type is important because tempering agents are generally distinctive enough to be identified visually and matched with geographically distinct source areas. In the absence of detailed sourcing data, locally produced ceramics can be inferred by the *criterion of abundance* which states that ceramics of particular paste composition will be most commonly

recovered in their locale of manufacture. However, care must be taken in application of the criterion. Shepard demonstrated that sandadine tempered sherds outnumber locally produced ceramics in some Chaco Canyon sites, although it was produced some distance away in the Chuska Mountains (Shepard 1942:177). As noted above, each temper type represents a manufacturing tract within the larger region.

Clay Type

Clay is an alumina silicate that constitutes the plastic fraction of pottery, made rigid through the application of heat. *Clay type characterization* results from the refiring of the nip created by temper analysis and subsequent color determination based on Munsell color comparisons (iron is the primary colorant of clay) and refired color allows for grouping of the samples into a number of discrete groups within each temper type category). Refiring is accomplished using an electric furnace with a repeatable time/temperature curve that serves to standardize all samples. The refiring procedure produces color-comparable samples, except in the case of vitrified ceramics. Vitrification (paste melting) occurs at various temperatures, given clay composition and firing atmosphere, and results in a nonreversible condition that negates color comparisons. Vitrified sherds are often glossy or glassy under microscopic inspection, and their characteristic yellow or olive green color permits their recognition and removal prior to the refiring procedure. Physical verification procedures for clay constituents include neutron activation analysis and Mossbauer spectroscopy (for references to these techniques, see Appendix C). The interpretation of clay characterization results in determination of the number of different clay types within each tract, which can be correlated with discrete clay sources for the location of specific zones of manufacture.

Paint Type

Paint is a decorative medium applied on the vessel. Three general classes of paint occur in Anasazi ceramics; 1) *mineral paints* consist of finely divided oxides of iron, manganese, or lead, each of which has its own range of colors depending on impurities and firing atmosphere (organic binders are often used to promote paint flow and to ensure mechanical bonding with the surface); 2) *organic paints* are boiled plant sugars, predominantly of Cleome or Tansy Mustard that also requires the presence of an absorptive clay that serves to "trap" the carbon, preventing it from being burned away during firing; and 3) *clay paints* are slurries of oxide-colored clays. Each class' characterization relies on the fact that mineral and clay paints are finely ground minerals, and therefore have a discernible vertical dimension on the surface of the sherd. In contrast, organic paints soak into (and are protected by) the clay, and represent a carbon stain within the clay.

Since most painted wares are also polished, distinction between the two is simplified by observing whether or not the paint lies over (mineral) or under (organic) the polishing sheen. Differentiation of the various mineral paints is based primarily on color. Lead paints are rare outside of the Durango area and vary from black to green/yellow. They are also generally glassy due to the presence of fluxing agents which result in low temperature vitrification. Iron

due to the presence of fluxing agents which result in low temperature vitrification. Iron paints turn red upon refiring, whereas manganese paints remain black. A black mineral paint on a red surface necessarily indicates manganese paint. A complex of chemical tests are used to verify type characterizations (for references, see Appendix C). Interpretation of paint type is a critical variable for white and red ware type descriptions in the Southwest. In the Mesa Verde region red wares are mineral painted while white wares exhibit mineral and organic paints. Both minerals and organic paint series occur in Chuslia white wares; red wares are mineral painted. Chaco white ware ceramics are mineral painted. Kayenta white wares are distinguished by their organic paints. Kayenta red ware types have mineral and mineral and clay paints.

Firing Atmosphere

Firing atmosphere refers to the balance of fuel and oxygen in the kiln chamber and duration of the heating process used to fire the ceramics. The degree of paste oxidation is used to characterize firing atmosphere. In reality, a continuum analysis allows for determination of one of three states of atmosphere: 1) *Reduction atmosphere* reflects short (or truncated) firing duration and is indicated by black surfaces (sooting), indicating the presence of more fuel (carbon) than there is oxygen to consume it (firing clouds are merely localized areas of reduction firing caused by contact of the vessel wall and fuel), 2) *neutral atmosphere* reflecting a short firing duration, is shown by white to gray surfaces, and indicates a balance of oxygen and fuel, and 3) *oxidation atmosphere* showing a longer firing duration demonstrated by orange, brown, and red surfaces, reflecting an overabundance of oxygen, which results in oxidation of iron in the paste. As should be apparent, red burning clays (or surface slips) were used for red ware production. Vitrification occurs through refiring analysis, which removes the effects of variable firing, use and deposition. Interpretation of firing atmosphere is required for ware separation. The Anasazi are unique in the Southwest in their development of ceramic technology which allowed for the production of gray and white ware ceramics. Southwest and eastern Great Basin firing atmosphere characteristics are as follows. Early Mogollon immigrants to Northern Anasazi and Fremont areas, faced with Cretaceous clays not very suitable for brown or red ware production (they turn out soft and pink or yellow under oxidation), quickly adapted their technology by restricting the flow of oxygen tint the kiln and by shortening the firing duration. the resulting gray to white ceramics are hard and relatively non-porous. Later potters began producing relatively hard red wares by varying the atmosphere of firing using red burning clays. the Hopi invented an interesting oxidation technology at ca. 1300 A.D. through the use of coal as a fuel source, resulting in hard yellow ware ceramics.

Decoration

Ceramics may be plain (undecorated), polished, or variously manipulated. Polish occurs when tool is rubbed on the clay surface in order to create a smooth surface to reduce porosity or to prepare a vessel for painting. The use of a polishing stone results in compaction of the surface clay recognizable as streaks and/or sheen. Corrugations, fillets, appliques, combing,

characterization follows examination of the surfaces for the characteristic marks and details of associated surface manipulations can then be described. No verification process is required. Interpretation of vessel decoration allows for ware categorization; brown and gray wares are plain or manipulated and white and red wares are polished (some may have decorative corrugations). Recognition of polish is invaluable for ware determination in the absence of painted decoration, such as on unpainted vessel fragments. Also, the variables associated with decoration aids in determination of the bowl (polished interior) versus jar (polished exterior) forms.

SUMMARY

Archaeologists have commonly ignored the sourcing and functional aspects of ceramic analysis in favor of the recognition of temporally diagnostic stylistic categories. In contrast, this paper virtually ignores stylistic and functional analyses to focus on the technological variables that allow for sourcing of ceramic artifacts. In practice, Colorado archaeologists are presented with a wide range of ceramic traditions whose understanding requires application of ceramic analysis that includes all three aspects described above.

In dealing with archaeological ceramic analysis, it suggested that Colorado archaeologists should remember the following cautions: 1) in non-collection situations do not assign type names based on simple inspection - use, if possible, establish field guides, learn and use stylistic variables for use in dating sites, 2) when faced with a ceramic assemblage requiring analysis, hire a ceramics specialist to formally type the ceramics in terms of sourcing, stylistic, and functional variables - it will cost you hard-earned money, but it will also result in more believable data, and therefore believable interpretations, 3) use technical reviews such as this one to acquire and maintain a minimal level of knowledge about current technological aspects of ceramic analysis.

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APPENDIX A

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APPENDIX B

TYPE SHEETS

The following listing presents a listing of cultural/regional types associations in the Southwest and Eastern Great Basin by ware in temporal series (from early to late). Certain esoteric varieties of the primary types are not noted in the following, e.g.. Cameron Polychrome, Shato Black-on white, Abajo Polychrome, etc. Note that Chuska white wares have a mineral (M) and an organic (O) painted series.

ANASAZI CULTURES

KAYENTA REGION

Kayenta Gray Ware
- Lino Gray
- Kana'a Gray
- Coconino Gray
- Tusayan Gray
- Moenkopi Corrugated
- Kiet Siel Gray

Kayenta White Ware
- Obelisk White
- Lino B/W
- Kana'a B/W
- Wepo B/W
- Black Mesa B/W
- Sosi B/W
- Dogoszhi B/W
- Flagstaff B/W
- Tusayan B/W
- Kayenta B/W

Kayenta Red Ware
- Tallahogan Red
- Medicine Black-on-red
- Tusayan Black-on-red
- Tusayan Polychrome
- Citadel Polychrome
- Kiet Siel Black-on-red

MESA VERDE REGION

Mesa Verde Gray Ware
- Chapin Gray
- Moccasin Gray
  - Mancos Gray
- Mancos Corrugated
  - Dolores Corrugated
  - Mesa Verde Corrugated
  - Hovenweep Gray

Mesa Verde White Ware
- Chapin B/W
- Piedra B/W
- White Mesa B/W
  - Cortez B/W
  - Mancos B/W
  - McElmo B/W
  - Mesa Verde B/W

Mesa Verde Red Ware
- Abajo R/O
- Bluff B/R
- Deadmans B/R

Kiet Siel Polychrome
Tsegi Orange
Tsegi Red-on-orange
Tsegi Black-on-orange

CHACO REGION

Chaco Gray Ware
- Lino Gray - Chaco
- Kana'a Gray
- Tohatchi Banded
- Coolidge Corrugated
- Chaco Corrugated

Chaco White Ware
- La Plata B/W
- Whitemound B/W
- Kiatuthlanna B/W
- Red Mesa B/W
- Puerco B/W
- Escavada B/W
- Gallup B/W
- Chaco B/W
- Chaco/McElmo B/W

Chaco Red Ware
- None

HOPI CULTURAL

Yellow Utility Ware
- Jeddito Plain
- Jeddito Corrugated
- Jeddito Tooled

CHUSKA REGION

Chuska Gray Ware
- Bennett Gray
- Sheep Springs Gray
- Tocito Gray
- Gray Hills Banded
- Newcomb Corrugated
  - Captain Tom Corrugated
  - Blue Shale Corrugated
  - Hunter Corrugated

Chuska White Ware
- Theodore B/W (M)
  - Pena B/W (O)
- Crozier B/W (M)
  - Tunicha B/W (O)
- Droplet B/W (M)
  - Newcomb B/W (O)
- Naschitti B/W (M)
  - Toadlena B/W (O)
- Taylor B/W (M)
  - Burnham B/W (O)
  - Chuska B/W (O)
  - Brimhall B/W (M)
  - Nava B/W (O)
  - Crumbled House B/W (O)

Chuska Red Ware
- Santostee R/O

NAVAJO CULTURE

Gray Ware
- Dinetah Gray
- Pinyon Gray
  - Navajo Gray

White Ware
- Polacca Black-on-white
- Hoyapi Black-on-white
- Bidahochi Black-on-white

Yellow Decorated Ware
- Jeddito Black-on-yellow
- Jeddito Polychrome
- Jeddito Black-on-orange
- Klageto Black-on-orange
- Klageto Black-on-yellow
- Klageto Polychrome
- Kintiel Black-on-orange
- Kintiel Polychrome
- Huckovi Black-on-orange
- Huckovi Polychrome
- Kokop Black-on-orange
- Kokop Polychrome
- Bidahochi Polychrome
- Sikyatki Polychrome
- Puyupki Polychrome
- Polacca Polychrome
- Walpi Black-on-yellow
- Walpi Polychrome
- Hano Polychrome
- Sichomovi Black-on-red
- Sichomovi Polychrome

FREMONT CULTURE

Gray Ware
- Snake Valley Gray
- Snake Valley Corrugated
- Paragona Coiled
- Sevier Gray
- Great Salt Lake Gray
- Promentory Gray
- Unitah Gray
- Emery Gray

White Ware
- Snake Valley Black-on-white
- Ivie Creek Black-on-white

Red Ware
- Gobernador Polychrome

SHOSHONEAN CULTURE

Brown Ware
- Undifferentiated Brown

MOGOLLON CULTURE

Brown Utility Ware
- Alma Plain
- Alma Neck Banded
- Three Circle Corrugated
- Reserve Corrugated
- Tularosa Corrugated

Brown Undecorated Ware
- San Francisco Red
- San Lorenzo Red-on-brown
- Mogollon Red-on-brown

Three Circle Red-on-white
- Boldface Black-on-white
- Mimbres Black-on-white

APPENDIX C

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SECTION 2

CERAMICS OF COLORADO'S WESTERN SLOPE

CERAMIC TYPES OF THE MESA VERDE REGION

by

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INTRODUCTION

This paper presents a typological classification system for Anasazi ceramics of the Mesa Verde or Northern San Juan region. All archaeological classification systems are designed to satisfy the needs of particular projects or studies. This system assumes goals of basic description in support of interassemblage comparisons, with an emphasis on temporally sensitive aspects of design and technology that are useful in generating ceramic date estimates. As research on Northern San Juan pottery progresses, the classification system should be amended to make better use of our understanding of stylistic variation, its meaning, and usefulness.

By itself, typology serves the goals of description and chronology well. However, these are limited goals within the context of modern ceramic analysis and the interpretive needs of archaeologists in the Southwestern Colorado's Northern San Juan region. Pottery type classification should be employed as part of a larger ceramic analysis systems, augmented by observations of resource, technological, and stylistic attributes. These attributes can include temper, clay, paint, surface manipulation, vessel form, and design style. Detailed descriptions of attribute categories employed during the Dolores Project (Blinman et al. 1984) and the La Plata Highway Project (Wilson and Blinman n.d.) provide suggestions for attributes that are useful for dealing with questions of exchange, production, and function.

TYPOLOGICAL CLASSIFICATION

Traditional Southwestern pottery typologies have been designed to summarize constellations of attributes known to vary through time and across space (Colton 1953; Lucius this volume). First, a ceramic item is assigned to a geographically distinct tradition on the basis of temper, paint, clay, or firing characteristics. Next, it is placed into a ware category based on temper and clay resources, production technology, and surface manipulation. Finally, it is assigned to a type based on surface manipulation or design style. In most cases, aspects of surface manipulation and design style have been chosen specifically to reflect temporal change.

TRADITIONS

Ceramic traditions refer to broad regions of postulated origin, usually distinguished by material and technology attributes such as temper, paint, paste, and slip clay. Stylistic elements also play a role,

but to a lesser extent. Ceramic traditions correspond closely to archaeologically recognized regions of the Southwest and are often considered cultural units as well (Cordell 1984; Kidder 1924; Peckham 1990; Wormington 1964). Traditions vary in scale from the Hohokam-Mogollon-Anasazi divisions of the Southwest to geographical and temporal subdivisions of the Anasazi. Subdivisions recognized for the northern Anasazi include the Northern San Juan (Mesa Verde), Upper San Juan (Gobernador), Chaco (Cibola), Chuska, and Kayenta (Tusayan). The approximate geographic boundaries of the five regional sub-traditions are well-known but each has temporal and spatial components to their definitions which tend to blur the archaeological utility of static physical boundaries among them.

The criteria used to distinguish ceramic traditions are imperfect, especially when applied to Anasazi subdivisions. Some temper types are common to multiple regions (such as crushed sherd temper) as are paint types (such as mineral paint). In cases where the characteristics of a sherd or vessel are ambiguous, it is common practice to assume that the pottery belongs to the "home" region of the site. Given the wide geographic extent of ceramic exchange by the northern Anasazi (Blinman and Wilson 1993), an alternative convention is to assign sherds to generic types that record temporal style while avoiding the source implications of a tradition assignment (Wilson and Blinman 1993).

WARES

Wares have been defined differently by various Southwestern archaeologists, some defining wares the same way we have defined traditions (Colton 1953). Here, we define wares as groups of types that share broad technological and decorative treatments. Wares appear to conform to broad divisions in production and use during the entire Anasazi occupation. As such, ware categories often represent useful interpretive divisions since they reflect distinct categories of production, exchange, and function.

Almost all Mesa Verde Tradition ceramics may be placed into either gray, white, or red ware categories. Gray ware refer to unpainted and unslipped vessels fired in a neutral atmosphere. With one singular exception, gray ware vessels are not polished, and decoration, if present, consists of variation in surface texture. Most gray ware vessels served cooking or storage functions, and gray ware is commonly called utility ware. White ware refers to decorated vessels, most of which are polished and nearly all of which are painted. White wares have gray to white surfaces resulting from firing in a neutral atmosphere. Red ware refers to painted or polished vessels which have orange or red surface colors as a result of firing in a strong oxidizing atmosphere. The functional characteristics of white and red ware vessels are identical and such wares are often described as decorated wares.

Where ware names are derived from predominant surface colors that result from firing and clay selection, the relationship between paste color and ware group is not absolute. Firing mistakes, clay selection, and post-firing alterations obscure or alter the original "intent" of the potter. For example, accidental oxidation of a high-iron gray ware sherd can produce an orange or red sherd as strongly colored as any red ware. Similarly,

an accidentally reduced red ware sherd can exhibit surface and paint colors identical to white ware colors. In both cases, surface texture, design style, and paste texture must overrule color-based criteria in ware assignments.

TYPES

Pottery types are defined within traditions and wares, and we make a distinction between formal and informal or grouped types. Formal types encompass distinctive design or manipulation styles whose descriptions have been published and whose usefulness extends beyond a particular project or local area. Conventions for formal type-names follow Colton and Hargrave (1937), resulting in a geographic place name followed by ware or decoration descriptor (for example, Mesa Verde Corrugated or Mancos Black-on-white). Pottery that lacks style or manipulation traits necessary for confident assignment to a formal type are assigned to informal types. These are defined to convey as much temporal information as possible, and are given temporal or technological names (for example, Pueblo II/III Black-on-white or Polished White) (Blinman et al. 1984).

Part of the need for both formal and informal types stems from ambiguous stylistic examples (types, after all, partition relatively continuous stylistic variation into normative categories), but the most important need for informal types stems from the vessel-sherd dichotomy. Potters execute stylistic conventions at the level of the vessel, and most types are defined and illustrated with vessels in mind. However, the overwhelming content of archaeological collections consists of sherds, often exhibiting small portions or samples of the overall vessel design. Less than 10 percent of sherds in most collections carry adequate stylistic information for assignment to formal types, but the remainder carry at least some information that can be summarized and used through the informal type convention. The alternatives are either to ignore the potential information (considering all untypeable sherds to be unclassifiable) or to assign sherds to types by association (e.g., most typeable sherds from a collection are from Mancos Black-on-white vessels, therefore all white ware sherds in the collection are assumed to be Mancos Black-on-white). Experience has shown that these alternatives result in the loss of valuable information and obscure potentially important variability.

The vessel-sherd dichotomy also raises an issue that can create considerable confusion for some archaeologists. A vessel can break and yield sherds not just of a formal type and several informal types, but it can yield multiple formal types. This results from the presence of some individual design motifs (such as scrolls) in the design suite of more than one type, or from inconsistent execution of surface manipulation in gray wares. As an example, it is not uncommon for a Moccasin Gray cooking pot to fragment into several Mancos Gray as well as Moccasin Gray and Plain Gray sherds. We do not view this result as inconsistent, but as an expected consequence of the normative nature of pottery type definitions. It is important to document that a Moccasin Gray vessel can yield the occasional Mancos Gray sherd, so that the occurrence of a Mancos Gray sherd within an assemblage otherwise dominated by Moccasin Gray is not cause for alarm.

An adjunct to this is that we believe all classification decisions should be explicitly sherd-based, assigning sherds to pottery types based only on the characteristics of that sherd and independent of the characteristics of other sherds in the assemblage. This viewpoint is especially important if ceramic data are to be used for generating date estimates and for distinguishing multiple components.

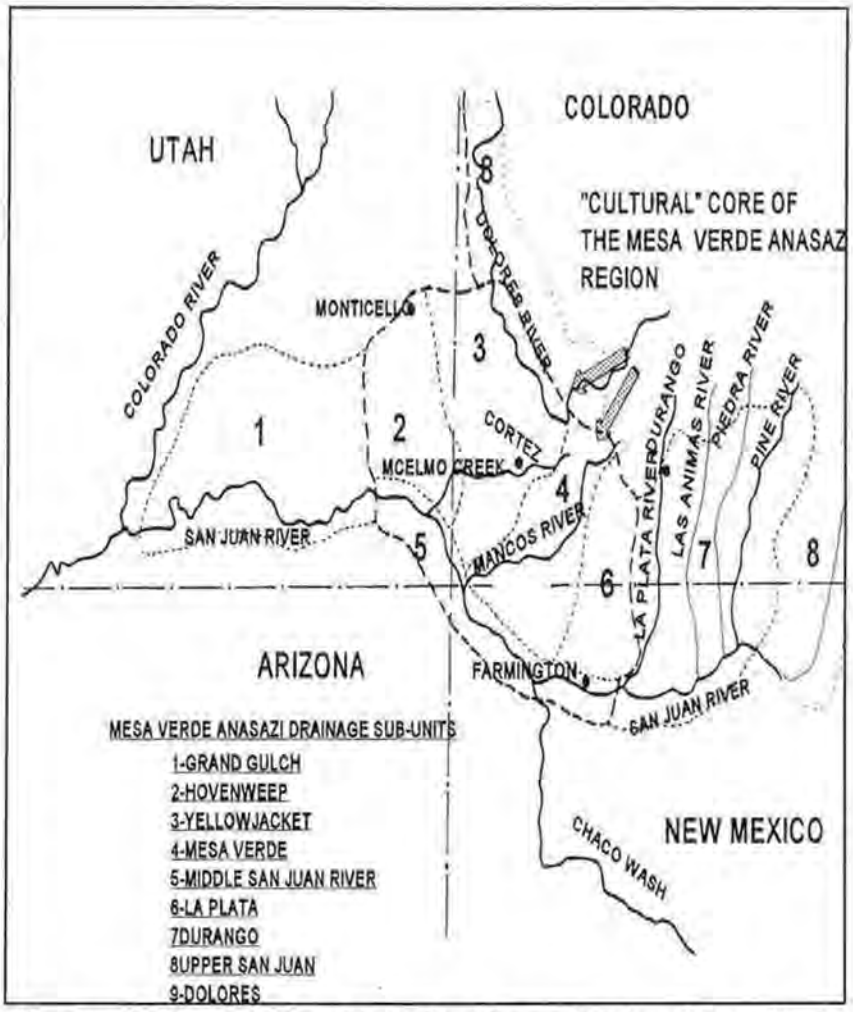

Figure 1-Geographic Distribution of the Mesa Verde Tradition based on River Drainages.

MESA VERDE TRADITION POTTERY

Anasazi ceramics occurring within the Mesa Verde (or Northern San Juan) region were first defined as a distinctive tradition based on the presence of crushed igneous temper (Abel 1955). Igneous source rocks include a range of porphyries, usually andesites or diorites. These rock types are present *in situ* as laccolithic mountains and dikes and igneous cobbles which occur in both modern and Quaternary alluvial deposits whose drainages include the primary sources and glacial deposits originating from such sources. As usually defined, the Mesa Verde region is the northernmost extension of the Anasazi, including large areas of southeastern Utah, southwestern Colorado, and northwestern New Mexico (see Figure 1).

It includes most of the area drained by the northern tributaries of the San Juan River. The confluence of the Colorado and San Juan Rivers forms the southwest boundary, and the Colorado River forms the western boundary. The eastern boundary varies through time and is sometimes drawn at the Animas River, but it may also be placed as far west as the La Plata River. The northern boundary is generally defined by watershed limits of the northern tributaries of the San Juan River, but it extends slightly further north to include southernmost portions of the Dolores River and its tributaries.

Although the original definition of the Mesa Verde Anasazi region was linked to the distribution of crushed igneous rock temper, there are several deviations from that material selection, some influenced by temporal and some by geographical factors. Widely scattered pockets of sand and crushed sandstone temper utilization were present during the Basketmaker III period, without regard to the local availability of igneous rock (Hurst 1985). Later, sherd temper was used in the production of white wares over much of the Mesa Verde region (Abel 1955). Other deviations resulted from the localized scarcity of igneous rock in some portions of the region. For example, neither laccolithic nor alluvial sources of igneous rock are present in the beanfield and canyon country located between Yellowjacket Canyon and Montezuma Creek along the Colorado-Utah border. Instead of importing igneous rock from as far as 30 km, potters utilized local Dakota Sandstone for temper during the entire Anasazi occupation of that area (Lucius 1981, 1982; Wilson 1988).

Upon their initial discoveries, each of these deviations raised the issue of whether or not the ceramics and their makers should be accorded Mesa Verde affiliation. The use of sherd temper in white wares prompted the definition of another pottery tradition, San Juan White Ware (Abel 1955). General inconsistencies within Mesa Verde tradition pottery types even prompted one complete revision of the regional taxonomy (Forsyth 1977). We feel that such taxonomic debates, *per se*, are unproductive, and that the deviations should be accepted as part of a single Mesa Verde or Northern San Juan ceramic tradition. Circumstantial support for this position comes from the association of population movement and temper abundance (Blinman 1988). As populations moved out of the beanfield and canyon country during the late ninth century, frequencies of non-igneous tempers decreased dramatically within the region as a whole, indicating that the dislocated potters switched to igneous rock temper sources as soon as they were within reach of the Mesa Verde region.

Within the context of the Mesa Verde Tradition, most of these deviations are useful in serving as signatures for pottery manufactured within specific production tracts that crosscut wares and type (Lucius 1981). These tracts have been defined using geographic variation in temper abundance with some confirmation by rare discoveries of production evidence in the form of tempered but unfired pottery clays. Currently, these tracts are the best basis for dealing with questions of intra-regional ceramic exchange and interaction.

The typology presented here is founded on a large number of existing descriptions and syntheses of Mesa Verde ceramic types (Abel 1955; Breternitz et al. 1974; Bond 1985; Brew 1946; Cattanach 1980; Franklin 1980; Hayes 1964; Hayes and Lancaster 1975; Hurst et al. 1985; Lucius and Wilson 1981a, 1981b; Martin 1936, 1939; Oppelt 1991; Reed 1958; Rohn 1971, 1977; Swannack 1969). These have been augmented by recent experiences and observations from working with extremely large collections from the Dolores Valley, Montezuma Valley, and La Plata Valley and smaller collections from other areas of the Mesa Verde region. All typologies need to be flexible in order to adequately represent prehistoric variability and the needs of archaeological interpretation, and we do not intend this typology to be monolithic.

Similarly, classification decisions are notoriously individualistic, and we have no illusions that this typology will result in any increased level of inter-analyst consistency in pottery classification. However, this typology will create a standard that can be adopted, contrasted with, or explicitly amended-improving the communication between ceramic analysts working within the region.

Gray Ware Types

Gray Ware types represent the majority of the pottery produced in the Mesa Verde region. There is a general decline in gray ware frequency through time, gradually decreasing from over 90 percent of the total assemblage during the Basketmaker III period to about half of Pueblo III assemblages. Surface treatment may range from coarsely scraped exteriors and interiors to carefully executed neckbanding and corrugation, and there is limited use of surface polish. Exterior sooting is common on the subset of gray ware vessels that were used for cooking, and most gray ware vessels appear designed for either cooking or storage.

The range of paste characteristics is very wide, apparently the result of the diverse clay sources available to and exploited by prehistoric potters in the region. Paste and surface colors of sherds and vessels are extremely variable, ranging from white, gray, and black to reddish colors. Dark cores are often present in the cross section of gray ware sherds, indicating the common use of carbonaceous clays. When exposed to standardized oxidizing conditions, color variation within gray ware pastes is the most extreme of all the wares, as significant frequencies of sherds from a given assemblage may fire to white, buff, pink, orange, and red colors. This variability, which is high in assemblages dating to all time periods, indicates the use of a wide range of clays (Wilson et al. 1985). Tempering material is usually coarse and often protruding through the surface. The overwhelming majority of gray wares produced during all Anasazi periods were tempered with crushed igneous rock; a consistent minority were tempered with crushed sandstone, forming a distinctive production tract in the center of the region (Wilson 1988). Sand and sherd tempers occur sporadically in gray wares. Specific Mesa Verde Gray Ware types are distinguished by surface (coil) manipulation or rim form.

Twin Trees Gray

The definition of Twin Trees Gray presents a problem in that it represents a gray ware type defined on the basis of polished surface, a criterion usually associated with white wares. Although this type has not been invoked during recent studies within the region, it is a valid utility ware type. The earliest utility wares recovered throughout the northern Southwest have been classified as brown wares and usually exhibit polished surfaces on alluvial clay pastes (Wilson and Blinman 1991). Polished surface treatment appears to have persisted in utility wares from their initial appearance prior to A.D. 400 through A.D. 700. In these contexts, Twin Trees Gray represents a gray ware type transitional between brown wares and subsequent unpolished gray wares. This type is analogous to Sambrito Utility as defined for the Upper San Juan region (Wilson and Blinman 1993), Obelisk Gray from the

Cibola or Kayenta region, Adamana Brown from the Southern Anasazi and Northern Mogollon country, and Alma Plain from the Mogollon country. Twin Trees Gray is distinguished from these types by the presence of crushed igneous rock temper. Although the dating of the type is speculative, Twin-Trees Gray is often the dominant ceramic type in assemblages dating from about A.D. 450 to A.D. 600 and may occur in lower frequencies in later assemblages.

Vessel surfaces are always unpainted and unslipped. Polished surfaces are often streaky with small unpolished areas resulting from the unevenness of the surface. Despite polishing, surfaces are fairly rough and uneven, indicating that polishing was done without much preliminary scraping and smoothing. Surface color may be white, gray, dark gray, or brown, and color is often highly variable across the same vessel or sherd. Cores are often dark gray to brown in color. Firing atmospheres appear to have been poorly controlled. Vessel forms include seed jars, ollas, cooking or storage jars, dippers, and bowls. Fugitive red pigment may be present, but it is very rare.

This type poses several problems during sherd classification since there is no independent means of assessing whether a polished sherd is derived from a Twin Trees Gray vessel or from an unpainted portion of an early white ware vessel. One approach is to place all unpainted sherds with uneven surfaces and streaky polish in the Twin-Trees Gray category, disclaiming the presence of the type if the sherds can be accounted for by the range of other early decorated types within the assemblage. Another approach is to assign all polished unpainted sherds to the white ware grouped type and to explicitly assess the possible contribution of Twin-Trees Gray to that category during discussion. In any case, an effort should be made to avoid circularity in the actual classification in preference to injecting it at the discussion stage. If Twin Trees Gray is excluded from a project's typology, the alternative classification convention would be to assign polished but unpainted sherds to an informal white ware type (Polished White), resulting in the loss of potentially valuable temporal data.

Chapin Gray

Chapin Gray is analogous to Lino Gray as defined for the Cibola and Kayenta traditions, Rosa Gray for the Upper San Juan tradition, and to Bennett Gray for the Chuska tradition. Chapin Gray refers to unpolished rim sherds with scraped or plain exterior surfaces (Figure 2. [*Editor's note: this and all further figures are appended at the conclusion of this text*]

Junctures between coils used in vessel production have been completely obliterated, and enough of the sherd is present to infer that obliteration applies to the neck of the vessel as well as to the rim. Within the Mesa Verde region, this type is associated with sites dating at least as early as A.D. 575, and the type occurs in diminished frequencies at least as late as A.D. 950. A variety of vessel forms is represented by Chapin Gray, including wide mouth cooking or storage jars, ollas, dippers, bowls, seed jars, and gourd jars. The range of forms is much greater prior to the mid-eighth century, after which many of the forms, such as cooking or storage jars and seed jars, begin to be replaced by both other gray ware types and

other wares. After the mid-ninth century, Chapin Gray is increasingly restricted to forms such as ollas, miniatures, and effigies. Fugitive red pigment often occurs on the exteriors of Chapin Gray forms other than cooking jars.

Chapin Gray can only be identified when rim sherds are present and the majority of sherds deriving from Chapin Gray vessels will be assigned to the informal type, Plain Gray. Small rim sherds from neckbanded and corrugated gray ware vessels have the same characteristics as Chapin Gray and sherds that are too small to confidently rule out these possibilities should be considered indeterminate. Sherds from the unpainted rims of unpolished white ware vessels (such as Chapin Black-on-white) sometimes are classified as Chapin Gray.

Plain Gray

Body sherds from Chapin Gray vessels are scraped or smoothed on both interior and exterior surfaces. Some typological conventions in use in the Mesa Verde region have assigned such sherds to the Chapin Gray type, but we question the practice. Plain body sherds could be derived from the lower portions of neckbanded or neck corrugated vessels as well as Chapin Gray vessels, and this inflation of the Chapin Gray category can lead to confusion in ceramic chronology estimates. It is best to classify all gray ware body sherds that are not neckbanded or corrugated as Plain Gray rather than Chapin Gray. This convention focuses attention on those sherds that have an extremely high probability of being derived from Chapin Gray vessels as opposed to those that have a much lower probability. As an example, a scatter of 15 Plain Gray sherds could easily be derived from the breakage of an early neckbanded pot and classifying the sherds as Chapin Gray would create a false impression. This distinction may appear to be trivial for the reporting of Basketmaker III sites but, if the convention is not used independently of site data, there will not be a body of comparative data for use in the interpretation of small or ambiguous sherd collections.

Classification problems also occur when large unpolished and unpainted body sherds from some Chapin Black-on-white vessels are encountered. These errors cannot be avoided and must simply be acknowledged as contributing minor background noise within ceramic data sets.

Moccasin Gray

Gray ware sherds displaying unobliterated nonindented coils on vessel necks may be placed into one of three types based on coil form: Moccasin Gray, Mancos Gray, or Mummy Lake Gray. Moccasin Gray sherds are identified by the presence of one or more unobliterated coil junctions on the neck of the vessel, beginning immediately below the rim (Figure 3 The coils are generally wide (often called fillets) and there is no exaggeration of the junctures by overlapping the coils or by tooling the junctures between coils (see the description of Mancos Gray below). The rim fillet is close to vertical (as opposed to the everted rims on most corrugated gray ware vessels). Fillets are almost always limited to the upper neck but may extend down to the shoulder of the vessel. In some cases, the rim fillet will overlap the second fillet, creating a single clapboard (as in Mancos Gray) at the first juncture while junctures between the

remaining fillets are not emphasized. The difference between Moccasin Gray and Mancos Gray neckbanding is gradational and it is not unusual to have sherds classifiable as both types from the same vessel. The vast majority of Moccasin Gray neckbands are constructed by concentric rather than spiral coils, but spiral coiling has been observed, and these construction techniques should have no role in the operational definition of the type. Moccasin Gray is similar to Kana'a Gray as defined for the Cibola and Kayenta traditions and to Sheep Springs Gray and Tocito Gray for the Chuska tradition, as well as to Rosa Neckbanded for the Upper San Juan tradition.

Moccasin Gray is found in ceramic assemblages dating as early as A.D. 775, but it can be absent from assemblages dating as late as A.D. 800. It is consistently present by about A.D. 820 and is the dominant formal gray ware type from A.D. 840 to about A.D. 870. It persists in diminishing quantities through at least A.D. 950. Although Moccasin Gray sherds are often more abundant than Chapin Gray sherds in early-to mid-ninth century assemblages, more classifiable sherds are produced by neckbanded vessels than by Chapin Gray vessels and the type frequencies should not be interpreted as representing the frequencies of vessels of the two types. This is especially true as Chapin Gray becomes more strongly associated with ollas and the neckbanded types become the predominant cooking or storage jar style.

Moccasin Gray vessel forms are overwhelmingly dominated by wide-mouthed cooking or storage jars. Ollas are extremely rare and other forms are absent. Examples of vessels dating prior to A.D. 820 tend to have stacked necks reminiscent of Chapin Gray cooking or storage jars rather than the more classic slightly flared necks of mid-to-late-ninth century vessels. Body sherds from below the shoulders of Moccasin Gray vessels are plain surfaced and are identical to body sherds of Chapin Gray vessels. We suggest that these body sherds be classified as Plain Gray even when there is a high probability that they are derived from Moccasin Gray vessels.

Mancos Gray

Mancos Gray is identified by the presence of unobliterated and accentuated coil junctures on gray ware neck sherds (Figure 4. A common form is clapboarding created by overlapping coil junctions, but careful preservation of rounded coils or incision between coils are other means of emphasizing Mancos Gray neckbands. Neckbands of Mancos Gray tend to be narrower than those of Moccasin Gray, but this difference is due primarily to change in coil size selection through time, regardless of coil juncture configuration. In other words, contemporary neckbanded sherds of both types tend to be similar in coil height, both diminishing through time. Only rarely do Moccasin Gray or Mancos Gray coil sizes reach the small sizes found in the later corrugated gray wares. Mancos Gray neckbands tend to be constructed by the addition of concentric coils, but spiral coiling has been observed and vessel building technique should not be used in operational definition of the type.

One point of confusion in the classification of Mancos Gray sherds comes from the use of patterned corrugations on some corrugated gray ware vessels. The

patterns are produced by alternating between unindented and indented coils during the construction of the vessels, resulting in areas of the vessel wall that are clapboarded. If all clapboarded sherds are accepted as Mancos Gray without regard to their location on the vessel, the temporal range of Mancos Gray sherds would be extended long after production of Mancos Gray vessels has ceased. This problem can be minimized by restricting the definition of the type to include only emphasized coils that occur on portions of the vessel above the shoulder and by excluding sherds where coil diameters are clearly smaller than those associated with Mancos Gray vessels. Some sherds from the necks of some corrugated vessels will still be classified as Mancos Gray, but the amount of noise in the ceramic data can be minimized.

Mancos Gray appears as a minority of neckbanded sherds as early as A.D. 850 and it is consistently present after A.D. 860 over most of the Mesa Verde region. It increases in abundance relative to Moccasin Gray, through the end of the ninth century. It is the dominant gray ware type during the first half of the tenth century; but its slow replacement by corrugated gray wares began by A.D. 930, and corrugated gray wares are more abundant by at least A.D. 975. Confusion between the unindented subset of patterned corrugated and Mancos Gray sherds will result in traces of Mancos Gray sherds in post-A.D. 975 collections, but this source of "contamination" should be easily identifiable at least in some of the larger sherds within assemblages.

The overwhelming majority of sherds assigned to Mancos Gray are derived from wide-mouthed cooking or storage jars. Neckbanding on these jars extends from the rim to the shoulder and Mancos Gray jar necks are flared rather than stacked. The only other Mancos Gray vessels are rare ollas that have emphasized coil junctures either just below the rim or at the shoulder.

Mancos Gray sherds are analogous to a minority of Kana'a Gray and most Coconino Gray sherds of the Kayenta and Cibola traditions. For the Chuska tradition, Mancos Gray sherds are analogous to some Tocito Gray sherds, all Gray Hills Banded sherds, and some Captain Tom Corrugated sherds.

Mummy Lake Gray

Mummy Lake Gray does not follow directly after Mancos Gray in time. Instead, it is contemporary with later corrugated types. It shares some characteristics with the neckbanded types and therefore is discussed here out of its temporal order. Sherds are assigned to this type if they are from a wide mouth jar or pitcher with a somewhat everted single rim fillet and a plain (scraped) body. Eversion varies from slightly everted to eversion angles of more than 45 degrees. The rim fillet is usually broad and unmanipulated and traces of coils have been completely obliterated on the exterior surface of the body, leaving a plain but often rough surface. Vessel forms are restricted to wide-mouthed cooking or storage jars and pitchers, and jar shapes duplicate those of corrugated types rather than being limited to the globular or flaring necked jar forms of Chapin Gray and the neckbanded types.

Mummy Lake Gray sherds can only be distinguished from the neckbanded and corrugated gray ware types if the sherd is large enough to indicate that only a single

fillet is present and that the remainder of the body is plain. Smaller sherds can be distinguished from neckbanded types if their eversion angle deviates significantly from vertical. Body sherds from Mummy Lake Gray vessels are indistinguishable from those from Chapin Gray vessels or from other types with obliterated bodies and body sherds should be classified as Plain Gray.

The scarcity of Mummy Lake Gray, and the relatively great risk of error assumed in assigning small sherds to this type, probably account for the ambiguity of its temporal placement. Within collections from the central Mesa Verde region, Mummy Lake Gray appears to span the A.D. 1050-1200 period. It is roughly contemporary with Dolores Corrugated. Elsewhere in the Mesa Verde region, traces of Mummy Lake Gray are described from collections dating as early as A.D. 700, but these sherds probably reflect portions of Moccasin Gray and Mancos Gray vessels. Because of the strong Pueblo II and later period varieties of the type, we recommend it not be used where small sherd size precludes confident comparisons between the unknown sherd and the various neckbanded and corrugated types.

Mancos Corrugated, Dolores Corrugated, and Mesa Verde Corrugated

Corrugated gray ware vessels exhibit indented or partially indented coils which usually cover the entire exterior surface (Figure 5). The earliest corrugated surface textures appear as neck corrugations in the mid-tenth century, both alone and in patterned combinations with clapboarded neckbands. By A.D. 1000, most gray ware vessels were corrugated over their entire surfaces, although corrugation may be limited to the area above the vessel shoulder in examples dating through A.D. 1300. Corrugated gray ware vessel forms are generally limited to cooking and storage jars, although corrugated bowls, ollas, and mugs occur in extremely low frequencies. Early corrugated jars generally continue the flaring neck pattern set for the later neckbanded vessels, but this shape is augmented and modified through time so that a diversity of shapes (such as egg shaped and globular) can be found in later assemblages. Although these body shapes vary somewhat in terms of rim eversion, temporal trends in body shape are not consistent enough to support typological distinctions in sherd collections. Corrugation also occurs as a rare decorative surface treatment on the exterior of white ware bowls between A.D. 950 and 1300.

A variety of types have been proposed within the corrugated gray wares of the Mesa Verde region. Some are defined by variation in rim eversion while others are based on corrugation style and paste texture. We believe that rim eversion changes are more useful for the purposes of ceramic-based chronology and that the treatment of corrugation style, while valuable for other purposes, should be held independent of a rim-based typology.

Three distinct corrugated types can be identified by arbitrary subdivision of a continuum of rim eversion from near vertical to extremely everted. Although the correlation is not as strong as we would like, this continuum correlates more strongly with time of vessel production than other corrugated sherd attributes. Originally, the continuum was broken into two types: Mancos Corrugated and Mesa Verde

Corrugated, representing the two extremes of the continuum (Breternitz et al. 1974). Examination of ceramic collections with intermediate rim eversion and comparison with white ware type associations led to the conclusion that an intermediate type would be a useful chronological tool (Lucius and Wilson 1981a; Wilson and Waterworth 1982). Dolores Corrugated was defined to subsume the central part of the range of variation formerly ascribed to the original two types.

Mancos Corrugated

Mancos Corrugated rims exhibit little or no eversion (less than 30 degrees). They are associated with the earliest neck corrugated and fully corrugated vessels, appearing in small quantities sometime around A.D. 930. Mancos Corrugated replaces Mancos Gray during the last half of the tenth century and it is the dominant gray ware type during the early eleventh century. Mancos Corrugated sherds give way to rims with greater eversion during the last half of the eleventh century and become rare after A.D. 1100. Some Mancos Corrugated sherds can be found in late Pueblo III assemblages.

Dolores Corrugated

Rim sherds exhibiting moderate eversion (approximately 30 to 55 degrees) are assigned to Dolores Corrugated. These sherds are extremely rare prior to A.D. 1050, but become more common through the end of the eleventh century, at which time they are the most common corrugated rim type. Dolores Corrugated frequencies declined through the twelfth century, but continued to account for a significant minority of the corrugated rim sherds through the end of the Pueblo III period.

Mesa Verde Corrugated

Corrugated rim sherds showing eversion greater than 55 degrees are classified as Mesa Verde Corrugated. These sherds were extremely rare prior to A.D. 1100, but they increased in frequency to form at least a plurality, and usually the majority, of post-A.D. 1200 corrugated rims.

Corrugated Gray

Since this rim-based typological convention explicitly ignores style of corrugated indentions and vessel shape, body sherds from corrugated vessels cannot be assigned to a specific type. Because of the wide range in coil manipulations for assemblages dating to the entire span in which corrugated vessels were utilized, we recommend that they be described simply as Corrugated Gray. Investigation of variation in corrugation style should be handled as an attribute that can be coded for all sherds, regardless of type assignment.

White Ware Types

Mesa Verde White Ware types are the principal decorated ceramics in most Northern San Juan assemblages. The exception is the Pueblo I period, during which red wares were the dominant decorated pottery in some areas. Apart from that deviation, there is a general increase in the overall proportion of white ware sherds in assemblages through time, culminating in abundances of 50 percent or more in Pueblo III collections. White wares are defined by painted decoration against a neutral (gray or

white) background, although rare unpainted vessels were also produced. Most white ware vessels are polished, some are slipped, and some bowl exteriors are textured (banded or corrugated). Vessel forms are dominated by bowls and serving jars, and only rarely are white ware vessels sooted by cooking.

Variation in white ware paste characteristics is usually less than for gray wares, but resource selection patterns change through time. In general, a more limited range of clays was used in white ware production due to a need to contrast dark painted designs against a light gray or white background. Early potters simply selected relatively low iron clays for white ware vessels, but many later potters (increasingly after A.D. 900) used white slip clays to increase the range of body clays which could be used for white ware vessels. Initial temper use in white wares paralleled that of gray wares, but temper size rapidly decreased, and localized use of sherd temper gave way to general use of sherd temper beginning around A.D. 900. A trend toward greater geographic variation occurred during the Pueblo III period as some areas reverted to finely crushed igneous rock temper while others continued use of sherd temper.

Types within the white wares are distinguished primarily on the basis of design style, with lesser dependence on technological aspects of pottery production. The types represent arbitrary partitions of continuous design variation and there is more ambiguity and debate about white ware type classification conventions than those related to gray ware types. There is some geographic variation in the content and timing of particular style changes, but these are more apparent through the early Pueblo II period than after.

Since white ware design styles can leave large areas of a vessel unpainted, the presence of a smoothed, polished, or slipped white (or gray) surface is considered sufficient to classify a sherd as a white ware (see the discussion of Twin Trees Gray). In the rare cases where a white ware vessel was left unpolished, some sherds may be misclassified as Plain Gray, but the practical effects of these errors are minor if the definition is applied systematically. As discussed earlier, Twin Trees Gray sherds blur the distinction between gray and white wares, but temporal associations and entire assemblage content data can be used to resolve the confusion. Misfiring of rare high iron white ware clays can result in reddish surface colors, but design style and paste texture are usually distinctive enough to differentiate these sherds from red ware sherds.

Informal Types

White ware sherds which do not display painted decorations distinctive enough to be assigned to formally defined Mesa Verde types are assigned to informal types. Polished white ware sherds not exhibiting any paint may be classified simply as *Polished White*. If slipping is deemed important to a particular study, *Slipped White* may be used to differentiate this portion of Polished White sherds. Unpolished, painted sherds without distinctive designs may be classified as *Painted Black-on-white*. Many decorated sherds with distinctive designs can be ambiguous as to specific type while still conveying some temporal information. In most cases, these sherds can be placed into one of the following categories: *Early Black-*

on-white (designs and treatments predating Pueblo II styles), *Pueblo II/III Black-on-white* (post-Pueblo I design styles), and *Pueblo III Black-on-white* (designs that could be from either McElmo Black-on-white or Mesa Verde Black-on-white vessels). The majority of the white ware sherds from a given assemblage are usually assigned to these informal types and these types can contribute significantly to dating arguments.

Chapin Black-on-white

Chapin Black-on-white is the earliest Mesa Verde White Ware type and exhibits an almost identical range of design styles and surface treatments as other early Anasazi (types such as Lino Black-on-white for the Kayenta tradition, La Plata Black-on-white for the Cibola tradition, Crozier Black-on-white for the Chuska tradition, and Rosa Black-on-white for the Upper San Juan tradition) (Figure 6).

Surfaces of Chapin Black-on-white vessels are often unpolished or slightly polished and slips are extremely rare. Unpolished surfaces are similar in texture to those of Chapin Gray. Paste and surface color are highly variable, reflecting less control of firing atmosphere than in later types. Rims are usually thin, tapered, and rounded and the rims may be either solidly painted or unpainted. The great majority of Chapin Black-on-white vessel forms are bowls, with rare examples of seed jars, ollas, and effigies. Bowl exteriors often exhibit fugitive red coatings.

Designs may be executed with either an iron or manganese mineral pigment, glaze pigment, or organic paint. Mineral pigments are the predominant paint type in the eastern and central Mesa Verde region and glaze pigments are found in most Animas River valley and some La Plata Valley assemblages. Organic pigments dominate areas to the west (southeastern Utah) while there are localized pockets of organic paint use elsewhere in the region. Poorly fused glaze paint can flake off, leaving the organic binder and designs that appear to have been executed in organic paint.

Chapin Black-on-white designs are usually simple and sparsely executed, with much of the vessel's surface unpainted. Unpainted sherds from unpolished Chapin Black-on-white vessels are often classified as gray wares. Painted decoration normally includes two or three isolated design units consisting of fairly simple combinations of a limited number of motifs. Lines are thin, may be straight, bent, ticked, or embellished with triangles. Spaces between lines are often filled with "Z," "I," or dot motifs. A small circle, which may or may not be embellished, is sometimes located in the center of the decorative field. These circles are usually isolated from the other motifs which are often located on the upper part of the design field, but the circles sometimes are connected to these motifs. Motifs that are present in Chapin Black-on-white, but which are absent from other types, are thunderbirds and walking circles.

Chapin Black-on-white is present in Basketmaker III contexts as early as A.D. 575 and continues as the only white ware type through the early eighth century. Sherds of Chapin Black-on-white continue to occur in Pueblo I contexts through A.D. 900, but are rare after A.D. 800. White wares produced during the ninth century often show characteristics intermediate between Chapin

Black-on-white and Piedra Black-on-white, reflecting the arbitrary nature of the division between the two types.

Sherds deriving from different portions of Chapin Black-on-white vessels may be placed into a variety of types. While all sherds with large decorated areas are often confidently classifiable as Chapin Black-on-white, those exhibiting small indistinct decorated areas may be classified as Painted Black-on-white or Early Black-on-white. Unpainted portions of polished vessels will be classified as Polished White. Because of the slight differences between the wares during this time period, significant proportions of unpainted sherds from unpolished Chapin Black-on-white vessels will be classified as Plain Gray or rarely Chapin Gray. This can result in an under-representation of white ware sherds for assemblages containing Chapin Black-on-white vessels.

The subset of Chapin Black-on-white pottery with designs executed in glaze paint poses several problems (Wilson 1988). This paint type constitutes a significant proportion of painted sherds from sites along the easternmost tributaries of the San Juan River and dating to the late Basketmaker III and early Pueblo I periods. Examples of this pottery recovered from the Durango area along the Animas River have been classified as varieties of Chapin Black-on-white (Carlson 1963; Breternitz et al. 1974; Ellwood 1980; Lucius 1982; Wilson 1988; Winter 1986), but they are not tempered with the typical igneous rock of the Mesa Verde region. Instead, the temper is similar to that found in Rosa Black-on-white (also often decorated with glaze paint) of the immediately adjacent Upper San Juan region (Eddy 1966; Hall 1944; Wilson and Blinman 1993). Given this similarity, it may be more appropriate to view some glaze painted white wares as western extensions of Rosa Black-on-white of the Upper San Juan tradition.

Piedra Black-on-white

Piedra Black-on-white is the dominant formal white ware type associated with middle and late Pueblo I sites, beginning about A.D. 775 and ending shortly after A.D. 900. White Mesa Black-on-white is another Mesa Verde white ware type that is partially contemporary but has a more restricted distribution. Piedra Black-on-white shares some features with, but is not identical to, contemporaneous types in other regions such as Kana'a Black-on-white of the Kayenta tradition, Drolet Black-on-white for the Chuska tradition, and Kiatuthlana Black-on-white for the Cibola tradition (Figure 7).

Piedra Black-on-white departs from Chapin Black-on-white in that it is generally polished, although the polish may be erratic. Early examples are generally unslipped, but the incidence of slipping increases with later examples which also tend to have a better polish. Rims are usually tapered and rounded and may be solidly painted or unpainted. Fugitive red coatings are sometimes present on vessel exteriors, but the coatings are not as common as in Chapin Black-on-white. Piedra Black-on-white vessel forms are dominated by bowls, but jar, gourd jar, pitcher, and dipper forms are present and are more common than Chapin Black-on-white non-bowl vessel forms.

Piedra Black-on-white is decorated primarily with iron oxide or glaze paint. The latter is generally limited to the northeastern

part of the Mesa Verde region, especially the La Plata and Animas river valleys. Organic paint is less common than in Chapin Black-on-white and, when organic paint occurs, it is limited to the southeastern Utah area (see White Mesa Black-on-white). Organic paint is sometimes present as a binder that remains after poorly fused glaze paint has flaked off sherds.

Design motifs present in Piedra Black-on-white resemble those described for Chapin Black-on-white, although they differ in overall arrangement and organization. Piedra Black-on-white designs are arranged with reference to the rim or circumference of the vessel rather than its center. In contrast to Chapin Black-on-white, many designs of Piedra Black-on-white are arranged as a single unit composed of a series of several thin parallel intersecting lines covering a large portion of the vessel surface. These lines are frequently embellished with triangles, flagged triangles, and ticked lines. The earliest examples of Piedra Black-on-white are simple in style and technology, approximating Chapin Black-on-white, while later examples are more complex and resemble Cortez Black-on-white or Mancos Black-on-white.

While the design layouts of Piedra Black-on-white vessels pose some of the same problems as those described for Chapin Black-on-white vessels, technological differences between these types will often result in very different sherd classification patterns. Nearly all sherds will be reliably identified as white wares; some will be classifiable as Piedra Black-on-white, some will be Early Black-on-white, and the remainder will be Polished White. An extreme minority of sherds may be difficult to distinguish from Pueblo II types (Mancos Black-on-white and Cortez Black-on-white) resulting in a few instances of Pueblo II/III Black-on-white.

The glaze painted subset of Piedra Black-on-white poses similar problems as those described for Chapin Black-on-white and should be dealt with in a similar manner. Glaze painted sherds with Upper San Juan tradition temper should be considered part of the Rosa Black-on-white continuum, while those tempered with crushed igneous temper should be considered as a glaze painted variety of Piedra Black-on-white.

White Mesa Black-on-white

White Mesa Black-on-white was originally defined as a variety of Piedra Black-on-white (Hurst et al. 1985). It is distinct from the latter type in that it is reminiscent of Kana'a Black-on-white design styles, with extremely thin linework (Figure 8). This type is spatially concentrated in the area of the Mesa Verde region to the west of Montezuma Creek (southeastern Utah), and most examples of this type appear to be painted with organic pigment. At the time of its description, White Mesa Black-on-white was believed to be perfectly contemporary with Piedra Black-on-white and a variety status was considered. Continued research has documented the persistence of White Mesa Black-on-white sherds to the west of Montezuma Creek after A.D. 900 (after Piedra Black-on-white has been replaced by Cortez Black-on-white at sites to the east of Montezuma Creek), and we believe that formal type rather than variety status is warranted.

White Mesa Black-on-white is

polished and sometimes slipped, exhibiting a fairly consistent blue-white surface color. Painted decorations are executed in organic pigment in most cases, but some examples have mineral pigment with strong evidence of an organic binder underneath the thin mineral paint. Vessel forms are dominated by bowls, but jars, seed jars, and pitchers have been reported. Vessel rims are usually squared and solidly painted.

Design styles and layouts more closely resemble those noted in Kana'a Black-on-white or Kiatuthlana Black-on-white than Piedra Black-on-white. These designs are usually laid out in a band and consist of a series of thin framing lines with attached triangles that are often flagged or ticked. In contrast to Kana'a Black-on-white, dots commonly fill spaces between fine framing lines. Secondary motifs such as appended dots and ticks appear to be less common on White Mesa Black-on-white than Kana'a Black-on-white.

Sherds of White Mesa Black-on-white have been identified in mid-ninth century collections and in association with early Mancos Black-on-white collections that probably date to about A.D. 1000.

Cortez Black-on-white

Compared with the continuous variation of the earlier white ware types, Cortez Black-on-white is relatively distinctive (Figure 9). Its design style overlaps significantly with Naschitti Black-on-white and Newcomb Black-on-white of the Chuska tradition, Red Mesa Black-on-white, and Arboles Black-on-white. In addition, some design elements are shared with those present in Kiatuthlana Black-on-white of the Cibola tradition, and Black Mesa Black-on-white and Kana'a Black-on-white of the Kayenta tradition.

Cortez Black-on-white is usually well-polished and commonly exhibits a white crackled slip. Rims are rounded and tapered and can be solidly painted or unpainted. Decorations are almost always applied in a mineral pigment with no significant occurrences of either glaze or organic paint. The range of forms is wider than that for earlier types and includes bowls, jars, seed jars, and dippers.

Cortez Black-on-white incorporates a number of distinctive design motifs which occur together in moderately complex combinations. These include sequences of thin parallel lines, wavy lines, ticked lines, and rick-rack. Bands may be filled by squiggle hatchure, interlocking scrolls, or stepped and ticked triangles, but Dogoszhi-style bands with squiggle hatchure that occur without other design elements are assigned to Mancos Black-on-white rather than Cortez Black-on-white. (This deviates from the practice of assigning such bands to Red Mesa Black-on-white in Cibola pottery typologies) A partitioned or banded layout is often present in which the vessel surface is divided into a series of two to four geometrically opposed sections. Each section consists of similar combinations of design motifs separated by a succession of thin framing lines.

The earliest occurrences of Cortez Black-on-white sherds are in late ninth century Pueblo I assemblages in association with Piedra Black-on-white. Cortez Black-on-white is the dominant white ware type by the early tenth century and continues

in that role until the late tenth century. Mancos Black-on-white begins to replace Cortez Black-on-white about A.D. 1000 and the replacement is complete by about A.D. 1050. There appears to be a complementary distribution of Cortez Black-on-white and White Mesa Black-on-white, with the former significantly less common on contemporary sites west of Montezuma Creek.

Sherds derived from Cortez Black-on-white vessels may be placed into a broad range of types. The distinctive combinations of styles occurring within Cortez Black-on-white vessels make the classification of larger sherds and vessels fairly reliable. Smaller painted sherds derived from Cortez Black-on-white vessels may be classified as Mancos Black-on-white, Piedra Black-on-white, Early Black-on-white, or rarely Pueblo II/III Black-on-white. Unpainted sherds should be classified as Polished White.

Mancos Black-on-white

Mancos Black-on-white encompasses a wider range of design styles and technological variability than other Mesa Verde White Ware types or contemporary types in other regions of the Southwest (Figures 10a, b, and c).

For example, Mancos Black-on-white subsumes design styles used to define the Cibola tradition types Gallup Black-on-white, Chaco Black-on-white, Escavada Black-on-white, and Puerco Black-on-white; the Chuska tradition types Chuska Black-on-white, Toadlena Black-on-white, and Burnham Black on white; the Kayenta tradition types Black Mesa Black-on-white, Sosi Black-on-white, and Dogoszhi Black-on-white; and the Rio Grande type Kwah'e Black-on-white. Differences in the number of Pueblo II types distinguished in the different Anasazi regions is a reflection more of archaeological classification conventions than of stylistic variability.

The wide technological variability of the type includes both well polished and unpolished surfaces and slipped vessels are common. Rims are subrounded and tapered and can be solidly painted or unpainted. A wide variety of forms is represented, including bowls, jars, ollas, and dippers. Designs are executed in mineral pigment throughout the region during most periods. However, organic paint is sometimes found on examples of late Pueblo II to Pueblo III transitional ceramics. These organic painted sherds were used as a basis for the definition of Wetherill Black-on-white (Hayes 1964), now subsumed under Mancos Black-on-white. Design styles are simple and boldly executed. Single motifs are often presented in an all-over or banded layout, although rudimentary combinations of design elements may occur. The design element most commonly associated with Mancos Black-on-white is a series of rectilinear bands filled with diagonal, squiggle, straight, or cross hatchure (Dogoszhi style). Where Cibola sherds with squiggle hatchure are assigned to Red Mesa Black-on-white, the same sherd from the Mesa Verde Region would be assigned to Mancos Black-on-white. Dots, opposing triangles, radiating triangles, step triangles, checkered triangles, checkered squares, parallel lines and scrolls are also associated with Mancos Black-on-white.

Mancos Black-on-white first appears in the last decades of the tenth century and is the dominant white ware type from A.D. 1000 through about A.D. 1150. After A.D.

1150, McElmo Black-on-white replaces Mancos Black-on-white, and only traces of the latter type occur in assemblages dating after A.D. 1200.

Mancos Black-on-white characteristics are fairly well reflected by even small decorated sherds, and a relative high proportion of sherds derived from Mancos Black-on-white vessels will be placed into this type. Smaller decorated sherds may be classified as Pueblo II/III Black-on-white, and unpainted sherds as Polished White.

Tin Cup Polychrome

Tin Cup Polychrome is among the rarest and most unusual of the Mesa Verde White Ware types. The very small number of Tin Cup Polychrome sherds thus far described or illustrated makes a complete characterization and dating of this type difficult. Tin Cup Polychrome probably represents a variation of Mancos Black-on-white and is associated with the latter type in assemblages that date between A.D. 1000 and 1100. Although not common anywhere, Tin Cup Polychrome was defined in southeastern Utah (Forsyth 1972) and other occurrences in that area suggest that the western Mesa Verde region was the area of its production. All sherds described to date belong to bowls.

The type is identified by an unusual polychrome effect created by the use of black mineral and white clay pigments applied over a gray surface. Designs include broad bands arranged in rectilinear patterns of white outlined with black. Although contemporary with Mancos Black-on-white, the greatest design similarity is with Tusayan Polychrome of the Kayenta region.

McElmo Black-on-white

Few types are subject to as much variation in assignment conventions as McElmo Black-on-white. Design elements overlap to some degree with both Mancos Black-on-white and Mesa Verde Black-on-white and few pure McElmo Black-on-white assemblages have been described in the literature. A greater consensus exists about the distinctions between Mancos Black-on-white and McElmo Black-on-white than about distinctions between McElmo Black-on-white and Mesa Verde Black-on-white. Some researchers have refused to segregate the latter two types (see discussions by Rohn [1971] and Reed [1958]) .

The basis for this difficulty is that McElmo Black-on-white designs are transitional between Mancos Black-on-white and Mesa Verde Black-on-white (Figure 11).

McElmo Black-on-white is similar but not identical to Flagstaff Black-on-white for the Kayenta tradition, Nava Black-on-white for the Chuska tradition, and Chaco-McElmo Black-on-white for the Cibola tradition. McElmo Black-on-white is associated with Pueblo III occupations dating from about A.D. 1075 to A.D. 1300, and it is the dominant white ware on sites dating between A.D. 1150 and the first decades of the thirteenth century (early Pueblo III).

McElmo Black-on-white vessels are generally well polished, slipped and often have a pearly white surface. Vessel walls are slightly thicker than earlier Mesa Verde white wares and rim treatment differs. Rims are thick, rounded to flat, and are frequently decorated with dots or ticked lines. Bowls are the most common vessel form, but

dippers, ollas, and mugs are present in most assemblages. The great majority of McElmo Black-on-white sherds found in the Mesa Verde region have organic paint and it has been common practice to distinguish between McElmo Black-on-white and earlier Mancos Black-on-white on the basis of organic versus mineral paint. This convention is unfortunate since as mineral paint dominates Pueblo III assemblages in the beanfield and canyon country along the Utah-Colorado border. McElmo Black-on-white is best distinguished and characterized on the basis of its stylistic attributes. Also, McElmo Black-on-white often exhibits slightly less precise execution than Mesa Verde Black-on-white and this has led to another unfortunate convention of distinguishing these two types on degree of sloppiness. Although the generalization has some validity, both types display varying degrees of precision in design execution. Distinctions between the two should not be made solely on the basis of design quality.

McElmo Black-on-white decorations are almost always organized in a single painted band. Elements making up these designs are fairly broad and simple. A common example is a series of broad lines either in bands parallel to the rim or in rectilinear panels. Other designs include bands filled with straight hatchure, triangles, stepped triangles, dots, diamonds, and ticked lines. Such designs within bands are generally more sparsely filled than in Mesa Verde Black-on-white. Framing lines may be present, but they are usually single. If multiple lines are present, all lines are of uniform thickness (usually thin) rather than the multiple thicknesses of the framing lines in Mesa Verde Black-on-white. Multiple framing lines on McElmo Black-on-white are a late design innovation, transitional to Mesa Verde Black-on-white. Isolated design elements or simple combinations may be painted on bowl exteriors, but exterior designs are not as common as on Mesa Verde Black-on-white.

Since design layout and organization is very important for the identification of McElmo Black-on-white ceramics, sherds assigned to this type will often be limited to rim elements. Larger decorated body sherds will be classified as Pueblo III Black-on-white, while smaller sherds will be classified and Pueblo II/III Black-on-white. Unpainted sherds will be classified as Polished White.

Mesa Verde Black-on-white

Mesa Verde Black-on-white was the last white ware type produced within the Mesa Verde region (Figure 12). The earliest examples date to about A.D. 1180 and the last examples date to the abandonment of the Mesa Verde region about A.D. 1300. Mesa Verde Black-on-white is the principal white ware after the first decades of the thirteenth century. Mesa Verde Black-on-white design styles are similar but not identical to other Pueblo III types in the northern Southwest, including Tusayan Black-on-white for the Kayenta tradition, Crumbled House Black-on-white for the Chuska tradition, and Galisteo Black-on-white and Santa Fe Black-on-white for the Rio Grande traditions.

Mesa Verde Black-on-white vessels are usually well polished. Slipped vessels are common, usually with a pearly white surface. Vessel walls, especially bowls, are thick, and bowl rims are flat and usually decorated with ticks, dots, or lines. Vessel forms are dominated by bowls, but dippers,

ollas, and mugs are relatively common. Pigments are generally organic, but there are enclaves of mineral paint production, including the beanfield and canyon country along the Utah-Colorado border and a separate area near Aztec, New Mexico.

Designs are usually complex and well executed, but imprecise examples are not uncommon. Two classes of designs can be defined: banded and all-over. Design fields for both classes are usually 30-50 percent filled. Banded designs are bracketed by framing lines both above and below. Large areas below the band, such as bowl bases, are left unpainted. Single framing lines are usually thick and, if more than one framing line is present, they are usually of different thicknesses. Design elements are similar to those of McElmo Black-on-white (bands filled with straight hatchure, triangles, stepped triangles, dots, diamonds, and ticked lines), but elements are often smaller and combinations are more complex. All-over designs often lack framing lines and elements are arranged so that the entire design field is covered. The design field is partitioned into two, three, or four fields, and each field is filled with similar arrangements of elements. Large curvilinear and rectilinear areas of hatchure are more common in all-over designs than in band designs. Exterior designs on bowls are common, both as isolated elements and as bands, usually without framing lines.

As design layout and organization is very important for the distinction of Mesa Verde Black-on-white sherds, rim sherds are most easily placed into this type. Large body sherds from Mesa Verde Black-on-white vessels generally are more easily classified than for those from McElmo Black-on-white vessels. Smaller painted body sherds will be classified as Pueblo III Black-on-white or as Pueblo II/III Black-on-white. Unpainted sherds will be classified as Polished White.

Red Ware Types

There are two and perhaps three distinct red ware traditions within the Mesa Verde region. The earliest is represented by a single Basketmaker III type (Dolores Red) that appears to be closely related to Tallahogan Red as defined in the Kayenta region. This type is technologically distinct from later Mesa Verde red wares and should not be grouped with them on grounds other than surface color. The second red ware tradition is San Juan Red Ware, the principal red ware of the entire northern Anasazi region from about A.D. 725 through at least A.D. 1050. The third tradition is problematic since it represents copies of Tsegi Orange Ware types that were manufactured after the large scale production of San Juan Red Ware ceased. Because of the similarity of late San Juan Red Wares and early Tsegi Orange Wares, these copies could be considered part of either tradition. At this time, we recommend classifying them with Tsegi Orange Ware type names while noting the disparate temper.

San Juan Red Wares are unique among the Mesa Verde pottery wares in that there is a strong but circumstantial argument for regionally specialized production (Blinman 1983; Hurst 1983; Lucius and Breternitz 1981; Lucius and Wilson 1981a). Throughout the period of San Juan Red Ware production, contemporary collections of ceramics include increasing proportions of red ware sherds from east to west across the

region. For example, only small percentages of red ware sherds are present in A.D. 780s sites in the Animas River valley. Collections from contemporary sites in the Dolores area can have 8-10 percent red ware sherds and the contemporary site of Alkali Ridge in southeastern Utah has as much as 25 percent red ware sherds. This cline in abundance characterizes all of the San Juan Red Ware types and has led to the conclusion that southeastern Utah was the principal (but not exclusive) source of San Juan Red Ware vessels. Clay resource distributions have been suggested as an explanation of this probable regional specialization, but clarifying field research has yet to be carried out.

Mesa Verde Red Ware vessels are thin and well formed. Surfaces are usually orange to red, although those in misfired examples may be buff or gray in color. Gray cores are often present, and may indicate the use of carbonaceous gray clays that are high in iron content. Variability in paste characteristics both between and within assemblages appears to be significantly less than that observed for other wares and is additional evidence for regional specialization. When exposed to standardized oxidation firing, sherds almost always fire to the same reddish-orange color. Temper is almost always crushed igneous rock, although sandstone and sherd temper is present in extremely low frequencies. Sand may be present as a minority constituent in sherds with other tempers, presumably as natural inclusions in the clay.

Informal Types

Red ware sherds that lack the distinct designs or manipulation necessary for an assignment to a specific formal type may be assigned to informal types based on slip characteristics. *Unslipped Red* includes untypeable sherds with either no evidence of a slip or an indistinct wash. If paint is present it must be black. *Slipped Red* includes painted (black) or unpainted sherds with evidence of a strong slip. Most, but not all, Slipped Red sherds are derived from Deadmans Black-on-red vessels while Unslipped Red sherds may be derived from any of the San Juan Red Ware types.

Dolores Red

Dolores Red is similar to Tallahogan Red as originally described in collections from the Hopi Mesas area (Daifuku 1961). Both of these types may derive ultimately from San Francisco Red, a slipped brown ware produced very early in the Mogollon country. Dolores Red differs from Tallahogan Red only in the use of crushed igneous rock, sand, or sandstone temper. The type was produced by slipping a gray clay with a red-in-nature clay rather than by oxidizing a high-iron gray clay slip. The slip was applied to exteriors of jars and to both interiors and exteriors of bowls and the slipped surfaces were then polished. No paint has been noted on any examples of Dolores Red that have been described to date. Vessels were fired in neutral to oxidizing atmospheres, but the color of the slip was not produced by oxidation firing as much as by the original color of the slip clay. Firing was well controlled in that the firing atmosphere did not reduce the iron in the slip. This firing regime, slipping technology and dependence on a red-in-nature clay, is the main point of difference between Dolores Red and the San Juan Red Ware types. The range of paste and slip clay color is more

reminiscent of the White Mountain Redwares than either the San Juan Red Wares or Tsegi Orange Wares.

Dolores Red is rare at all times but is documented at least as early as A.D. 610. It remains the only red ware through the first few decades of the seventh century and traces occur through the end of the eighth century. Dolores Red appears to have been replaced by other San Juan Red Ware types, and it may or may not have served as an inspiration for the latter. Vessel forms are limited to bowls and jars, but the described sample of sherds is small and other forms may exist. Unlike the later San Juan Red Wares, there are no obvious clines in abundance across the Mesa Verde region and the diversity of tempers suggests local manufacture at scattered points within the region rather than regionally specialized production. The use of red clays would appear to link production to outcrops of the Morrison Formation, but slip clays can be procured over long distances (Arnold 1985), precluding placing much weight on this potential association.

Abajo Red-on-orange

Abajo Red-on-orange is the earliest of the San Juan Red Ware types (Figure 13). Its first occurrence appears to be sometime between A.D. 700 and 750, with a slightly earlier initial date in the western portion of the region. While no similar red wares were produced elsewhere in the Anasazi region, Abajo Red-on-orange is very similar to the earliest painted types produced in the Mogollon region, such as Mogollon Red-on-buff. This similarity raises the possibility of a relationship between these two widely separated traditions. Abajo Red-on-orange, and traces of Dolores Red, constitute the only red ware vessels through about A.D. 780, but by A.D. 800, Bluff Black-on-red is more common than Abajo Red-on-orange. By A.D. 850, Abajo Red-on-orange is rare and presumably no longer in production.

Abajo Red-on-orange is identified by an orange background with orange to red painted designs. The paste commonly has a gray core, indicating that, in most cases, the orange surface color results from the oxidation of a gray iron-rich clay whose iron content is reduced in its naturally occurring state. Slips are present on a minority of sherds, but the slips are washy as opposed to the strong slips associated with the later Deadmans Black-on-red. Vessel forms are dominated by bowls, but other forms have been noted (such as seed jars and pitchers).

Designs are relatively simple and boldly executed. Design elements include straight lines, wavy lines, triangles, and ticked lines. Design layouts may be bilateral, spiral, all-over, or more rarely, banded. Line widths include both thick and thin brush strokes, but thick lines are more prevalent than in later red ware types. Abajo Red-on-orange designs and layouts are duplicated by early Bluff Black-on-red designs and the only distinguishing characteristic is paint color.

In some cases, Abajo Red-on-orange design elements and layouts are executed in both red and black paint on the same vessel, and these sherds are described as *Abajo Polychrome*. Sherds of this type are too rare for confident dating, but they occur in late eighth and early ninth century contexts. Abajo Polychrome is presumed to span the transition between Abajo Red-on-orange and Bluff Black-on-red, and it is considered here

as a variety of Abajo Red-on-orange. Another type recognized in some studies is Abajo Black-on-gray, but sherds placed in this type are portions of misfired Abajo Red-on-orange or Bluff Black-on-red vessels and should not be considered as a separate type or variety.

Bluff Black-on-red

Bluff Black-on-red succeeds Abajo Red-on-orange beginning about A.D. 780. The transition is nearly complete by A.D. 820 and the type persists until at least A.D. 940, perhaps as late as A.D. 1000. The paste characteristics of Bluff Black-on-red are identical to those of Abajo Red-on-orange, including the occasional presence of a washy slip. Early examples of Bluff Black-on-red share design elements and layouts with Abajo Red-on-orange (Figure 14). The principal distinction between the two types is paint color. The range of vessel forms (bowls, seed jars, and pitchers) probably continues without change between the two types, although the greater longevity and therefore larger archaeological sample of Bluff Black-on-red vessels reveals a myriad of minor or exotic forms such as feather boxes, beakers, and dippers. One non-Mesa Verde type, Sanostee Black-on-red for the Chuska tradition, is superficially identical to Bluff Black-on-red, but the use of trachyte temper in Sanostee Black-on-red is sufficient to separate the two during microscopic examination.

Although design elements on early examples of Bluff Black-on-red are identical to those of Abajo Red-on-orange, there is a temporal trend toward increasingly fine linework and reliance on design elements other than straight and wavy lines. Late in the Bluff Black-on-red time range, there is considerable overlap with design elements used in Deadmans Black-on-red. This has resulted in a strong emphasis on slip characteristics as a means of distinguishing the two types. An additional difference between Bluff Black-on-red and both Abajo Red-on-orange and Deadmans Black-on-red is that a minority of late (post-A.D. 880) Bluff Black-on-red vessels were produced with crushed sherd temper. The use of sherd temper does not appear to continue past A.D. 920, and the value of this attribute in dating prompted the classification of these sherds as Bluff Black-on-red, McPhee variety (Wilson and Erickson 1985) or McPhee Black-on-red.

Deadmans Black-on-red

Bluff Black-on-red begins to be replaced by Deadmans Black-on-red sometime after A.D. 880 and the latter type persists as late as A.D. 1100. Details of the transition are fuzzy due to a lack of tenth century excavated and reported collections from southeastern Utah, but the differences between collections of ninth and eleventh century San Juan Red Ware sherds are striking. Thin but strong red slips are common in Deadmans Black-on-red and they contrast sharply with the weaker slips occasionally found on Bluff Black-on-red. The broader line work of early Bluff Black-on-red is replaced by finer linework, often in designs that are reminiscent of contemporary white ware design styles (Figure 15). This is a strong departure from Bluff Black-on-red and Abajo Red-on-orange designs where there are few similarities with contemporary white ware types. Vessel forms are dominated by bowls, but various jar forms are also present.

Deadmans Black-on-red designs are also similar to Tusayan Black-on-red and Middleton Black-on-red of Tsegi Orange Ware, reflecting a single northern Anasazi red ware style during the period of overlap between the two red ware traditions. Shared design elements include the use of bands filled with diagonal and squiggle hatchure and the use of nested straight thin lines with attached triangles. The hatchured bands are often arranged in all-over designs (Dogoszhi style) while the nested parallel lines usually form rim-oriented or pendant designs. In rare examples, Deadmans Black-on-red vessels may have partial slips on unpainted surfaces (jar interiors and bowl exteriors).

The A.D. 880-1100 dating of Deadmans Black-on-red places the onset and end dates of the type approximately 100 years later than previously reported (Breternitz et al. 1974). The later onset date is in part definitional, since other conventions would place all slipped and black-painted San Juan Red Ware sherds into the Deadmans Black-on-red type, regardless of design style or quality of slip. Including sherds with even light slips places a minority of Bluff Black-on-red into the Deadmans Black-on-red type, putting the onset of the type at about A.D. 800. Our convention of accepting the existence of slipped Bluff Black-on-red is based on experience with extensive excavated collections dating throughout the ninth century. The combination of both strong slip and late design elements is rare until after A.D. 900. The later end date for Deadmans Black-on-red is based on collections that are tree-ring dated to the middle of the eleventh century. Such persistence of Deadmans Black-on-red requires careful temper evaluation to distinguish San Juan Red Ware sherds (igneous rock, sandstone, and sand tempers) from Tsegi Orange Ware sherds (sherd and sand tempers).

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Mexico (identified as MNM/OAS in captions). We are grateful to the staff of these institutions, especially Bruce Bradley, Larry Hammack, Winston Hurst, Ricky Lightfoot, Shela McFarlin, Stephen Olsen, Angela Schwab, and Susan Thomas, for providing access to these collections and space to photograph them. All photos except those of MNM/OAS collections were taken by Eric Blinman. Nancy Warren took the photos of MNM/OAS pottery and also printed all of the photos used in this manuscript. Financial support for the photography of the Colorado and Utah collections was generously provided by a grant from the Museum of New Mexico Foundation.

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Figure 2a-Chapin Gray, AHC, 5MT4644, Vessel 24.

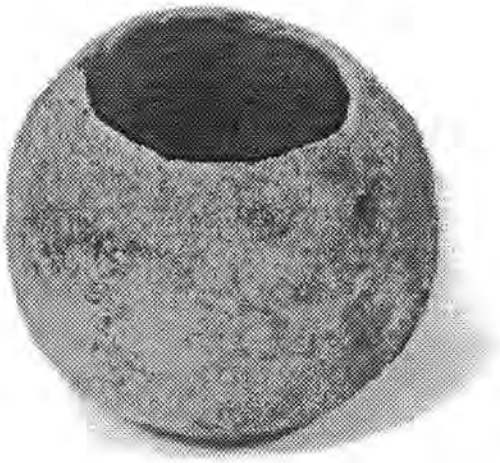

Figure 2b-Chapin Gray, AHC, 5MT4684, Vessel 7.

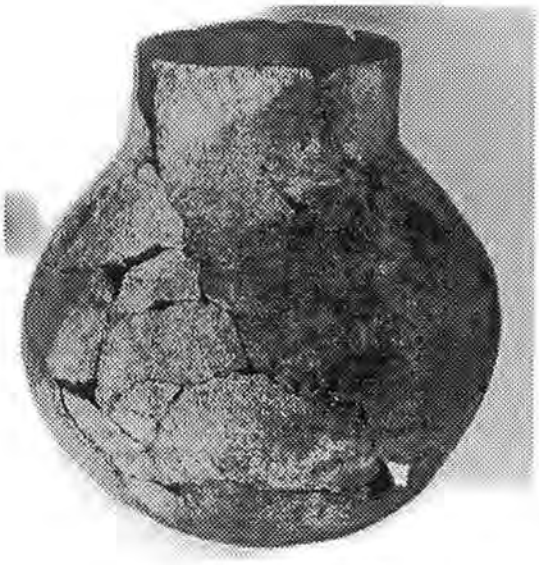

Figure 2c-Chapin Gray, AHC, 5MT2181, Vessel 14.

Figure 2d-Chapin Gray, AHC, 5MT4671, Vessel 5.

Figure 3a-Moccasin Gray, AHC, 5MT2181, Vessel 15.

Figure 3b-Moccasin Gray, AHC, 5MT23, Vessel 51.

Figure 3c-Moccasin Gray, AHC, 5MT2182, Vessel 33.

Figure 3d-Moccasin Gray, AHC, 5MT23, Vessel 46.

Figure 4a-Mancos Gray, AHC, 5MT23, Vessel 68.

Figure 4b-Mancos Gray, CCAC, 5MT3868, Vessel 10.

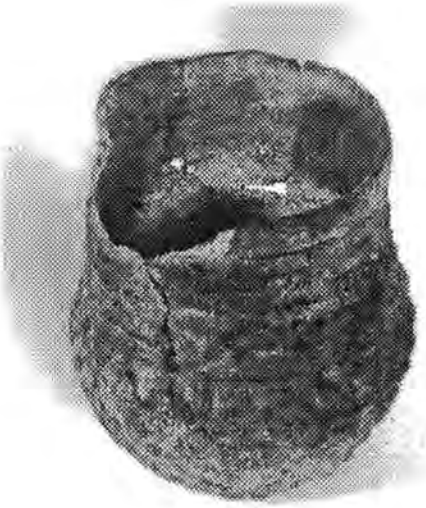

Figure 5a-Mancos Corrugated, BAB, 5MT6970.

Figure 5b-Dolores Corrugated, CCAC, 5MT765, Vessel 165.

Figure 5c-Mesa Verde Corrugated, CCAC, 5MT765, 628-18-1.

Figure 6a-Chapin Black-on-white, CASA/BR, 5DL112, Vessel 11.

Figure 6b-Chapin Black-on-white, CASA/BR, 5DL1138, Vessel 10.

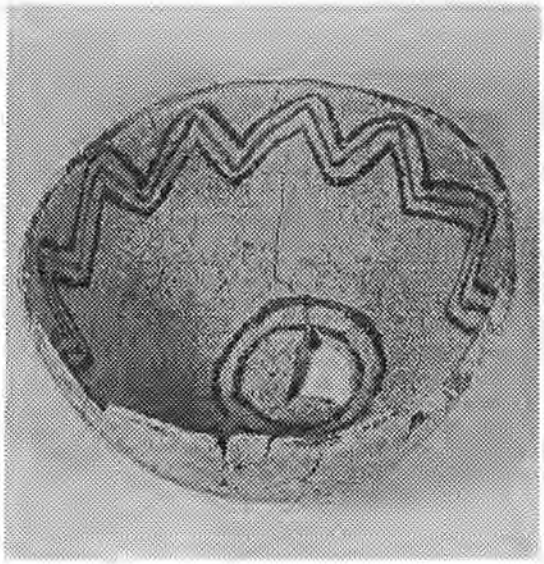

Figure 6c-Chapin Black-on-white, CASA/BR, 5MT8899, Vessel 9.

Figure 6d-Chapin Black-on-white, AHC, 5MT2858, Vessel 2.

Figure 7a-Piedra Black-on-white, AHC, 5MT5106, Vessel 17.

Figure 7b-Piedra Black-on-white, AHC, 5MT23, Vessel 146.

Figure 7c-Piedra Black-on-white, AHC, 5MT4475, Vessel 27.

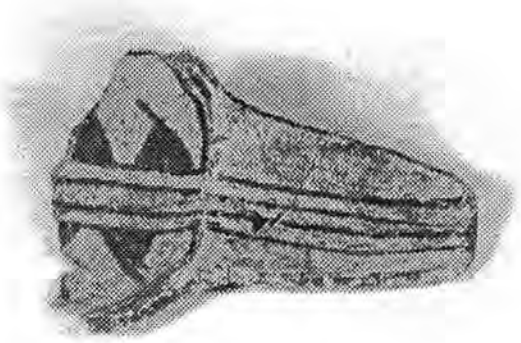

Figure 7d-Piedra Black-on-white, AHC, 5MT23, Vessel 25.

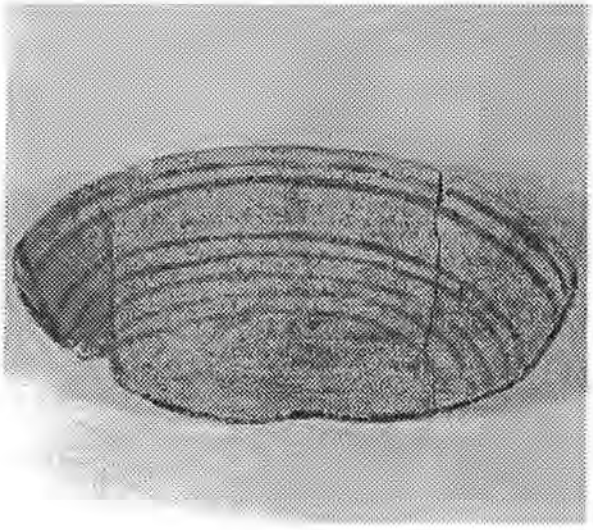

Figure 7e-Piedra Black-on-white, AHC, 5MT23, Vessel 108.

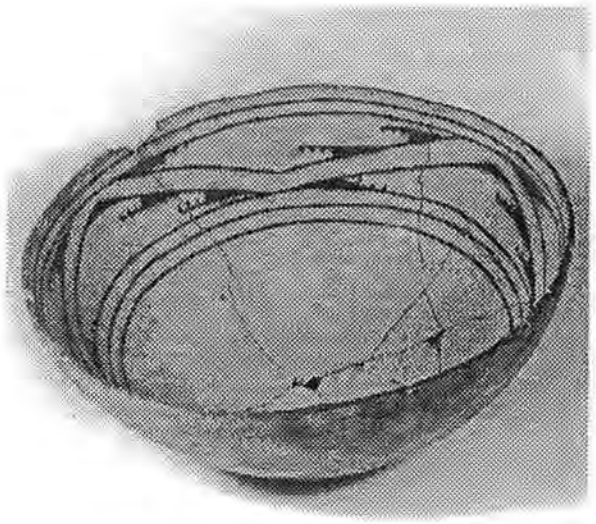

Figure 8a-White Mesa Black-on-white, ECSP, EC69024.

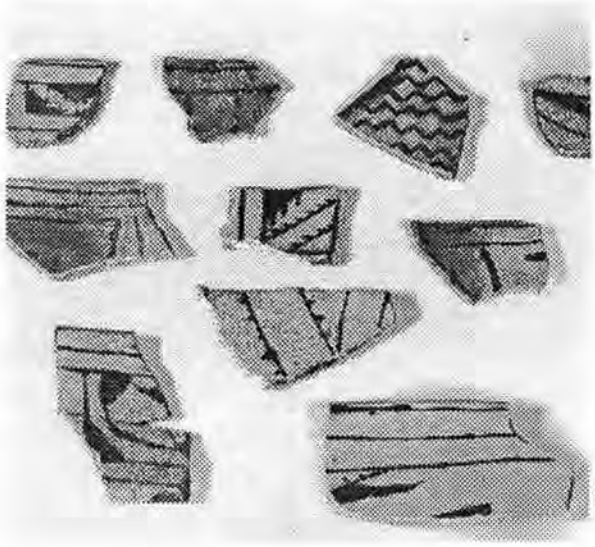

Figure 8b-White Mesa Black-on-white, ECSP, Edge of the Cedars sherd collections.

Figure 9-Cortez Black-on-white, AHC, 5MT4475, Vessel 51.

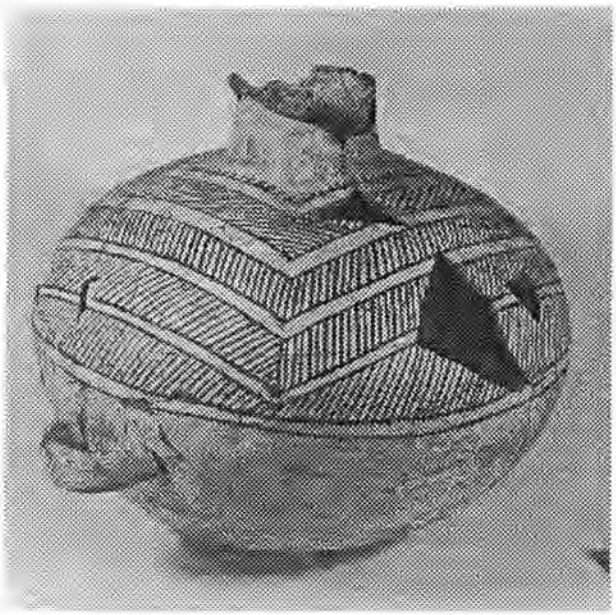

Figure 10a-Mancos Black-on-white, BAB, 5MT6970, Vessel 10.

Figure 10b-Mancos Black-on-white, AHC, 5MT2235, Vessel 11.

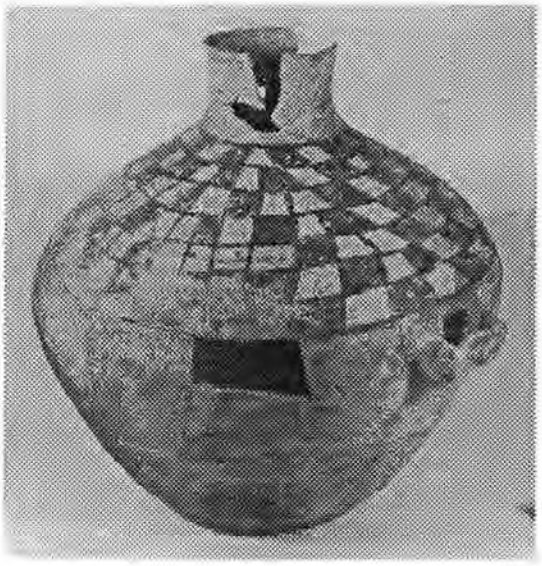

Figure 10c-Mancos Black-on-white, BAB, 5MT6970, Vessel 17.

Figure 11a-McElmo Black-on-white, AHC, 5MT5106, Vessel 9.

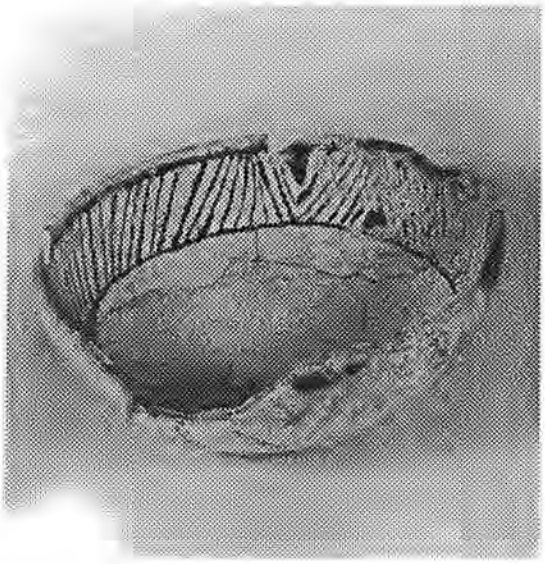

Figure 11b-McElmo Black-on-white, CCAC, 5MT765, Vessel 122.

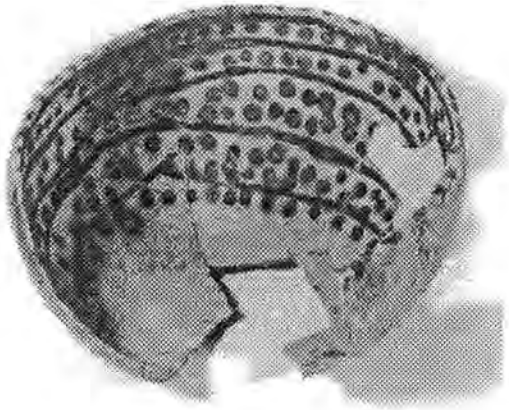

Figure 11c-McElmo Black-on-white, BAB, 5MT6970, W-25-32.

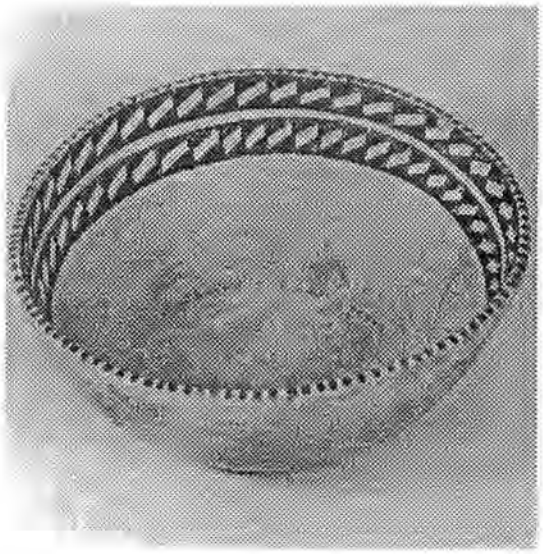

Figure 11d-McElmo Black-on-white, BAB, 5MT6970, W-17-94.

Figure 12a-Mesa Verde Black-on-white, CCAC, 5MT765, Vessel 57.

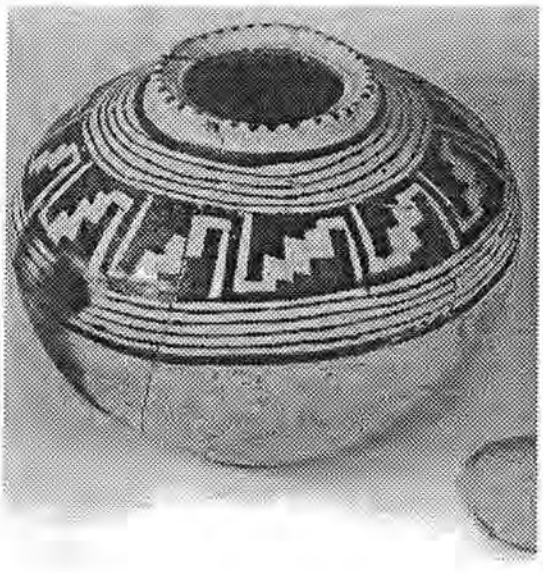

Figure 12b-Mesa Verde Black-on-white, CCAC, 5MT765, Vessel 121.

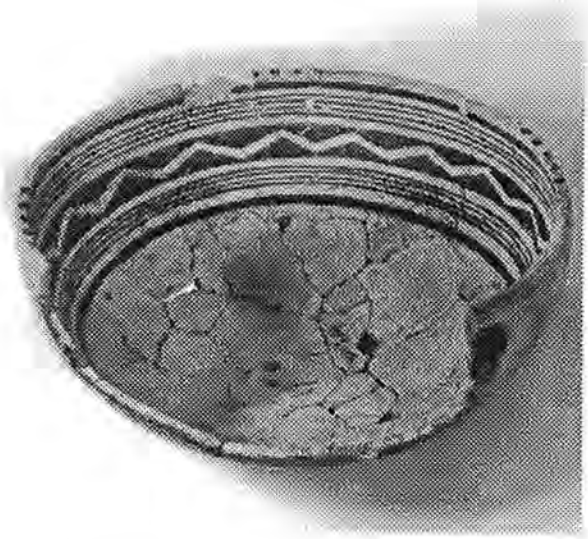

Figure 12c-Mesa Verde Black-on-white, CCAC, 5MT765, Vessel 149.

Figure 12d-Mesa Verde Black-on-white, CCAC, 5MT765, Vessel 107

Figure 13a-Abajo Red-on-orange, AHC, 5MT4644, Vessel 23.

Figure 13b-Abajo Red-on-orange, AHC, 5MT4644, Vessel 19.

Figure 13c-Abajo Red-on-orange, AHC, 5MT4644, Vessel 3.

Figure 14a-Bluff Black-on-red, AHC, 5MT2320, Vessel 43.

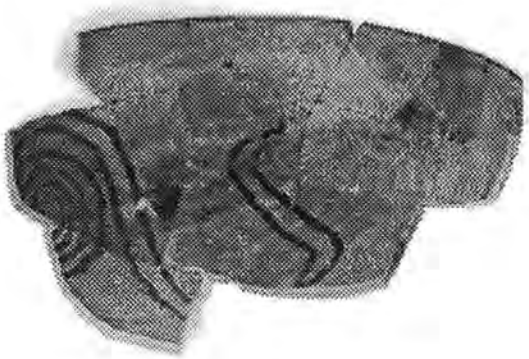

Figure 14b-Bluff Black-on-red, CCAC, 5MT3868, Vessel 32.

Figure 14c-Bluff Black-on-red, AHC, 5MT2182, Vessel 16.

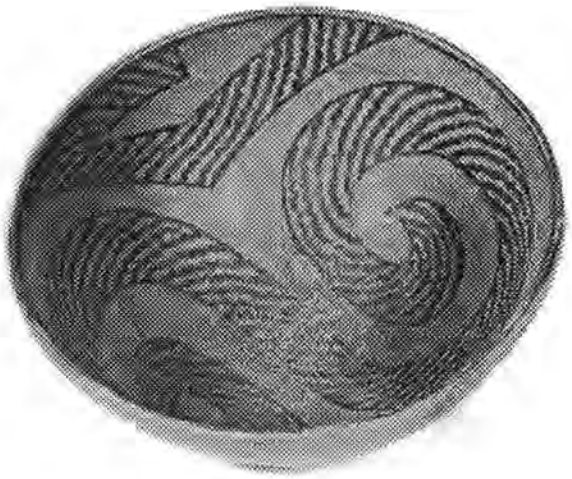

Figure 15a-Deadman's Black-on-red, BAB, 5MT6970, W-14-179.

Figure 15b-Deadman's Black-on-red, ECSP, 82.3.1.

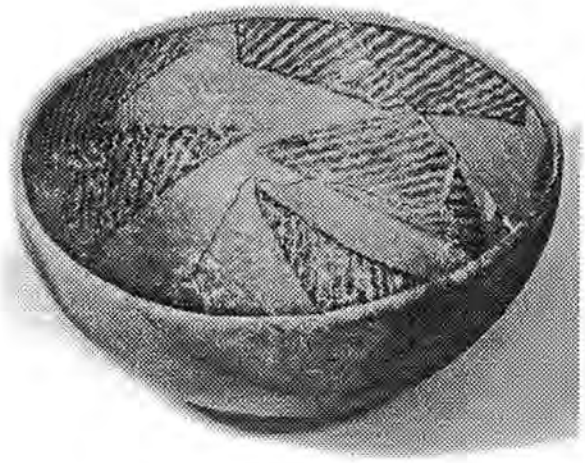

Figure 15c-Deadman's Black-on-red, ECSP, 83.3.2.

FREMONT CERAMICS IN COLORADO

by Michael D. Metcalf
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INTRODUCTION

Colorado is on the eastern periphery of the distribution of sites attributed to the archaeological culture known as the Fremont (Morse 1931). As traditionally defined, the Fremont lived in an area covering most of Utah and small adjacent portions of Nevada, Idaho, Wyoming, and Colorado. Widely accepted dates for the Fremont are from A.D. 400 - A.D. 1300, although some people would argue for an earlier, aceramic Fremont manifestation, and there are indications of later Fremont sites in some fringe areas like the White River basin in Colorado.

A concise yet fairly comprehensive overview of the Fremont is Marwitt's contribution to the Great Basin volume of the *Handbook of North American Indians* (Marwitt 1986:161-172). There are several longer overviews including those of Ambler (1966), Gunnerson (1969), Marwitt (1970) and an edited volume of papers which summarizes multiple aspects of the Fremont Culture (Madsen 1980). A comprehensive Fremont bibliography would be quite long and few references would cover Colorado sites. The best introductory reading on the Fremont is Madsen's popular work *Exploring the Fremont* (Madsen 1989).

Marwitt's trait list division of the Fremont into five regional variants is still widely recognized: the Great Salt Lake, Sevier, and Parowan in the eastern Great Basin, and the San Rafael and the Uinta on the northern Colorado Plateau (Marwitt 1970). An alternative interpretation splits Fremont into more inclusive units, the Great Basin dwelling Sevier and the Colorado Plateau dwelling Fremont, mainly on the basis of differences in subsistence. A tentative third division places the Uinta Basin in a "Plains influenced" split (Madsen and Lindsay 1977; Madsen 1980). Ultimately, the traditional Fremont variants might be discarded or changed, but at this time the five variant model is universally known, well-defined and can continue to be used. Colorado is on the eastern edge of the San Rafael and Uinta areas (Figure 1).

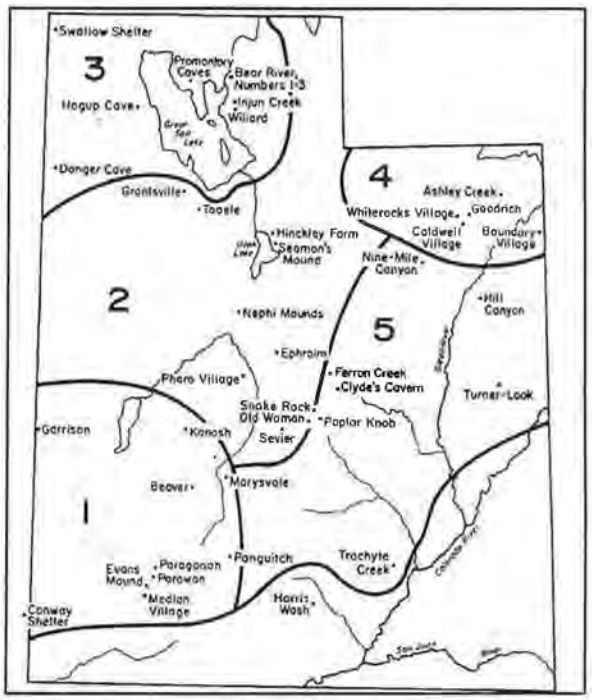

Figure 1-Adapted from R. Madsen 1977: Figure 1)

The Uinta variant is confined mainly to the Uinta Basin of northeastern Utah along the Green River and its tributaries. Sites are small hamlets or rancherias with only a few shallow, circular pit houses occupied at any given time. Storage facilities are mainly pits within dwelling sites and small granaries occur in the canyon country along the Green and Yampa rivers. Middens are generally small and thin leading to the speculation of short-term, very likely seasonal occupation. Although corn and other crops were grown there is also ample evidence of a strong hunting and gathering component of diet.

Traditional phases for the Uinta variant, Cub Creek (A.D. 650 - 800) and Whiterocks (A.D. 800 - 950). Major Cub Creek Phase sites include Mantle's Cave (Burgh and Scoggin 1948), Deluge Shelter (Leach 1970), Boundary Village (Leach 1966), the Goodrich, Felter Hill, and Flattop Butte Sites, (Shields 1967), and a number of sites in the Cub Creek locality of Dinosaur National Monument (Breternitz 1970). Whiterocks phase sites include Whiterocks Village (Shields 1967) and Caldwell Village (Ambler 1966). Tucker (1986) has proposed, on the basis of small pit structures at the Cocklebur Wash site in the Uinta Basin, an earlier, aceramic phase which he calls Cliff Creek that dates from A.D. 350 - A.D. 650. Schroedl and Hogan (1975) propose a later Book Cliffs Phase dating between A.D. 900 and 1200 based on reclassification of Turner-Look (Wormington 1955) and some of the Nine Mile Canyon sites (Gunnerson 1969).

Radiocarbon dates from recent research at the Cub Creek sites at Dinosaur National Monument show house structures there to date in the range between 1920 $\pm$ 70 B.P. and 1310 $\pm$ 50 (A.D. 30 - A.D. 640), with dates consistently older than the A.D. 650 early age estimate for the Cub Creek phase (Truesdale 1990).

Ceramics are present at most of these newly dated sites, although are absent at Burnt House Village (Breternitz 1970) where the earliest of these dates is derived. Even given the propensity for "old wood" problems in dating pit structure sites, these dates are indicative of an earlier emphasis on ceramic use than has been traditionally thought. This evidence is not inconsistent with early Fremont dates from elsewhere.

The San Rafael variant covers the remainder of the Colorado Plateau, butting against the Kayenta Anasazi area on the south. Small hamlets or rancherias are also the most common dwelling sites in this branch. Architecture is more varied including both pit houses and small masonry structures. Some of the masonry sites appear to have defensive functions. Some of the better known sites include Turner-Look (Wormington 1955), Innocents Ridge (Schroedl and Hogan 1975), Crescent Ridge, Power Pole Knoll, and Windy Ridge Village (Madsen 1975) and the Bull Creek sites (Jennings and Sammons-Lohse 1981).

FREMONT SITES IN COLORADO

In assembling this paper, no attempt was made to provide a comprehensive synthesis of Fremont sites within Colorado. Brief syntheses appear in the west-central and northwest Colorado prehistoric context documents (Reed 1984; Grady 1984), and the topic is also pursued by Creasman (1981) and La Point (1987).

A computer search of the records at the Office of Archaeology and Historic Preservation at the Colorado Historical Society done for the 1990 ceramic workshop by Kevin Black and Mary Sullivan lists 382 sites coded as Fremont. Fully 55% of these have no definitively Fremont artifacts, architecture, or ceramics, and presumably are considered as Fremont because of the presence of Rose Spring, or similar projectile points. Projectile points alone, however, are rarely diagnostic of Fremont. Only 24 ceramic sites are in this sample (6%). Other features contributing to the Fremont coding include 50 (13%) with granaries or storage bins/cists, 80 (21%) with rock art, 6 (<2%) with pit houses, and 22 (<6%) with stone alignments, rock walls or masonry rooms. Two sites, one with pottery, have wickiups recorded.

TABLE 1

DISTRIBUTION OF FREMONT SITES BY COUNTY

DELTA	1
GARFIELD	25
HINSDALE	1
MESA	82
MOFFAT	93
RIO BLANCO	173
ROUTT	2
SAN MIGUEL	5
TOTAL	382

The state computer files are not complete, and several important Fremont sites recorded earlier in the century are no doubt missing from this sample, but it is clear that sites bearing Fremont ceramics in Colorado are rare, and that Fremont sites are distributed mainly in the three counties that border Utah in northwestern Colorado. Both Reed (1984) and La Point (1987) question the extent of true Fremont occupation of Colorado and suggest the possibility that local Archaic groups adopted some aspects of a Formative lifeway.

FREMONT CERAMICS

The definitive work on typing and describing Fremont ceramics is by Rex Madsen (1977) entitled *Prehistoric Ceramics of the Fremont*. This work has been supplemented to a degree by descriptions made by Pat Dean (n.d.; Dean 1992) of sherds in the comparative collection of the Utah Museum of Natural History. Dave Madsen (1986) presents a concise summary in the *Handbook of North American Indians*. Ten ceramic types are defined. Of these, eight are plain wares and two are painted. Surface manipulation on plain gray wares is the most common form of decoration on Fremont ceramics. This surface manipulation has a wide variety.

R. Madsen (1977) presents a history of the definition of Fremont ceramics and recognizes three ceramic traditions based on color and method of manufacture. Utility Gray Ware (formerly Desert Gray Ware [Rudy 1953]) is the dominant ceramic category in the Fremont Tradition. Types within this category are coil constructed and tempered with a variety of materials of local origin, the most common of which are crushed basalt, calcite, or sand. A gray to

dark gray color was produced by firing in a reducing atmosphere. It is unslipped, but fugitive red washes are fairly common. Finishing was by scraping, smoothing, and sometimes a light polish. Both obliterated or unobliterated coils occur in the southern area and applique, incising, punching, and modeling are common in the northern areas (Madsen 1977:v-vi). Seven types are represented, including Snake Valley Gray, Snake Valley Corrugated, Snake Valley Black-on-Gray, Sevier Gray, Great Salt Lake Gray, Emery Gray and Uinta Gray.

The second tradition is represented only by Promontory Gray, a type thought to result from introduction from, or contact with, the Plains. It is a paddle-and-anvil constructed gray ware with poorly finished surfaces, varied temper including angular pieces of calcite, shell, quartz, feldspars, hornblends, and biotite (Madsen 1977; Dean n.d.).

The final Fremont ceramic tradition proposed by Madsen includes a single type, Ivie Creek Black-on-White. He describes it as coil-and-scraped manufacture, contrasting with gray smudged varieties by having a white color resulting from a less smokey firing atmosphere and interiors are highly polished or slipped. It has crushed basalt temper and vessel forms are almost exclusively bowls. Fugitive red is common, and paint is carbon-based (Madsen 1977:vi). Dean (n.d.) suggests this type can be considered as a variant of the Sevier and Emery varieties, a position that is supported by recent excavations in central Utah (Morris et al. 1993). The main difference between the two varieties is in temper, with gray crushed basalt temper being indicative of the Emery variety and black or dark gray crushed basalt temper being indicative of the Sevier variety.

Pottery types are a part of the definition of the Fremont variants. The plain wares associated with the Colorado variants include Uinta Gray for the Uinta variant, and Emery Gray for the San Rafael variant. These two pottery types, along with the Emery variety of Ivie Creek Black-on-white, are the main previously defined Fremont types found in Colorado. Great Salt Lake Gray is the "garbage" category of the Fremont Gray Wares. It contrasts with Promontory Gray in method of manufacture, but has a similar degree of variation in temper. It also has a wide range of variation in construction quality and in the control of firing. It has a northern range of distribution in the Fremont area, northern Utah and southern Idaho.

Type descriptions for basic Fremont types may be found in *Prehistoric Ceramics of the Fremont* (R. Madsen 1977) and are not reproduced here. Descriptions for Great Salt Lake Gray, Promontory Gray, Uinta Gray, Emery Gray, and Ivie Creek Black-on-white are relevant to western Colorado. While it is unlikely that Great Salt Lake Gray or Promontory Gray will be found in Colorado, there are hints that other, as yet undefined, Fremont or Fremont-influenced wares occur. In adjacent portions of southwest Wyoming researchers at Western Wyoming College have been working on definition of a ceramic tradition which predates "Intermountain Ware" and has numerous similarities to the basic Fremont Gray Ware. (Metcalf 1988; Creasman *et al.* 1990). This ware is termed "Black Butte Gray Ware".

Black Buttes Gray tends to be gray in

color, ranging from gray to very dark gray. Tempering material includes both quartz sand and crushed rock, the latter being dominant. Crushed rock temper consists of granite, quartzite, and calcite or dolomite. The size of the temper, although variable from one vessel to another, is generally uniform within the vessel, especially those with crushed temper. Reconstructible vessels are few. Indicated forms are shouldered to globular with rounded bottoms, and elongated shoulders with a pointed bottom. Vessel walls are generally uniform in thickness with thicknesses ranging from 5 mm to 8 mm. Common surface finish is smooth to slightly rough. Sherds from the Harrower site are fingernail impressed, while Wardell specimens are scraped. Only on the Wardell assemblage is there any obvious indication of paddle and anvil finishing (Creasman *et al.* 1990:6).

Within northwest Colorado and adjacent portions of Utah, the presence of non-Shoshonean ceramics with Fremont similarities has been noted as well. A ceramic assemblage from 42DA485 in Brown's Park is problematic in this regard, having sherds from three vessels that are not readily classified (McKibbin 1992: 258). Similarly, as yet untyped sherds from 1992 excavations in several sites near Maybell in northwestern Colorado yielded sherds not readily classified as Shoshonean or classic Fremont. Creasman found pottery at Texas Creek which, except for having dolomite temper, could be considered classic Fremont in type. Although it might be tempting to classify these diverse sherds as Great Salt Lake Gray or to force them into another type, such as Promontory Gray, doing so would obscure a pattern important within the Fremont area. That is, "Fremont Gray Wares" should be identified following the technology description of R. Madsen (1977), but considering the presence of local variation in paste and temper. Ceramic assemblages within western Colorado should be critically examined against type descriptions and thin section analysis should be routinely included as an analytical tool. Also, assemblages need to be physically dated if possible dated. There is quite likely a northwestern Colorado version of an early Late Prehistoric, Fremont-like ceramic tradition, but it will take more intensive analysis and better chronological control to unequivocally establish this.

SUMMARY

Fremont ceramics appear to form a loosely definable tradition, as was suggested years ago. Some types, especially within the Fremont "core area", are well defined, and the types are internally consistent. On the northern and eastern peripheries, the basic ceramic technology described by R. Madsen (1977) appears to hold true, but there is variation in paste and temper which appears to reflect local manufacture, either by Fremont people or from Fremont influence. Sherds traditionally classified as Great Salt Lake Gray in various parts of the Fremont area may in fact, be local variants of the general Fremont Gray Ware. Future research on ceramic sites in the Fremont area of Colorado needs to focus on this problem.

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A BRIEF OVERVIEW OF THE NAVAJO PRESENCE IN THE UPPER SAN JUAN DRAINAGE AND IN SOUTHWESTERN COLORADO AND THEIR CERAMICS

David V. Hill

INTRODUCTION

This brief overview is designed to provide a synthesis of Navajo archaeology and ceramics for archaeologists working in Colorado and northern New Mexico. More detailed overviews of Navajo archaeology are provided in Brugge (1963), Hester (1962), and Riley (1954). Due to a lack of well reported excavations of Navajo sites from Colorado, much of the data reported here are derived from work conducted along the San Juan River and its tributaries in New Mexico. Thus, some of the Navajo cultural patterns and ceramic compositional variations identified in New Mexico may not be completely valid for all areas of southwestern Colorado. Accordingly, this document and the descriptions of the ceramic types should be used for identification of suspected Navajo materials rather than for explicitly defining Navajo occupations.

ARCHAEOLOGICAL AND HISTORICAL OVERVIEW OF NAVAJO ARCHAEOLOGY IN THE UPPER SAN JUAN DRAINAGE AND SOUTHWESTERN COLORADO

The history of Athapaskans in the American Southwest is a subject of some debate. Timing, size of populations and migration route for Athapaskans in the Western United States are controversial issues. Evidence for Athapaskan immigration into the Southwest through the Great Plains with a subsequent dispersion to the west has been offered by various authorities (Gunnerson 1956; Schaafsma 1981; Turner 1980; Wilcox 1981). An alternative route across the Basin and Plateau has also been suggested (Brugge 1981; Harrington 1940; Huscher and Huscher 1942, 1943). Neither position is currently supported by well-dated archaeological contexts within possible migration routes that would be sufficient to select one over the other. We also currently lack an extensive series of Athapaskan-associated skeletal material that could be used for discrete trait analysis or DNA sequencing.

Unfortunately, the present lack of archaeological evidence, as well as the different historical reconstructions of Athapaskan entrance into the Southwest, makes recognition of Navajo materials in Colorado difficult at best. Evidence of Navajo occupation in Colorado has been described by Richard Van Valkenburgh as extending one hundred miles north of the New Mexico state line (Harrington 1940: 529). Exactly what the evidence for Navajo occupation is, as suggested by Van Valkenburgh, is not presented. Some of his inferred evidence likely included early work of the Huschers in western Colorado and the San Luis Valley (Huscher and Huscher 1943). However, the Huscher excavations lack independently derived dates and could reflect other Proto-historic, such as Ute, or even Formative occupations as well as

Navajo.

The occasional recovery of Proto-historic Puebloan ceramics in southern and western Colorado is not thought to represent the only, exclusive evidence of Navajo occupation. Jeddito Yellow Wares have been found in both Navajo and Ute contexts in southwestern Colorado at locations within Van Valkenburgh's one hundred mile limit (Errickson and Wilson 1988; Karlson and Biggs 1985; Wilson 1991). A single vessel of Gobernador Polychrome has been recovered from 5MT10342, approximately one mile south of the Montezuma/Dolores county line, northwest of Rico (McClure 1988). That vessel could also represent evidence of Ute/Navajo interaction known to have occurred during the period when Gobernador Polychrome was manufactured (Hill 1940). Other Navajo materials have recently been reported from near Gunnison (Mark Stiger personal communication 1993).

The study of Navajo archaeology had its origins at the beginning of this century with fieldwork conducted at a number of spectacular fortified Pueblito sites of Gobernador Canyon and other areas of the eastern and southern drainages of the San Juan River system (Carlson 1965, Kidder 1920). It is that area of New Mexico that has, until recently, seen the majority of Navajo archaeological research.

Excavations conducted in advance of the construction of the Navajo Reservoir constituted the first systematic study of Navajo remains in Colorado (Adams 1976; Dittert 1958; Dittert, Hester and Eddy 1961). Based on survey data, Dittert (1958) assigned Navajo materials to two phases. The Dinetah Phase, thought to represent the earliest Navajo occupation of the reservoir was defined as lacking common Puebloan traits such as decorated ceramics and the construction of masonry Pueblitos. Using this sort of negative-trait approach, the Dinetah Phase was recognized by what was proposed to be a core of attributes thought to represent Navajo culture at its initial entry into the Southwest. That early culture "core" was seen as including forked-stick hogans, Dinetah Gray pottery, side-notched and corner-notched projectile points, side-notched axes, full-grooved mauls and a diverse chipped stone assemblage based on local materials (Dittert et al. 1961: 246). The cultivation of maize, bottle gourds, and beans were added later, based on excavation data (Hester 1962:63). The Dinetah Phase was thought to date from about A.D. 1500 until the end of the Pueblo Revolt sometime during the late seventeenth century when acculturative influences from Puebloan refugees introduced painted pottery and masonry architecture to the Navajo. The Gobernador Phase persisted until 1775 when the Navajo were thought to shift to a more pastoral economy (Hester 1962:65).

The use of a subtractive approach in identifying early Navajo occupations within the Navajo Reservoir made the Dinetah Phase suspect, given the range of variation in the amount of material recovered from Navajo sites within the project area. In a synthesis of the Navajo Reservoir project, Eddy (1966: 507-508) utilized the term *indeterminate Navajo* to describe Navajo sites that could not be assigned to the Gobernador Phase as a means of addressing the lack of chronological assignment. The most positive evidence for a pre-Gobernador Phase Navajo occupation of the Reservoir area was the presence of corn pollen in alluvial deposits

dating between A.D. 1300 and 1700. At the time of the Navajo Reservoir project, however, a more thorough, follow-up test of the Dinetah Phase concept was suggested (Eddy 1966:507).

Recently, excavations carried out for mitigation of adverse effects for the La Plata Coal Lease, located near the Colorado/New Mexico border, have provided extensive evidence for the Dinetah Phase in the form of forked-stick hogans and artifacts in the lease area by Navajos between A.D. 1450 and 1500 (Brown 1991; Reed et. al. 1988; Reed and Horn 1988, 1990). Other excavations of sites further to the south and east in New Mexico have produced what would be considered Dinetah Phase dates as well (Hogan 1989; Marshall 1985; Linda Wheelbarger personal communication 1990).

Little is currently known regarding the economy of the Navajo during the Dinetah Phase. While hunting and gathering probably comprised major components of Dinetah Phase diet, corn pollen, corn macrofossils, and beans have been recovered from some Dinetah Phase features and structures on the La Plata Mine (Brown and Hancock 1992; Reed et. al 1988; Reed and Horn 1988). Whether the corn and beans were cultivated locally or derived from trade with Puebloan peoples is unknown.

Much more is known about subsistence practices during the Gobernador Phase. This is due not only to the fact that more Gobernador Phase sites have been excavated, but also because contemporary documents exist that supplement the archaeological record (Hill 1940). Remains of maize, beans, pumpkins and melons have been reported from excavated contexts or reported by Spanish chroniclers, although wild plant foods also contributed to the diet as well. Maize has also been observed in rock art associated with Gobernador Phase occupations (Schaafsma 1971). The Gobernador Phase Navajo are reported to have had sheep, goats, and horses by the early eighteenth century (Hill 1940). Recovery of sheep and horse bone from Gobernador Phase middens and Spanish riding tack from sites in the Gobernador drainage substantiates the historic records (Carlson 1965). Evidence for communal hunting of antelope has been reported from a site located south of Farmington, New Mexico (Reynolds et al. 1984).

Evidence of regional interaction during the Dinetah Phase is reflected in the presence of obsidian from New Mexican sources and the Jeddito Yellow Ware from the Hopi Mesas. During the Gobernador Phase, both before and after the Pueblo Revolt, an even greater variety of trade ceramics are found. These include Rio Grande Glazeware, Biscuitware, Jemez Black-on-white, Tewa Polychromes, Eastern Keres ceramics, Zuñi ceramics, and Hopi ceramics as well as obsidian from the Jemez caldera (Reed and Reed 1992).

Historic sources suggest that the Navajo were driven from southwestern Colorado by Utes around 1756 (Schroeder 1965), effectively terminating Navajo occupation of southwestern Colorado until the late 20th century (Hayes 1964). Occasional Navajo Gray ceramics and a pictograph have been reported from Colorado that could represent items of trade or occasional trips by individuals (Mark Stiger, personal communication 1993).

Little can be about Navajo settlement patterns in Colorado. Only six Navajo sites are recorded in the San Juan National Forest site file database. Those sites represent small open camps and a modern sweat lodge. An additional seven Navajo sites have been reported from the Southern Ute Reservation (Adams 1976; Karlson and Biggs 1985). The limited number of reported Navajo sites in Colorado is surprising given extensive evidence for both Dinetah and Gobernador Phase occupations that have been reported just south of the state line in New Mexico (Brown 1991; Reed et al. 1988). As more work is conducted in southwestern Colorado, undoubtedly further evidence of Navajo occupation will emerge.

NAVAJO CERAMIC TYPES IN THE UPPER SAN JUAN AND SOUTHWESTERN COLORADO

Dinetah Gray is the earliest dated Navajo ceramic type. Based on radiocarbon, obsidian hydration, and thermoluminescence dates from excavations at the La Plata Mine, and from other locations within the upper San Juan drainage, the type is thought to have been manufactured from around A.D. 1450 to 1500 (Brown 1990; Reed et al. 1988; Reed and Horn 1988; Linda Wheelbarger, personal communication 1990).

One variation in surface treatment within Dinetah Gray is Gobernador Indented (Dittert 1959). The surface of some Gobernador Indented sherds resembles contemporary obliterated corrugated utility ceramics of the Rio Grande Pueblos and Jemez. Like obliterated corrugated ceramics of the pueblos, indentation reflects a construction technique for joining coils rather than serving as decoration. Indeed, some sherds or containers of Gobernador Indented could represent less well-finished vessels of Dinetah Gray.

A particular surface treatment, that has been included within Gobernador Indented that is quite similar in appearance to obliterated corrugation is fingernail incision. Use of the fingernail impression technique can create a fish-scale appearance or one similar to that of Anasazi grayware spiral corrugation as well as simple columns of impressions. Columns of fingernail impressions often resemble the surfaces of obliterated corrugated vessels. Fingernail impressed designs are also present in Uncompahgre Brownware (Buckles 1971).

During the Gobernador Phase, Dinetah Gray vessels continued to be produced and were elaborated in a number of ways, including columns of fingernail impressions and simple incised lines on the upper body of jars, and lip incising and scalloping. Gobernador Indented becomes more common over time during the Gobernador Phase. A period of plastic experimentation during the Gobernador Phase probably included the first use of appliqué so common on Navajo Gray, a more recent pottery type (Brugge 1963). The scraping of vessels with a corn cob in order to smooth the surface, while possibly present during the Dinetah Phase, became more common during the Gobernador Phase. Unlike the more spherical utility ware jars of the Pueblos, Dinetah Gray jars have a more conoidal shape.

Three different types of temper have been recognized within Dinetah Gray from the upper San Juan drainage. Dinetah Gray

ceramics from the La Plata and Animas drainages are tempered with detrital material or sands derived from intrusive igneous sources. (Hancock 1988; Hill 1988, 1991; Karlson and Biggs 1985). In more easterly drainages of the San Juan, including the Largo and Gobernador, Dinetah Gray is tempered with a sandstone that grades into a siltstone or intrusive, igneous detrital material (Hill 1987, n.d.a, n.d.b; Wilson and Warren 1974). Dinetah Gray ceramics containing granitic rock have been reported from LA 79280, located at the head of John Brown Canyon near the Colorado/New Mexico border (Hill n.d.c.). Approximate contemporaneity among these temper varieties is indicated by sherds containing sandstone/siltstone occurring with detrital intrusive igneous rock in some ceramic assemblages from the La Plata Mine sites and detrital intrusive igneous rock found along with crushed or weathered granite in collections from LA 79280 (Hill n.d.c., Wilson 1991).

The major distinguishing characteristic of the Gobernador Phase ceramic assemblages is Gobernador Polychrome. The type was first named by Kidder based on his work in Gobernador Canyon (Kidder and Shepard 1936: 372-373). Gobernador Polychrome is thought to reflect acculturation of Navajo and Puebloans as the result of population dislocation during the Pueblo Revolt of 1680 and the subsequent incorporation of Puebloan peoples into Navajo groups (Brugge 1963; Kidder and Shepard 1936). Recent excavations conducted at several Gobernador Phase sites indicate that the type may have been manufactured as early as the mid-seventeenth century, prior to the Pueblo Revolt of 1680 (Brown et. al 1992; Reed and Reed 1992; Reynolds et. al 1984). Puebloan influences on the type are apparent. Gobernador Polychrome utilizes a number of contemporary Puebloan decorative techniques such as the occasional use of white or red slip underlying a design and framing lines around larger design elements. Some vessel forms are similar to contemporary Puebloan ceramics. Vessels are fired in a fairly well controlled oxidizing atmosphere. Gobernador Polychrome is either fired at a temperature greater than common to other southwestern pottery types or is made utilizing a clay with a low vitrification temperature, as some vessels show evidence of bloating and sintering which occasionally caused the ceramics to warp.

Gobernador Polychrome was produced exclusively in the eastern drainages of the San Juan, based on the presence of sandstone/siltstone temper matching that of the local Dinetah Gray (Hill 1992; Karlson and Biggs 1985; Wilson and Warren 1974). Further excavations in the Largo and Gobernador drainages combined with compositional analysis will probably serve to further restrict the manufacturing area of Gobernador Polychrome.

An later outgrowth of Gobernador Polychrome is Navajo Painted. This is a later variety which is considerably more variable in terms of paste composition and decorative treatment than its predecessor (Brugge 1963). While Blessingway specifically excludes painted pottery from use in modern Navajo religious ceremonies, a few painted pieces are known to have been produced and used in such ceremonies well into the twentieth century.

Navajo Gray is a direct outgrowth of

the plastic experimentation exhibited in Dinetah Gray vessels from the Gobernador Phase. The type represents modern Navajo pottery with its characteristic appliqué clay fillets usually located near the rim. Navajo Gray is thought to have been produced from sometime around 1750-1800 until the present day. Compositional variation in Navajo Gray has been used to identify several regional varieties (Brugge 1963, Baugh and Eddy 1987). Occasional sherds and vessels of Navajo Gray have been reported from southwestern Colorado (Hammack 1990; Mark Stiger personal communication 1993).

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NAVAJO CERAMIC TYPE DESCRIPTIONS

DINETAH GRAY

A. Technology

Construction: Coiled and Scraped

Firing Method: Uncontrolled firing atmosphere; incompletely oxidizing.

Core Color: Black, dark brown, dark gray.

Paste: Clays appear to be derived from alluvial sources.

Temper:

Material: Detrital material; sand, silty sandstone, intrusive igneous rock, granite. The composition of the temper varies from region to region.

Size: .01 mm. to 2.5 mm. Temper sizes are heterogeneous.

Abundance: 25% to 40% by volume of the paste.

Fracture: Crumbling, brittle, relatively easy to break.

Vessel Wall Thickness: 4.0 - 7.0 mm.

Surface Color: Dark gray, brown, reddish brown. Color can be variable across a single vessel due to the uncontrolled firing atmosphere.

Surface Finish: Surface finish ranges from poorly smoothed, with occasional floating of the surface clays, to well marked with stria from smoothing the surface of the vessel with a bunch of grass, a stick or corn cob. Some vessels show evidence of the systematic pinching together of the coils giving the appearance of some Puebloan utility ware types (Obliterated Corrugated). A single vessel with unobliterated neck coils has been reported. Sherds showing these pinching marks have been classified as Gobernador Indented (Dittert 1958).

Decoration: Dinetah Phase A.D. 1450 to 1680: Smooth surface, brushing with grasses, indentation, some rare fingernail/fingertip impression, corn-cob smoothing. These latter two forms of surface treatment probably occur late in the phase.

Gobernador Phase: A.D. 1680 to 1800; Smooth surface, Corn-cob scraping, brushing with grasses, fingernail/finger tip impression, lip incision and scalloping, rare incised lines pendent from the rim on jars. Increased plastic manipulation of vessel surfaces is a hallmark of Dinetah Gray ceramics from the Gobernador Phase.

Vessel Shape: Jars with rounded or conoidal bases, bowls, occasional miniature vessels.

Rim Shape: Jars;I A3, I B3, I B4, II A4, II B4, III A10, III B3, III B5, V B4.

Bowls; I A3, I A4, I A5, II A2.

Estimated Period of Production: ca. A.D. 1450 to 1800

Comparisons: Anasazi Gray Ware may be difficult to distinguish from Dinetah Gray. Dinetah Gray is much softer, has more of a brownish cast to the paste and a darker core. Most Anasazi Gray Ware temper is derived by crushing rocks to size for use as temper. Dinetah Gray utilizes sand and/or in composition and size.

Varieties: Variations in plastic deformation such as indentation or incising and differences in the type of temper have been used to identify varieties of Dinetah Gray. It is suggested that differences in surface treatment or composition be treated as sorting criteria for analysis rather than as different types or varieties in order to facilitate communication between workers.

References for Illustrated Examples: Brugge 1963:10; 1987:4, Carlson 1965:66-67; Dittert, Hester and Eddy 1961:153; Hartman and Musial 1987:29.

Associated Ceramics:

Dinetah Phase: Jeddito Yellow Ware, Jemez Black-on-white.

Gobernador Phase: Most contemporary Puebloan decorated ceramic types. Types reported include: Jemez Black-on-white, Jeddito Yellow Wares and Biscuit B, Acoma-Zuñi ceramics, Rio Grande Glaze wares (C - D through F) as well as later Post-Reconquest Tewa and Keres matte-paint wares. Occasional sherds of Olive Jar, Mexican Majolica, and Chinese porcelain have also been reported.

NAVAJO GRAY

Construction: Coiled and Scraped

Firing Method: Uncontrolled firing atmosphere; incompletely oxidizing.

Core Color: Black, dark brown, dark gray

Paste: Clays appear to be derived from alluvial sources

Temper: Material: Sand, crushed sherds. Sherd temper can contrast with the paste due to the use of prehistoric pottery as temper.

Abundance: 25% to 40% of the paste

Fracture: Crumbling, brittle, relatively easy to break

Vessel Wall Thickness: 7.0 - 3.0 mm.

Surface Color: Dark brown, black, dark gray. Color can be variable across a single vessel due to the uncontrolled firing atmosphere.

Surface Finish: Interior usually smoothed by wiping with corn husks or juniper bark or rarely scraped. Exterior smoothed using a corn cob or bark covered stick. Some vessels appear to have been smoothed Some specimens are coated with piñon resin while the vessel is still warm from firing producing a varnished look.

Decoration: One to three fillets of appliquéd or modeled clay around the necks of jars below the rim. These fillets are usually modified at regular intervals with fingernail, fingertip, or stick impressions. Rims are sometimes notched.

Vessel Shapes: Jars with rounded or conoidal bases, bowls, miniature vessels, rare pipes.

Rim Shape: Jars; I A3, IA4, II B4, V B4

Estimated Period of Production: 1750-1800 to present

Comparison: Body sherds of Navajo Gray are difficult to distinguish from Dinetah Gray without the characteristic appliquéd clay fillets.

Varieties: Variation in paste composition has been recognized from different areas in New Mexico and Arizona. As with Dinetah Gray, observed compositional and decorative differences should be treated as sorting criteria for analysis.

References For Illustrated Examples: Brugge 1963:10, Hammack 1990, Hill 1937.

Associated Ceramics: Modern Hopi and Tewa wares, Euro-American ceramics.

GOBERNADOR POLYCHROME

A. Technology

Construction: Coil and Scrape.

Firing Method: Oxidizing, occasional bloated sherds show that vessels were occasionally fired to a high enough temperature to cause incipient vitrification of the clay body.

Core Color: Red or orange to buff near the surface, gray to dark gray or occasionally buff in the central part of the sherd.

Paste: Dense, hard.

Temper: Material: Detrital material, silty sandstone and occasional igneousrock fragments. The paste of Gobernador Polychrome includes clay pellets that range in color from gray to yellowish to white. These pellets are thought to be a natural inclusion in the clay.

Size: .01 to 2.5 mm. Temper particle sizes are heterogeneous.

Abundance: Approximately 25% by volume.

Fracture: Sharp, even.

Vessel Wall Thickness: 10.0 mm. to 2.5 mm.

Surface Color: Orange to orange buff.

Surface Finish: Uneven polishing on bowl interiors and jar exteriors, otherwise vessel surfaces are smoothed by hand finishing.

Pigments: Red and white of mineral origin, black of an organic/ mineral mix.

Decoration: Usually solid red geometric elements framed in black, also independent black lines and solid elements, some naturalistic elements i.e., feathers and corn plants. Rare white slipped background underlying black geometric or naturalistic elements.

Vessel Shape: Bowls, some carinated or shouldered, some jars.

Rim Shape: I A3, I A4, I B4, III A3, III A4, III B3, III B4, V B4.

Estimated Period of Production: ca. A.D. 1650 to ca. 1800

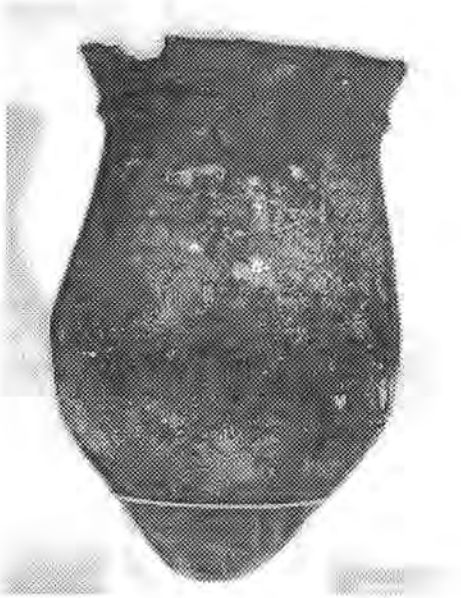
Comparisons: Design layout and the use of red with black framing lines on Gobernador Polychrome is similar to Tusayan Polychrome, Variety A; however, Gobernador Polychrome has a much harder paste and is tempered with crushed sandy siltstone rather than crushed sherds.

Remarks: Two other varieties of decorated Navajo pottery have been reported. Frances Polychrome (Eddy 1966:406-407) is thought to represent Navajo copies of later Gobernador Polychrome vessels due to the lower quality of design and manufacturing technology. The approach taken here is that Frances Polychrome most likely represents variability within Gobernador Polychrome. Navajo Painted is a variety of decorated ceramic using both lifeforms and geometric designs often in imitation of Puebloan pottery. This latter variety is highly variable in terms of composition and decorative treatment using either geometric designs or life forms. Common to the early twentieth century.

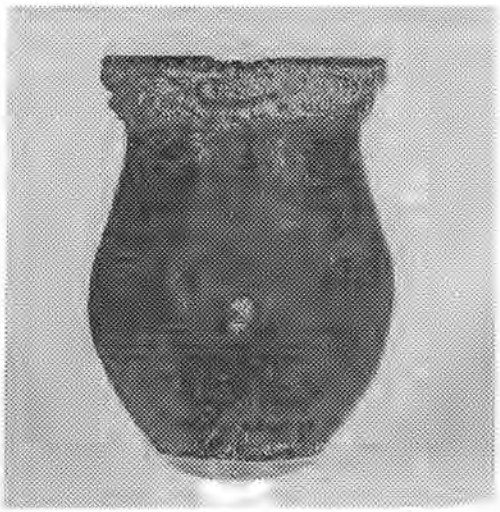
References for Illustrated Examples: Brugge 1963: 11; 1987: 2,3,5; Carlson 1965: 58-63; Dittert, Hester and Eddy 1961: 153; Hartman and Musial 1987: 31; Kidder and Shepard 1936: 373.

Associated Ceramics: Indigenous: Dinetah Gray.

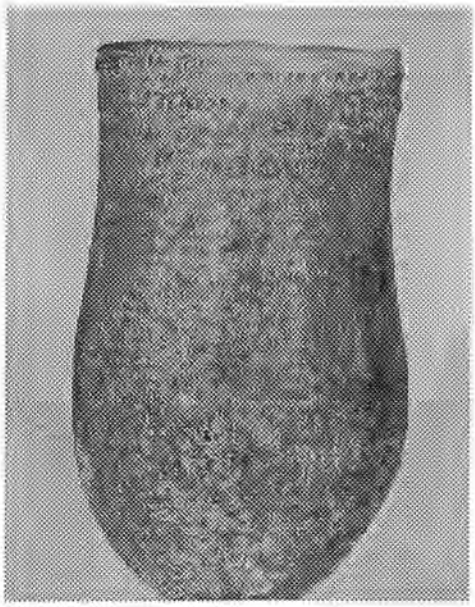
Imported: Most contemporary Puebloan decorated Ceramic types. Types reported include: Jemez Black-on-white, Jeddito Yellow Wares and Biscuit B, Acoma-Zuñi ceramics, Rio Grande Wares (C - D through F) as well as later Post-Reconquest Tewa and Keres matte-paint wares. Occasional sherds of Olive Jar, Mexican Majolica, and Chinese porcelain have also been reported.



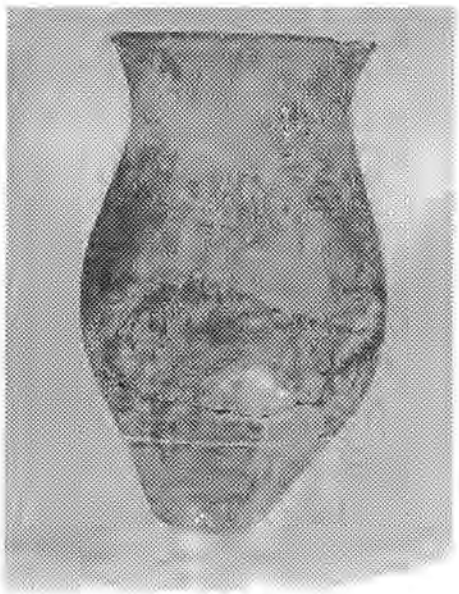
Type: Navajo Gray
Provenience: "Dry Side, La Plata Mountains"
Catalog No. 54.18.1
Vessel Courtesy of The Maxwell Museum of Anthropology
University of New Mexico, Albuquerque



Type: Navajo Gray
Provenience: Northwest New Mexico
Catalog No. 46.30.16
Vessel Courtesy of the Maxwell Museum of Anthropology
University of New Mexico, Albuquerque

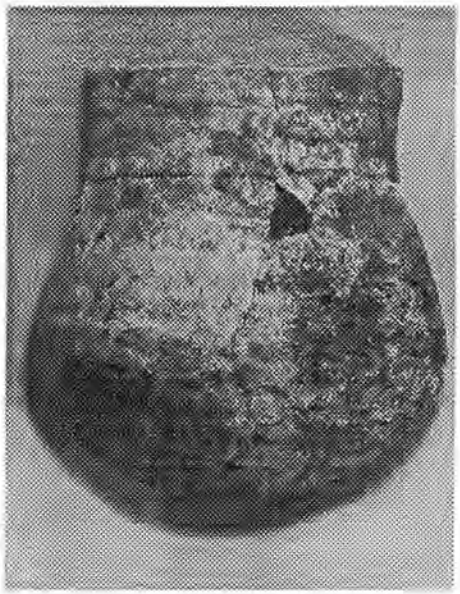


Type: Navajo Gray
Provenience: Northwest New Mexico
Catalog No. 49.2.2
Vessel Courtesy of The Maxwell Museum of Anthropology
University of New Mexico, Albuquerque

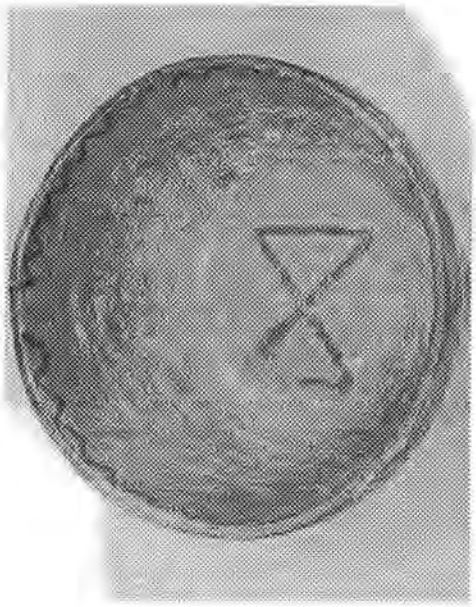


Type: Dinetah Gray
Provenience: Northwest New Mexico
Catalog No. 63.49.1
Vessel Courtesy of the Maxwell Museum of Anthropology
University of New Mexico, Albuquerque

Type: Dinetah Gray
Provenience: Chacra Mesa, New Mexico
Catalog No. 65.14.1
Vessel Courtesy of the Maxwell Museum of Anthropology
University of New Mexico, Albuquerque.



Type: Dinetah Gray
Provenience: LA 61852, Structure 1
Vessel previously figured in Brown 1991, p. 474 Figure 6.6
Photo Courtesy Mariah Associates, Inc. Albuquerque



Type: Navajo Painted
Provenience: Unknown
Catalog No. 80.36.3
Vessel Courtesy of the Maxwell Museum of Anthropology
University of New Mexico, Albuquerque

Type: Gobernador Polychrome
Provenience: Unknown
Catalog No. 383
Vessel Courtesy of the Navajo Tribal Museum, Window Rock

UTE CERAMICS

by Alan D. Reed
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INTRODUCTION

Brownware pottery found in western Colorado is generally regarded as Ute. The Ute were historically the primary residents of the mountains and plateaus of western Colorado and most ethnographic accounts of Utes suggest that some bands manufactured pottery. Those ethnographic accounts also suggest that Ute pottery was made in open fires, a practice would have produced partially oxidized pottery similar to brownwares found in prehistoric contexts. That brownware ceramics in western Colorado are affiliated with Ute culture is also suggested by the association of sherds with Euroamerican metal and glass trade goods, wickiups, and the common presence of Desert Side-notched and Cottonwood Triangular projectile points. Furthermore, most brownware sherds from archaeological sites in western Colorado are more similar to each other than they are to ceramic types of the Plains, of Athapaskan groups in New Mexico, or of Formative stage groups of Utah and southwestern Colorado. The similarity of brownware sherds from sites near the Uncompahgre Plateau of western Colorado led Buckles (1971) to define the type as *Uncompahgre Brown Ware*. Sherds recovered throughout much of western Colorado are commonly compared to the Uncompahgre Brown Ware type.

GEOGRAPHIC DISTRIBUTION OF UTE CERAMICS

Callaway, Janetski, and Stewart's (1986:337) depiction of nineteenth century Ute territory is probably a good indication of the geographic distribution of Ute ceramics.

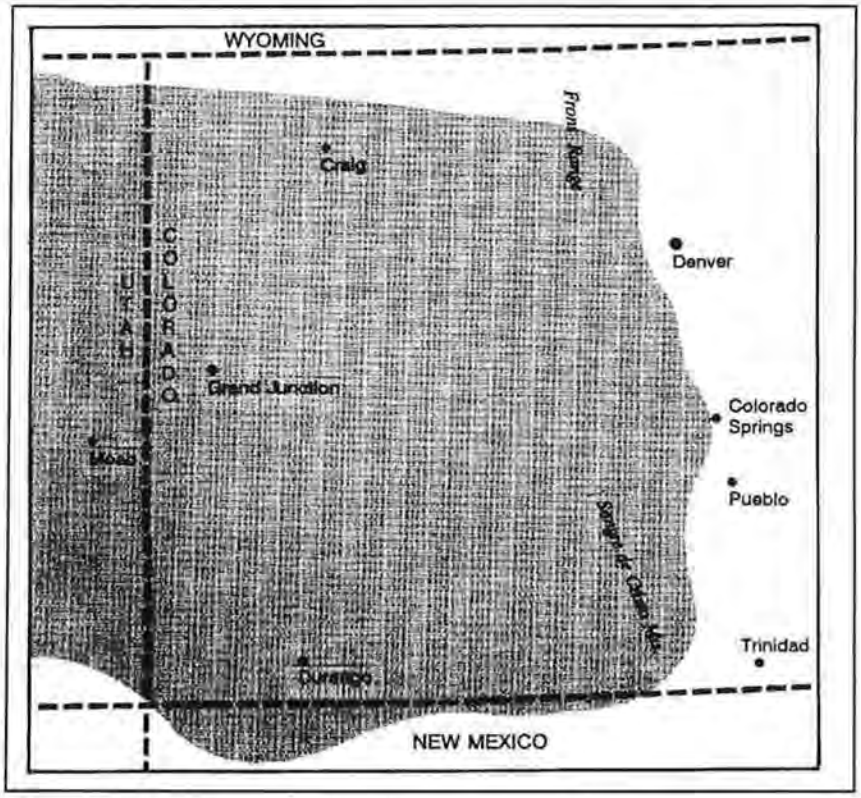

Figure 1-Historic Distribution of Utes (after Callaway et al. 1986)

Those authors indicate that the Ute homeland during the nineteenth century extended west of the Front Range and the Sangre de Cristo Mountains to the eastern Great Basin, north almost to the Wyoming border, and south to the New Mexico border (Figure 1). Probable Ute ceramics occur in mountain settings (e.g., Benedict 1985a, 1985b; Gooding 1981; Metcalf and Black 1991; Black 1982) and on the Colorado Plateau (e.g., Buckles 1971; Annand 1967).

CHRONOLOGY

Data from chronometrically dated components yielding brownware sherds in western Colorado and eastern utah indicate that brownwares were part of the material culture of peoples living in the region since at least A.D. 1100. As shown in Figure 2, all but one of the calibrated date ranges (at two sigma) for components yielding brownware ceramics date after A.D. 1000 (see also Table 1). The one exception (TX-2640) is from the Vail Pass Camp, a multi-component high altitude site where differentiation of components and associated assemblages was not very successful. Certainly, all of the higher confidence calibrated ranges postdate A.D. 1000. The fact that none of the calibrated ranges with higher confidence ratings occurs before A.D. 1000 suggests that the appearance of brownwares may date after A.D. 1000. The two earliest radiocarbon dates associated with brownwares with high confidence ratings (Beta 13329 and Beta 36043) have midpoints in their calibrated

Sample No.	Age B.P.	Calibrated Range	Site No.	Reference
TX 2640	990 ± 60	AD 899-1191	5ST85	Gooding 1981
UGa 1144	950 ± 70	AD 980-1230	5ST85	Gooding 1981
RL 1170	860 ± 110	AD 980-1382	5ME429	Martin et al. 1981
WSU 1749	830 ± 100	AD 1000-1385	5ST85	Gooding 1981
Beta 13329	870 ± 60	AD 1004-1280	5GF1336	Rhodes 1986
Beta 36043	810 ± 90	AD 1005-1385	5MN2629	Greubel 1989
TX 2647	860 ± 60	AD 1020-1280	5ST85	Gooding 1981
I 5450	765 ± 90	AD 1030-1393	5GA22	Benedict 1985a
RL 1950	730 ± 100	AD 1039-1410	5ME3789	BLM site form
WSU 1760	720 ± 90	AD 1073-1410	5ST85	Gooding 1981
Beta 32593	770 ± 50	AD 1161-1284	42GR2236	Reed 1990
Beta 32592	710 ± 50	AD 1220-1389	42GR2236	Reed 1990
Beta 19517	665 ± 80	AD 1220-1420	5GA22	Benedict 1985a
I 12530	630 ± 75	AD 1260-1430	5JF8	Nelson and Graeber 1984
Beta 14323	510 ± 70	AD 1280-1490	5ME4971	Horn 1989
Beta 49093	590 ± 60	AD 1280-1430	5MF2631	Murcray et al. 1993
Beta 2994	540 ± 50	AD 1297-1441	42SV981	Hauck 1986
Beta 5563	484 ± 70	AD 1304-1618	5GN41	Dial 1989
Beta 3277	474 ± 70	AD 1315-1623	5GN41	Dial 1989
WSU 1751	430 ± 90	AD 1319-1650	5ST85	Gooding 1981
Beta 34680	460 ± 50	AD 1332-1493	42DA485	McKibben 1992
Beta 14314	420 ± 70	AD 1333-1640	5ME4957	Nickens and Assoc. 1986
Beta 14324	420 ± 70	AD 1333-1640	5ME4971	Horn 1989
Beta 52690	420 ± 60	AD 1410-1640	5MF2631	Murcray et al. 1993
Beta 34681	230 ± 110	AD 1440-1950	42DA485	McKibbin 1992
UGa 1146	190 ± 65	AD 1523-1950	5ST85	Gooding 1981
Beta 35123	180 ± 40	AD 1646-1955	5DT271	Baker 1991
Beta 18088	140 ± 50	AD 1650-1950	5DT271	Baker 1991
Beta 14325	80 ± 80	AD 1650-1955	5ME4971	Horn 1989
Beta 20209	70 ± 60	AD 1667-1955	5DT271	Baker 1991

Table 1-Additional dates for calibrated ranges of radiocarbon determinations presented in Figure 2.

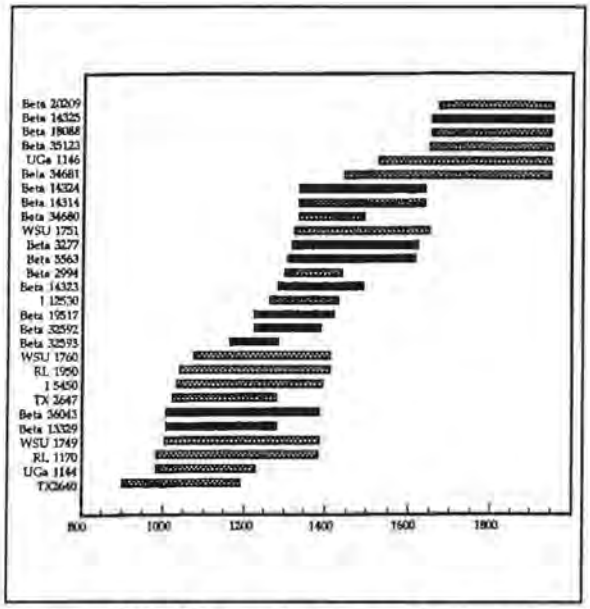

Figure 2-Calibrated range (2 sigma) of components yielding brownware ceramics. Higher confidence rating is denoted by solid bars.

ranges of A.D. 1142 and A.D. 1195, respectively. It is likely that the components and associated brownware sherds post-date A.D. 1100, though it is possible that they date as early as approximately A.D. 1000.

In addition to the ceramic components dated by radiocarbon determinations, Benedict (1989) conducted themoluminescence dating of three punctate brownware sherds collected at the Caribou Lake site (5GA22) in the Front Range. The sherds yielded dates of 320 B.P., 450 B.P., and 210 B.P., with an estimated uncertainty of $\pm$14% (Benedict 1989:6). The average for the three thermoluminescence dates is 325$\pm$ 25 B.P.. However, a carbon sample from the interior of one of the sherds produced an AMS radiocarbon determination of 665$\pm$80 B.P. (Beta-19517) (Benedict 1989:6). Benedict (1989:8) believes that the radiocarbon date probably best represents the actual age of the artifacts. Chronometric data suggest that ceramics were part of Ute material culture during all phases of Ute culture. Reed's (1988) suggestion that ceramics were absent during the Chipeta phase - the earliest Ute phase - has been shown to be incorrect.

TECHNOLOGY

Construction

Ethnographic and archaeological data indicate that Ute Pottery was constructed by coiling (Smith 1974). Archaeological evidence for coiling consists of incompletely obliterated coil junctures, sherd breakage parallel to the vessel rim, and the general absence of anvil impressions on interior surfaces.

Finishing and Thinning

The manner of finishing and thinning of Ute pottery has long been a topic of debate. Ethnographers working among the Ute evidently observed both the paddle-and-anvil technique (e.g., Barber 1876) and scraping and wiping (e.g., Smith 1974:86, Stewart 1942:273) for thinning and finishing purposes. Archaeologists working with prehistoric assemblages have argued that one or the other technique was practiced. Most assert that scraping and wiping was used for finishing, based upon surface striations which are indicative of scraping vessels with the hand or with flexible tools when the clay was still plastic (Buckles 1971; Dial 1989). Annand (1967), however, noted small indentions on some interior sherd surfaces from a collection near Collbran, Colorado, that he thought resulted from paddle-and-anvil thinning. Perhaps the most compelling evidence of paddle-and-anvil thinning has resulted from David Hill's microscopic inspections of sherd cross sections. In a sample of brownware sherds from western Colorado, Hill observed temper particles and fabric pores which tended to be aligned parallel to the vessel surfaces (Hill and Kane 1988; Hill 1993). Hill and Kane (1988) suggest that such alignment resulted from the physical impacts of paddle-and anvils. In such cases, coiling would result in a more random orientation of temper particles. Buckles (1988:221) suggests that micaceous sherds thinned with paddle-and-anvil should be regarded as Sangre de Cristo micaceous ware-a ware that entered western Colorado through trade with other ethnic groups (see Brunswig-this volume). A great deal more sherd cross section analyses need to be done to identify the range of variation of Ute pottery thinning and finishing.

Firing Method

Uncompahgre Brown Ware was fired in a poorly controlled atmosphere, probably on an open fire (see Smith 1974). The atmosphere may have been either oxidizing or reducing, resulting in partial oxidation of the vessels (Buckles 1971).

Core Traits

Analysis of sherd cores and materials suggest that local clays were probably used, close to where most Ute ceramics are found. Sherds from the Pioneer Point site near Blue Mesa Reservoir in western Colorado were made of clay derived from volcanic tuff which outcrops out in the immediate vicinity (See Dial 1989). Sherd cores are generally darker than sherd exteriors and consist of solid colors that may range from black to dark shades of gray or brown.

Sherds are generally friable. Their tempering materials are generally moderately to heavily abundant. material used for temper is variable, and probably reflects local availability. Quartz or quartzite sand appears to be the most common tempering agent; mica is often but not always present (Buckles 1971; Annand 1967; Murcray et al. 193). Other temper materials may include crushed granite (Benedict 1985a; Rhodes 1986), gneissic granite grus (Hill and Kane 1988), igneous rock similar to rhyolite or andesite (Dial 1989; Hill and Kane 1988), and quartz and mica schist (Hill 1993). Size of temper particles is highly variable. A wide range of sizes is usually present, often including granules. Sherds may range between 3mm and 10mm in thickness, but the majority are between 4mm and 5mm.

Surface Traits

Sherd color may range from light gray or light brown to black while the majority are probably grayish brown, dark grayish brown, or very dark gray. Surfaces are smoothed by scraping and/or wiping and none are polished. No Ute sherds have slipped surfaces.

Shapes and Sizes

Vessels may be exclusively wide-mouthed jars with slightly flaring rims and low shoulders (Buckles 1971; Figure 3). Bases are generally conical or pointed, though some rounded bases have also been documented (Buckles 1971). Complete vessels are generally about as wide as they are tall. Most of the relatively complete vessels reported in the regional literature range between 19 cm and 27 cm in height, and between 17 cm and 28 cm in maximum width (Buckles 1971; O'Neil 1993; Benedict 1985a).

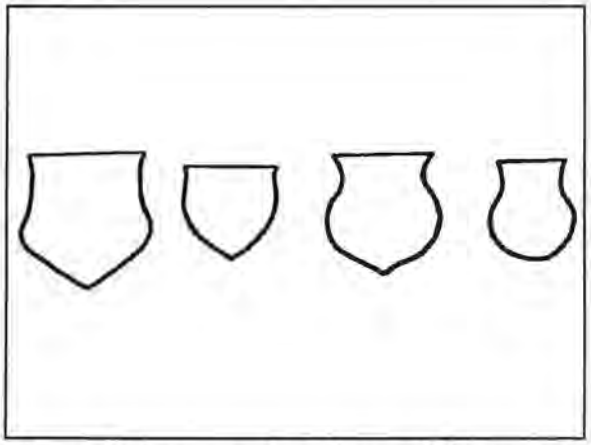

Figure 3-Uncompaghre Brown Ware vessel shapes (after Buckles 1971, Figures 50-51)

Decoration

Vessels may be either plain or fingertip impressed. None are painted, incised, or appliqued. Fingertip impressions may cover the entire exterior of a vessel. The impressions are generally aligned in parallel rows encircling the vessel; the long axes of the impressions are parallel or diagonal to the vessels' vertical axes (Buckles 1971). Occasionally, the fingertip impressions are partially obliterated (Rhodes 1986; Annand 1967). Punctate and corrugated sherds have also been attributed to the Ute, but are discussed below under the next *variations section*.

Variations

A small number of stick-impressed sherds have been reported from sites in the Colorado Rockies (Benedict 1985a) and in the Plateau country of western Colorado (Nickens and Associates 1986:55). The patterning of the stick impressions are similar to common fingertip impressions. Benedict's (1985a) punctate sherds from the Caribou Lake site also had possible anvil impressions on their interior surfaces. Additionally, some corrugated brownwares may also be present. Site 42GR2236 in Grand County, Utah, yielded a small number of brownware sherds associated with Desert Side-notched and Cottonwood Triangular projectile points and radiocarbon determinations of 710±50BP. and 770±50B.P. (Reed 1990:100). The corrugations were partly obliterated. The sherds were thought to be of Numic origin, possibly similar to what Walling et al. (1986:373) termed Paiute Corrugated in southwestern Utah. A corrugated brownware sherd has been reported from Montrose County, Colorado, from a site that also may be of Numic origin (Reed and Horn 1992:25). Murcray et al. (1993) found several fingertip-impressed sherds at the Sand Wash Wickiup site in Moffat County, Colorado, that appear similar to Uncompahgre Brown Ware, but instead referred to them as the Firehole Fingernail type - a type developed in the Wyoming Basin. Buckles (1988) suggests that micaceous sherds produced by paddle-and-anvil may represent the Sangre de Cristo Micaceous type. According to Baugh and Eddy (1987), the Sangre de Cristo micaceous is of Athapaskan origin and is primarily distributed in northeastern new Mexico and along the southeastern border of Colorado (see Brunswig, this volume). The extension of Sangre de Cristo Micaceous into western Colorado has not been convincingly demonstrated.

COMPARISON WITH OTHER TYPES

Ute Ceramics in Colorado probably represent a local variation of Southern Paiute Utility Ware. They are also similar to the pottery of the Shoshone of Wyoming, another Numic-speaking group. Ute pottery is also somewhat similar to Athapaskan pottery types such as Dinetah Gray and Sangre de Cristo Micaceous, but can be differentiated from these types through careful analyses.

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SECTION 3

CERAMICS EAST OF THE CONTINENTAL DIVIDE

POTTERY OF EASTERN COLORADO'S EARLY AND MIDDLE CERAMIC PERIODS

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University of Colorado Museum

INTRODUCTION

It is the purpose of this paper to present a definitive description of the four earliest ceramic traditions of eastern Colorado. The four ceramic traditions investigated are the Plains Woodland of the Early Ceramic Period, the Upper Republican Culture, the Panhandle Aspect (Apishapa Phase) and the Upper Purgatoire Complex (Sopris Phase). The latter three belong to the Middle Ceramic period. The Upper Republican and the Panhandle Aspect both have Plains Village connotations while the Upper Purgatoire Complex shows Pueblo/Plains influence.

The ceramic descriptions given below are based on vessel form and surface finish as well as manufacturing aspects such as method of construction, method of firing, and paste. Form information is derived from the Plains whole or partial vessel research currently being conducted by the author. This research included vessels located in museum collections, retrieved from excavations and provided by private sources. A manuscript presenting this information as it pertains to pottery traditions of the Early, Middle, and Late Ceramic periods is in final preparation for publication by the author.

The impetus for cultural development and change from the Archaic to the Plains Formative in eastern Colorado spread from the southern United States into the woodlands of the Northeast and eventually onto the plains of Colorado (Wedel 1986:81). "Formative" implies horticulture and partial reliance on agriculture for subsistence (Wedel 1986). Since this reliance on agriculture did not take place to any extent in eastern Colorado, the term "Formative" is no longer applicable and use of the classification terminology, *ceramic periods*, is considered more appropriate.

Taxonomies are necessary in the study of prehistory to present facts in an orderly and timely system. A very general taxonomic scheme for the pottery of eastern Colorado was proposed by Wood (1967:570) and included Early, Middle and Late Ceramic periods. His categorization is especially helpful when dealing with sherds, but with whole or partial vessels, slightly finer categorizations are possible, reflecting higher resolution chronological and regional distinctions.

THE EARLY CERAMIC PERIOD COLORADO PLAINS WOODLAND TRADITION

The acquisition of pottery signals the beginning of the Ceramic period and a culture known as Early Woodland (Willey 1966:267). Plains Woodland peoples in Colorado lived basically a hunting and gathering existence with little dependence on

crops from horticultural activities. Campsites were usually small and scattered, probably indicative of temporary or seasonal usage, and occurred on low terraces rising a few feet above river or creek bottoms. Small, shallow basins may have been associated with lightly built shelters of poles possibly covered with brush or hides (Gleichman n.d.; Tucker, Tate, and Mutaw 1992; Wedel 1986:85). Plains Woodland peoples appear to have subsisted on plant foods including goosefoot, pigweed, amaranth, and various roots and berries. Bison, elk, deer, and rabbit represent the mainstay of the meat sources (Cassells 1983:164). There is evidence for game drives of bighorn sheep by Woodland people in eastern Colorado as documented by the high altitude studies of Benedict (1975, 1985, 1990, 1991). Sherd counts show that pottery was not abundant at Woodland sites.

Although there are numerous descriptions of Woodland pottery (Irwin and Irwin 1957, 1959; Irwin-Williams and Irwin 1966; Steege 1967; and Wood 1967, 1971), few serious attempts have been made to isolate or identify types for the western perimeter of the Central Plains culture area. These attempts have resulted largely in site-specific types. Cassells (1983:170) states that for this early time period "progressing beyond the gross level of Plains Woodland seems unjustifiable.... ". Many sites remain in limbo for want of sufficient evidence to place them in an established classification or to justify a new taxonomic unit (Wedel 1986:82). Many more sites need to be excavated, accompanied by acceptable dates and with discernible variations in ceramic styles before definitive types can be recognized.

Technology

Construction of Plains Woodland pottery follows a tradition different from the coiling and scraping method of Anasazi pottery. Woodland vessels are constructed by piece building or direct modeling from a lump, followed by cord-wrapped paddle or dowel modeling, resulting in exterior cord marking. Cord-marked surfaces and conical forms are the most distinctive features. The vessels may have been roughly formed and the exterior surface finished by rolling with a cord-wrapped paddle or dowel. To shape the damp clay surface of the vessel, the hand was used as an anvil on the interior of the vessel. The cord mark impressions on the exterior shaped, thinned and bound the clay together.

The firing of Plains Woodland pottery can be partly constructed from technical traits and partly from analogy with modern and historic ethnographic ceramic studies. From such sources, it appears probable that firing most likely occurred at low temperatures, produced by wood-fired open hearths. Once the pots are completely dry, they are ready for firing. Usually a small fire is built on open ground and allowed to burn down. After the hot coals are raked over, the pottery is placed on top and covered with fuel. Temperature, length of firing, and atmosphere affect the degree of oxidation so that clays which contain a large amount of carbonaceous matter and other impurities require longer oxidation (Shepard 1968:214, 313). Shepard (1968:213) states that American archaeologists deal principally with wares fired without a kiln and in "reducing atmosphere" or fired in "oxidizing atmosphere" are interpretations, not simple descriptions. Variable clay colors indicate a

lack of firing control and, sherds may be only partially oxidized during the firing.

Paste can be defined as the clay body and temper or the fabric of the ceramic (Johnson et al. 1990:5). Clay types or sources are rarely mentioned in early literature on Plains Woodland ceramics. However, Ellwood (1987:117) lists the probable source area for Bayou Gulch ceramics for both tempers and clays as along the Front Range. "There is nothing in the Bayou Gulch pottery assemblage that could not have been manufactured from local clays and tempering material" (Ellwood 1987:117).

Core or paste colors range from dark gray to very dark gray at Happy Hollow Rock Shelter (Steege 1967), black to buff in the Agate Bluff area (Irwin and Irwin 1957:20), and from buff to gray brown (Munsell 7.5YR 3/0-3/2), with a small percentage of sherds in the pinkish gray range (7.5YR 6/2), at Bayou Gulch (Ellwood 1987:124). The Munsell color measurements were taken from dry sherds. Such variation in paste color indicates that color does not provide a good criterion for differentiating types.

Temper is defined by Rice (1987:483) as "a material mineral or organic, but usually nonplastic--added to a clay to improve its working, drying, or firing properties. Assistance of a geologist is recommended for temper identification due to fact that expensive, microscopic/petrographic thin section analyses are often needed to identify the additions or constituents. In the literature, (Irwin and Irwin 1957, Wood 1967, Ellwood 1987: 116) temper listed for Colorado Woodland pottery includes clear or milky quartz particles, feldspar, crushed granite and/or crushed rock. Minute quantities of hematite, muscovite, and/or hornblende, crushed rock, and unidentified ferromagnesium minerals are also listed for Bayou Gulch ceramics (Ellwood 1987:116).

Recent research by Ellwood and Parker (1994) indicates a preference by Plains Woodland potters in Eastern Colorado for aplastics such as crushed rock of granitic family - Pikes Peak granite or Boulder Granodiorite. All are Perisitic igneous rocks common to the Front Range. The biotite content of clays increases as one approaches the mountains or Fountain Formation which extend north and south along the Hogback. Analysis is based on a petrographic study from 25 documented sites and clay sources from each vicinity. The analysis included thin section examination of the sherds as well as of fired tablets of the collected clays.

Lithology improves the quality of the analysis. The use of the term "grit" is no longer acceptable and merely indicates a scoop of gravel or any material at hand. The terminology "sand-sized crushed rock" can be used in place of "grit." The use of the term "sand" alone is not an adequate description. Sand is a geologic term meaning larger than silt and smaller than gravel. Sand represents a particle size. It is listed in the Dictionary of Geologic Terms (1962:434) as "detrital material of size range 2 - 1/16 mm diameter" and includes the size terms for very coarse, coarse, medium, fine, and very fine. Sand must also be defined as either quartz, basaltic, olivine or an appropriate geological term. To verify the exact constituents, a sample should be sent to a professional geologist for analysis.

Temper size can best be described by using the Wentworth Scale as published in Shepard (1968:118). The Wentworth Grade Scale is an extended version of the Udden Grade Scale, adopted by Chester K. Wentworth, a U.S. geologist, who modified the size limits for the common grade terms but retained the geometrical interval or constant ratio of ½ (Ed Licht, *personal communication* 1991). The term *temper size,* as used here, includes pebble, granule, very coarse, coarse, medium, fine, very fine and silt grade categories. Grade limits are provided by diameters in millimeters. Recognizable particles of temper are often in the range of "very coarse" to "coarse" although smaller percentages range to "granule" or "medium" according to the Wentworth Scale (Shepard 1968:118). Temper sizes in Colorado's Woodland pottery mainly ranges from pebble to medium.

Temper shape can be classified as angular, subangular, sub-rounded, rounded or well rounded. In Colorado, Woodland pottery temper shapes are commonly subangular to subrounded. A useful tool in naming the last two variables is a translucent plastic card, produced by Frank Frasier for American/Canadian Stratigraphic Company, which can be introduced into viewing range for the microscopic sherd study.

Another variable which increases the value of the ceramic description is the percentage of temper to paste. On the Mee-Parker vessel, found five miles northeast of Parker, Colorado, the percentage of temper to paste on the upper portion of the vessel was close to 10% whereas in the base, temper increased up to 30% (Ellwood n.d.).

Descriptions of paste fracture range from uneven and friable to irregular (Ellwood 1987:119). This variable is often dependent upon the porosity or compactness of the fired paste and may illustrate lamination. Hardness is also often used as a descriptive variable scale. Common Plains Woodland ceramic Mohs' values range from 3 to 5 on that scale.

Decoration of Plains Woodland pottery in eastern Colorado does not include painted designs. Manipulation of surfaces includes cord marks. Nodules and/or incised or trailed decorations along vessel necks may be considered decorations. Lines are often parallel to the neck and become zig-zag lines along the rims of Upper Republican pottery. Although cord-markings may have been used partially as decoration, the principal function of the cord-impressions is to shape and bind the clay together (Cassells 1983:165). A variable in the clarity and depth of cord-markings is the post-manufacture environment of the sherds. Open sites as opposed to rock shelters offer less protection to the ravages of the weather. Through time, vessel surfaces become increasingly obliterated. Most of the sherds from rock shelters west of Denver are deeply and clearly cord marked and those markings are generally perpendicular to the rim. Associated radiocarbon dates of deep cord-marked sherds appear to be earlier than components containing more obliterated sherds, such as those described from Bayou Gulch (Ellwood 1987).

Surface color ranges from light brown to dark gray (Munsell 7.5YR 6/2-4/0) measured from fry surfaces. The use of a Munsell Color Chart (1954) is essential to consistent terminology.

"The Woodland ceramic tradition is identifiable by its exterior of cord-marking" (Cassells 1983:162). Instruments, such as paddles or dowels wrapped with cordage, made of natural fibers (e.g. bast fibers) (Hurley 1979:3), were pressed into the wet, leather hard but not dry clay on the exterior of the vessel. Markings most often slant diagonally toward or are perpendicular to the rim. Clear and deep cord-marks are parallel and usually close to vertical (see Figure 1-**note: all figures for this article are located at the conclusion of this text**). This type of marking occurs early and can be demonstrated by the Scott-Rainbow Creek partial vessel (Ellwood n.d.; Irwin-Williams and Irwin 1966:161; Wedel 1986:86). Cord twist information may prove to be valuable, although both "S" and "Z" twists have been reported from sherds of the same excavation unit. At other times, the twist or number of cords is not clear (Champe 1946:112; also see Hurley 1979 for more detailed information).

Finely Cord Marked and Partially Obliterated Cord-Marking generally occurs at a later time and is manifested on the Franktown Cave vessel (Ellwood n.d.; Figures 2 and 3). My own observations of sherds found near Pueblo, Colorado and a whole vessel from near Canon City suggest a southern geographical source as well as a later time period for finely cord-marked and partially obliterated cord-marks. Further observations are required before this hypothesis can be verified. An example of criss-cross cord-marking occurs on a partial vessel from the northeast corner of the Rocky Mountain Arsenal near Denver (Ellwood n.d.) and another in Irwin-Williams and Irwin (1966:165; also see Figure 4). The occurrence of overlapping marks may increase toward the base of the vessel because of the conical shape. No specific dates are known for use of that method.

Vessel shapes (or forms) of Plains Woodland cord-marked pottery include very tall and narrow jars up to 35 cm in height (example at the Nebraska Historical Society, Lincoln, Nebraska) and vessels as small as 10 cm in height (see Figures 5, 6, and 7 at the conclusion of this text). The vessel orifice is usually also the greatest diameter of the vessel. However, rims can be incurving, leaving the greater diameter lower on the vessel body. Jar bodies are conical with little or no curvature to the walls. Bases are most often roundly pointed. Bowls or other forms are uncommon.

Vessel wall thicknesses range from 4.9 mm to 19.9 mm (Ellwood 1987:116), and often is a variable of the position of the sherd on the complete vessel. Thickness generally increases toward the base of the vessel.

Rims are most often direct or slightly incurving. Short necks evolved later. Lips vary from flattened to rounded. Rims and necks of vessels found in eastern Colorado feature simpler and less decorated forms than those from Nebraska and farther east. Drawings of rim and body profiles are excellent descriptive material.

Geographical Distribution

Plains Woodland cord-marked pottery has rarely been found above the 6,000 foot level along the foothills in eastern Colorado, although Benedict reports that rare sherds may be found as high as 11,000 feet (*personal communication* 1991; see the

Figure 8 map at the conlusion of this paper). Habitation sites, along with their cultural remains, are most frequent along or close to waterways, including the South Platte and the Arkansas rivers and their many tributaries. Isolated finds of whole or partial vessels occur in areas scattered in the open hills and plains country north and east of Denver (such as the Mee-Parker, Colorado, whole vessel).

Temporal Span

Radiocarbon dating has established a general date range of A.D. 150 to 1050 (Johnson 1976:2) and from A.D. 300 to 1100 (Wood 1972:12) for Plains Woodland site components.

Comparison with Later Middle Ceramic Pottery

Plains Woodland vessels of the Early Ceramic Period in eastern Colorado have concoidal jar shapes with straight or slightly incurved walls and with cord-marked surfaces. The main difference between Plains Woodland pottery and pottery from the following Upper Republican Period is in form and surface finish. Globular vessels with high rounded shoulders and constricted necks mark the form of Upper Republican pottery. Either sharply everted rims or collared rims are also evident.

Sources for Illustrated Examples of Plains Woodland Ceramics

Wedel (1986:86) displays photographs of restored pottery vessels of various cultures in the Republican River Basin in Nebraska including a Keith Focus Woodland vessel, dated to ca. A.D. 650, and an Upper Republican vessel with collared rim, dated to ca. A.D. 1200. Illustrations from Ellwood (n.d.) vessel form outlines show many of the attributes mentioned above (see Figure 9).

THE MIDDLE CERAMIC PERIOD

The presence of the Middle Ceramic Period in eastern Colorado is represented by the Upper Republican Culture in northern and central Colorado along the South Platte River Basin, the Panhandle Aspect (Apishapa Phase) from along the Apishapa River, and, the Upper Purgatoire Complex from the Upper Purgatoire River and west of Trinidad, Colorado. The Apishapa and the Purgatoire rivers are both tributaries of the Arkansas River. Gunnerson (1989) associates the cultures of Upper Republican and the Apishapa Phase to the Plains Village Complex of the Great Plains with an adjustment to a drier environment. The Upper Purgatoire Complex had more permanent structures and a definite relationship to the Pueblo cultures of New Mexico's Upper Rio Grande Valley.

UPPER REPUBLICAN

The term "Plains Village" is not always considered applicable in Colorado. Many of the features defined in this complex are not apparent in the state's archaeological record. House structures have only recently been identified or documented at Box Elder - Tate Hamlet, DV5017 (Tucker Tate and Mutaw, 1992: 79-99) and only scant evidence exists for domesticates in that site's Upper Republican component. Cassells states (1983:172) that collective evidence indicates the Upper Republican peoples in Colorado were engaged in activities different from their more easterly contemporaries.

While there is a general lack of sedentary behavior in Colorado's Upper Republican components, use of classic Upper Republican artifacts (as defined to the east) is well documented. Villages in northeastern Colorado were characteristically small, unformalized and unfortified (Wood 1967:619). Upper Republican settlements or campgrounds tended to occupy upper terraces of the smaller tributaries. Early Plains Village Indians of Nebraska's Republican River country relied upon a garden economy based on domestic maize, beans, squash and sunflowers combined with hunting, fishing, gathering of mussels and, infrequently, the collecting of various wild plant foods in season (Wedel 1986:106). In Colorado, there was less emphasis on horticulture and only slim evidence for the utilization of wild plant foods.

Upper Republican ceramics are distinctive. Vessel form attributes include full-bodied, round-shouldered and round-bottomed jars with constricted necks, and mouths with collared or braced rims (Wedel 1986:106; Figures 10 and 11). Unthickened, vertical or flaring rims from a short neck are found in a minority of specimens, although both collared, braced rims and plain necks were manufactured. Bowls and other forms were uncommon. Cord impressions reached to the vessel lip on short-necked vessels and exteriors of collared rims were often incised with three to six parallel horizontal lines and embellished further with slanted or diagonal lines. Sigstad (1969:18-19) has designated Nebraska Upper Republican Class I rim sherds as Frontier Ware and Class II rim sherds as Cambridge Ware. Class I rims are characterized by a thickened "collar" which overhangs and accentuates the constricted neck. Class II rims include those that lack collars (Kivett and Metcalf 1988). In most cases, rim profiles vary from nearly vertical to a sharply flaring form (Ellwood n.d.; Figure 9). Exterior vessel surfaces include either plain and smoothed or roughened with impressions from a cord-wrapped paddle. Witty (1978:57) states that surface treatment is predominantly all-over cord roughening, usually applied with a cord-wrapped paddle in a haphazard manner. Cord markings on Upper Republican pottery are usually finer and often less deeply impressed than those of the earlier Plains Woodland vessels. Upper Republican vessels were relatively thin walled and often tempered with quartz sand. They were also much more abundant in eastern Upper Republican sites (Wedel 1986:108).

In northeastern Colorado, distinctive Upper Republican ceramic types remain undefined due to the sparsity of excavated sites. In northeastern Colorado, there is some evidence to suggest that many Upper Republican house sites may exist but are on private land and go unreported (Al Parrish, *personal communication* 1987). Studies which have described Upper Republican pottery include Irwin and Irwin (1957, 1959), Irwin-Williams and Irwin (1966), Steege (1967), and Wood (1967, 1971), Wood (1971), and Johnson (1992).

Technology

Construction of Upper Republican pottery is by accretion or lump modeling with the use of a cord-wrapped paddle or dowel rolled along the surface to shape and seal vessel walls. Lintz (*pers. com.* 1994) believes very thick coils were most likely used. No evidence of coiling can be detected. Finger impressions on vessel

interiors suggest the use of the hand as a supportive anvil.

The inferred firing method involves low temperature, uneven firing. An oxidizing atmosphere is inferred for vessels or sherds with warm tones, although most seemed to have been fired in nonoxidizing atmospheres.

Eastern Upper Republican pastes (clay type or source) include well-rounded fragments of quartz. Temper fragments appear to be from mature stream beds or washes, carried some distance from their original sources. It is difficult to determine exact paste composition without thin sections or sourcing information.

Core or paste color ranges from gray to very dark gray (Munsell N 5/0-N 3/0). Color measurements are taken from dry surface.

In Colorado Upper Republican pottery, the temper is usually crushed granite with biotite rich clay (Ellwood and Parker 1994). Research indicates that Upper Republican peoples moved into Colorado after A.D. 1000 and brought with them their pottery style and used materials from the High Plains. At some point, they ventured further west into the Colorado Piedmont and began making ceramics from raw materials found there. Upper Republican pottery excavated at the Rock Creek Site (5BL2712) indicated both Pikes Peak Granite and Boulder granodiorite were used for temper (Ellwood and Parker, 1995). Upper Republican people were then exploiting raw materials from both the High Plains and the Colorado Piedmont. In Wood's (1967:629) research of northeastern Colorado, Upper Republican temper was found to consist of moderate amounts of coarse to very coarse quartz sand. The use of thin-sectioning is recommended to identify other ingredients.

Temper sizes range from medium to coarse (Wentworth scale in Shepard 1968:118). The clasts of the Carlson-Chimney Canyon vessel (Ellwood n.d.) measure 0.3 mm to 1.0 mm. Whether weathered or polished particles of quartz, temper shapes are generally rounded, although they may vary to subangular. The overall percentage of temper to paste may vary from 8% or 10% or up to 60% of paste in various areas of a single vessel, such as the neck or base.

Fractures tend to occur in straight or curved lines if the paste texture is fine or compacted. Texture ranges from compact to friable. Another distinctive characteristic of the vessel cross-section core is the presence of numerous thin laminations parallel to the surface of the sherd (Wood 1967:629). Fracture often shows the presence of lamination, an indication of paddling (Ellwood n.d.). Wood (1969:629) lists hardness as 5 to 6 on Mohs' scale.

Decoration includes surface manipulation by cord roughening with a cord-wrapped instrument in strokes which often leave choppy, haphazard impressions. Collared rims are often decorated with geometric patterns of incised lines.

Dry surface color ranges from brown to dark gray or black. In the case of the Carlson-Chimney Canyon vessel, the surface is variable in color. Original color of the upper portion of that vessel is pinkish gray to brown (Munsell 7.5YR 7/2-5/2). The Donovan-Hobbs - Lewis Canyon vessel

ranges from dark gray to very dark gray (Munsell 7.5YR 4/0-3/0. A caliche-covered soot-encrusted area along the shoulders and sides is light gray (Munsell N 8/0).

Surface finish appears to be cord-wrapped markings or cord-impressions in vertical, horizontal or criss-cross patterns (Wood 1967:620). Ellwood (n.d.) reports that cord impressions vary from haphazard to criss-cross on the Carlson-Chimney Canyon vessel. In the case of the Donovan-Hobbs-Lewis Canyon whole vessel (Ellwood n.d.), the exterior surface finish is very finely cord marked and obliterated with ridges of five per centimeter. Depth of cord-marks vary from shallow to deep. Wood (1969:629) lists a "Z" twist with one and two-ply cords represented. Twist is not usually identifiable in Upper Republican ware.

The only known vessel shape in Colorado is a jar of varying sizes. Kivett and Metcalf (1988) report a minor occurrence of mug and bowl forms as well as miniatures from Medicine Creek in Nebraska. The two medium-sized, whole Upper Republican vessels from my research have a pronounced shoulder near the upper one-third of the vessel height. The underbody of the Donovan-Hobbs vessel is globular to slightly elongated and the constricted neck has a narrow line of juncture between the rim and the body. That juncture is at the point where the inwardly sloping upper body turns up and out to form the rim and is the narrowest point of the vessel above the shoulder.

Vessel wall thickness varies from 4 mm to 9 mm but the majority of body sherd thickness range from 4 mm to 6 mm (Wood 1967:629). Wall thickness of the Carlson-Chimney Canyon vessel varies from 6.0 mm at the flattened rim to 3.7 mm at the shoulder.

Rim shape is often characterized by a thickened collar which overhangs and accentuates a constricted neck. Another style of rim lacks the collar and profiles vary from nearly vertical to flaring. Wood (1967:620) reports one class of rim which consists of a simple, unthickened rim which may be vertical or flaring in profile. The second class consists of rims which are thickened to form a wedge-shaped collar, the most common variety of rim form. Collars are sometimes decorated with two to eight horizontal, incised lines. Cord-impressed designs are uniformly absent (Wood 1967:631).

Geographic Distribution

The distribution in northeastern Colorado of Upper Republican ceramics may be restricted to escarpments flanking the Colorado Piedmont (Irwin and Irwin 1957; Wood 1967), and the northern and eastern tributaries of the South Platte River and the Arikaree-Republican drainage (Withers 1954; Figure 8). Evidence for Upper Republican pottery in the foothills and mountains parks remains inconclusive (Husted 1962). Most recently, Upper Republican ceramics have been identified at the Denver International Airport site (5DV3017) (Tucker, Tate and Mutaw 1992).

Temporal Span

The Middle Ceramic Period as exemplified by the Upper Republican culture appeared at the end of the Central Plains Early Ceramic Period in the tenth or early

eleventh century A.D. with an influx of peoples and ideas from the southeast and probably lasted into the late 1400's (Wedel 1986:98). For the purpose of research on the prehistory of northeastern Colorado, the taxonomic term Upper Republican "phase" is the most suitable. Almost 90% of the available radiocarbon ages form a relatively tight cluster, suggesting a major occupation between A.D. 1000 and 1300 (Wood 1967:624). Zier and Kalasz (1985:16) suggest the Middle Ceramic period extends from approximately A.D. 1000 to 1400.

Comparisons of Middle with Early Ceramic Pottery

Comparisons between Plains Woodland and Upper Republican vessels (Early vs. Middle Ceramic periods) indicate that form and surface finish provide the greatest distinctions between the two wares. The latter are globular vessels with constricted necks and flaring or collared rims. Surface treatment of the latter tend to be choppy strokes of cord-wrapped paddles with the impressions often smoothed over or slightly obliterated.

As a general rule, cord-markings on Upper Republican pottery are finer and shallower than on those of earlier Plains Woodland vessels and many show some obliteration (Wedel 1986:107). Vessel forms of Upper Republican peoples feature high rounded shoulders and more globular forms as opposed to the tall, slender conical shapes of the Plains Woodland. Kivett (*personal communication* 1989) suggests that the total volume of the two vessel forms may have been similar. Variation in form suggests a difference not in function but in usage. As a cooking utensil, the tall concoidal based Plains Woodland vessels may have been set within rock-lined hearths while the more globular vessels of Upper Republican peoples with either sharply everted or collared rims may have been suspended slightly above hearth fires.

The outer panel of collared rims usually bear incised or trailed decorations, varying from three to six parallel, horizontal lines. Sometimes a zig-zag incised line is superimposed over the horizontal lines, such as in the Taft-Kirchnavy Butte partial vessel. There is some evidence that rim decoration became more elaborate and varied in later times (Wedel 1986:107). Upper Republican jars, as a rule, were relatively thin walled.

References for Illustrated Examples

Wedel (1986:107) displays photographs of restored pottery vessels illustrating rim styles. Ellwood (n.d.) illustrates two Upper Republican rim forms, one with a sharply flaring rim and one with a collared rim (the Carlson-Chimney Canyon and Donovan-Hobbs Lewis Canyon vessels; also see Figures 9, 10, and 11 at the conclusion of this text).

THE MIDDLE CERAMIC PERIOD PANHANDLE ASPECT - APISHAPA PHASE

"The Apishapa phase in southeastern Colorado is the southwesternmost manifestation of the Plains Village pattern and is related to the Central Plains tradition" (Gunnerson 1989:11).

The shortgrass High Plains that extend east from the Rocky Mountains for 200 to 350 miles (323-565 km) were sparsely

occupied during the Plains Village Complex (Gunnerson 1990). Apishapa Phase sites found in southeastern Colorado, northeastern New Mexico and the northwestern Oklahoma panhandle may be the best known village sites of that complex on the western High Plains. Important researchers on the Apishapa include Campbell (1969), Chase (1949), Gunnerson (1989), Ireland (1968), Lintz (1986), Nowak and Jones (1986), Renaud (1931, 1932, 1933, 1942), Stigler (1949), Zier and Kalasz (1985), and Zier et al. (1988).

In dealing with eastern Colorado archaeological taxonomy, Withers (1954:3) proposed the name "Apishapa focus" and Campbell (1969, 1976) later assigned the Apishapa Focus (phase) to the southern High Plains Panhandle Aspect. Gunnerson (1989) recently extended the definition of Wither's Apishapa "focus", suggesting use of the term "Classic Apishapa." His Classic Apishapa sites in Apishapa Canyon are mainly defined by the Cramer (5PE484) and Snake Blakeslee (5LA1247) type sites. However, he excluded some sites that Campbell would have included as type sites (cf. Gunnerson 1989:125). Also within Classic Apishapa, but not found within Apishapa Canyon is the Avery Ranch site (5PE56), 30 miles northwest of Pueblo (Ireland 1968; Zier et al. 1988). Gunnerson excavated the Cramer site and did limited work at four others, including Snake Blakeslee (Gunnerson 1989:74). For other opinions on the definition of Apishapa, see Lintz (1986:25) and Watts (1971, 1975).

A summary of Gunnerson's work indicates that the Apishapa Phase can be assigned to the Central Plains Tradition, with which it shares distinctive although varied traits. Primary traits of the Central Plains tradition according to Gunnerson (1989), include globular, cord-roughened, grit-tempered pottery vessels with possible decoration on the rim or lip (Gunnerson n.d.). A lack of bone artifacts other than awls and beads suggests a limited subsistence economy.

Colorado's Apishapa Phase indicates utilization of a broad economic system based on a wide variety of animals such as bison, pronghorn, coyote, rabbit and small burrowing animals. Gathering and some horticulture were also important subsistence elements (Gunnerson n.d.). In most areas, however, horticultural products served only as dietary supplements. Generally, Apishapa environmental contexts were harsh and horticultural subsistence was limited by poor sandy soils, extreme temperatures with high winds, and limited annual precipitation.

The Apishapa Phase, like the related Antelope Creek (Panhandle) Phase of the southern High Plains, provides evidence for the use of substantial amounts of slab rock for structural construction (Gunnerson n.d.). Sites and structures are generally located along the lower Apishapa Canyon, about 35 miles (56 km) up the Apishapa River from its confluence with the Arkansas. They mainly consist of circular to square permanent dwellings, often built on high terraces overlookinq valley floors offering potentially tillable land. Incorporated in larger structures at the Cramer and Snake Blakeslee sites are great quantities of large, vertically set rock slabs which are readily available from the adjacent Dakota Sandstone Formation.

The Munsell site (5PE797) is set back and up a canyon wall. A cord-roughened,

restorable pottery vessel was recovered from this site (Gunnerson 1989:36). He (1989:66) has given the restored pottery vessel the type name "Munsell Gray" after the name of the site and landowner, Howard Munsell. Gunnerson states that "because we recovered here the only known whole or restorable pottery vessel excavated from an Apishapa site, we are naming the type "Munsell gray," (Gunnerson 1989:66). In addition to the Munsell Gray vessel two other Apishapa Phase vessels, the Cramer and Wyeth vessels, were also recovered. The three known Apishapa culture vessels exhibit considerable variation in their attributes (described below).

Technology

Apishapa ceramic construction techniques are questionable since there is neither evidence of hand anvil and paddle molding nor coiling. However, radiograms made by Douglas R. Parker (Appendix C, Ellwood n.d.) suggest that the Munsell reconstructed vessel was finished with a terminal fillet, a trait is not unusual in a slab constructed vessel. The partial Cramer vessel is not as finely smoothed on the interior as the Munsell vessel, but is quite thin for a lump modeled vessel. The Wyeth vessel was cord-marked and suggests construction by rolling with a thin cord-wrapped paddle or dowel-like instrument against an interior hand anvil (Ellwood n.d.).

Firing traits of the Wyeth vessel indicate mixed oxidation and nonoxidation firing because of its light reddish brown to dark gray color (Munsell 5YR 6/3-4/1). The Cramer vessel indicates nonoxidizing firing (Ellwood n.d.) while the Munsell vessel was fired in a neutral method, neither completely oxidized nor reduced (Bill Lucius, *personal communication* 1991).

Paste in the Munsell vessel is fairly white and is from a different clay source than that either the Wyeth or Cramer vessels. Mica (muscovite) is present in the paste of the latter two. Good clay sources are usually found in areas where there are coal deposits (Bill Lucius, *personal communication* 1991).

Core or paste colors for the Wyeth whole vessel ranges from reddish brown to dark gray (Munsell 5YR 6/2-4/1). Both the Cramer and the Munsell vessel core colors vary from light gray to pinkish gray (Munsell N 7/0 - 7.5YR 7/2) (Ellwood n.d.)

Temper or nonplastic material is difficult to identify on reconstructed vessels and very little paste area can be seen from microscopic examination of either the Wyeth or Munsell vessels. Sherds from the Cramer vessel were thin sectioned and show the presence of quartz, shale, and quartzite temper. The parent material could have been a sand with an igneous origin, possibly from the Spanish Peaks. Purgatoire shale and sand are available in the Apishapa River bed and such river bed sand would have provided the aplastics, shale, and the clay observed in the Apishapa paste (Ellwood and Parker 1994). Lithology for the Cramer vessel was noted by Gunnerson (1989:38) as "an abundance of heterogeneous angular material." Gunnerson (1989:42) further commented that most of the material could have come from disintegrating schist or sandstone, some from siltstone and others possibly are crushed sherd fragments. Ellwood (n.d.) reports primarily subangular to subrounded quartz sand in the Cramer partial vessel. Temper of the Munsell vessel, diagnosed from one small

area not covered by glue or plaster, showed very fine particles of quartz sand.

Temper size is indicated by very coarse particles of unidentified white material in the Wyeth vessel, very fine particles in the Munsell vessel and coarse particles in the Cramer vessel. Temper size ranges from 0.125 to 2.0 mm. Gunnerson (1989:42) states that temper size varies in the Munsell vessel from microscopic specks to particles up to 5 mm across. Temper shape includes subangular for the Cramer, subangular to subrounded for the Munsell, and angular for the Wyeth vessel. The percentage of temper to paste ranges up to 25% for the Munsell vessel, 20% for the Wyeth vessel, and 15% for the Cramer partial vessel. Gunnerson (1989:42) reports that tempering constitutes from 10% to 60% of paste volume.

Fracture for the Munsell vessel is fairly even and straight while, for the Wyeth vessel, the fracture is uneven. Sherds from the Cramer vessel have fracture edges which are ragged and uneven. However, fracture variation exists from straight and even to ragged and uneven. Hardness averages around 4 on the Mohs' scale.

There is no painted decoration known for Apishapa vessels. Surface manipulation varies consists of widely spaced ridges caused by cord-wrapped paddles and very fine striations made by what is thought to be a "combing" technique. All surface indentations are partially obliterated, indicating heavy usage or post-production polishing or erosion.

Surface color varies on the Wyeth vessel from light reddish brown to reddish brown (Munsell 2.5YR 6/4-5/4) to very dark gray where fire clouds occur (Munsell 2.5YR 3/0). For the Munsell vessel, color ranges widely across its exterior surface from off-white to dark gray under a large fire cloud (Munsell 7.5 YR 8/24/0). For the Cramer sherds, colors vary from pinkish white to reddish yellow (Munsell 5YR 8/1-7/8) with soot-encrusted areas being gray to very dark gray (Munsell 5YR 5/1-3/1). Generally, Apishapa dry surface colors vary from light reddish brown to very dark gray in sooted areas.

Surface finish and decoration on the Wyeth vessel consist of three to five choppy obliterated cord markings per centimeter. The Munsell vessel surface finish consists of widely separated cord markings which average 2.5 marks per centimeter. The Cramer sherds exhibit a surface finish of very fine striations, with up to seven ridges per centimeter. Lucius (*personal communication* 1991) calls this finishing technique "combing." Variation between surface finishes of the Apishapa vessels ranges from wide to finely marked (2.5 to 7.0 per centimeter) although all are fairly vertical, parallel and partially obliterated.

Apishapa vessel forms are varied (see Figure 9). The Wyeth vessel is ovoid with a short neck and slightly flaring rim. Its base is rounded to semi-conical and its vessel walls taper from the lower one-fourth of vessel height to the base. Bases of the Wyeth and Munsell vessels are similar, but the difference in the two vessels lies in the constricted rim of the Munsell vessel. The Cramer partial vessel is essentially globular.

Vessel wall thickness varies from 7.O mm at the rim to 8.O mm at the neck on the Wyeth vessel; from 4.O mm at the rim to 8.O mm on the Munsell vessel body and

from 3.5 mm to 7.O mm on the sherds of the Cramer vessel (Ellwood n.d.). Generalized sherd thicknesses range from 4.O mm to 7.O mm. At the Cramer site sherd thickness varies from 4.2 to 8.8 mm (Gunnerson 1989:42).

Rims are often flaring. A slightly flaring rim meets the shoulder of the Cramer vessel in a smooth curve. However, Gunnerson (1989:38) comments that rims show a great deal of variation in sherd materials from the Cramer site. Lips for all three Apishapa vessels are square. The Wyeth vessel lip has oblique incisions made by what appears to be a form of braided cordage (Ellwood n.d.). Lips on the Cramer and Munsell vessels are undecorated (Ellwood n.d.; Figure 9 this text).

Geographical Distribution

Roughly, the area of the Apishapa phase is restricted to southeastern Colorado and as far south as the western tip of the Oklahoma Panhandle (Figure 8). The Phase's western and northern boundaries are formed by the foothills of the Sangre de Cristo Mountains and the Arkansas River and its associated drainages (Gunnerson 1989:12).

Temporal Span

The Middle Ceramic period of the Apishapa Phase dates from approximately A.D. 1000 to 1400 (Zier and Kalasz 1985:17). Gunnerson (1989:98) dates the Snake Blakeslee site between A.D. 1275 and 1400, based on decorated Southwestern pottery collected and analyzed by Curtis Schaafsma. By combining radiocarbon dating evidence, Pueblo trade sherds, and projectile point typology, a late 1200's or early 1300's time range for the Cramer and Snake Blakeslee sites is the best estimate (Gunnerson 1989:57). Campbell (1969) suggests that the Apishapa phase ended about A.D. 1350. The uppermost level at Trinchera Cave has been attributed to the Panhandle aspect (Apishapa Phase) and is estimated to date between A.D. 1000 and 1400 (Wood-Simpson 1976:200-202).

Comparisons with External Traditions

The three existing whole or partial Apishapa vessels show evidence for less globular forms than those found in Upper Republican vessels, with Apishapa vessel maximum diameters occurring at a higher point relative to their total height. The Munsell vessel's constricted rim is rare or nonexistent in Upper Republican ware (Gunnerson 1989:72; see Figure 9).

References for Illustrated Examples

Profiles of whole or restored pottery vessels from the Cramer, Munsell, and Wyeth sites appear in Gunnerson's Apishapa Canyon Archaeology (1989:72; cf. Figure 9). Photographs of the Wyeth whole pottery vessel from site 5LA1698 just south of the Snake Blakeslee site and the restored pottery vessel from the Munsell site appear in Gunnerson (1989:154). The Ellwood (n.d.) manuscript carries photographs of the vessels and close-up views of the surface finish of those vessels.

THE MIDDLE CERAMIC PERIOD UPPER PURGATOIRE COMPLEX - SOPRIS PHASE

More westerly areas of southeastern Colorado in the Middle Ceramic Period are

exemplified by a cultural adaptation designated as the Upper Purgatoire Complex. The complex appears to be restricted to a short stretch of the Upper Purgatoire River primarily upstream from Trinidad (Cassells 1983:117). The Upper Purgatoire Complex, unique in many aspects, flourished there with more permanent structures, an apparent increased reliance on horticulture, and a definite orientation to Upper Rio Grande Pueblo cultures (Zier and Kalasz 1985:17). Overall, Upper Purgatoire components west of Trinidad, Colorado, are believed to date between ca. AD 1000 to 1250 (Ireland 1971; Wood and Bair 1980). Wood and Bair's (1980) report on the only major excavated sites (5LA1416 and 5LA1211) in the area mainly defined currently known archaeological traits of the complex. One such site, 5LA1416, yielded material from the entire Upper Purgatoire cultural spectrum (Cassells 1983:117). Three sequences of culturally and chronologically related occupations have been defined and include: 1) the Initial Sopris Phase (A.D. 1000-1100), 2) the Early Sopris Phase (A.D. 1100-1150), and 3) the Late Sopris Phase (A.D. 1150-1225) (Wood and Bair 1980:1). Other important Upper Purgatoire Complex investigators include Dick and Mountain (1963).

Pottery from the Trinidad Reservoir site (5LA1416) provides an incontrovertible link to the Rio Grande puebloans. Ceramic evidence present in the Early Sopris Phase (also termed "subphase" by Lintz and Anderson 1989:26) includes Taos Gray as the dominant ceramic type, but also includes wares from the northern Rio Grande pueblos. These wares include cord marked, polished and corrugated as well as occasional Taos Black-on-White and Red Mesa Black-on-White specimens (Lintz and Anderson 1989:26). During the late Sopris Phase, Taos Gray Incised wares dominate and Taos Gray and Sopris Plain wares are abundant. There is also a decrease in Red Mesa Black-on-White ceramics with a concomitant increase in Taos Gray Incised wares (Lintz and Anderson 1989:27).

Types of ceramic wares identified and described from Sopris Phase sites include Taos Gray and Sopris Plain wares, Taos incised, and an unidentifiable polished ware (Wood and Bair 1980:184). A complete Taos Incised jar with both parallel incising and herringbone designs will be further described in the author's (Ellwood n.d.) forthcoming research of Plains whole and partial vessels. Taos Incised and Sopris Plain discussed in this manuscript is based on type descriptions by Peckham and Reed (1963), descriptions from Wood and Bair (1980), and the author's own whole and partial vessel research.

TAOS INCISED

Technology

Construction of Taos Incised vessels was by coiling and scraping. Small uniform coils were placed horizontally and then scraped smooth to mold and obliterate junctures both on the vessel exteriors and interiors. Coiling is visible on the interior, slightly above the shoulder, of a complete vessel recovered from the Trinidad Lake area (Wood and Bair 1980:185-186).

The inferred firing method is low temperature firing in an unoxidizing atmosphere. Paste traits (clay type or source) indicate a secondary clay type although

further sourcing information is not available. Core or paste colors are gray to dark gray (Munsell N 5/04/0). Little is known of Taos Incised temper. "Sand" as a temper description is the only descriptive word in the 5LA416 site report (Wood and Bair 1980:186). Paste material observations made from small chips along the Trinidad vessel rim suggests temper of quartz sand and light colored particles which appear to be crushed sherds. Temper size information is poor due to limited access to paste for examination, but available materials appear to be in the range of fine to medium (0.25 mm to 0.5 mm in diameter). Observed temper shape are subangular to subrounded and the percentage of temper to paste in Taos Incised varies with a 10% - 20% range. Fracture lines in Taos Incised sherds vary from straight to irregular.

Surface finish in the Trinidad Lake vessel varies from smoothed to bands of incised decoration. Decoration includes areas of parallel incised lines separated by a herringbone design. The uppermost area consists of seven horizontal lines where the herringbone design comprises 4-5 rows. Below the herringbone lines is another set of eleven horizontal lines. Peckham and Reed (1963:13-14) state that construction of both parallel incising and herringbone designs occur in the late phase of this variety. Decoration extends from the neck to the shoulder and the height of the decorated area is 12.4 cm (Ellwood n.d.).

Surface color on the exterior is gray to dark gray (Munsell N 5/0-4/0). The interior is fire-blackened and ranges from dark gray to very dark gray (N 4/0-3/0). Vessel shape/form is that of an elongated, necked jar (27.3 cm in height) with a small indented base. Four lugs (two to each side) are present, approximately 2.2 cm below the rim. The base and mouth are small in comparison with the maximum diameter of the vessel (24.6 cm). Vessel wall thickness varies from 4.O mm to 7.O mm. It is not possible to measure thickness at the base of the vessel. The Trinidad vessel rim shape is slightly flaring at the lip, which is 4.0 mm thick.

Geographical Distribution

Geographical distribution of Taos Incised is less clearly known than its temporal range. Although descriptions of the Sopris Phase are based on excavations at Trinidad Reservoir, 20 years of work within the Trinidad Lake area have provided a vivid account of the Upper Purgatoire complex (Dick and Mountain 1963). Sedentary villages of the complex are situated on alluvial terraces in the Park Plateau/Upper Purgatoire area west of Trinidad (Figure 8).

Temporal Span

Manufacturing dates for Taos Incised are A.D. 1100-1300 (Peckham and Reed 1963). An archaeomagnetic date of A.D. 1195 was obtained from the feature which contained the Trinidad Lake vessel. The herringbone design is a late embellishment and the jar is representative of styles used by peoples of the Sopris phase encompassing the time period A.D. 10001225 (Wood and Bair 1980:19).

External Comparisons

Apishapa and Upper Republican wares are startlingly different those of the Sopris Phrase. The first two wares are thought to be of paddle and anvil

construction with some form of cord- marked exteriors, usually choppy cord-marked and cord-roughened surfaces with some obliteration. In contrast, Sopris Phase ceramics were constructed by coiling and scraping, with incised decorations. Vessel shapes for Upper Republican and Apishapa ware are globular-the former with constricted necks and either collared or flaring rims. Sopris Phase vessels are basically elongated jars. The Taos Incised whole vessel has incised decorations on the upper body over a plain surface. The Sopris Plain vessel is the same general elongated jar shape with coiling construction and a cylindrical base marked by basket impressions (see Ellwood n.d. and the following description).

References for Illustrated Examples

References for Sopris ceramics include Wood and Bair (1980:186) and Ellwood (n.d.). The latter includes photos of whole vessels plus microscopic study of their surfaces.

TAOS GRAY AND SOPRIS PLAIN

Technology

Taos Gray and Sopris Plain are represented by 2,813 sherds and consist of three-fourths of all sherds recovered from the Trinidad Reservoir site (Wood and Bair 1980:187). These two types are contemporaneous and subsumed here under the name Sopris Plain, also termed elsewhere Taos Gray Plain and Taos Gray Incised. Each of those types were originally described by Dick and Mountain (1963:3) from the type site at Sopris, Colorado, 5LA1416. Type descriptions are also found in Wood and Bair (1980:188). One whole vessel, the Hudson-Trinchera vessel, is described in Ellwood (n.d.).

Sopris Plain construction consists of coiling with finishing by scraping and use of the paddle and anvil method. Use of a basket as a shaping mold is probable and there is a further possibility that the basket was also used as a puki. "A puki is a shallow container in which the bottom of a vessel is placed as it is built and shaped. Pukis may be regular bowls or baskets appropriated for pottery making. A layer of ash or sand is sometimes put in the puki to keep the moist clay from sticking" (Christenson 1991:1). Very coarse scraping from the construction process is evident in the Hudson-Trinchera vessel.

The original firing method is unknown (William Lucius, *personal communication* 1991). In sherd cross-sections, 1/3 of sherd exteriors appear oxidized while the inner 2/3's are sooted, indicating a cooking function. Paste traits (for clay type or source) suggest use of secondary clays with fairly large quartz sand temper particles. Clay composition of sherds is of local river bed materials and non-Puebloid in origin (William Lucius, *personal communication* 1991).Core colors range from very dark gray to reddish brown (Munsell (N 3/0 to 5YR 5/4). The core color of the Hudson-Trinchera vessel is light gray to pinkish gray (5YR 7/0-7/2 to 6/3). Information on core color is unavailable on the Davidson-Salt Creek whole vessel because of the absence of surface breaks.

Sopris Plain temper as described by Dick (1963:3) includes sand, sandstone, and siltstone with tabular siltstone predominating. There were no mica inclusions. No temper is

visible on the Davidson-Salt Creek vessel. Temper of the Hudson-Trinchera whole vessel consists of large quartz sand particles. More specific information regarding material type, size, shape and percentage of temper to paste for this pottery type are not available (Wood and Bair 1980). Fracture or paste texture is fine when sherds contain a small percentage of siltstone but ranges to coarse and very friable when a high percentage of sandstone is present.

Surface finish is rough with basket impressions very common on lower sides of the vessel, although plain bottoms do occur (Wood and Bair 1980:188). Both the Hudson-Trinchera and the Davidson-Salt Creek vessels display basket impressions between 6.2 cm and 5.8 cm, respectively, from their bases. Hardness is 2 to 3 (Mohs' scale). Carbon streak occurs very frequently, especially on thicker sherds. Decoration may be present in the form of incising, usually consisting of very irregular, horizontal lines just below the neck. Neck banding may also occur.

Surface color for Sopris Plain vessels appear to be only a little more reddish brown than those often defined as Taos Gray, (Wood and Bair 1980:188). The Hudson Trinchera vessel is gray (Munsell N 5/0).

Vessel shape is not mentioned in the Sopris Phase literature other than for an excavated Taos Incised jar (Figure 7). Basically, shapes are similar for Taos Incised and for Sopris Plain. The Wood and Bair report does acknowledge the presence of lugs and handles that resemble those on Taos Incised vessels. Both the Hudson-Trinchera and Davidson-Salt Creek vessels are widemouthed, with a small amount of side curvature and basket-impressed lower bodies. The Davidson-Salt creek vessel has lug handles on either side, placed approximately 5.5 cm below the rim. Both vessels are crude and demonstrate sides swelling above their basket-impressed bases. Vessel Wall thicknesses range from 5 mm-14 mm. The Hudson-Trinchera vessel demonstrates an increasing thickness from 4.O mm at the rim to 12.O mm at the base. The Davidson-Salt Creek vessel thickness ranges from 7.O mm at the rim to 9.O mm near the base (Ellwood n.d.). Rim shapes are tapered and uneven on both the Hudson-Trinchera and the Davidson-Salt Creek vessels (Ellwood n.d.).

Geographical Distribution

Distribution of Sopris Plain (and associated varieties) is limited to Trinidad and west on the Purgatoire River in the original study (Figure 8). However, Campbell (1969) has mentioned basket-impressed base sherds in the Trinidad area. Ellwood (n.d.) has two examples of basket-impressed bases, one found near Trinidad on Salt Creek and the other at Trinchera, Colorado.

Temporal Span

Wood and Bair (1980:15) estimate the Upper Purgatoire Complex time span to be ca. A.D. 1000-1225. An archaeomagnetic date of A.D. 1195$\pm$13 was obtained for Feature 31, which contained the Taos Incised vessel described above.

External Comparisons

Pottery from Plains Woodland through Apishapa components is all lump-modeled with slabs being used to build up

side walls where the Sopris ware is manufactured by coiling and scraping. Main distinctions between the Taos Gray and the locally made Sopris Plain are that the latter include: "1) the lack of mica in the paste, 2) general lack of incising and the uneveness of the incising when it does occur, 3) total absence of herringbone design elements, 4) color of paste, Sopris Plain is usually more reddish brown than Taos Gray wares and 5) overall crudeness" (Wood and Bair 1980:189). However, the two types cannot consistently be separated without microscopic analysis.

References for Illustrated Examples

Wood and Bair (1980:186) illustrate the Taos Incised jar but not the Sopris Gray vessel. Photographs can be found in Ellwood (n.d.) of the Taos Incised jar, the Hudson-Trinchera, and the Davidson-Salt Creek Sopris Gray vessels, including close-ups of all three vessels.

CONCLUSIONS

The purpose of this paper has been to provide descriptions of the first four pottery traditions as they appeared in eastern Colorado. The traditions include the Early Ceramic Plains Woodland Period and the Upper Republican, Apishapa, and Sopris cultures of the Middle Ceramic Period. The above descriptions are based, in part, on sherds and partial and whole vessels recovered from sites along the Front Range in Colorado. It is hoped this paper's description and analyses of attributes of eastern Colorado pottery will assist archaeologists in their assessments of time periods and cultural affiliations of those early ceramic periods in the future.

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FIGURES

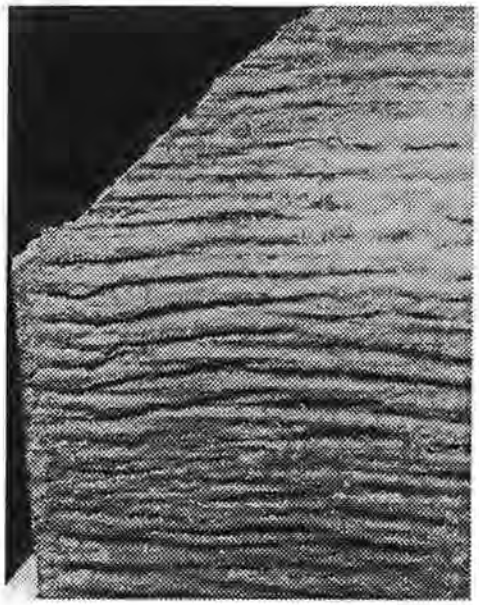

Figure 1-Close-up of Plains Woodland Cord-Marks on Cronkhite-Hereford Partial Vessel.
(*Courtesy of Whole Vessel Research of P.B. Ellwood*)

Figure 2-Late Plains Woodland Fine Cord-Marking. Hall-Beaver Creek
(*Courtesy of Whole Vessel Research of P.B. Ellwood*)

Figure 3-Late Plains Woodland Obliterated Cord-Marking. Franktown Cave.
(*Courtesy of Whole Vessel Research of P.B. Ellwood*)

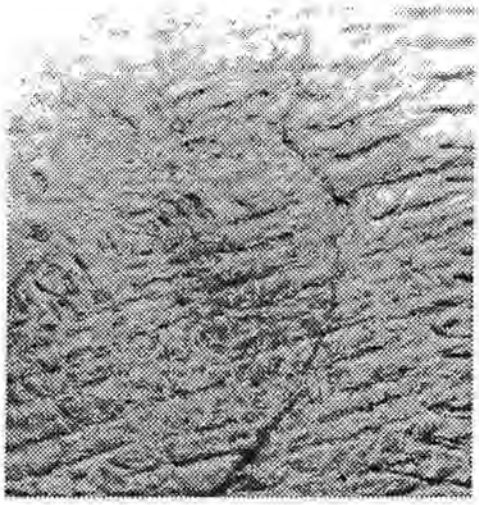

Figure 4-Plains Woodland Criss-Cross Marking and Mat Impressions.
Rocky Mountain Arsenal Partial Vessel.
(*Courtesy of Whole Vessel Research of P.B. Ellwood*)

Figure 5-Nebraska Keith Focus Plains Woodland Jar.
(*Courtesy of Nebraska State Historical Society*)

Figure 6-Nebraska Valley Focus Plains Woodland Jar.
(*Courtesy of Nebraska State Historical Society*)

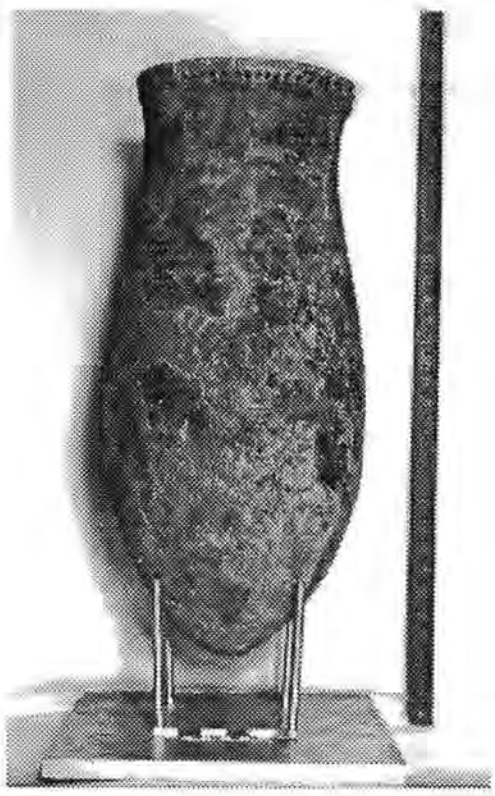

Figure 7-Tall Plains Woodland Jar from Nebraska
(*Courtesy of Nebraska State Historical Society*)

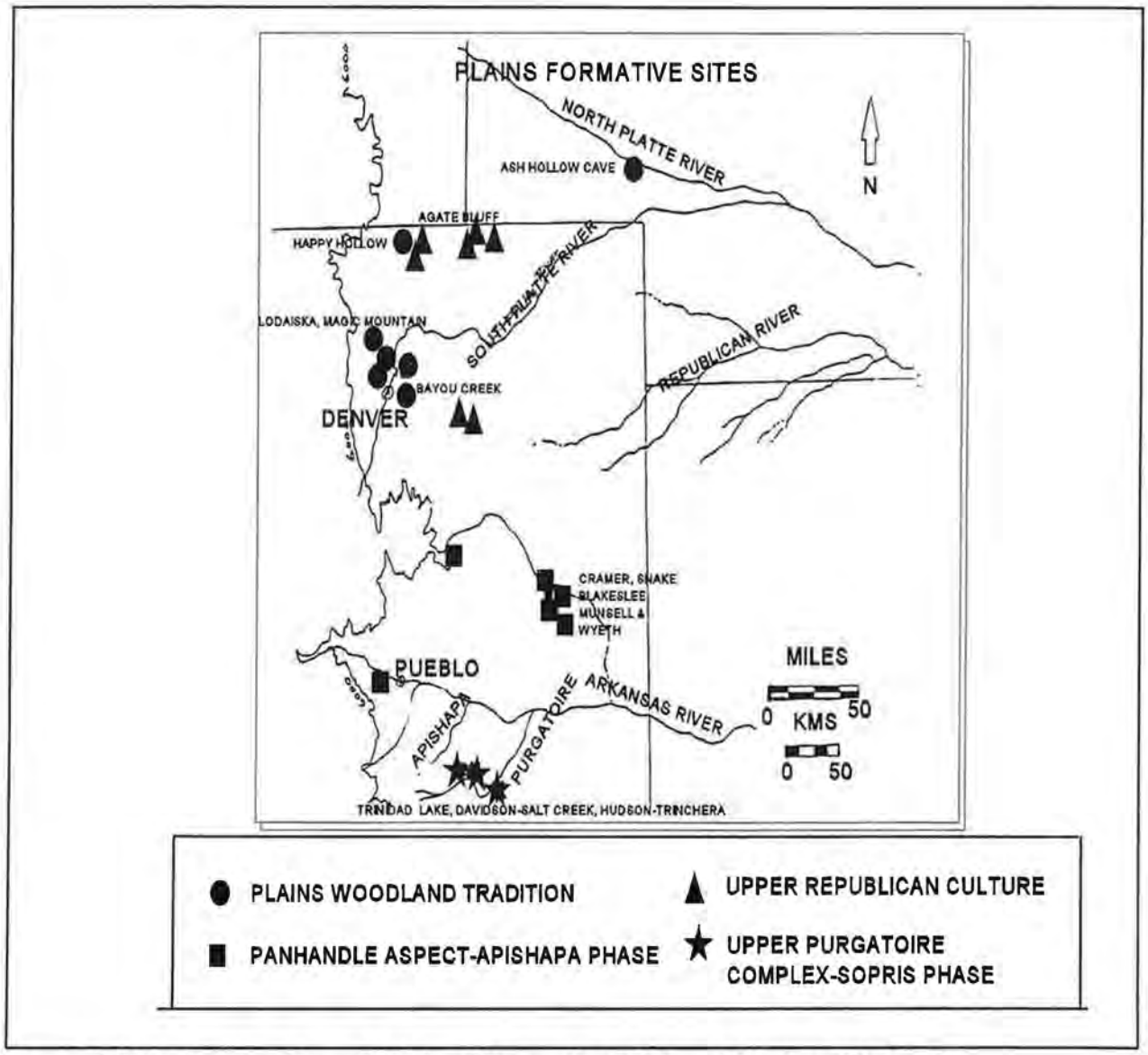

Figure 8-Distribution Map of Plains "Formative" Sites of Eastern Colorado.

OUTLINE FORMS FORMATIVE CERAMICS OF EASTERN COLORADO

EARLY CERAMIC PERIOD

MIDDLE CERAMIC PERIOD

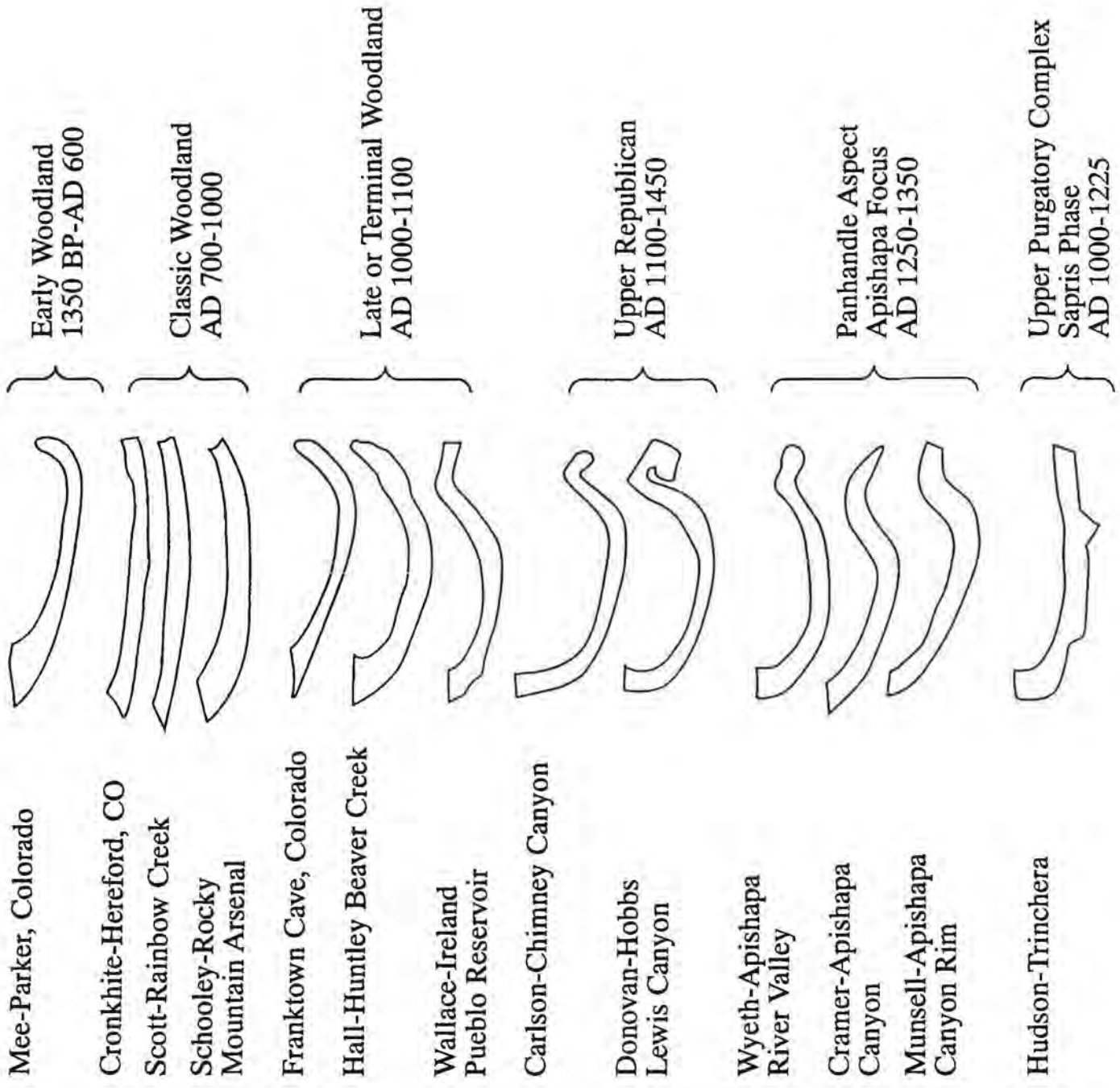

Figure 9-Outline Forms from whole vessel research of P.B. Ellwood 1990-1994

Figure 10-Upper Republican Vessel with Collared (Cuffed) Rim.
(*Courtesy of Nebraska State Historical Society*)

Figure 11-Upper Republican Vessel with Outcurving Neck and Rim.
(*Courtesy of Nebraska State Historical Society*)

INTERMOUNTAIN POTTERY IN COLORADO

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INTRODUCTION

The title of the CCPA ceramic symposium session for which an earlier version of this paper was prepared was entitled `Shoshone Ceramics'. I prefer to consider Intermountain Pottery (or Intermountain Tradition Pottery). For all practical purposes the terms *Shoshone Ceramics* and *Intermountain Pottery* have been used interchangeably by archaeologists in Colorado because, when Intermountain Pottery was originally defined by Mulloy (1958), he suggested that the Shoshone as a likely source for the pottery . However, he also recognized that it may be a regional style rather than an ethnic style and that other groups may have produced a part of it (1958:200). After all, pottery similar to that described by Mulloy was then known to have been made by several Indian groups in and around the Northwest Plains (Ewers 1945; Flannery 1953; Sapir 1923; Schaeffer 1952).

Today, several authorities believe that Intermountain Pottery, and/or pottery very similar to it in the Intermountain West, was of Shoshone-ancestral manufacture (Madsen 1975; Frison 1991:116; Wright 1975). Essentially, that argument is based on four observations. First, the spatial and temporal distributions of pottery similar to Intermountain Pottery correspond to what is known about aboriginal Shoshone occupation of the Northwest Plains (Wedel 1954). Second, the Shoshone are known to have made pottery (Thwaites 1904-5:19). Third, the pottery made by some other groups of the Northwest Plains really is not that similar to what is called Intermountain Pottery (Wedel 1954). And, fourth, the spatio-temporal distribution of pottery similar, to and/or associated, with Intermountain Pottery conforms to a model for the spread of Numic speakers out of the Great Basin (Madsen 1975).

Despite this, I would like to avoid the Shoshone appellation for the purposes of this paper because it involves a consideration of the use of pottery in ethnic boundary maintenance (Larson and Kornfeld 1992), and such a consideration is slightly outside the objective of the original ceramic sessions for which this paper was originally written. Those sessions had as their goal the clarification of ceramic terminology as currently used in Colorado, and in contributing to that goal, I was assigned the task of considering Shoshone or Intermountain pottery.

As far as I am aware, the Intermountain Pottery designation has been applied to ceramic material from only four sites in Colorado, all located along the northern Front Range: Graeber Cave (Nelson and Graeber 1965), Roberts Buffalo Jump (Witkind 1971), T-W Diamond (Flayharty 1972; Flayharty and Morris 1974), and (Old Man Mountain (Benedict 1985b). None of these collections includes whole vessels.

However, all contain partial vessels or sherds indicating flat bases on pots, a trait that is considered diagnostic of the Intermountain Pottery type. Sherds in two of the collections (Graeber Cave, Old Man Mountain) include some with a distinctive flange at the juncture of the side and base while one other Robert Buffalo Jump) has a simple base/side juncture. Both juncture forms are known for Intermountain Pottery from surrounding areas. The fourth collection, that from T-W Diamond, does not have sherds from the base/wall juncture, but does contain sherds from a flat base. Enough of the sherds from Graeber Cave and Roberts Buffalo Jump were refitted to provide a fairly good idea of the original vessel shapes for two pots.

Whether other sherds from undiagnostic portions of Intermountain Pottery vessels have gone unrecognized in other collections is difficult to determine. However, sherds from at least one other assemblage appear to be within the range of Intermountain Pottery variability. In Component A at LoDaisKa, Irwin and Irwin (1959:82) reported finding the remains of a probable pot and small bowl. Identification as Intermountain Pottery is made on the basis of the similarities of the LoDaiska sherds to other Intermountain examples in paste, temper, shape and surface treatment (Butler 1986:103). Although bowls are uncommon vessel forms in Intermountain Pottery, the partially reconstructible bowl from LoDaisKa seems to have a flat bottom, but no flange at the side/base juncture. Aside from the LoDaiska ceramics, a substantial number of other sites with good archaeological context have been reported with probable Intermountain sherds. Figure 1 illustrates the distribution of those sites within the state.

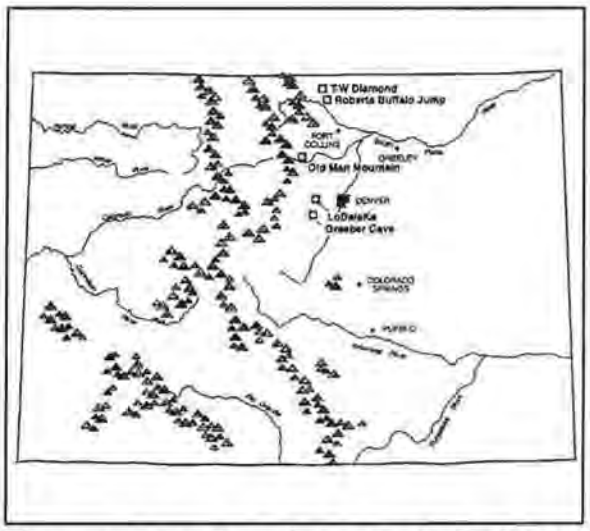

Figure 1- Location of Archaeological Sites where Intermountain Pottery has been Reported in Good Archaeological Context

DESCRIPTIVE QUALITIES OF COLORADO INTERMOUNTAIN POTTERY

The above five collections, then, can be used to describe what is known about Intermountain Pottery in Colorado in terms of vessel form, manufacture, and technical qualities.

Vessel Form/Shape

All of the Colorado pot examples have flat bottoms and direct rims. One (from Graeber Cave) of the two reconstructed pots has a distinctive flange at the juncture of the base and side wall. The diameter of the Graeber Cave pot increases with greater distance from the base, producing a shape that is similar to a flower pot or truncated cone. The shape of the Roberts Buffalo Jump pot can also be described, generally, as a truncated cone, but the side of the pot has a small but sharp shoulder about one third of

the way down from the rim to form a distinct shelf-like area (Witkind 1971:38). A large sherd from LoDaisKa seems to be from the shoulder area of a pot. Published dimensions are as follows:

	GRAEBER CAVE	ROBERTS BUFFALO JUMP	LODAISKA
VESSEL HEIGHT	14.0 CM	26.1 CM	9.0 CM
RIM DIAMETER	28.5 CM	23.9 CM	13.5 CM
BASE DIAMETER	12.5 CM	--------	--------
GREATEST DIA. AREA	RIM	SHOULDER	RIM

Technology

The paste often has a high mica content. Hardness ranges between 2.5 and 4.0 and the texture is usually coarse. Temper material is usually described as grit or crushed rock, particularly consisting of granite In general, the temper particle size ranges below 4 mm, but the Graeber vessel is described as having granitic particles as large as 8 mm. Temper shape is described on the basal sherd from Old Man mountain as being subangular to subrounded. Manufacturing technique has been difficult to determine, but Benedict believe that the Old Man Mountain pots could have been made by patch molding, and Irwin and Irwin feel that coiling is indicated in the sherds from LoDaiska. The sherds reveal relatively thick vessel walls that vary between 7 and 8 mm. The rims tend to be the thinnest portion of the vessels. When described, surface color appears to be irregular, but mostly occur in dark grey to dark brown shades. The surface color of the Roberts Buffalo Jump pot, as it appears in a black and white illustration (Witkind 1972:38) could be mottled with lighter colors as if it had been subject to irregular oxidation during firing. Irregular oxidation is also indicated in the LoDaisKa collection because one of the plain-surfaced sherds is bright orange in color. Core color is described as dark brown or black.

Surface Finish

Both interior and exterior surfaces are plain. some smoothing and scraping is apparent on the exterior and interior vessel walls.

CHRONOLOGY AND ARCHAEOLOGICAL CONTEXTS OF INTERMOUNTAIN POTTERY

Radiocarbon dates are associated with the Graeber Cave pot and T-W Diamond sherds. A date of 1550±340 BP (A-1272) was determined for the same tipi ring (Feature 11) from which the T-W diamond sherds came (Flayharty and Morris 1974:168). However, this date is at least 600 years earlier than two other dates from the site: 930±230 BP (A-1273) and 780±220 BP (A-1274), and Flayharty and Morris consider T-W Diamond to be a single component site dating in the 11th or 12th centuries AD. Nelson and Graeber (1966; 1984) obtained an even later date from Graeber Cave, 630±230 BP (I-12530). Thus, we are left, conservatively, with a very long time range (1550 to 630 BP) for the possible occurrence of Intermountain Pottery in Colorado. Using radiocarbon date correction methods, (Stuiver and Reimer 1993) the range would be between about 850 and 1400 AD, but could be even greater if the full extent of the statistical uncertainty

were included. To complicate matters further, Benedict reports a thermoluminescence determination from the Graeber Cave vessels that suggests a modern date for the vessel. If the theromoluminescence date and early date from T-W Diamond are incorrect, then a smaller date range for Colorado Intermountain Pottery, between the 11th and 14th centuries, is possible.

The Intermountain Pottery from Colorado has been found at a wide range of site types. It was uncovered at a camp near a bison kill (Robert Buffalo Jump), at rock shelter camps (LoDaisKa and Graeber Cave), at a tipi ring site (T-W Diamond), and at a suspected vision quest site (Old Man Mountain).

Intermountain Pottery has been described from the surrounding states of Utah, Idaho and Wyoming. As mentioned earlier, it was first defined by Mulloy (1958) from material found in Wyoming; although, similar ceramics attributed to the Shoshone had been described earlier (Mulloy 1952; Tuohy 1956; Wedel 1954) or at about the same time (Kehoe 1959). These ceramics are very similar to those described from Colorado with one major exception-a second vessel shape was included in the original definition. In addition to the flower pot shape, Intermountain Pottery has been found in a shouldered variety that is also flat bottomed and often flanged. From controlled contexts, the shouldered variety is the more common of the two varieties. The surface is undecorated and dark brown to gray in color. The surface of the straight-walled variety is described as undulating or dimpled with brush marks on the interior and exterior. The surface of the shouldered variety is often smoother or almost burnished and more uniform in thickness (Frison 1971; Haspel 1984; Creasman, Thompson, and Sennett 1990). Rim profiles undulate around the pot and vary from incurving to outcurving. Lips are rounded or flattened and sometimes thickened. The paste is tempered with coarse crushed rock or quartz, and the core is dark brown to black when fired.

There also appears to be a strong similarity between Intermountain ceramics and carved steatite vessels in the Northwestern Plains. Wedel (1954) pointed out that the shape and spatial distribution of Intermountain Pottery in the Northwest Plains is similar to those of stone vessels made of steatite, and, therefore, it is not surprising to find that flowerpot shaped vessels made of steatitie are reported from some of the same Colorado sites that produce Intermountain Pottery. Benedict (1985b) describes a portion of a steatite vessel that was found on Old Man Mountain. Portions of another steatite vessel were found near Old Man Mountain at a site called Beaver Point (Benedict 1985b:34-35). Since steatite vessels have seldom been recovered under controlled conditions (Frison 1982:274) and seldom found with Intermountain Pottery (McGuire 1977:14), the relationship between the two vessel types is far from clear even though the similar shape is suggestive of a relationship.

One interesting characteristic of some examples of Intermountain Pottery is the presence of fingernail impressions. At both Old Man Mountain (Benedict 1985b:18) and at Roberts Buffalo Jump (Witkind 1971:40), sherds with fingernail indentions were recovered. In the case of Roberts Buffalo Jump, fingernail indention is the only other

type of surface treatment noted from the site. While fingernail indented surface treatment is not part of Mulloy's definition of Intermountain Pottery, Kehoe (1959:238) notes finger and fingernail indentions, among several other types of decorations, on sherds that otherwise conform to the characteristics of Intermountain Pottery. In addition, in the Great Basin, both surface treatments are viewed as part of a general Paiute/Shoshone ceramic tradition (Madsen 1986:209). Along the same lines, Creasman, Thompson, and Sennett (1990) include fingernail indention as part of their definition of Boars Tusk Gray, a pottery type within Intermountain Pottery found in the Upper Green River Basin of Wyoming.

These observations raise the possibility that Intermountain Pottery may sometimes be decorated with rows of fingernail indentions. In this regard, it should be noted that, as far as I am aware, fingernail indentions have not been documented on flat bottomed pots. Kehoe's and Creasman, Thompson, and Sennett's descriptions are based on sherds. None of the whole or reconstructible pots from Wyoming with flat bases have fingernail indented decorations. Fingernail indented pottery of the Paiute/Shoshone tradition are, apparently, from conical-based pots (Madsen 1986:209). Therefore, it is still possible that Mulloy's original definition (plain-surfaced, flat bottomed pots) is still sound, and the assemblages of sherds, like Old Man Mountain and Roberts Buffalo Jump, with both surface decorations may reflect pots from two different types. They may be assemblages of mixed Intermountain Pottery and Uncompaghre Brown Ware. A brief discussion of Uncompaghre Brown Ware is given in the article on Ute ceramics in this volume and beyond the scope of this paper. However, it should be noted that some Uncompaghre Brown Ware, which is found in Western Colorado and into the Front Range (Benedict 1985a; Buckles 1971), does exhibit fingernail indentions, but not on flat bottom pots. Fingernail indented Uncompaghre Brownware pots tend to have pointed bases.

Intermountain Ware is found at a number and different variety of sites in the Northwestern Plains and mountains. The type is found at an antelope procurement site (Eden-Farson; Frison 1971), rockshelters/caves (Pictograph Cave, Mulloy 1958), base camps with structures (48SW5176, Galian Site, Creasman, Thompson and Sennett 1990), intense large mammal processing/bead production sites (John Gale and Nidiwh, Brox and Miller 1974 and Chomko 1986) and quarry/stone tool production sites with habitation structures (48AB301, Ziemens 1975), camps (48SW7646, Creasman, Thompson and Sennett 1990). Chomko (1986) argues that Intermountain Pottery in the intermountain basins of Central Wyoming is often found at late prehistoric Period sites with a distinctive point series (corner, side, tri-notched and un-notched triangular arrow points), intensive large mammal processing, and bone bead production. He proposes grouping assemblages/components with the above association from the intermountain basins of Central Wyoming into a Nidiwh Phase.

Some nine published radiocarbon dates are associated with Intermountain Pottery in Wyoming--all from the Western part of the state (Frison 1971; Husted and Edgar n.d.; McGuire 1977; Metcalf 1987; Creasman, Thompson, and Sennett 1990).

Corrected (Stuiver and Reimer 1993), they are:

SITE	LAB #	BP DATE	2 RANGE DATE (AD)	VESSEL FORM
GALIEN	BETA-36433	150±70	1528-MODERN	SHOULDERED
NIDIWH	BETA-3815	210±70	1480-MODERN	SHOULDERED
EDEN-FARSON	RL-101	230±100	1442-MODERN	BOTH
SKULL POINT	UGa-2047	300±50	1445-MODERN	SHOULDERED
MUMMY CAVE	I-1O74	370±90	1400-MODERN	SHOULDERED
48SW5176	BETA-41037 BETA-41036	500±50 570±50	1306-1617 1289-1450	SHOULDERED
FIREHOLE BASIN	UGa-2049 UGa-2048	625±50 645±135	1276-1435 1049-1490	FLOWERPOT

Thus, the date range indicated for Intermountain Pottery from Southwest Wyoming, 11th to 17th centuries, suggests that Intermountain Pottery was being produced several centuries later than has been documented for Colorado. The Colorado date range, tentatively from the 11th to 14th century, is closer to the range documented for Paiute/Shoshone pottery in Utah and Nevada (Madsen 1975). It seems probable, however, that subsequent date determinations will produce later dates in Colorado, also.

There is some indication in the above Wyoming dates, however, that the shouldered shape lasted longer than did the flowerpot shape, an idea that has been proposed by Creasman, Thompson, and Sennett (1990).

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APACHEAN CERAMICS IN EASTERN COLORADO: CURRENT DATA AND NEW DIRECTIONS

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INTRODUCTION

Apachean ceramics refer to a wide range of archaeological pottery types thought to have been made by ancestors of modern-day Apache tribes and bands now largely resident in New Mexico and Arizona. Speculation and research into the historic and archaeological origins of the Apache began more than a century ago when William Turner discovered a strong linguistic connection between Southwest Apachean languages and those of Athapascan Native Americans of west central Canada (1852). Over the years, an increasingly complete picture of prehistoric migrations of Canadian Athapascan groups southward into the Rocky Mountains, Great Plains, and, ultimately, to the Southwestern United States, has emerged (Hoijer 1956, 1971; Palmer 1992). However, that picture has not been without occasional confusion and controversy, particularly concerning archaeological culture remains which are believed to have marked Apachean ancestral presence along a migration route of more than two thousand miles and spanning as many as two thousand years of time (cf. Wilcox 1981).

It is the purpose of this paper to synthesize current archaeological, historic, and Apachean ceramic technical data found in Colorado and adjacent states. Published data were supplemented with laboratory analyses by the author of Dismal River ceramics from known sites in Colorado, Nebraska, and New Mexico along with ceramics from new and unpublished Dismal River sites in northeastern Colorado. Within the scope of that synthesis of data, this paper analyzes earlier hypotheses on Apachean ceramic culture origins, chronology, context, and definitions and proposes a hypothetical model of protohistoric/historic Dismal River culture dynamics.

PRE-CERAMIC EVIDENCE OF COLORADO APACHEANS

Southern Athapascan/Apache Origins

It is still unclear exactly when Athapascan bands first crossed geo-political boundaries into the present-day state of Colorado. Spanish historical records appear to indicate that Athapascan bands were scattered from the Black Hills region of the Great Plains to the Southern Plains of Texas by the early to mid 17th Century A.D. (J. Gunnerson 1960; Wedel 1961; Thomas 1966; Schlesier 1972). Thomas Kehoe has advanced the hypothesis that the Avonlea complex of Saskatchewan, Montana, and Wyoming, dated roughly between A.D. 100-1000, can be attributed to southward migrating Athapascans (1966: 839; 1973; Kehoe and Kehoe 1968). Wilcox has recently emphasized evidence for the Avonlea-Plains Apache association, noting that, in reevaluating the hypothesis:

> "that the Avonlea assemblages on the Northern and Northwestern Plains are a manifestation of Athapaskan migration..a review of linguistic, ethnological, biological and archaeological data shows that the Avonlea hunters were in the right places at the right times...A chronological analysis of current Avonlea data further supports this hypothesis, but more thorough testing through comparative studies and problem-oriented fieldwork is needed." (1988: 273).

The Avonlea cultural inventory includes small, finely-flaked, side-notched Avonlea projectile points which may, in part, be ancestral to later known Plains Apache side-notched points (cf. Frison 1978: Fig. 5.41 c, d, f). Avonlea ceramics, so far confined to the Northern Plains, consist of parallel-grooved and net-impressed wares (cf. Johnson 1988). Avonlea ceramics, although rare, are known from the Avonlea type-site in south-central Saskatchewan and from sites in eastern Montana, central Wyoming, and western South Dakota. The closest published Avonlea ceramic site to Colorado's eastern plains is western Wyoming's Wardell bison kill and processing site which contained fragmentary sherds and a partial, elongate, shoulder-less, pointed bottom vessel at Wyoming's Wardell site (Frison 1973; Frison 1978: 224-229). The Wardell vessel form is closely paralleled by contemporary Besant and Plains Woodland pots and may represent ceramic technology borrowing, at least in vessel form, by Avonlea proto-Apachean populations from their Besant neighbors. However, recent discoveries in northeastern Colorado suggest that Avonlea groups may have also entered the state. Avonlea-like parallel-grooved ceramics were recently recovered from the Hiatt site in extreme northeastern Colorado's Sedgwick County and this author has noted several Avonlea points in private collections, including one recovered a short distance west of Greeley in 1993.

Probable contact with Besant and northern Plains Woodland peoples by proto-Apachean groups may have given early northern plains Athapascan proto-types of ceramic technology well before they entered Colorado (cf. Johnson 1988: 140-141). Such ceramic technology borrowing from neighboring cultural groups, as will be seen later, became an on-going cultural trait of later early historic Plains Apache populations throughout the plains regions.

There have been a number of competing theories about how and when Athapascan proto-Apachean groups first entered and/or migrated through or around the present state of Colorado into the American Southwest. One early idea viewed Apache ancestors, particularly Navajo Apache ancestors, as having taken a Rocky Mountain intermontane route along the western side of Colorado's continental divide (cf. Amsden 1932; Spencer 1947: 27; Riley 1954). And, for a time, a popular idea was that Apachean invaders were at least partly responsible for the demise of Mesa Verdean Anasazi cliff dwellers in Southwest Colorado (Gladwin 1957: 269).

Another better-substantiated theory

proposed the gradual diffusion of proto-Apacheans southward through the High Plains of Eastern Colorado and Western Kansas. That theory is well-supported by incontrovertible early Spanish documentation of early Apachean groups in the High Plains during the mid 17th through the late 18th Centuries (cf. Hammond and Rey 1928: 200-203; Matson and Schroeder 1957). However, it is also possible that some proto-Apachean bands may have also filtered south along the western side of the Rockies, particularly if Avonlea sites in western Wyoming are truly Athapascan in nature. Some researchers in the past have proposed a link between early Athapascans and Fremont and Promontory Point cultures of the northern Colorado Plateau (Hyde 1959: Aikens 1967). Current archaeological evidence, though, indicates that both Promontory Point and Fremont cultures were largely indigenous developments and not associated with migrating Athapascans (Madsen and Berry 1975). If even limited Athapascan proto-Apachean groups did take the western "high road", their presence remains to be adequately demonstrated in archaeological terms. For the purposes of this paper, I will assume that the greater preponderance of southward Athapascan migration through Colorado took place on the eastern side of the continental divide (Figure 1).

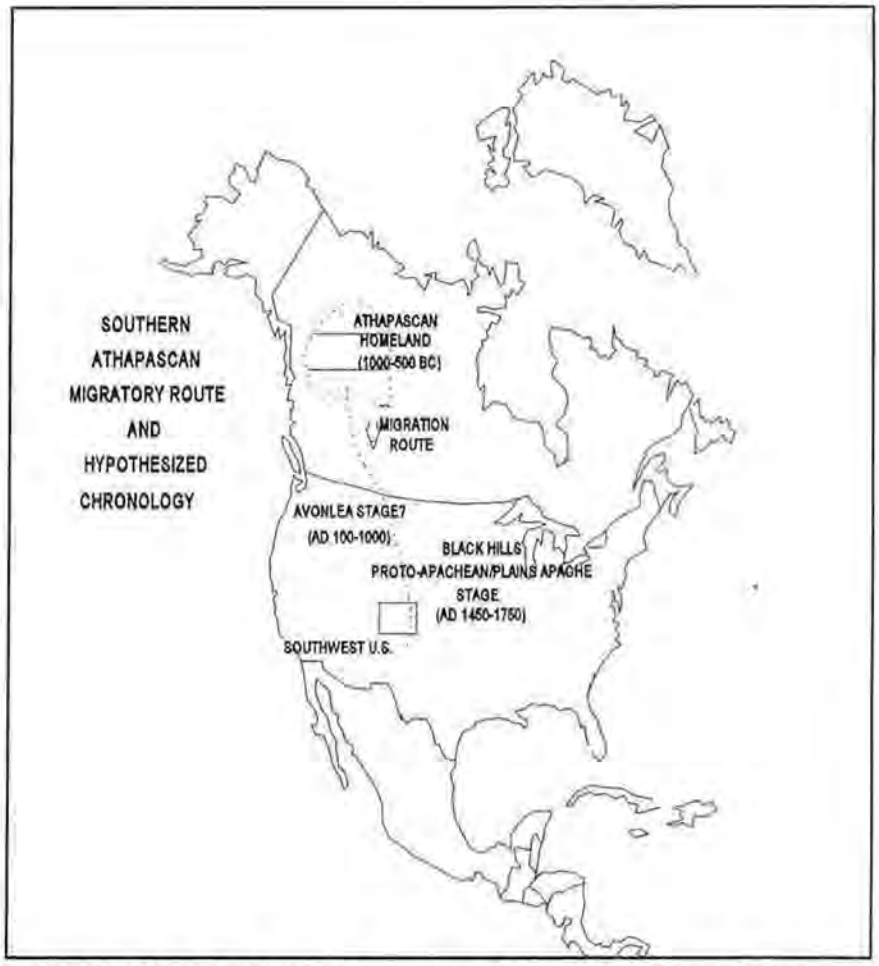

Figure 1-Hypothesized Athapascan Migration Route from Western Canada to the Western U.S.

Although, on current evidence, it is reasonable to assume that the predominant proto-Apachean southward migrations occurred east of the Rocky Mountains, chronological perspectives on those migrations remain somewhat speculative. David Wilcox has suggested that migratory Athapascan bands, in the form of Avonlea Complex populations, had drifted south and eastward into Wyoming and the western Dakotas by at least A.D. 1000 (1981: 220-223). Radiocarbon dating of Avonlea sites in Wyoming and Montana range between A.D. 400 and 1250, with a bias toward the mid-point in that range, centered around A.D.

750 (Morlan 1988: 304-305, Fig. 5). There is some evidence to suggest that these early Plains Apache may have remained in the northern plains, centering in the Black Hills region, until they again resumed their southward migration around A.D. 1450-1500. Dorothy Gunnerson (1972) has proposed that this southward proto-historic movement could have been motivated by a re-generation of bison population numbers in the High Plains and Southern Plains after their depression from a series of warming, drought cycles, the Pacific Climatic Episode, between A.D. 1250 and 1450. Limited paleo-climatic and archaeological data indicate that late Upper Republican populations of northeastern Colorado and late Upper Purgatoire Complex and Apishapa populations of southeast Colorado largely abandoned Colorado's High Plains after A.D. 1250-1300 (cf. J.J. Wood 1967: 656; C.E. Wood 1986; Gunnerson 1987: 85, 1989: 127-128). Reinvigoration of Eastern Colorado bison populations with cooler and moister Neo-Boreal Climatic Episode conditions, along with the area's earlier human depopulation, could have helped draw more northerly proto-Apachean populations into Colorado after A.D. 1450/1500 (cf. Butler 1986: 57-58).

To date, there is very *limited and largely circumstantial evidence* of a late prehistoric, *ca.* A.D. 1300-1550, aceramic and ceramic Apachean presence in Colorado's Eastern Plains and foothills. Early suspected Apachean site localities, such Carrizo Ranches in southeastern Colorado, which consist of a series of stone ring groupings associated with small side-notched and unnotched triangular projectile points and Pueblo IV trade pottery, are dated between A.D. 1490 and 1515. A single bone radiocarbon determination from one of the Carrizo Ranches ring clusters yielded a dating of A.D. 1350±55 (Kingsbury and Gabel 1983). Other, somewhat circumstantial, evidence of early Athapascans in Colorado has been cited in the presence of tri-root molars in a handful of Upper Purgatoire Complex burials of southeastern Colorado (Turner 1980; Wood 1986: 139). Three-rooted molars, versus two-rooted molar patterns of previous regional skeletal populations, are thought to be largely characteristic of Northwest Coast and Canadian Athapascan peoples and may indicate the presence of Athapascans in the Upper Purgatoire Valley. Current dates for the skeletal remains and the Upper Purgatoire Complex, are A.D. 1000-1225. Such an early date for Colorado Apacheans may well be supported by the presence of Avonlea projectile points and possible parallel-grooved ceramics in northeastern Colorado (noted above).

APACHEAN CERAMIC-USING CULTURES

Early Historic and Archaeological Evidence

Whether or not Athapascan proto-Apachean peoples were present in Colorado prior to the early 16th Century remains an unresolved archaeological problem. But there appears little doubt that bands of modern-day Apache ancestors were interacting with northeastern New Mexico pueblos and Spanish conquistadors by the start of the 17th Century. Juan de Onate, an early Spanish explorer of the Upper Rio Grande and Southern High Plains, reported in 1599 that Apache were living in small pueblo towns in northeastern New Mexico and adjacent

southeastern Colorado (Hammond and Rey 1953: 484). Later Spanish expeditions, Ulibarri in 1706 and Valverde in 1719, described Apache villages and modestly irrigated fields in the foothills and plains margins of modern-day northeastern New Mexico (Thomas 1935: 62-64, 110-133, and 263). Spanish documents further indicate that early southern Athapascan Apaches, by the early and mid-1700's, were being pressured by hostile Comanche and Ute bands into moving westward off the southern High Plains into the Upper Rio Grande Valley (cf. Twitchell 1914: 150; Gunnerson 1969: 23, 1979: 164). Ethnohistoric and archaeological evidence from South Dakota and western Nebraska suggests that northern Plains Apache, known as Padouca or Gataka (probable Kiowa Apache), had largely abandoned the northern plains by the late 1700's (Lazio 1978).

Between 1959 and 1965, James Gunnerson (1969) conducted excavations and surveys in the Sangre de Cristo mountains east of the Rio Grande River which uncovered a number of sites he identified as belonging to Jicarilla Apache living between A.D. 1600 and 1750. One site, Glasscock, contained an L-shaped adobe pueblo foundation once consisting of seven rooms. The Glasscock assemblage included small, delicate triangular side-notched and unnotched projectile points, Rio Grande Pueblo pottery, clay pipes, a bell-shaped roasting pit, a fragment of Spanish iron, and Mexican blue-on-white trade ceramics. Other Apachean-affiliated sites in the region included shallow pitstructures and stone rings. Nearly all of Gunnerson's Jicarilla sites had varying amounts of two closely related, and chronologically sequential, ceramic types, Ocate Micaceous and Cimarron Micaceous, both of which are discussed below.

Dismal River: a Plains Apachean Ceramic-Using Culture

Historic and archaeological data from northeastern New Mexico support the presence of Athapascan groups in that region by at least A.D. 1600 and possibly earlier. There is also significant archaeological, but less complete Spanish documentary, evidence for the presence of Plains Apache bands as far north as the North Platte River in Wyoming and Nebraska, including the Colorado High Plains, by that time. Schlesier (1971: 101) and others have proposed that northern and southern variants of Plains Apache culture were present in the Great and High Plains by the mid to late 17th Century. Based on mainly historical documentation, Schlesier concluded that the northern Apachean Tradition, or "Dismal River proper", was confined to areas north of the North Platte River in Wyoming and Nebraska. A southern tradition, represented by four sub-regional divisions, reflected varying degrees of contact and interaction with neighboring plains Caddoan or Rio Grande Pueblo populations south of the North Platte River. Based on the analysis of ceramic and other archaeological data, this author agrees with Schlesier's assertion of multiple variants of protohistoric Plains Apache culture, but does not accept a primary north-south geo-cultural division as being represented by the North Platte River. Instead, at least three cultural variants are seen to have existed within the state more or less contemporaneously, with a western Dismal River variant representing the most common Plains Apache cultural presence within the Colorado. Arguments and data

supporting that hypothesis are presented in the following paragraphs.

Northerly Plains Apachean groups, commonly referred to as the *Dismal River Aspect*, have been documented by more than a half century of archaeological research in the Dakotas, Wyoming, Nebraska, Kansas and Colorado. The Dismal River culture tradition was first identified in the Dismal River area of southwestern Nebraska during the early 1930's (Strong 1932, 1935; Gunnerson 1960: 141-143). At that time, the Dismal River culture had not yet been associated with proto-historic/historic Plains Athapascans. However, such an ethnographic association, although possessing a history of considerable controversy, has been reasonably well-established in the past half-century of archaeological and historic documentary research by a number of scholars, most notably James Gunnerson of the University of Nebraska (cf. Hill and Metcalf 1942: 164-165; Wedel 1947: 151-152; Champe 1949: 292; Gunnerson 1960, 1968, 1969, 1987).

Initial archaeological data on the Dismal River culture were derived from southwest Nebraska excavations of the 1930's and 40's, later followed by surveys and excavations in Kansas and Colorado. Nebraska Dismal River sites were found to be mainly small, shallow-pithouse villages situated along river and tributary creek terraces. The earliest, most completely excavated site was the Lovitt site (25CH1), but its excavation was shortly followed by work at such localities as White Cat Village and Ash Hollow Cave-the latter site providing stratigraphic evidence of Dismal River as being post-Upper Republican/Plains Village (Hill and Metcalf 1942; Champe 1946, 1949). A primary seminal description of the Dismal River was provided by James Gunnerson's monograph, *Introduction to Plains Apache Archaeology*, published in 1960. Numerous other studies on Dismal River, cited throughout this paper, have formed the basis of our substantial, but still incomplete, framework of Dismal River/Plains Apache history today.

Based on archaeological, historic documentary, trade ceramics correlations, radiocarbon, and dendrochronology data, the ceramic-associated Dismal River chronology may span no more than two centuries, *ca* A.D. 1525-1725, with a more probable ceramic-using phase of *ca* A.D. 1625-1725 (Gunnerson 1968: 167; Brugge 1982; O'Brien 1984: 75). Current evidence on the Dismal River culture indicates that material culture and lifestyles were relatively diverse throughout an extensive territory in the High Plains and Central Plains of Southeastern Wyoming, Eastern Colorado, Southwestern Nebraska and Western Kansas. Data analyzed for this article suggest that three generalized cultural sub-sets of Plains Apache may have existed in the western plains regions: (1) eastern populations (western Great Plains) with semi-sedentary to sedentary settlements and modest agriculture-based subsistence components, (2) western (northern and central High Plains) nomadic hunter-gatherer bands with little significant evidence of agriculture and sedentism, and (3) southern (southern High Plains) populations emphasizing various mixes of semi-sedentary horticulture/hunting-foraging and nomadic hunting-foraging. The first two sub-divisions are considered here to be sub-variants of the above described Dismal River culture while the third, southern archaeological manifestation, is distinctive enough to

warrant inclusion as a second Plains Apache culture, the *Sangre de Cristo* or *Jicarilla Apache*.

As a rule, archaeological evidence indicates that, many, if not most, Eastern Dismal River community bands lived as semi-sedentary agriculturalists and seasonal hunter-gatherers who occupied the higher rainfall areas of southwestern Nebraska, and limited areas of western Kansas and extreme northeastern Colorado. On at least a seasonal basis, eastern Plains Apache lived in small, shallow, five or four post-hole pithouse, or earth-covered lodge, villages and cultivated corn and squash. Excavations of Nebraska sites show that agricultural production was largely secondary to hunting and plant-foraging subsistence. Bell-shaped roasting pits are a particularly common Dismal River Plains Apache trait along with less diagnostic small, finely flaked side-notched and unnotched triangular projectile points, bison-scapula hoes, and a distinctive stub-nosed end scraper. Normally, identification of archaeological cultures in Colorado is made possible through diagnostic projectile point types dated by physical methods in well-stratified contexts. Dismal River side-notched and unnotched points, however, are essentially similar to those of earlier Plains Village and other contemporary regional cultures and appear to lack a distinctive, diagnostic potential for identifying Dismal River sites. Elsewhere, I have suggested that one potentially distinctive trait of Plains Apache side-notched points could be their seemingly common possession of concave bases and a uniform lack of basal notching, the latter often found in other earlier and contemporary cultures (Brunswig 1990: 34). However, this trait will have to tested by a more thorough review and analysis of the archaeological data than presented here.

Today, the primary means of distinguishing Dismal River sites, both in eastern and western regions, is through the presence of diagnostic ceramics. Eastern Plains Apache communities, being sedentary and minimally food-producing in nature, made, used, and traded relatively substantial amounts of pottery, a topic described and discussed in more detail below.

Western Plains Apache, those living west of the High Plains 15" rainfall isohyet line-mostly in eastern Colorado and southeastern Wyoming, appear to constitute a second lifestyle sub-division. Slim archaeological data provide a picture of wide-ranging nomadic to semi-nomadic hunting-gathering bands ranging from the continental divide of the Rocky Mountains to the foothills and plains of eastern Colorado and western Kansas. The only known semi-sedentary Dismal River site, with five small pithouse remains, is Cedar Point Village northwest of Limon in northeastern Colorado (R. Wood 1961). Excavation of the Cedar Point site provided no indication of supplemental agricultural production, but only of hunting and gathering subsistence, particularly focused on bison. However, the presence of natural springs draining from Cedar Point Mesa to a wide alluvial valley west and northwest of the site could have made limited irrigation farming possible. All other known or suspected Colorado Dismal River sites appear to be medium to short term hunting-gathering camps of nomadic or semi-nomadic hunter-gatherers. These are universally represented by the presence of stone ring tipi/wickiup rings or rock shelters, non-diagnostic lithic debitage, lithic tools, loosely defined Dismal River ceramics, and

side-notched and unnotched triangular points. In 1994, the author excavated a stone ring camp (5WL1995) in northeastern Weld County which yielded Dismal River pottery and an unnotched triangular projectile point (Brunswig 1994). Widespread mobility of the Western, and probably some Eastern, Plains Apache groups, is evident in the distribution of Southwest-derived turquoise beads, Rio Grande Pueblo IV trade ceramics, and Ocate Micaceous pottery from northwest New Mexico (cf. Benedict 1985: 21; Husted 1962: 51-52, 1964; Wedel 1983; Witty 1983: 104).

A third Plains Apachean cultural variant, considered here to be distinctive enough *not to be labeled Dismal River*, appears to occur largely south of the Arkansas River. Its main distribution was in the mesa-canyon lands, foothills and plains of northeastern New Mexico, southwestern Kansas and northwestern Oklahoma. Southern Plains Apache populations practiced a wide variety of lifestyles from nomadic hunter-foragers in the more easterly plains to semi-sedentary, possibly pueblo-building, communities east of the Rio Grande River. Nevertheless, a handful of southern Plains Apache ceramics appear in more northerly Dismal River contexts (see below), either through trade or direct travel.

Distribution of Dismal River Sites in Colorado

Distribution of Colorado's Dismal River sites is directly tied to often insecure identification of that culture's ceramics at localities, usually from ephemeral surface scatters, throughout the state's eastern plains, foothills, and Rocky Mountain Front Range mountains. A recent computer search for reported Dismal River sites at the Colorado State Archaeologist's Office in Denver turned up only eight sites *officially* listed with Dismal River components. A comprehensive review of current published and grey archaeological literature and examination of curated ceramics revealed the presence of nearly seventy sites thought to be affiliated with the Dismal River culture. Each of these sites is listed with brief descriptive data in Appendix A at the conclusion of this article. Figure 2 illustrates the general distribution of reported Plains Apache sites of the three "cultural variants" within Colorado and immediately adjacent state areas.

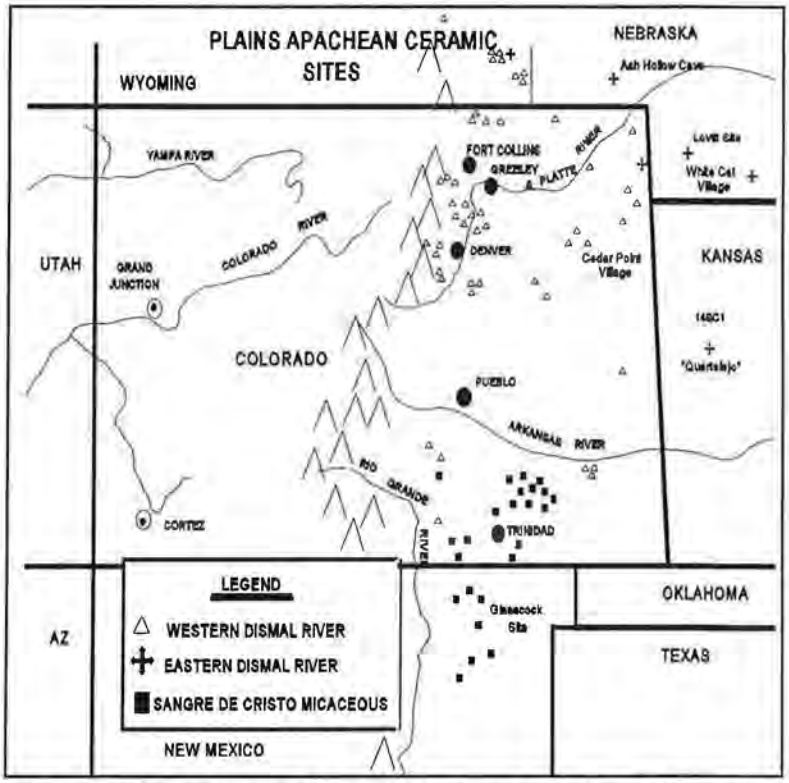

Figure 2-Distribution Map of Various Apachean Ceramic Culture Sites in Colorado and Adjacent States.

Geographic and topographic locations of reported Dismal River sites range from the High Plains of extreme eastern Colorado to the Rocky Mountain Front Range foothills and mountains westward to the continental divide. If accurate, the distribution pattern shown in figure 2 suggests that Dismal River groups ranged through all of Colorado's Eastern Slope environmental zones from high mountain passes and valleys eastward through its foothills and across its plains.

The second protohistoric/historic Plains Apachean cultural variant, noted at the start of this section as Jicarilla Apache peoples (documented by Spanish historic and archaeological records in northwest New Mexico), inhabited the mesas and canyons of southeastern Colorado's Chaquaqua Plateau and adjacent areas (see J. Gunnerson 1969). Although closely related to the Dismal River Plains Apache culture, southern Plains Apachean ceramic technology is also closely related to Rio Grande pueblo wares, and is sufficiently distinctive to distinguish its makers as constituting a cultural sub-set (at least ceramically) from the more northerly Dismal River cultural sub-variants. Still incomplete, but highly suggestive, field data on possible Jicarilla Apache sites in extreme southeastern Colorado suggests that their "home range" did not extend far northward into the state. However, the presence of modest amounts of "Jicarilla" (designated here as the "Sangre de Cristo Apache" cultural variant) ceramics at many Dismal River sites in Colorado's southern High Plains suggest that the Jicarilla were engaged in active trade and contact with their northern Dismal River Apachean counterparts. At the same time, interaction with pueblo communities of the Rio Grande Valley has been also been well-documented in numerous research publications through the years (cf. Baugh 1991; Brugge 1984; Speth 1991; Spielmann 1983, 1991). The tentative distribution of Sangre de Cristo Apache sites in southeastern Colorado (shown in Figure 2) indicates the northernmost active penetration of that cultural population into the state. It also appears to denote a probable "interaction" zone in which Jicarilla and Dismal River Apaches culturally overlapped.

PROTOHISTORIC/EARLY HISTORIC APACHEAN CERAMICS: DESCRIPTION AND ANALYSIS

More than a half century of research has gone into development of the current database and interpretations of Plains Athapascan archaeology and ceramic technology. The earliest definitive Apachean ceramic typologies were derived from Nebraska Dismal River site excavations in the 1940's and formalized by George Metcalf in a short Plains Conference Proceedings paper (1949). Metcalf proposed the existence of three primary ceramic types; **Lovitt Stamped**, **Lovitt Plain**, and **Lovitt Micaceous**. James Gunnerson later expanded on Metcalf's types with his synthesis on Dismal River data in 1960. Two further types, **Scott Micaceous** and **Scott Plain**, were proposed by W.R. Wedel for western Kansas Dismal River sites in 1959, constituting sub-regional co-variants of the earlier established Lovitt types (Wedel 1959: 441-444). Later, during the 1960's, Gunnerson's work on Apachean sites in northeastern New Mexico resulted in his proposal of two additional, chronologically sequential ceramic types in that region, **Ocate Micaceous** and **Cimarron Micaceous** (1969). Finally, in 1985, a five day conference was convened at the University of

Colorado (Boulder) to "rethink" the issue of Apachean ceramics in plains regions and the American Southwest. Conference participants examined numerous examples of Apachean pottery, including Navajo Apache types of north central New Mexico. Some of the Boulder conference's concerns were beyond the scope of this study, namely southern plains Apache ceramics of Texas, Oklahoma and Arizona which, in all likelihood, represent yet another variant of Apachean culture.

Other conference topics, however, coincided directly with this study's goal of systematically evaluating Apachean ceramics documented east of the continental divide within of Colorado. The Boulder conference proposed a major revision of Apachean/southern Athapascan archaeological ceramic taxonomy. Broad details of the new taxonomy were subsequently published in a brief *American Antiquity* article (Baugh and Eddy 1987). Additional information on the CU conference's new taxonomy criteria was obtained by this author through discussions with conference organizers Frank Eddy and Timothy Baugh and their observations incorporated into this study's analysis of Apachean ceramic typology. This study also includes new physical and microscopic analyses of museum collection ceramics and a thorough review of current literature on Apachean ceramics. The ultimate goal of this research, as stated elsewhere, is to help to determine the probable context, role, and typological validity of currently defined Apachean ceramics in protohistoric/historic Apachean culture dynamics.

The Boulder conference taxonomy divided all known southern Athapascan ceramics into four hierarchical taxonomic levels based on a common Southwest U.S. ceramic classification system of descending trait similarity groupings of wares, series, types, and varieties (cf. Colton and Hargreave 1937; Wheat, Gifford and Wasley 1958; Sabloff and Smith 1966). Details of how this system was used to classify the various southern Athapascan ceramics remain to be adequately described and published. Nevertheless, the Boulder conference's taxonomic classification of wares, series and types for Colorado-based Apachean ceramics are considered to have sufficient validity to be adopted as a working conceptual framework. This does not mean that more detailed future work won't be needed for a more substantial validation of that framework. In fact, data presented here are considered to be an early effort in a long-term research effort in describing and validating the Boulder taxonomy. A slightly modified version of the Boulder Apachean taxonomy, including only ceramic culture elements occurring within Colorado, is presented in Figure 3.

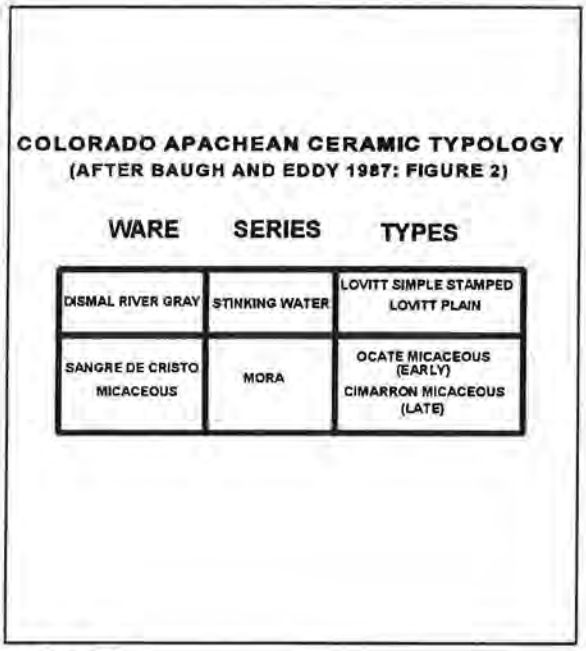

Figure 3

According to the Boulder taxonomy, two major Apachean ware groups occur within the plains and eastern Rockies regions: (1) Dismal River Gray, and (2) Sangre de Cristo Micaceous. A third ware group is Quemado Gray, which includes a descending series class of Navajo Apache ceramics that was ephemerally present in southwestern Colorado during the protohistoric/historic period. Quemado Gray, its typological equivalents, and proto/early historic Apachean Navajo archaeology are topics beyond the scope of this paper, but are discussed elsewhere in this volume (see Hill, this volume).

The first of the two Apachean ware groups, *Dismal River Gray Ware*, consists of a reduced-atmosphere fired ceramic which includes two primary types; *Lovitt Plain* and *Lovitt Simple-Stamped*. Only one intervening series class was defined at Boulder, *Stinking Water*, referring to the Stinking Water focus, an archaeological taxonomic sub-division (analogous to a phase) of southwest Nebraska's original Dismal River Aspect. Further ceramic analysis of Dismal River materials should result in the definition of other taxonomic *series* if this ware-series-type framework gains wide acceptance in the future. Previously proposed Scott Plain, Scott Micaceous, and Lovitt Micaceous ceramics have been dropped from the Dismal River type list for reasons which will become clear shortly. It is proposed here that Dismal River Gray Wares be tentatively sub-divided into regionally variant ceramic patterns; *Western Dismal River*, where the Lovitt Plain type (with localized variety variants) is essentially the only represented type, and *Eastern Dismal River*, where Lovitt Simple-Stamped and Lovitt Plain types appear in varying percentages. The Western Dismal River pattern appears to be found almost entirely in Colorado from just north of the Wyoming-Colorado border to just south of the Arkansas River. The Eastern Dismal River pattern is typical of southeastern Nebraska and western Kansas, again approximately southward to the Arkansas River, but examples of its ceramic types also occur rarely in extreme northeastern Colorado.

Sangre de Cristo Micaceous Ware is also a reduced-atmosphere ceramic group, but is defined by quite different paste composition and surface treatment. Even so, it has a large number of important traits in common with the northern Dismal River Gray Ware and is undoubtedly Apachean in nature. Only two types have been defined for the Sangre De Cristo Micaceous Ware group; *Ocate Micaceous* and *Cimarron Micaceous*. Both types were defined by Gunnerson's archaeological research on Jicarilla Apache

sites in northeastern New Mexico's Sangre de Cristo mountains and foothills. Current archaeological and typological evidence suggest that Ocate Micaceous is ancestral to Cimarron Micaceous and contemporaneous with Dismal River. Cimarron Micaceous is thought to be post-Dismal River or, at the very most, terminal Dismal River in date.

Cultural Origins of Plains Apachean Ceramics

Origins and sources of inspiration for Apachean ceramics in the plains and eastern Rocky Mountain margins have been debated for many years. In particular, the debate has centered on two possible sources of ceramic technology for Apachean ceramics: (1) protohistoric Plains Village populations of the Great Plains of southern Nebraska and central Kansas, and (2) Pueblo IV population of New Mexico's northern Rio Grande valley. For instance, a recent model of Apachean ceramic development proposed that nearly all Apachean ceramic technology could be ultimately traced to intense contact and interaction with Rio Grande pueblos, well-documented in early historic Spanish records (Brugge 1982). The 1985 Boulder conference participants rejected that hypothesis, concluding:

> "that more than one source was responsible for the development of Southern Athapascan ceramics..."
> (Baugh and Eddy 1987: 793)

The results of this study tend to confirm an hypothesis of multiple sources of ceramic technological inspiration from various regions of the High and Great Plains and eastern periphery of the Rockies. Specific traits of these multiple ceramic technology stimuli are noted, in part, in ceramic type descriptions below.

Dismal River Gray Ware Type Descriptions

The two Dismal River Gray Ware ceramic types, *Lovitt Plain* and *Lovitt Simple-Stamped* are, on present evidence, identical in their physical and composition traits. They are separable only by a presence or absence of decorative traits.

Lovitt Plain/Lovitt Simple-Stamped

Construction and Surface Treatment

Dismal River vessels were mostly roughed into form by hand-forming, thinned by the use of a paddle and anvil, and then surface smoothed by scrapping. Coil-construction is suspected in rare cases, but cited examples are not unequivocal. Thinning paddles were either roughened by carving or, in some cases, were wrapped in fine cord. Surface scrapping and smoothing, though, tends to almost always thoroughly obliterate carved-paddle or cord marks, particularly in the Lovitt Plain examples. In fact, in many Western Dismal River examples of Lovitt Plain sherds, paddle thinning marks are typically indistinct or almost completely obliterated by surface working or subsequent sherd erosion. In cases where carved paddle or cord-marks are found, there is often a condition of possible stratigraphic component-mixing with earlier Plains Woodland or Upper Republican ceramic levels, often confusing the issue. Surface smoothing of the Lovitt types occasionally includes the rubbing and light burnishing of the vessel exterior after the clay has almost

completely air-dried.

Paste Composition

Paste inclusions include mostly coarse to medium (1-.34 mm-Wentworth Scale) angular to rounded quartz sand and grit. Many Eastern Pattern, and fewer Western Pattern, sherds and vessels have slight to modest amounts of fine to medium mica particles in the paste. There is no doubt that fine mica inclusions (temper?) is an occasional Dismal River Gray Ware trait since they are found in Lovitt Simple-Stamped vessels manufactured in large quantities at Eastern Pattern sites in southwest Nebraska. However, a handful of heavily micaceous (medium to very coarse sized mica particles) sherds found at Eastern Pattern sites are undoubtedly Ocate Micaceous "trade" ceramics from south of eastern Colorado's Arkansas River. The Ocate Micaceous type is described in detail below. A full analysis of an Ocate Micaceous sherd from the Lovitt site was undertaken as a part of this study's technological analyses of Apachean ceramics.

Lovitt type(s) pastes are generally compact and moderately friable, the breaking fracture tends to be straight and regular. Their sandy, granular texture is usually fine and well-worked, with few air pockets and fissures evident. Cross-section and exterior/interior surfaces range from dark buff to gray to black in color, with a bias toward a dark gray. Heavy fire-blackening is usually present, particularly in Eastern Dismal River sites where sherds have remained in their original buried contexts with abundant charcoal and ash. Western Dismal River sherds almost all have been recovered from surface contexts where much evidence of heavy burning has weathered and bleached off. Some surface spalling, due to trapped air pockets in the paste clay, is found on Dismal River pottery, although it is fairly uncommon. Paste clay condition and coloration show that firing took place in a reducing atmosphere. Carbon streak, again particularly in Eastern Pattern ceramics, is fairly common. Sherd hardness, measured on the Moh's scale, ranges between 3.0 and 4.0.

Vessel Forms and Components

Data on Dismal River vessel forms are limited to a handful of whole or partially reconstructible examples. Only one complete vessel is known from Colorado, a recently acquired pot from a Trinidad private collector by the University of Colorado Museum (Priscilla Ellwood, *personal communication*).

Dismal River vessel forms can be morphologically defined as pots-having mouths wide enough to allow stirring and being taller than wide. Dismal River implementation of the pot form, though, is highly variable, ranging from moderately tall (height to width ratio of 1.75:1.00) to short (height to width ratio of 1:1). Vessel bodies appear universally globular in shape with gradual to abrupt body/neck junctures. Necks are short to medium in length, but none are more than 10% of the overall vessel height. Bases are rounded, but vary from being quite wide and stable to nearly pointed. There do not appear to be substantive differences in Eastern and Western Dismal River vessel forms, although complete examples of western pots are nearly unknown. Figure 4 provides illustrations of eastern pots from Nebraska and Kansas site localities while figure 5 illustrates a recently documented

western Dismal River vessel from the southeastern Colorado area near Trinidad.

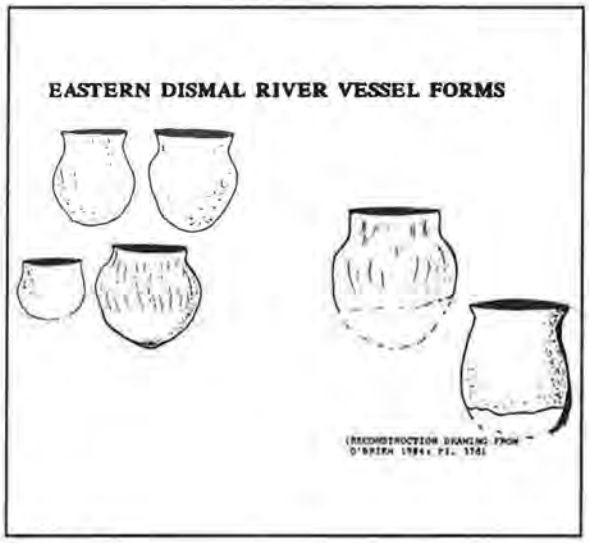

Figure 4

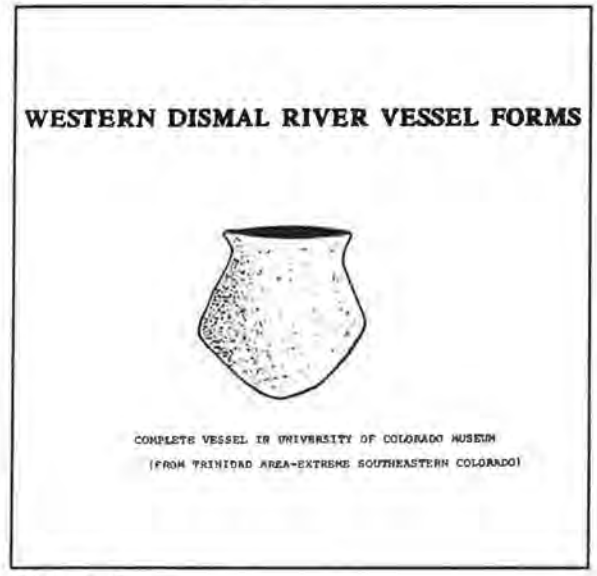

Figure 5

Dismal River rims are almost universally turned out, but vary from having strongly excurvate oblique to nearly vertical (straight) angles. Rim profiles vary from gradual thinning to an abrupt thickening at the terminal lip. Lip forms can be pointed, rounded, or flattened (Fig. 6a and 6b).

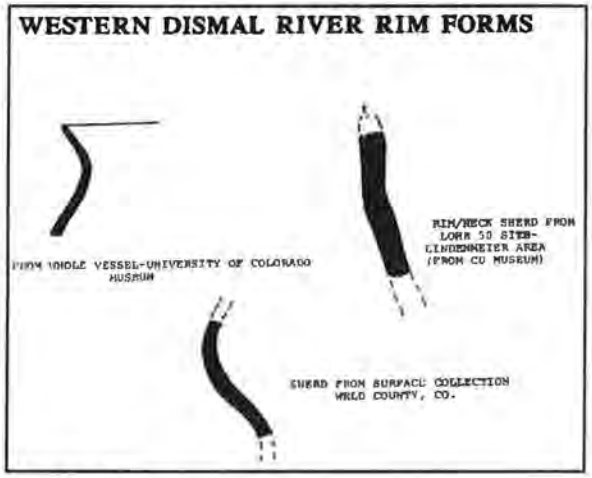

Figure 6a

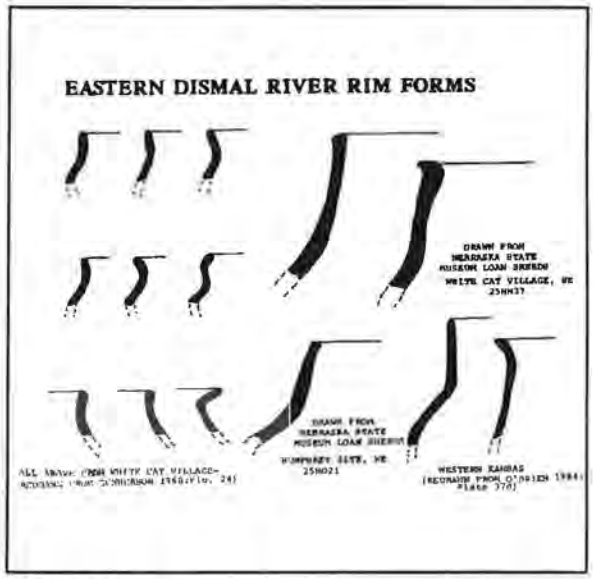

Figure 6b

The above rim and lip forms are based on mostly Eastern Dismal River examples. Very limited evidence for Western Dismal River rim and lip forms indicate a

preponderance, if not an exclusive, preference for turned out, uniform width to gradually thinning rims with pointed to bluntly rounded lips (Fig. 7).

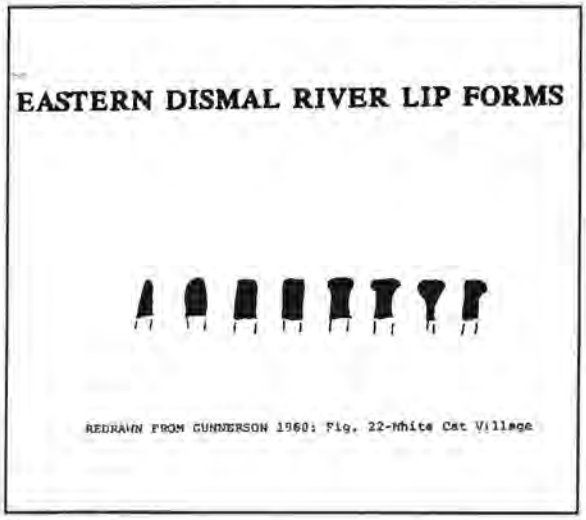

Figure 7

Vessel Size and Wall Thickness

Dismal River vessel sizes vary from 10 to 40 cms. in height. The single Colorado whole pot specimen is at the high end of that range, 38 cms. Mouth orifices can be as wide as their maximum vessel widths, but appear to never be narrower than 50% of the overall vessel height.

Vessel wall thickness, as a diagnostic trait, has limited usefulness in most cases. In particular, sherd thickness will depend, to some extent, on where sherds originate on the vessel body. However, it can be a valuable supplementary criteria for comparing different wares, types, or varieties within types. Eastern Dismal River pottery wall thicknesses range from 3 to 10+ mm., with and estimated mean of 6-7 mm. Western Dismal River vessel wall thickness criteria are more difficult to judge, due to the relative paucity of samples. However, on present evidence, Western pattern ceramics tend to be somewhat thicker than the eastern examples, ranging up to more than 11 mm. with an estimated mean of 8-9 mm. There may also be an incremental increase in vessel wall thickness from east to west, although this is far from certain with present data.

Decoration

The only known decorated Dismal River pottery belongs to the Lovitt Simple-Stamped type. Vessel exterior surface decoration consists of rectanguloid, stamped paddle marks (carved into the paddle) which leave a shallow U-shaped depression in the exterior surface.

Stamping is mostly found just below the rim on the vessel neck and on the upper vessel body below the neck juncture. Some possible whole vessel stamping examples appear to exist, but stamp decoration is normally confined to the vessel sectors just noted. It appears likely, considering the composition similarity of the two Lovitt types, that many Lovitt Plain sherds came from undecorated portions of stamp-decorated vessels. Stamped sherds are almost completely absent from Western Pattern (and Colorado) Dismal River components. The only possible exception may be sherds with heavily-obliterated stamp marks from northeastern Colorado's Cedar Point Village (R. Woods 1971: 59). Rare Eastern Pattern Dismal River sherds have heavily smoothed (or weathered) fine cord-marks which may have been a working by-product form of decoration. Some very rare Eastern Dismal River sherds have parallel lines of linear, ovoid punctates made with a sharp tool.

Another form of ceramic decoration consists of incised and punctate patterns on the flat lip forms of some vessel rims. Incised patterns include straight, oblique and linear parallel rim lines and punctates (Fig. 8).

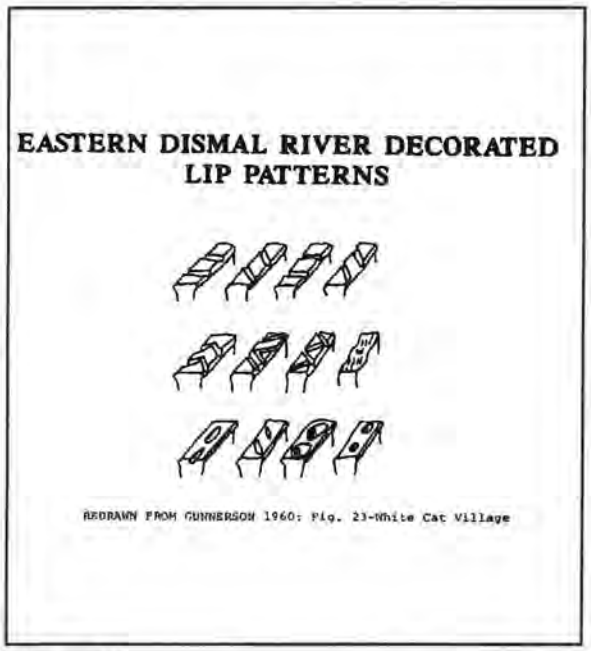

Figure 8

Flat lip decoration is only known from Eastern Dismal River sites. Their use is closely related to the presence of similar ceramic traits among contemporary, neighboring Caddoan cultural groups of the Lower Loup (Pawnee) and Great Bend (Wichita) Aspects in south central Nebraska to central Kansas (cf. Wedel 1936, 1959; Bell, Jelks and Newcomb 1974).

Dismal River ceramic traits, particularly eastern pattern variants, have both close similarities and important differences from ceramics manufactured by the protohistoric Lower Loup populations of south and east central Nebraska and north central Kansas. The Lower Loup cultural complex is generally identified as early Pawnee and its earliest phase is broadly contemporaneous with southwestern Nebraska Dismal River components, *circa* AD 1500-1750 (Grange 1989: 49-50, 55-56; Grange 1968: 15, 1979; Wedel 1938: 4-5). There are several important trait analogies of the two ceramic traditions. They both had a predominance of quite similar vessel forms, generally globular pots, although Dismal River vessels tended to be more vertically elongate (cf. Gunnerson 1960: Plate 8 and Grange 1968: Plate VI). Both ceramic traditions had quite analogous plain rim and lip forms, although Lower Loup components also included a moderately high frequency of collared rims, a form completely absent in known Dismal River sites (Grange 1968: 46-47, Table 7; O'Shea 1989: 75-76). There is also an identity in incised lip decoration with the shared use of punctates, transverse parallel lines, opposed diagonal lines, herringbone lines, and undulating lip surfaces (Compare Grange 1968: 48, Plate VII, VIII, X and Gunnerson 1960: Figure 23). Stamped surface treatment, represented by the Dismal River Lovitt Stamped and the Lower Loup Nance Flared Plain types, was relatively common in both the Dismal River and Lower Loup cultural traditions (Grange 1968: 47-49, 114-116, Table 11; Metcalf 1949). In both cases, surface smoothing and polishing of stamped exteriors was common. The most prominent difference between Lower Loup and Dismal River ceramics is the relatively high occurrence of handles on Lower Loup vessels while handled vessels have yet to be documented from Dismal River assemblages.

Despite strong typological similarities, an apparent chronological contemporaeity, and relatively close geographic proximity of Dismal River and

Lower Loup ceramics, no scholar intimately familiar with either culture has ever noted their presence in each other's cultural components. In a comprehensive analysis of Lower Loup and later Pawnee pottery, Grange noted that "there is no ceramic evidence of contact between later Lower Loup sites and the Dismal River culture..." (Grange 1968: 122). Yet it is unlikely that the Dismal River and Lower Loup peoples ever failed to come into contact with each other, although that contact may have been sporadic and not always marked by harmonic relationships. The close technical parallels between the two ceramic traditions suggests that the two cultures shared at least some common mental templates about how their pottery should look and be made, if not there was not actual exchange of the pots themselves. One hypothesis may be that the Dismal Apache of southwestern Nebraska may have raided more easterly Lower Loup villages and summer hunting parties for slaves-a source of knowledge about pottery-making. Although it would be difficult to fully test this hypothesis, some suggestive evidence may exist in early Spanish documents which describe Apache and Navajos as holding Pawnee slaves in the late 17th and early 18th centuries (O'Shea 1989: 55).

Sangre De Cristo Micaceous Ware Ceramic Type Descriptions

Protohistoric/historic Apaches of extreme southeastern Colorado and northeastern New Mexico manufactured a ceramic ware which is both quite distinctive and, at the same time, similar in some ways to the northern Dismal River Gray Ware. Two evolutionary types, Sangre de Cristo *Ocate Micaceous* and *Cimarron Micaceous*, have been identified and described in good detail (cf. Gunnerson 1969: 26-27; Warren 1981: 155). Further data on the Ocate Micaceous type have been added here from a detailed analysis of Glasscock, New Mexico, site sherds lent by the Nebraska State Museum for this study (*courtesy of James Gunnerson*). It should be pointed out that only one of the types, Ocate Micaceous, appears to have been contemporary with the more northerly Dismal River ceramics that have been recorded within the state of Colorado. Gunnerson (1969: 33, 38), on historic documentation and ceramic-correlation grounds, considers the Cimarron Micaceous type to be post-A.D. 1750 in date, after Dismal River Apache populations had been forced off Colorado's plains and eastern mountain by Utes and Comanches. At present, we have no firm evidence of Cimarron Micaceous pottery in southeastern Colorado, a fact which tends to support Gunnerson's and others claims of Apache absence from the northern Great and High Plains after A.D. 1750. In the following sub-section, Ocate Micaceous is fully described, based on various published sources and this author's own laboratory analysis of samples of that ware kindly made available by James Gunnerson of the University of Nebraska. However, since there is no firm evidence of the later Apachean Cimarron Micaceous ware appearing within Colorado, its description has been omitted.

SANGRE DE CRISTO OCATE MICACEOUS

Construction and Surface Treatment

Sangre de Cristo Ocate Apachean vessels were constructed by both hand-forming and coil methods. Coil construction, unlike some suspected Dismal River

examples, is well-evident in the paste cross-section of many Ocate Micaceous sherds. As in Dismal River Gray Ware, there is good evidence for paddle and anvil thinning although exterior surface remains of paddle marks are nearly always destroyed in a scrapping process. Anvil marks, along with finger indentations, are usually present on the interior vessel surface. Exterior vessel surfaces typically have straight vertical to obliquely vertical and horizontal striations from thinning scrapping with corn cobs. In many cases, the corn cob scrapping was done while the clay was still damp, resulting in the "floating" of finer temper and inclusion particles to the surface.

Paste Composition

Ocate Micaceous paste is compact and has a fine texture. Paste inclusions (and temper) consist of moderate to heavy quantities of very fine to medium fine quartz sand (.07 to .5 mm-Wentworth scale), medium fine to medium crushed quartz, and very abundant mica flakes. Mica flake size ranges from very coarse (1.4 mm) to fine (.18 mm) and often has a pyrite constituent. Mica inclusions/temper are evenly present throughout the sherd wall cross-section. The Sangre de Cristo use of heavy micaceous temper is thought to be directly related to a major micaceous ceramic tradition of the neighboring Rio Grande pueblos which appeared in the early to mid 17th Century A.D. (Warren 1981). Like the Eastern Dismal River ceramic tradition, influenced by neighboring Caddoan peoples, the Sangre de Cristo seem to have shared certain ceramic traits with neighboring Rio Grande pueblo populations. Other related micaceous wares and ceramic types are found to the east and southeast of the Sangre de Cristo mountains and foothills in Oklahoma and Texas. It is believed that some, but not all, of these related wares and types might have belonged to Apachean groups inhabiting the southern plains (cf. Baugh and Eddy 1987: 797; Habicht-Mauche 1987). However, there is, at present, little archaeological evidence of these other micaceous Apachean ceramics in Colorado, and they can be excluded from further consideration for the purposes of this study.

In cross-section, Ocate Micaceous pastes show numerous laminations which run parallel to the interior and exterior surfaces. Sherd and vessel coloration varies from a light buff to dark gray to black.

Vessel Forms and Components

Ocate Micaceous vessel forms (Figure 9) are similar to many Dismal River specimens. They are globular pots, usually with moderately out flaring to almost vertical rims. Both elongated and shorter globular pots are known. One whole pot, newly acquired from the Trinidad area by the University of Colorado Museum, appears to have a higher height to width ratio than most Dismal River pots, but is still closely related. Two other partial upper body and rim sherds from southeastern Colorado's Pinyon Canyon indicate wide-mouthed, squat globular pots analogous to recent historic Apache "bean pots" (Hummer 1989). Bases vary from small flat bottoms to rounded points.

Figure 9

Rim lips are mostly tapered to rounded with a few flattened examples being known (Figure 10). Rim thicknesses from the main vessel body to the outer lip tend to be fairly uniform, although some rims gradually thin out as they reach the lip.

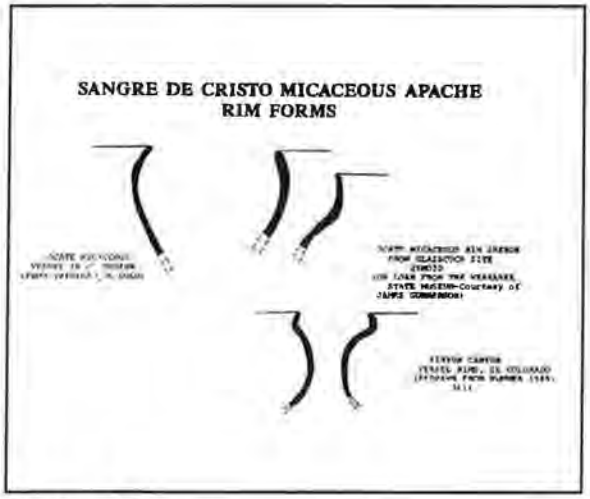

Figure 10

Vessel Size and Wall Thickness

Vessel dimensions are quite similar to those of Dismal River Gray Ware types. Known whole and reconstructible vessels range from 12 to 35 cms. in diameter and 20 to 45+ cms. in height. Wall thickness, although variable, appear to be an important diagnostic trait of the Ocate Micaceous type. Vessel walls tend to be quite thin. Measured sherds and the few known whole vessels indicate a range of 1.5 to 6 mm, with a mean thickness of around 3.5 mm.

Decoration

Aside from corn cob scrapping striations, Ocate Micaceous decoration is nearly absent. In extremely rare cases, pots are decorated with sectioned rows of small punctations made with an elongated sharp tip tool. This form of decoration is almost certainly related to similar, also rare, punctation on Eastern Dismal River pottery.

CONCLUSION: CULTURAL DYNAMICS OF PLAINS AND EASTERN ROCKY MOUNTAIN APACHEAN CERAMIC-USING POPULATIONS

The above data suggest the presence of a potentially complex set of inter- and intra- cultural dynamics of Apachean and other regional populations of the High Plains and Central Plains during the Protohistoric and Early Historic periods. Colorado's eastern plains and Front Range mountains and foothills are hypothesized to have been home to three culture pattern variants of Plains Apache groups-inferred in part from analyses of ceramic types and their geographic distributions. The hypothetical cultural pattern variants appear to include: 1)

an Eastern Dismal River variant, defined by semi-sedentary, quasi-horticultural Apachean populations living in small pithouse villages in higher rainfall areas of southwestern Nebraska/western Kansas, 2) a Western Dismal River variant, consisting of nomadic to semi-nomadic hunter-foragers in northeastern Colorado and southeastern Wyoming-extending to just south of the Arkansas River in southeastern Colorado, and 3) a southern Sangre de Cristo Plains Apache variant in the Mesa-Canyon lands, foothills, plains and river valleys of northeastern New Mexico, extreme southeastern Colorado, southwestern Kansas, and northwestern Oklahoma (Fig. 11).

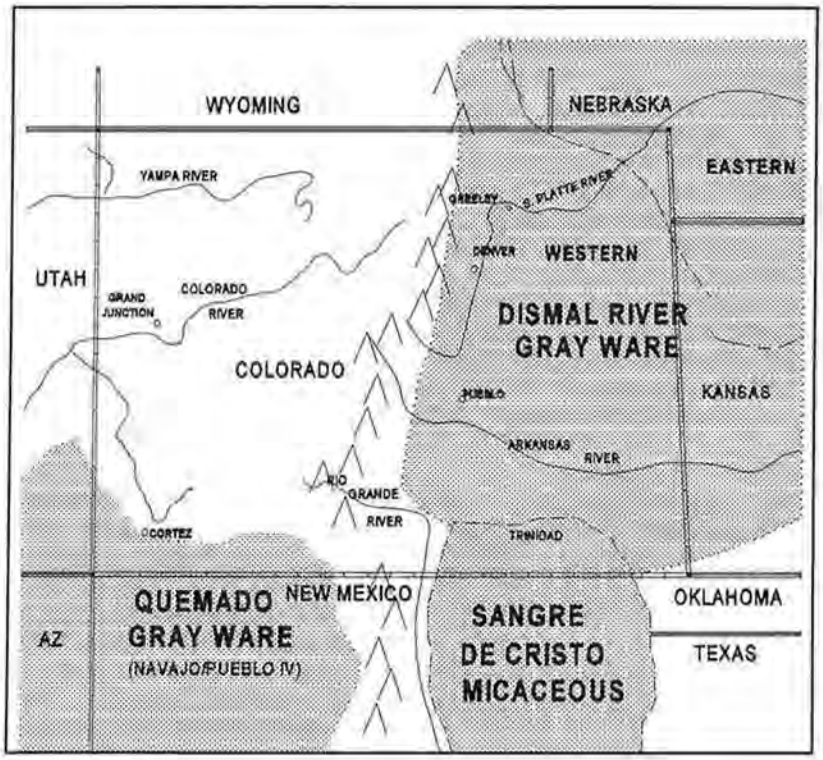

Figure 11

Southern Sangre de Cristo Plains Apache populations, based on available archaeological and historic documentary data, ranged from fully nomadic hunter-foragers to semi-sedentary hunter-forager/agriculturalists.

Two important cultural dynamics processes are seen to have "driven" the evolutionary development of all three geographically/archaeologically defined Plains Apache pattern variants defined for the central and southern High Plains regions of Colorado and adjacent states: 1) evidence of intra-cultural population mobility, and 2) a strong tendency to "borrow" ceramic technology and decoration from neighboring cultural peoples. Eastern Dismal River groups adopted many traits of form, decoration, and manufacturing technology from neighboring Caddoan populations south central Nebraska and north central Kansas. Western Dismal River ceramics exhibit plainware traits highly consistent with, or possibly influenced by, Shoshonean plain and finger-marked ceramics more commonly found in the Central Rockies. Southern Sangre de Cristo Plains Apache ceramics reflect varying degrees of direct and indirect contact with the Rio Grande Pueblos and their micaceous wares. This cultural plasticity has been noted elsewhere by Gunnerson (1960: 239-240) and is a direct indicator of inter-cultural interaction. Existence of these patterns implies that future research in Plains Apache archaeology, through micro-analysis of archaeological remains, particularly of ceramics, could yield substantial data on social, economic and cultural interactions among protohistoric/early historic populations of the

Central and High Plains regions.

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APPENDIX A

Catalogue of Reported Dismal River and Sangre de Cristo Apachean Sites in Colorado with Associated Diagnostic Ceramics

Site #	County	Site Type	Ceramic Types	Source
D:4:2*	Larimer	Rockshelter	Lovitt Plain	Gunnerson 1960: 227
E:1:7	Larimer	Open Camp	Lovitt Plain	Gunnerson 1960: 227-228
Lohr 51	Larimer	Open Camp	Lovitt Plain	CU Museum Collections
CU 17	Larimer	Unknown	Lovitt Plain	Gunnerson 1960: 231
Old Man Mountain	Larimer	Sheltered Camp	Lovitt Plain Rio Grande Pueblo	Husted 1962: 50-52, 81-82, Fig. 4
Flattop Mountain	Larimer	Open Camp	Lovitt Plain	Yelm 1935: 28; Husted 1962: 50-52, 100, Fig.4
Beaver	Larimer	Open Camp	Lovitt Plain	Husted 1962: 50-52, Fig.4
5LR144	Larimer	Open Camp	Lovitt Plain Pueblo Corrugated	SHPO Office Site Files
5LR288	Larimer	Rockshelter	Lovitt Plain	Morris 1982: 223
E:2:1	Weld	Open Camp	Lovitt Plain	Gunnerson 1960: 228
E:7:1	Weld	Open Camp	Lovitt Plain	Gunnerson 1960: 228-229
E:14:11	Weld	Open Camp	Lovitt Plain	Gunnerson 1960: 229
Tilden	Weld	Open Camp	Lovitt Plain	Gunnerson 1960: 232
"Band M"	Weld	Open Camp	Lovitt Plain	Gunnerson 1960: 232
Weld	Weld	Unknown	Lovitt Plain	Gunnerson 1960: 233
Weld County General	Weld	Unknown	Lovitt Plain	Gunnerson 1960: 233

APPENDIX A (cont)

Site #	County	Site Type	Ceramic Types	Source
5WL31	Weld	Rockshelter	Lovitt Plain	J. Wood 1967: 283, 340
5WL1995	Weld	Open Camp Stone Rings	Lovitt Plain	Brunswig 1994
Sterling	Logan	Unknown	Lovitt Plain	Gunnerson 1960: 233
F:15:1	Washington	Open Camp	Lovitt Plain	Gunnerson 1960: 229
5WN3	Washington	Open Camp	Lovitt Plain	J. Wood 1967: 510-513
Schneller	Phillips	Open Camp	Lovitt Plain Lovitt Stamped	Undocumented
G:4:gen	Sedgwick	Open Camp	Lovitt Plain	Gunnerson 1960: 229
G:5:1	Yuma	Open Camp	Lovitt Plain	Gunnerson 1960: 230
G:16:6	Yuma	Open Camp	Lovitt Plain	Gunnerson 1960: 1960: 229
N:4:1	Yuma	Open Camp	Lovitt Plain	Gunnerson 1960: 231
CU 101	Boulder	Open Camp	Lovitt Plain	Gunnerson 1960: 231
CU 104	Boulder	Open Camp	Lovitt Plain	Gunnerson 1960: 231-232
Lafayette	Boulder	Unknown	Lovitt Plain	Gunnerson 1960: 232der
Boulder	Boulder	Unknown	Lovitt Plain	Gunnerson 1960: 232
Byers	Adams	Unknown	Lovitt Plain	Gunnerson 1960: 232
5DA40	Douglas	Open Camp	Lovitt Plain	Windmiller and Eddy 1975: 331, Table 5, Fig. 35 & 36
5DA41	Douglas	Open Camp	Lovitt Plain	Windmiller and Eddy 1975 (as cited above)

APPENDIX A (cont)

Site #	County	Site Type	Ceramic Types	Source
K:8:2	Jefferson	Unknown	Lovitt Plain	Gunnerson 1960: 230
M:9:6	Elbert	Open Camp	Lovitt Plain	Gunnerson 1960: 230
M:10:2	Elbert	Open Camp	Lovitt Plain	Gunnerson 1960: 230
5EL	Elbert	Pithouse Hamlet	Lovitt Plain	W.R. Wood 1971: 59, 81-82
5EL44	Elbert	Sheltered Camp	Lovitt Plain	SHPO Office Site Files
5EL50	Elbert	Open Camp	Lovitt Plain	SHPO Office Site Files
5EL80	Elbert	Sheltered Camp	Lovitt Plain	SHPO Office Site Files
5EP44	El Paso	Open Camp	Lovitt Plain	SHPO Office Site Files
5SU2	Summit	Unknown	Lovitt Plain	Gunnerson 1960: 230
U:5:9	Cheyenne	Unknown	Lovitt Plain Southwest Pueblo	Gunnerson 1960: 234
8:12:5	Pueblo	Unknown	Lovitt Plain?	Gunnerson 1960: 233
Z:14:2	Las Animas	Unknown	Lovitt Plain	Gunnerson 1960: 235
5LA1411	Las Animas	Open Camp, Stone Rings	Ocate Micaceous	Wood and Ireland 1974: 113
5LA1579	Las Animas	Sheltered Camp	Ocate Micaceous	Lutz and Hunt 1979
5LA3378	Las Animas	Open Camp	Ocate Micaceous	Hummer 1989: 332-336

APPENDIX A (cont)

Site #	County	Site Type	Ceramic Types	Source
5LA3490	Las Animas	Open Camp	Ocate Micaceous	Hummer 1989: 332-336
5LA5244	Las Animas	Open Camp	Ocate Micaceous	Hummer 1989: 332-336
5LA5254	Las Animas	Open Camp	Ocate Micaceous	Hummer 1989: 332-336
5LA5255	Las Animas	Open Camp Rock Art	Ocate Micaceous	Loendorf and Kuehn 1991: 41, 77-79.
5LA5256	Las Animas	Open Camp	Ocate Micaceous	Hummer 1989: 332-336
5LA5290	Las Animas	Open Camp	Ocate Micaceous	Hummer 1989: 332-336
5LA5331	Las Animas	Open Camp	Ocate Micaceous	Hummer 1989: 332-336
5LA5403	Las Animas	Open Camp	Ocate Micaceous	Hummer 1989: 332-336
5LA5454	Las Animas	Open Camp	Ocate Micaceous	Hummer 1989: 332-336
5LA5619	Las Animas	Open Camp	Ocate Micaceous	Hummer 1989: 332-336
Z:5:7	Huerfano	Unknown	Lovitt Plain	Gunnerson 1960: 235
Z:6:1	Huerfano	Unknown	Lovitt Plain Ocate Micaceous Southwest Pueblo	Gunnerson 1960: 235
5HF1093	Huerfano	Open Camp	Ocate Micaceous	Arbogast and Zier 1991: 44-45, 69

APPENDIX A (cont)

Site #	County	Site Type	Ceramic Types	Source
Y:13:1	Costilla	Unknown	Lovitt Plain Ocate Micaceous	Gunnerson 1960: 234
Y:14:1	Costilla	Unknown	Lovitt Plain	Gunnerson 1960: 234-235
5BN169	Bent	Open Camp	Lovitt Plain?	Eddy et al. 1982: 141-143, 146, Fig.5.13
5BN252	Bent	Open Camp	Lovitt Plain?	Eddy et al. 1982: 141-143, 146, Fig.5.13
5BN206	Bent	Open Camp	Lovitt Plain?	Eddy et al. 1982: 141-143, 146, Fig.5.13

*Site survey numbers given by James Gunnerson in his study of Dismal River in the 1950's. More recent tri-nomial site designations were not found in current SHPO files.