OSL and Ceramic Analysis at the Humphrey Site

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OSL and Ceramic Analysis at the Humphrey Site

by

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A THESIS

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The Sand Hills of Nebraska are a unique environment located in the west-central portion of Nebraska. This portion of North America has long supported human life. One group in particular that called the Sand Hills home are the Dismal River people. Dismal River is the name that archaeologists gave to a group of horticulturalists that lived in circular structures on the sand dunes, often near the rivers, in the Sand Hills. This group, while generally known through archaeology, also has a potential historic or ethnographic presence in the form of the Cuartalejo Apache visited by Ulibarri, and potentially mentioned by several other historic sources. With that said, they are best known through archaeology, and one of the key features through which they are archaeologically identified is their use of dark gray, simple stamped, sand tempered ceramics. The ceramics from one Dismal River site in particular, the Humphrey Site, were thoroughly analyzed to better understand the importance of these ceramics, and how similar or different Humphrey site ceramics are to those at other Dismal River sites. Alongside the ceramic analysis, Optically Stimulated Luminescence (OSL) was used in order to acquire further dates for two houses at the site, features 12 and 14. These individual analyses
demonstrated the importance of Dismal River ceramics, showed that these ceramics are indeed very similar to one another, and as such should continue to be considered as belonging to one group of Plains Apache people, and also continued to demonstrate the utility of OSL dating methods in the Nebraska Sand Hills.
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Chapter 1: Introduction

25HO21, colloquially known as the Humphrey Site, is an archaeological site located on private property in the Sand Hills of west-central Nebraska, near the town of Mullen. Fortunately, there is a strong relationship between the landowners and the leadership of History Nebraska (formerly the Nebraska State Historical Society). This site has received a relatively small amount of archaeological work, though recent field work has taken steps to change that. Specifically, the site has been visited and excavated by two main groups. The first was a party from the Nebraska State Historical Society as part of the Missouri River Basin survey. The survey party first located in the site in 1947, and then returned, led by Marvin Kivett, in 1949 to perform limited testing (Gunnerson 1960, 187). Information and collections made by this 1949 party are still housed in the archaeology building of History Nebraska. While the work done by Kivett and colleagues was ground breaking and critical in our understanding of Nebraska archaeology, changes in archaeological method led to a desire at History Nebraska to re-initiate work at Humphrey. This, alongside minor mapping errors which led Kivett to misplot the proposed site boundaries for Humphrey led to the later excavations at the site.

In 2017, History Nebraska archaeologists, alongside a small team from the University of Iowa led by Dr. Matt Hill, returned to Humphrey in order to employ modern archaeological techniques including systematic water screening and powerful mapping tools in the form of a total station to rectify the prior geographical inaccuracies listed by Kivett, while also allowing for a more detailed understanding of Dismal River assemblages based on the high percentage of artifact recovery that 1/16 inch water
screening allows for. With these goals in mind, Rob Bozell of History Nebraska enlisted the help of a team from the Midwest Archaeological Center (MWAC), a division of the National Parks Service (NPS) to conduct geophysical survey of the site, in order to establish the grid, while also illuminating features that might provide the greatest understanding of the site through the limited time afforded to the teams. This geophysical survey unveiled three main features, alongside a plethora of smaller geophysical anomalies (Figure 1). This information showed that there were three main house-like features, and so those features (labeled features 12, 13, and 14 respectively), were targeted for testing. This testing showed that these were in fact house structures, largely based on the presence of burnt timbers on the floors.

Figure 1. Map of archaeological excavations at the Humphrey site from History Nebraska.
After the successful 2017 field season at Humphrey, a second field season was planned for the site with the same crews as 2017, this time also incorporating a University of Nebraska-Lincoln (UNL) field school led by Dr. Phil Geib, as well as a small contingent from the University of Oklahoma led by Dr. Sarah Trabert. I personally was a graduate teaching assistant (GTA) alongside fellow colleague Sara Anderson for this 2018 season. The crew for the 2018 season decided to primarily focus on feature 12, the northeastern-most house feature in figure 1, with the goal of establishing a full cross section of the house in order to determine the feature’s diameter, and to more carefully establish house form. A second cross section, creating a “T” intersection with the first approximately in the center of the feature, was also established, though this unit did not cover the full diameter. Several test units were also excavated to explore geophysical anomalies discovered by the MWAC team.

After the 2017 season, Dr. Hill borrowed much of the collection from that excavation and processed it with students in the University of Iowa lab. After the 2018 season, the artifacts recovered were processed by a team at History Nebraska’s archaeological lab. Analyses are being conducted by multiple groups. The Lithics are being analyzed by Brian Goodrich, a former UNL graduate student working at History Nebraska. Faunal analyses are being conducted by Rob Bozell, with Katy Likely, a UNL graduate student, conducting her own thesis on the turtle bones from the site. Dr. Mary Adair from the University of Kansas is conducting macrobotanical analyses. As part of the goal to fully process and analyze this site in a reasonable timeframe, I have conducted the ceramic analysis. Dr. Phil Geib also ran a course (ANTH 891: Archaeology Lab
Analysis) through the UNL Anthropology Department in the fall of 2018 in which students conducted analyses on all types of materials from 2017 and 2018 at Humphrey. These analyses have been considered and utilized, as well as verified in the official analyses conducted, including the one presented here.

This site is one of the key examples of what archaeologists on the Plains call the Dismal River Complex. Dismal River sites span a relatively large portion of the Central Plains, even brushing up against the American Southwest. While a heavy portion of Dismal River Sites appear in western Nebraska, there are also sites attributed to the Dismal River group in northeastern Colorado, South Dakota, western Kansas, and even southeastern Wyoming (Gunnerson 1960; Scheiber 2006). While all of these sites are seen as belonging to one overarching group, it is generally agreed upon that there is a separation, based on ceramic diversity and site types, between those sites in the eastern portion of their range, meaning Nebraska and Kansas, and those in the west, meaning Colorado and Wyoming (Gilmore and Larmore 2012; Gunnerson 1968; Trabert 2015). As such, the following discussions will only focus in great detail on information concerning the eastern division of the Dismal River Complex.

In the course of this work, the author set out, and subsequently completed, several goals. The first goal, as mentioned above, is to aid in the completion of analysis of the 2017 and 2018 materials recovered from History Nebraska’s work at the site with a specific focus on the ceramics. As a member of the 2018 party, and one of the workers in the lab processing the finds in the Summer of 2018, there is a personal connection to the work for this author, as well as a desire to aid in its speedy completion. It is, at least in
part, for this reason that the author completed the following ceramic analysis. The optically stimulated luminescence (OSL) analysis also aids with these goals. However, this extra analysis also greatly illuminates chronology, both relative and absolute, at the Humphrey Site. OSL analysis was originally chosen for several reasons. First, Dr. Wandsnider was already involved in OSL work that included the 1949 Humphrey collection, and has had great success in using it (Greiman et al. 2019). With that said, the following analysis can help verify the results of the aforementioned study, as it was conducted on more recent materials. This analysis also was conducted in the hopes that, by analyzing a sherd from each of the three house features, it might be possible to determine a relative chronology of these houses to better understand how many people might have lived at the site, and when they were living there; to decide whether this was one family returning to a camp occasionally, or whether it was a relatively permanent site inhabited by multiple families. These are the main goals that propelled this study forward.

While this project was mainly focused on problems that are more local in nature, meaning that they are focused quite tightly on Dismal River people and the archaeology of their sites in general, it does also encompass some larger anthropological and archaeological issues. One part of this relates to the attempts, especially in Chapters 2 and 3, to humanize what is primarily an archaeological group. All too often, archaeological sites are treated in a way that somewhat dehumanizes the subjects, turning them into neat cultures that act largely scientifically without truly human influences. However, this way of approaching archaeological sites, if practiced to its fullest extent, can remove the
human focus on anthropological studies. The other major issue that this work discusses is the changing dating methods in archaeology. The OSL analysis here is part of a larger movement in archaeology to use various dating methods in conjunction to gain more knowledge about chronology. It also attempts to show that OSL is useful, under the correct conditions, as a relative dating method as well as an absolute one. These goals are not only important for the Humphrey site itself, but for archaeology and anthropology as a whole.

Following is the division of sections for this work with brief descriptions of the goals of each. Chapter 2 undergoes a background discussion concerning who the Dismal River people were, and who their descendants might be based largely on ethnohistorical sources. Chapter 3 provides a summary of previous work done on Dismal River sites as a whole, focusing especially on those from Kansas and Nebraska. Chapter 4 will detail the ceramic analysis conducted on the 2017 and 2018 materials from the Humphrey site, while Chapter 5 will detail the OSL analysis. Finally, Chapter 6 will provide a synthesis of the information discussed up until that point, as well as discussion of what research might be done in the future thanks to this new information.
Chapter 2: Who Were the Dismal River People?

The Dismal River Complex is an archaeological culture that is known of due to the findings of archaeologists and private collectors. It is all too simple to remove their humanity in seeing these people as only a series of artifacts and postholes over which scholars can argue in journals and at conferences in an attempt to come to some singular truth. It is critical in the study of anthropology to be sure not to remove the humanity of a group of people in this way. While most of this work will participate in similar versions of nitpicking and arguing about artifact types and measurements as mentioned above, it is important to first understand exactly who is being discussed. Whose objects have archaeologists been removing from the ground and studying?

The first answer to this question that the author ever heard was simple: they are Plains Apache. While that seems quite cut and dry, complex questions rarely have such simplistic answers. Still, Plains Apache is an excellent place to start from. While there is minor disagreement that will be discussed in more depth below, it is generally agreed upon in the Dismal River literature that these people were in fact a group of Apache, and of course the locations of their archaeological remains tell us indisputably that they did in fact live on the Plains. But can they be attributed to any specific later group of the Apache? Did they leave their own homelands and join with another group in a slightly different location? Are all Dismal River people a singular group, or are there stark enough differences over geographical space to categorize them as separate groups? Our discussion above has suggested that there is, but we will cover it in more detail below. These questions are an important baseline from which one might work, allowing the
There are really two main ways that researchers can begin to try and understand who exactly the Dismal River people were. The first is through historical texts. In this part of the world, that information came from only two groups: the Spanish and the French (Secoy 1951; Thomas 1935), and their entrances into or near the Plains. Specifically, the information available from these groups typically is in the form either of a historical map or some type of journal, likely from a journey that a member of a group made. The other place to gain this kind of information is from ethnographic research among modern day Apache groups (Gunnerson 1974; Opler 1982).

Of course, each kind of information has its benefits and pitfalls. Historic information is excellent in that it was documented by people living, at least in this case, during the same time and in approximately the same area as the group under discussion here. However, it is important to note that the risk of bias becomes incredibly high when the main sources treat indigenous groups solely through a European lens. Also, these Europeans did not speak the same languages as the indigenous groups, likely causing problems of translation as well. While these are the key problems in treating historical sources, ethnographic sources suffer in that they are only useable as sources of inference. Obviously, when the Dismal River people ceased to live in the same ways as they were visible to archaeologists, the ability to study them ethnographically ceased to exist. The closest option then is to study other Apache groups, and try and understand if any of the ethnographic traits present among these modern day groups can be seen at Dismal River
archaeological sites. By using these two imperfect sources of information together though, researchers can begin to understand who these people were in the past, who they might have become now, and how they went about their lives.

It is important to begin this ethnographic discussion by first shedding all doubts that the Dismal River people can be attributed to any group other than the Apache. While the large majority of scholars agree with this placement, there is a small minority that argue to the contrary. This is comprised largely of two people, Opler and Gulley. As Opler himself was the original holder of this position, one must begin by discussing his stance before moving on to Gulley. After these discussions, I will finally discuss how these arguments fare against the majority stance.

Opler has two publications in which he mentions his belief that Dismal River people were not in fact Apaches (1971; 1982). The 1971 book chapter, Pots, Apache, and the Dismal River Culture, details an ethnographic account of Jicarilla Apache pottery making with the express goal of approaching the idea “that Apache were responsible for Dismal River culture” (29). He goes on to clarify that he does not necessarily agree with this attribution. This argument is made based on the attribution that the Jicarilla are related to the Dismal River people, so by understanding ethnographic accounts of Jicarilla pottery, one might compare and contrast that information with what scholars know of Dismal River. This does not take the form of actual comparison of ceramic forms, but rather involves the origins of Jicarilla pottery styles and the time depth indicative in the deeply sacred relationship between these people and their pottery (31). Jicarilla pottery shows great similarity and association with that made in the Southwest,
specifically in Taos and Picuris. Based on both ceramic form and production method, Opler argues for an intense similarity between these groups, and so claims that Jicarilla pottery is clearly rooted in the Southwest, and not to the east on the Plains where Dismal River evidence is largely located. Through these arguments, Opler concludes that “to consider Dismal River culture mainly a progressive stage in Apache development rather than a Pueblo retrenchment is to ignore historical knowledge and an array of ethnographic fact” (32). He continues this line of thinking in his 1982

This 1982 article focuses specifically on a well known site attributed to the Dismal River Complex called the Scott County Pueblo (14SC1), with the goals of, first, highlighting the history of excavations there with a focus on the changes in opinion that subsequent studies have formed, and then with arguing against the attribution of the Apache to Dismal River, as well as arguing that it was not Apaches that built the Scott County Pueblo (Opler 1982). The arguments arrive at similar conclusions to those outlined in the 1971 chapter, mainly concluding that the pueblo and Dismal River as a whole should be aligned with Southwestern groups as opposed to those in the Plains. While the arguments take a broader form, citing ethnographic reports of Apache fears of death or living where a person has died as a reason why they would not inhabit a multiroom pueblo as well as his previous stance on Jicarilla pottery, the argument still falls quite similarly. With that said, more recent evidence has appeared which more clearly elucidates the habitation history of the Scott County Pueblo that will be discussed in depth in Chapter 3 (Hill et al. 2018), while the remainder of Opler’s points will be
discussed as part of the upcoming discussion of the majority view of Dismal River people as Apaches.

The other major dissenting opinion in regards to attributing Dismal River people to a group of Plains Apache comes from Cara Gulley’s thesis, “A Reanalysis of Dismal River Archaeology and Ceramic Typology” (2000). While a large portion of this work focused on a ceramic analysis of the Lovitt site, the portion that is under discussion here is Chapter 3, where Gulley discusses the debate concerning attribution of Dismal River people to the apache. Gulley fully falls into Opler’s camp, and focuses their arguments around a debate over the attribution of the use of the Querecho or Vaqueros to the Apache. They also call into question the claims that the ceramics and house forms present at Dismal River sites are clearly and solidly Apachean in origin. Overall, Gulley presents arguments in a very productive way, and one that has surely earned a place in Dismal River literature. With that said, the arguments in general focus so heavily on ethnography, and especially on the work of Opler alone, that it can not possibly dispute all of the evidence given by the plethora of other authors supporting an Apachean association.

One of Gulley’s main arguments is that it is not truly possible to ensure that Dismal River people were solely Apachean in origin (2000). Perhaps they are some mixture of Plains groups, or Plains and Puebloan people. This argument is valid, but assumes at its very core that, to be associated with modern Apaches means that there must have been little to no change in these people since the 16th and 17th centuries. Groups, especially those that are semi-nomadic in nature, will surely change through time. Perhaps Dismal River people were a group of Apache whose lifeways have since
changed, or that later joined and took on the ways of some other group. Overall, there are many traits that appear in Dismal River sites that are Apachean in nature as will be discussed further below. Until the arguments against an Apachean attribution can further utilize archaeological data and contradict fully the plethora of claims raised by other scholars, this author does not see reason to disagree with the Apachean nature of these people. With that said, perhaps it is less important to fit every group into neat groups throughout time, and instead just focus on what we can learn about them from the evidence that is archaeologically extant.

One of the most powerful voices in the debates surrounding Dismal River people overall is that of James Gunnerson. He is a firm believer in the attribution of Dismal River with Apache and published a great number of works discussing archaeological field work he conducted on Dismal River sites and all other topics on the subject. The most notable may be his 1960 “Introduction to Plains Apache Archaeology - The Dismal River Aspect,” in which he gives detailed descriptions of every Dismal River site that was known at the time, as well as an overview on the group itself (Gunnerson 1960). As one can clearly see from the title of this work, Gunnerson is firmly in the camp of attributing Dismal River to the Apache, this based largely on archaeological features including bell shaped pits and houses, as well as ceramic forms such as the existence of micaceous sherds at Dismal River sites (Gunnerson 1960; 1968; 1987). This stance, based on archaeology, is also held by Wedel (1959) and is the generally accepted stance. With that said, the argument is also supported strongly by ethnohistorical approaches which Opler failed to discuss.
Before discussing the ethnohistorical sources in depth, it is worth mentioning the flaws that are inherent in this entire debate. This entire discussion hinges on the use of the culture historical approach, that certain cultures can be traced through time based on certain supposedly unchanging features. This project does work within that framework to some extent due to the prevalence of its use in Dismal River archaeology. To forego a discussion within this framework would mean ignoring a large portion of the scholarship that scholars produced previously concerning these people. With that said, it is worth pointing out the weaknesses of this approach briefly before proceeding. The main idea here, that a culture can be traced through time based on certain traits is a dangerous one, especially when working with a semi-nomadic group that covers a large portion of the Plains. When a group frequently moves around the landscape, they will necessarily adapt to the conditions that they face, regardless of where they are. This means that the ways Dismal River people live and survive in Colorado or Wyoming are inherently different from those of the people in modern day Nebraska, simply due to a difference in conditions. With that said, certain traits may persist more easily than others. Ceramic form could easily remain similar over a great distance, assuming clay is available, as that technology does not really change based on location, but instead focuses on the knowledge base of the crafter. Similar things are true of house form. Hill and Trabert (2018) recently confronted this topic to some extent, and concluded that, while it is still likely the Dismal River people were Apache, or at least Athapaskan speakers, variation amongst these people over the landscape is common, and to be expected.
A large portion of the ethnohistorical data that exists about groups that might be considered as Dismal River are from Spanish sources, most easily accessible to modern scholars through the translation of Thomas (Thomas 1935). The reach of the Spanish was often long, and they made multiple expeditions outside of their standard area in the Southwest further into the Plains. Some of the earliest examples of this come from an early colonization of New Mexico led by Don Juan de Oñate in the late 16th century. Our first report of the Eastern Plains comes from Vicente de Saldívar Mendoza who met a group of “vaqueros,” which Thomas identifies as Apaches, as well as groups of traders and a series of settlements, all likely Apache in origin. Mendoza also makes note of the use of dogs by these people for dragging items alongside their masters who hunt buffalo (Thomas 1935). Oñate also made a venture towards the east in which he identifies large numbers of Apache, and later meets the Quiviras, identified as likely being the later Wichita (Thomas 1935). This was the final mention of Apache groups until the middle of the 17th century when Juan de Archuleta was sent with twenty soldiers to retrieve a group of indigenous people from Taos that had fled due to unrest.

Archuleta found them among the Apaches who had supposedly enslaved them in an area which from then on was referred to as El Cuartalejo (Thomas 1935). This location is critical, and is frequently equated with either the actual location of the Scott County Pueblo or, at the very least, the region around it (Beck and Trabert 2014; Hill et al. 2018; Trabert 2015; Wedel 1959). It is not until after the Pueblo Revolt of 1680 that the Spanish again venture into the area of the Apaches. The next time is actually in response to a second unsuccessful revolt in 1696 after which a group of Taos and Picuríes
fled to the East and were rapidly pursued by Vargas. In his pursuit, he first discovered an empty Picuris pueblo, but continued the pursuit on local information, and was guided to an Apache camp by a Taos captive. This camp had been so rapidly vacated that the trail had traces of tipi poles and other items indicative of a headlong rush to flee the Spanish.

The majority of the fugitives were soon captured, but a group including chief Don Lorenzo of the Picuríes had managed to flee further east (Thomas 1935). This group is the same one that is the catalyst for Juan de Ulibarri’s expedition to El Cuartalejo in 1706.

Juan de Ulibarri’s expedition is likely the best known, and likely the most informative, of all the ethnohistoric evidence that exists in regards to Dismal River and the Plains Apache in general, due in large part to the detailed nature of his journal, and the fact that he physically visited El Cuartalejo (Thomas 1935). In 1706, chief Don Lorenzo supposedly sent a messenger to the Spanish begging forgiveness and asking for aid at El Cuartalejo. While Ulibarri’s journal is greatly detailed, only a few specific instances will be mentioned here. During the journey, he specifically mentions encountering a group of Jicarilla.

Later in the journey, just before reaching El Cuartalejo, the Spanish find a series of Apache habitations around the pueblo. Then, after being welcomed into El Cuartalejo, Ulibarri dispatches groups to nearby places to round up the fugitives, and takes notes on the discussions he had with the indigenous people while he waited, noting their reactions to Christianity, their agricultural practices, and word of some sort of alliance between the Pawnee and the French (Thomas 1935). There is also discussion of a group called the
Pelones to the northeast who live near a place where the “road is without grass, for there are on the way only sand dunes of very fine sand” (74). This information recorded by Ulibarri is of the utmost importance to Dismal River ethnohistorical studies, in large part because it references a location that is known to contain Dismal River artifacts, while also identifying that Apaches were living there. Also, the mention of an area to the northeast of fine sand dunes is very interesting. While most of the ethnohistorical data of note for this topic comes from the Spanish, it is worth mentioning the French sources as well.

French sources are far less prevalent in these discussions, though they are still important. There are two groups of indigenous people from ethnohistorical sources that will be discussed here; the Padouca and the Gattaka (Schlesier 1972; Secoy 1951). The Padouca are the focus of Secoy’s 1951 article, and there is a relatively strong case to be made in calling this group Apache, and potentially even specifically identifying them with the Dismal River Complex. The earliest evidence for the term Padouca, or any close variant, comes from maps published in the 1680s. The earliest, in 1684, is called the Franquelin map of Louisiana, and it includes a river called the *Riviére des Parouke* which is potentially even one of the Loup rivers in Nebraska (Secoy 1951, 525). It is worth noting that the Humphrey Site itself is located on a terrace just above the Middle Loup.

The other map was apparently created with data compiled from Father Hennepin, a Franciscan friar and explorer from the Minnesota area, includes a site of the Padoucas near the Missouri River, and also includes the *Pays des Apaches et des Padoucas* east and northeast of New Mexico. This is the only mention of the Apache on this map, and it
aligns them with the Padouca. Secoy sees this as an attempt to remedy the disparity between French and Spanish sources, meaning that these are seen as the same group, but with different names depending on the source (527). So, here we have evidence of a group of Apaches living in the region where archaeologists have found evidence of Dismal River people. Another variant, *Padonka*, was likely used by the Omaha to refer to an Apache group living on the Dismal River, and this river was referred to as “where the Padonka built breastworks” (Howard 1970). Again, the French sources provide reasonable evidence of Apaches living in places where archaeological evidence of Dismal River people is known at the same time when they should have been living there, or slightly after. The other term by which the French referenced some earlier Apache groups was Gattacka, or Cataka, which references the Kiowa Apache in particular (Schlesier 1972; Secoy 1951).

While this term is critical to Schlesier’s overall argument, which I will discuss in more depth below, the term itself is typically used later, and so will be set aside until a more in depth discussion of Schlesier can occur. As it is, it is clear to see from the Spanish sources that there were a great deal of Apache groups in and around areas known to be inhabited by Dismal River people, especially *El Cuartalejo*. While French sources may be somewhat less descriptive due to a reliance on maps and a lack of detailed journals like that of Ulibarri, it is clear to see that there is solid evidence of Apaches inhabiting the same locations at the same times as the archaeologically known Dismal River people. With this understanding of the primary sources at hand, it is important to
briefly discuss how secondary sources have utilized this information to determine further identification of Apache groups and Dismal River people.

While it is generally agreed that Dismal River relates to Apache people, discussions are frequent concerning potential divisions among the culture itself, as well as the possible modern Apache groups that the Dismal River people eventually joined. In reference to the former, there is generally an acceptance that these assemblages can be divided more or less on an east-west line, with sites in Colorado and Wyoming making up the western division, and those in Kansas and Nebraska making up the eastern division (Brunswig 1995; Gilmore and Larmore 2012; Gunnerson 1968; Trabert 2015; Wedel 1959). This distinction is typically based off of ceramic types as well as variations in site and structure types. A simple glance at Gunnerson’s 1960 map detailing all of the then known Dismal River sites also suggests at the very least a cluster of sites in the east, and potentially another smaller cluster in the west, especially in Colorado (figure 2).

Some scholars have attempted to argue for further divisions of this culture, adding as well northern and southern divisions depending on the scholar (Brunswig 1995; Gilmore and Larmore 2012; Schlesier 1972). These divisions lack the strength of the previous arguments, but they are worth mentioning nonetheless. The northern aspect of the
Dismal River group was proposed as containing only the sites in the Nebraska Sand Hills, with the argument that these people were the Fremont people after their migration from Utah and Wyoming (Schlesier 1972, 105). This argument is bold, and while it could hold some merit along with his general ethnohistorical approach, it has not been generally accepted or utilized. Trabert suggests that this may stem from Schlesier’s use of a direct-historical approach as well as a lack of supporting archaeological evidence in his arguments (Trabert 2015, 67). The use of a southern division is based largely on the presence of certain micaceous ceramics as well as some variation in house forms (Brunswig 1995; Gilmore and Larmore 2012; Gunnerson 1968). Micaceous ceramics at Dismal River sites have long been a confusing and contentious subject. Based on that alone, hesitation is perhaps due in regards to this southern division. Likewise, modern archaeology has begun moving away from this culture history approach and its desire to give every slight variation its own individual classification. As such, I will refrain from further discussion of these divisions, and will instead mainly refer only to the state in which a site is located, such as Humphrey being a Nebraska site.

One of the final discussions necessary in this ethnographic background is to try and understand what happened to the Dismal River people after they ceased to exist in the form that archaeologists call Dismal River. This in no way means that these people simply disappeared in the way that this terminology makes it sound. Rather, their archaeological traces have not been identified by archaeologists, or can not be currently recognized as what said scholars refer to as Dismal River. Of course, this discussion will continue under the assumption that Dismal River people were Plains Apache, leaving the
main question as what group of Plains Apache they were. Most of the confusions that arise in this discussion come from naming conventions. Spanish explorers might record names as closely as they could, but two different explorers might hear two names differently, in which case they will be recorded differently. Likewise, the French did not necessarily use the same names that the Spanish did. Likewise, names also change through history, so a group that was called by one name in 1700 may be known by a completely different name now, even if they remain essentially the same group. With this in mind, the following highlights two of the main Apache groups that could have some relation to Dismal River, and relates them to the groups that they are known as more recently.

The first Apache group that is likely related to what archaeologists call Dismal River is the Paloma Apache. The Paloma are mentioned by name in Valverde’s account mentioned above. A member of this tribe was found at a ranchería near El Cuartalejo with a gun wound. When asked how he received it, he said that it was during a battle of his people, the Paloma, against a force of French, Pawnee, and Jumanos. He also tells Valverde that his people live “farther in from El Cuartalejo, on the most remote borderlands of the Apaches” (Thomas 1935, 132). This description is critical for the identification of the Dismal River People. Of course, archaeologists know that the area of El Cuartalejo has Dismal River sites, and the further in from that area would lie the Nebraska Sand Hills. The presence of the Paloma west of the Pawnee but north of El Cuartalejo very well aligns with the presence of Dismal River sites. It is through this
argument that Gunnerson and Gunnerson argue that the Paloma were Dismal River people (Gunnerson and Gunnerson 1971, 12).

Schlesier also argues for the Paloma, who he argues are also the Pelones that are mentioned as living near or in an area that closely resembles the Sand Hills as Dismal River people, but he argues that they are the group in Kansas, not the group in the Sand Hills (Schlesier 1972). Instead, Schlesier argues that his Northern Aspect can be equated with the groups the French call the Gattaka and the Padouca, and that these groups are later known as the Kiowa Apache (Schlesier 1972, 107). Gunnerson and Gunnerson agree with the attribution of the Gattaka as the Kiowa Apache, but instead argue that perhaps they are simply the most northern group of the Paloma (Gunnerson and Gunnerson 1971, 13). The basic argument here again lies in Schlesier’s argument for a northern division of the Dismal River people. As this stance has already been discussed, this thesis will tend more towards seeing fewer divisions, and as such sees the Gunnersons’ argument as more likely. While Schlesier may be correct, it seems that separating a single group into extra, potentially nonexistent parts, could cause issues for further study until this northern aspect can be more concretely proven.

This ethnohistoric background of the Dismal River people is extensive, and in many ways this discussion has only covered it in part. With that said, this discussion provides a strong base for further discussions of Dismal River Sites and people, as understanding the history of these people, as well as the struggles they faced, is critical when discussing the marks they left on the landscape.
Chapter 3: Dismal River Complex Background

This portion of the discussion has its focus on providing a background in regards to previous excavations of Dismal River sites, and what scholars have learned from those excavations. This will include not only a full overview of the Kivett excavations at Humphrey during the Missouri River Basin Survey, but also the excavations of several other key Dismal River sites. These are mostly in Nebraska, with one in Kansas. Specifically, this discussion will cover White Cat Village, Humphrey, Lovitt, Ash Hollow, and the Scott County Pueblo. These sites are generally the type sites for Dismal River, as well as the sites that have the most information collected about them. As this discussion will of course be only a brief overview as part of a larger analysis of the ceramics at Humphrey, please see Gunnerson (1960) and Trabert (2015) for full overviews of the remainder of the Dismal River sites including those in Colorado and Wyoming.

The previous chapter demonstrated clearly that Dismal River people can, with a reasonable amount of certainty, be considered a group of Plains Apache. That discussion, in essence, described the ethnographic knowledge of the Dismal River people. But what about the archaeological knowledge? After all, it is through archaeology that these people were first learned about in modern times. This is the main focus of the following chapter. As such, it is important to first receive a background concerning the archaeology of Dismal River people. What identifies a Dismal River Site? Where are they found? When were they present in these areas? These sorts of questions are critical for a deeper understanding of specific Dismal River sites, and even later, for an understanding of Humphrey and the importance of its ceramics.
Dismal River archaeological sites were largely, though not entirely, discovered as part of the massive and incredibly important Smithsonian River Basin Survey which took place in the 1930s and 1940s in and around the Missouri River Basin. As part of this project, the Smithsonian Institute partnered with various institutions such as universities and historical societies throughout the region to hire help and conduct surveys and excavations in order to mitigate damages from planned dam projects throughout the region. It is through these works that Dismal River sites were originally reported to the academic archaeological community. The earliest documentation of these sites comes from W.D. Strong and his reports concerning Nebraska archaeology (Strong 1932; 1935). He, along with A.T. Hill and members of the Nebraska Survey Team, camped near the forks of the Dismal River for two days while searching for archaeological sites as part of an archaeological reconnaissance for the Bureau of American Ethnology (Strong 1935, 213). It is as a part of this reconnaissance that Strong was shown several Dismal River sites. While the sites themselves were generally first known to archaeologists through A.T. Hill, Strong was the first to document and report on them. At this early juncture, sites of this type were rare, but they were all found near or along the Dismal River in the Nebraska Sand Hills (Strong 1935, 212-217).

Ceramics were an important part of the collections from the three sites looked at by Strong and his team. He reports two different types of ceramics, but notes that they are generally similar in make and shape, with the main difference being that his first type, which he calls “hole tempered,” has large holes in the paste where some sort of vegetation in the temper has burnt out, as well as a surface treatment which creates a
ridged pattern on the exterior (Strong 1935, 215-216). With that said, both types are darkly colored, mostly a light gray, though occasionally more of a brown, and they contain a sandy temper as well. This is the earliest description of what we now call Dismal River Grayware, as well as the earliest description of the simple stamping that appears at Dismal River sites. While this will be discussed in far more detail in the analysis portion, simple stamping occurs from paddle and anvil pottery making and results in a ridged exterior surface due to the fact that the paddle is wrapped with some sort of twine. While Strong’s original reporting of this group is critical, it is undoubtably certain that the most significant work to date in identifying and describing Dismal River sites is that of James Gunnerson.

Gunnerson’s 1960 monograph, published with the Smithsonian Institute’s Bureau of American Ethnology, is called “An Introduction to Plains Apache Archeology - The Dismal River Aspect” (Gunnerson 1960). This work gives a description of every single Dismal River site that had been discovered at that point throughout the country. While the majority of sites are located in Nebraska and Kansas, Gunnerson reports the presence of sites in states including Colorado, Wyoming, and South Dakota as well. He gives a description of each individual site in accordance with the information known about it. Of course, sites that only contained a handful of surface sherds received a far smaller treatment than sites like Humphrey which had been partially excavated by this point. Gunnerson was the first person, and to date still really the only person, to fully compile descriptions of every single Dismal River site and publish them together. He was intent on demonstrating the legitimacy of these sites as one type which could be attributed to a
group of Plains Apache. This work provides the backbone from which all other Dismal River work spreads, including this thesis and all works that have come before it. With this general background for Dismal River sites and archaeological research in mind, it is critical to go further in depth concerning individual type sites, and sites that have helped provide chronological data on Dismal River people.

The first major Dismal River site that was excavated is 25CH1, the Lovitt site, located in southwestern Nebraska, and its excavation provided the foundation for future excavations of these types of sites (Hill and Metcalf 1942). The excavation collected artifacts that provided the base with which other artifacts from future sites could be compared to determine whether or not they could be attributed to the Dismal River people. As such, this site is of critical importance to the history of Dismal River archaeology, and will provide a useful background for the future discussion of Humphrey and its place in this complex.

The Lovitt site was originally excavated with two main intentions: to create an inventory of Dismal River materials as mentioned above, and to place it chronologically in Nebraska’s archaeological history (Hill and Metcalf 1942, 159). This site in particular was excavated because many Dismal River sites that had been located to date were too hard to get to, or appeared too small to warrant excavation. However, 25CH1 was more accessible, and reports from local collectors indicated that the site was sizable and certainly worth investigation (159). With these things in mind, A.T. Hill directed the excavation of the site during the 1939 field season. Labor was provided through the Works Progress Administration (WPA), and George Metcalf was the foreman for the
excavation (159). Below is a brief description of the work done at 25CH1, and its importance for the general knowledge of Dismal River people and their archaeological remains.

In the summer of 1939, the team conducted excavations of three primary trenches through excavations of ten foot squares, each in a different area of the site, as well as several individual ten-foot squares, and some test units to determine the extent of the site (Hill and Metcalf 1942, 167-168). The first trench was excavated in what the authors refer to as “area 1,” and consisted of a twenty foot wide trench that spanned four hundred fifty feet to the north. That trench was later crossed with a ten foot by two hundred eighty foot trench running east to west. These units were abandoned when the landowner needed to plant corn where they were digging (168). Area two, where the archaeologists moved after area one had to be abandoned, was at the southwest of the site along a fence line where the crops had died. The trench was ten feet wide by five hundred twenty feet long, occasionally wider where the crops were dead even further than at the beginning of the trench (168). Area three was excavated after the crops were harvested, and contained two trenches. One of them ran for seventy feet to the south, and then another was extended to the east off of that, stretching one hundred ten feet. These trenches, according to the authors, outlined the outer limits of the habitation site (168). With the basic structure of the excavation understood, it is best to move towards an understanding of what was uncovered at the site, and how those features and artifacts have led to a better understanding of the lives and habitations of Dismal River people.
One of the most important discoveries from Lovitt was that of two houses. Dismal River architecture has proven a tricky subject, but the houses at 25CH1 have proven very beneficial in understanding housing structures at these sites. The first house, found in area two, was at the south edge of the site. It was round, and twenty feet in diameter, with fourteen posts in the outer circle, with a few missing, and with a fireplace in the center. There were also seven post holes located around the fireplace, forming a horseshoe shape (169). While the assemblage will be discussed in more detail below, this house contained Dismal River sherds, stone and bone artifacts, three copper jingles, an iron awl, and an unidentified piece of iron in a prong-like shape (170).

House two was on the south edge of area two, and was not in as good of condition as house one. The structure had clearly been disturbed through the cultivation of the area, with clear plow ruts visible at the site, and evidence of the penetration of alfalfa roots (170). The living surface of the house where the fireplace was found was only three inches below the current ground surface. The fireplace itself had evidently been plowed, and there was also clear evidence of wind erosion at the site. Archaeologists did locate the presence of five post holes surrounding the fireplace at intervals between five and six feet from the center of the fireplace. While there were post molds scattered in the excavation area, they did not appear to demonstrate the exterior of the structure, suggesting that either the exterior posts had been plowed or otherwise destroyed by cultivation at the site, or that this structure was constructed differently than house one, using five center posts as a central base which would then have exterior posts leaned against it, creating a house with a cone shape (171). While it seems unlikely that two
houses at the same site, in relatively close proximity, from the same group would
demonstrate such different methods of construction, it is a possibility, and it is impossible
from available information to conclude how house two was constructed.

The third structure at the site is completely unique from the two houses. Named
Feature 1, this structure was rectangular in nature, made up of three rows of posts, likely
with three posts in each row, even though one row only had the remains of two posts,
with the area where the third post was expected completely disturbed by rodents. This
structure was ten feet long and nine feet wide, and the middle row of posts was closer to
the west row than the east (171). Seven of the post holes contained bison leg bones
placed vertically in the holes which were wedged between the posts themselves and the
walls of the holes. The structure also contained a feature including a patch of gray ashes
one foot wide and one inch deep. Outside of the structure, there were two features. One, a
shallow pit with bison bones and a bone hide flesher, was just north of the northwest
corner of the structure. The other was located four feet to the east of the structure, and it
was a much larger and deeper pit (171). According to the authors, this structure is
indicative of a summer shelter, probably made of brush, while the other two, while
potentially of different styles, were likely more permanent structures (172).

Likely the most notable features from the site were in the form of pits which were
shallow and shaped in irregular ways. These pits were typically bowl shaped, and
typically connected with one another at some part of the lip. While this was not always
the case, it was relatively common. The pits were generally filled with dark soil, as well
as animal bones, charcoal, evidence of burning, and other artifacts. It is suggested that
these pits might be for garbage, as there was no other evidence of midden pits or piles at the site (175).

There were a great variety of artifacts discovered at 25CH1, some of which were briefly mentioned above. These included chipped stone and pottery, as well as bone, ground stone, antler, metal, wood and leather (179). While all of these artifacts are critical for a complete understanding of the site, this work in particular has its focus on ceramics. As such, the following discussion of artifacts from the Lovitt site will focus on the pottery. The ceramics were the indicative dark color, ranging from grey to black, as well as a handful of buff sherds. They conform to what is now known as Dismal River Greyware, and that form will be discussed in intricate detail as part of the ceramic analysis from the Humphrey site. Of note from these sherds is the occasional use of shell as a tempering agent, as well as the fact that 42 of them were tempered with significant amounts of mica (180).

The excavation also recovered sherds that were able to be reconstructed into four pots, all of which were small or medium in size, and included miniature pots (180). Finally, ceramics from Lovitt showed significant evidence of paddle and anvil construction. However, unlike in many cases with this construction type, these pots were then burnished, largely obscuring or entirely destroying the distinctive marks left behind by the wrapped paddle (182). The overall counts for Dismal River sherds from Lovitt were four restored pots, 425 rim sherds, and 5254 body sherds (179).

The traits listed above are critical for the understanding of Dismal River as a whole. As the first full scale excavation of a Dismal River site, Lovitt provided the
blueprint for understanding what to expect from a site created by these people. In many ways, it is likely the main type site for this group, and the discoveries made at Lovitt are of great value even in understanding Dismal River sites today.

Another of the key sites that has provided a great deal of information concerning Dismal River people is that of White Cat Village (25HN37), located six miles southeast of Alma, NE, in Harlan County on a terrace along the north side of Prairie Dog Creek, just three miles away from the Republican River (Champe 1949). The site itself is now impacted by the Harlan County Reservoir, as much of the area around the site is flooded, and at maximum pool, Gunnerson reports that the site itself will be covered (Gunnerson 1960, 146). As with many of these Dismal River sites, White Cat village was first located through the Smithsonian’s Missouri River Basin Survey. In the summer of 1946, Marvin Kivett and J. M. Shippee, as part of the River Basin Survey, conducted a preliminary survey and several small test excavations that located and provided some context concerning the site (Champe 1949, 285). After this work at the site, Waldo Wedel with the Smithsonian Institute invited the anthropology department at the University of Nebraska-Lincoln to participate in further work at White Cat Village in 1948. As such, the University gathered a field school for the summer of 1948, led by John Champe himself, which included among its members Dolores and James Gunnerson, as well as multiple other students, and received visits from George Metcalf and Waldo Wedel (285). The Champe 1949 report is noted as being only a preliminary study, but a further, more in depth analysis was not published by him. However, Gunnerson does treat the site fully in his 1960 work (Champe 1949, Gunnerson 1960). The author also knows that the
University of Iowa, under the direction of Matt Hill, intends to conduct further work at White Cat in the near future. They intended to begin work at the site in the summer of 2018, but poor weather forced them to abandon those plans. However, this work is not yet published, and is only known because the University of Iowa group was working at the Humphrey site in the summer of 2018 directly before traveling to White Cat. So while nothing can be reported about this work yet, it will surely provide valuable information about the site in the years to come.

The early work at White Cat Village provided a great deal of valuable information concerning general patterns found at Dismal River sites in general. One of the greatest pieces of information uncovered at White Cat has to do with architecture. While Lovitt had two houses and a third temporary structure, excavations at White Cat Village uncovered six houses (Gunnerson 1960, 146). These houses have provided excellent information concerning Dismal River house form, and as such will be briefly discussed below. At the Lovitt site, there were two houses, one which had seven interior posts, and another that had five posts, both with a fireplace in the center. This introduced uncertainty concerning Dismal River houses. However, White Cat Village helps to alleviate some of that uncertainty. Of the six houses at White Cat, five of them had five post holes evenly spaced around a fireplace, while the other house had six posts (Gunnerson 1960, 146). Of course, this shows continuity with house two at the Lovitt site, suggesting that this might be the main way that Dismal River people built their houses. The clarity that White Cat Village structures brought to the discussion of Dismal River house form is likely its main
contribution to knowledge of this group. However, the excavations at the site also provided further knowledge about other artifact types.

The ceramics of 25HN37 conformed quite closely to those found and discussed from the Lovitt site. Champe utilizes the three distinctions made by Metcalf (1949), breaking the ceramic artifacts into Lovitt Plain, Lovitt Simple Stamped, and Lovitt Mica Tempered (Champe 1949, 288). The use of these three terminologies is not actively used as part of analysis in modern Dismal River analyses. All of these surface and temper treatments are present in Dismal River Ceramics, sometimes even on the same vessel. They are all consistently recorded at Dismal River sites, including Humphrey. One valuable discovery from White Cat, which will be discussed in further detail while discussing the excavations at Ash Hollow Cave, was the discovery of Upper Republican sherds at the site. Yet Champe said that there were too few of these sherds to definitely indicate a previous occupation at the site (Champe 1949, 288).

The other artifacts that were discovered at White Cat Village mostly adhered to the types that were found at Lovitt, and as will be discussed below, at all other Dismal River sites, such as bone and chipped stone tools, bone beads, and significant amounts of bison and turtle bones among other things. However, this site did contain several artifacts that were somewhat more unique. For example, there were two brass jingles, iron trade hoes modified for use as scrapers, a gunflint, and a piece of obsidian (Champe 1949, 289). However, the artifact that is likely the most unique to White Cat Village is a piece of iron that was found in the fireplace of house VI. This piece of iron was later identified as a trade ax that had been driven into the fireplace. While the purpose of this is
unknown, Gunnerson proposes two possibilities. First, that the people of White Cat may have buried the head of the ax in the ground to protect it from excess heat while burning off the old handle so that they could replace it with a new one. The other thought is that the ax may have been left there by an enemy who had burnt the house down, and then left the ax there as some sort of message or symbol (Gunnerson 1960, 155). While it is uncertain which of these is the correct interpretation, Gunnerson appears to favor the latter, as he expects that the person replacing the handle would not have simply abandoned such a valuable item, even if the house had burnt down. With that said, just the presence of such a valuable item at White Cat is important, as it demonstrates a further connection between the people of the village and the approaching colonizers.

Another critical Dismal River site is Ash Hollow Cave, or 25GD2. While the previously mentioned sites are all notable specifically for the individual finds or structures that were present at them, Ash Hollow Cave is largely important for the information it provides concerning chronology of Nebraskan prehistory, including that of Dismal River people. Ash Hollow Cave is a multicomponent site which includes a Dismal River component, among other groups. While all of these components will be mentioned below, of course the main focus here will be on the Dismal River component, and how that falls into the chronology that is demonstrated through stratigraphy at the site.

The main report of the excavations at Ash Hollow Cave was made by John L. Champe in 1946 (Champe 1946). Gunnerson also provides a brief discussion of the site in his 1960 work (Gunnerson 1960), but the majority of information will be taken from
Champe. According to Champe, Ash Hollow Cave was first known to local collectors well before it was introduced to archaeologists. However, in 1939, local collectors brought the site to the attention of A.T. Hill, then director of the Nebraska State Historical Society (Champe 1946, 10). When he first arrived at the site, he noted that some unknown person had previously excavated the site, probably in search of artifacts to sell or add to a collection, excavating a large hole in the center of the cave, down approximately 36 inches (10). While this looting activity certainly damaged some of the site, there was still plenty left intact to warrant further investigation.

Excavations were conducted by the Nebraska State Historical Society in 1939. The entire cave was organized into a grid system. According to Champe, the team originally attempted to excavate the site stratigraphically, but this proved impossible, so they instead excavated, as Champe says, by “block and column” (Champe 1946, 12). In other words, the site was excavated by arbitrary three inch, levels, revealing a clear stratigraphy in the walls. Dirt within each block, or level, was loosened with trowels, and then screened, before being bagged by block and transported to their lab in Lincoln where artifacts were further processed. Overall, this excavation was conducted in a sufficient manner to demonstrate stratigraphical proof of the order of habitation of several important groups from Nebraska’s prehistory.

Excavations at 25GD2 uncovered seven cultural layers, referred to as lenses by Champe, called lenses A-G. The main focus here lies in Lens A, however it is important to briefly outline the stratigraphy and cultures of the whole site before going in greater detail on Lens A. Lens A was a layer of dark sand, approximately two inches thick, which
fell just above the datum point used at the site. Present in this lense was a fireplace, and with it a significant amount of charcoal, as well as around fifty Dismal River sherds, scrap metal, and glass, though some of the latter two are potentially even after Dismal River. Below this lens, there is a layer of clean soil, after which begins lens B (Champe 1946, 19). Lens B is approximately four to five inches thick in most places, and includes several fireplaces of a basin-shape filled with white ash. Artifacts at the site consist of Upper Republican sherds, a group that is part of the Central Plains Tradition (CPT) (20). Dendrochronology conducted at the site suggest an occupation from AD 1312-1517, though Champe suggests that the occupation began after 1450, and ended around 1517 (49). Lens C is approximately seven inches thick, filled with darker sand and some charcoal, though in some places of the cave, it is a lighter colored layer, which Champe attributes to “a heavy admixture of the white ash from the basin fireplaces (20). Artifacts include charcoal, Upper Republican sherds, and Woodland sherds, suggesting multiple habitations by different groups (20). Dates of AD 1210-1334. were given for this lens, though it is likely that the major occupation began at approximately AD 1300 (50). Lens D is approximately eight inches thick, and is filled with charcoal throughout. The main artifacts identifying this lens are Woodland sherds as well as pits and hearths (21). After including an arbitrary time gap of 50 years between lenses C and D, the author suggests an estimated date of AD 1000-1150 for lens D (52).

While Lenses A-D are typically identifiable in regards to their cultural habitation, the remaining lenses provide more difficulties in this regard. Lens E is a four inch layer of sand with charcoal in it (21), and is attribute to a time between AD 600 and 850 (53).
Lens F is between two and six inches in thickness, and generally contains charcoal, a few hearths, and some artifacts (22), and was given a date between AD 300 and 400 (53). Finally, Lens G appears to be a temporary occupation, noted by up to three inches of sand mixed with charcoal (22), and was dated by Champe to approximately AD 0-100 (54). Due to a very limited number of artifacts in these layers, the author does not suggest a cultural affiliation for any of them, but instead simply suggests that they are likely pre-ceramic, and relies instead on the aforementioned dendrochronological dates (52-53).

While Ash Hollow is an incredibly important site for Nebraskan chronology, the main focus here is on Lens A, as it contained a significant Dismal River component. Artifacts uncovered in Lens A included 71 ceramic sherds, of which 69 were Dismal River. One other was Upper Republican, and the remaining sherd was attributed to what Champe calls “type Z” (46). Champe specifically compares the artifacts from Ash Hollow with those from Lovitt, and finds a significant amount of overlap. He notes that, besides the sherds alone, the chipped stone work, worked bone, and faunal remains all resemble those found at Lovitt. Champe does note that short tubular beads discovered at 25GD2 do not have have any comparison with artifacts from 25CH1, but later excavations, including those already discussed from White Cat, and those yet to be discussed of Humphrey, also uncovered similar tubular bone beads. As such, the attribution of Lens A to Dismal River is very clear, and as such lends important aid in the chronology of Dismal River people. Charcoal from Lens A was analyzed by H.E. Weakly, and he gave it a dendrochronological date of AD 1587-1684, but suggests the addition of a twenty year buffer on the late side to account for the missing outer rings, giving an end
date of AD 1704, well within the general timeframe of Dismal River people (Champe 1946, 47). Excavations at 25GD2 clearly identified a Dismal River occupational layer in a highly stratified site, suggesting a time period after that of the Upper Republican people. The presence of Dismal River people at a highly stratified site like Ash Hollow Cave is incredibly useful for a further understanding of these people, and especially of a chronological attribution for them.

The final site that will be discussed here before covering the main topic of this thesis, the Humphrey Site (25HO21), is that of the Scott County Pueblo, also known at times as El Cuartalejo, or simply 14SC1. This site very well may be the most researched site with a Dismal River component, due to the fact that, as discussed above, many researchers have discussed its possible attribution to the site described by Ulibarri (Thomas 1935). While the ethnographic importance of this site has been covered in some detail above, there is a significant amount of archaeological data that needs to be discussed concerning this site.

14SC1 is located in Scott County, Kansas, north of Scott City in the valley of Beaver Creek. As one of its names, the Scott County Pueblo, might suggest, the site itself is a seven room stone pueblo, and it is often referred to as the furthest east pueblo. As was previously mentioned, the site is also often considered to be synonymous with El Cuartalejo which was visited by Ulibarri, and subsequently documented, during his voyage into the area. While its name might suggest that the principal artifacts discovered in the pueblo itself were of Puebloan origin, this would be mistaken. 14SC1 was excavated very early due to its association with Ulibarri. The original excavation of the
site was conducted in 1898 by Williston and Martin from the University of Kansas (Williston and Martin 1899; and Martin 1909). Further test excavations were also conducted through the Smithsonian under the guidance of Waldo Wedel (Wedel 1959) with the goal of finding datable Puebloan remains to help better understand the chronology of the site (426). This site has also received significant attention in more recent years, and these topics will be discussed in further detail below (Beck and Trabert 2014; Hill et al. 2018; Trabert 2015). It is first critical to gain an understanding of the earlier excavations, and the related artifacts that suggest an attribution of Dismal River people to a pueblo in western Kansas.

The building that was uncovered by Williston and Martin was rectangular and ran east to west, measuring 53 by 35 feet. The building had mud plastered floors, and all but one of the rooms contained at least one stone slab lined hearth. Room five contained an oven, and room one had a grinding basin. Many of the rooms also had a pair of postholes in the corner, likely indicating a ladder. Finally, the presence of a significant amount of carbonization, both on the structure itself, and on many of the artifacts, suggests that the building had been burnt down (Williston and Martin 1899; Martin 1909). This is the very basic layout of the structure itself. The information that directly relates to Dismal River is directly discussed by Wedel (1940; 1959), and will be discussed in somewhat greater detail.

Wedel’s 1939 investigation of 14SC1 and the subsequent discussions of the site provide a significant amount of information, especially in the discussion of a Dismal River occupancy of the site. Of course, Dismal River archaeological sites were unknown
in 1898, but were under scrutiny by 1939, and certainly by 1959 at the time of this publication concerning an overview of Kansas archaeology. As Williston and Martin had already excavated the main structure, Wedel focused on the related and untested midden deposits and other features in connection with, but not directly inside of, the original structure (Wedel 1959, 426). The main focus of this work was the excavation of three test units, as shown in Figure 3 (Wedel 1959, 427). Wedel reports that the excavations conducted by his team in 1939 uncovered a variety of features and artifacts including, but not limited to, sherds, stone, bone, glass, copper, iron, horn, animal bones, charred maize and squash, bell shaped roasting pits, and large, irregularly shaped trash pits. He points out that all of these types of artifacts and features strongly indicate an association with Dismal River people (Wedel 1940, 83).

Wedel’s 1959 work also gives a relatively detailed description and comparison of the ceramics at the site. Of the 3,810 sherds recovered, 95% were described as “Scott Plain,” while the other 5% are called Scott Micaceous. While he assigns them their own name and categorization, Wedel does admit that these ceramics are nearly identical to those described at the Lovitt site except for the minimal presence of simple stamping on the exterior surfaces of these sherds. With that said, the other traits, including the dark gray color, presence of mica and
sand in the temper, and general size, thickness and form, all directly compare with Dismal River ceramics, and as such, Wedel admits that the site itself can be attributed to Dismal River people (Wedel 1959). It is very understandable that, given the significant geographical separation between the Nebraska Sandhills and western Kansas, that there will be minor differences in the specific construction of the ceramics, and yet it is very clear that Dismal River people were living at, or at the very least, around the Scott County Pueblo. While the attribution of Dismal River people to this site is relatively well accepted, there has been significant debate in recent times concerning chronology and specific occupation of this site.

One of the biggest players in this debate, and surely the most recent installment in it, comes from a collaboration between Hill et al. in 2017 in their *American Antiquity* article titled “A Hard Time to Date: The Scott County Pueblo (14SC1) and Puebloan Residents of the High Plains (Hill et al. 2017). While other works have suggested that Apache people had entered the Central Plains in the AD 1400s or 1500s (Brunswig 1995; Gilmore & Larmore 2012), Hill et al. were able to use careful chronometric analysis to strongly argue against the standard date provided by Gunnerson and used frequently after him of AD 1675-1725 for Dismal River populations (Gunnerson 1960). As such, a brief discussion of the findings from this article is in order to more carefully ground the dates of Dismal River sites, specifically 14SC1.

Hill and colleagues undertook the project of better understanding dating at 14SC1 in large part because of recent evidence concerning different occupations at and around the site, consisting of northern Rio Grande Puebloan remains in the pueblo itself, and
Dismal River remains outside of it (Beck and Trabert 2014). This distinction, and the realization that a difference of occupation dates would likely be attached with this, led this group to use Bayesian models to constrant the dates of various radiocarbon dated remains based on the strata from which they were excavated. This method of research allowed the researchers to distinguish between different occupational levels, and correspond those to the dates for the site (Hill et al. 2017). Through their use of these models and restrictions, the team found that Dismal River people had occupied the site before, and likely during, the occupation of the actual pueblo, which was inhabited by northern Rio Grande people. Specifically, they argue that the Dismal River occupation of the site was between cal. AD 1490 and 1650, whereas the Puebloans did not likely begin building the actual pueblo until approximately cal. AD 1630 (Hill et al. 2017). While this is only a brief description of the study, it demonstrates clearly that, at least in the case of 14SC1, Gunnerson’s range of dates of AD 1675-1725 does not properly contain all Dismal River sites, and as such should not be used as the overarching standard.

The final site that must be described before the beginning of the full analysis portion of this thesis is 25HO21, or the Humphrey Site, which is the specific site that the remainder of this work will concern itself with. The Humphrey Site is currently listed on the National Register of Historic Places, located in Hooker County, approximately five miles east of Mullen, Nebraska, in the Nebraska Sand Hills on a terrace above the Middle Loup River. While some discussion was given of the site above, it will be recapped here in order that the context and past work is fully understood before going in great depth about the ceramic and OSL analyses conducted at the site.
25HO21 was originally located by a group of surveyors from the Smithsonian River Basin Survey in 1947, and was subsequently partially excavated by Kivett as part of the Nebraska State Historical Society under the direction of A.T. Hill in 1949. The main description of this work actually comes from James Gunnerson, as well as some details from the original Humphrey nomination for the national register, and the original 1947 survey report (Kivett 1973; Kivett and Hughes 1947; Gunnerson 1960). The original survey which located the Humphrey site was conducted through the RBS in order to prepare the area for the proposed, but never completed, Mullen Reservoir (Kivett 1973). After the site was located in 1947, the team with the NSHS that returned to excavate in 1949 spent multiple days testing the edges of the site that had been impacted by a gravel operation that was run on the land previously. As such, excavations remained on the sloping part of the terrace without reaching the main, upper portion of the terrace (Gunnerson 1960). The 1949 excavations uncovered some critical features and artifacts which will be discussed below.

The original excavations at the site uncovered several features related to structures or habitations, including firepits, postholes, and structure floors. The floors were marked by heavy staining and concentrations of “village detritus,” as well as burnt posts and one example of a potential clay floor. However, it is worth noting that no pattern was obvious in regards to the postholes surrounding the fireplaces (Gunnerson 1960, 188). There were also pits present, most of which were considered trash pits, though Kivett marked one of them as a roasting pit (Gunnerson 1960, 189). Ceramics from the original excavation are very similar to ceramics that have been discussed from
other Dismal River sites previously, with mostly a gray surface, sand temper, with rare pieces that include micaceous flakes in the clay. Surfaces are anything from polished to simple stamped. Rim sherds contained some decoration, when present generally in the form of incised or impressed lines, and seventeen of the rims were flattened. While these and some other decorations were found on these sherds, most of the rim sherds were undecorated (Gunnerson 1960). There were also fragments from six ceramic pipes (192). While there are a great variety of other artifacts that were found at the site, such as bone beads, scapula hoes, chipped stone tools, and so on, it is enough to say that the other artifacts are like those found at the aforementioned Dismal River sites, as these types of artifacts are not the focus of this work. Of note from the site is the presence of very few trade goods. In fact, Gunnerson notes that the only trade good present was a single small piece of iron (Gunnerson 1960, 205). With a general understanding of the original excavation and survey of Humphrey, it is now time to discuss the most recent work at the site.

Since these earliest excavations, two field seasons have been spent at 25HO21. History Nebraska, alongside the University of Nebraska-Lincoln, the University of Iowa, and the University of Oklahoma, conducted excavations, first in 2017, and again with a larger party, in 2018. This work was originally conducted in order to employ modern archaeological techniques including systematic water screening and powerful mapping tools in the form of a total station while also allowing for a more detailed understanding of Dismal River assemblages based on the high percentage of artifact recovery that 1/16 inch water screening allows for. It was this goal that fueled the work at the Humphrey
Site. The work in 2017 consisted mainly of the excavation of small test units. Prior to this season, History Nebraska worked alongside the Midwest Archaeological Center (MWAC) to conduct geophysical survey of the site. In the field, excavators utilized the generated map to excavate their units on geophysical anomalies, especially the three features that appeared to be structures, features 12, 13, and 14. This work was conducted with a smaller team, but the 2018 excavation was conducted with a larger group, and with a more targeted goal. Since the 2017 work had demonstrated the general artifact availability and general layout of this portion of the Humphrey Site, the 2018 work specifically targeted feature 12 with the intention of uncovering a cross section of one of the habitations at the site to better understand Dismal River architecture, while recovering a great variety of artifacts to help with a wider general understanding of the site itself. The ceramics from these two seasons are under examination as part of this work. Nothing has been published from these excavations, so the above information is from my own time at the site, and my conversations with others working at 25HO21.

The above discussions of the Lovitt site, White Cat Village, Ash Hollow Cave, 14SC1, and the Humphrey site provided a basic overview of what Dismal River sites look like in terms of layout, features, and artifacts, with a focus on ceramics, while also providing a solid foundation for further discussions of the Humphrey site itself. With this understanding in place, it is now time to move towards the ceramic analysis portion of this work. Hopefully, this background has provided the reader with a sufficient understanding and appreciation for Dismal River archaeology to fully understand the coming analyses, and to understand the groups and topics that will be discussed below.
Chapter 4: Ceramic Analysis

The following ceramic analysis was conducted on the entirety of the Humphrey ceramic collection from the 2017 and 2018 field seasons. In the Fall of 2018, Dr. Phil Geib ran a course at the University of Nebraska-Lincoln, in which students performed a wide variety of archaeological analyses. Among these analyses conducted by the class was a ceramic analysis, in which the class analyzed the entirety of the 2017 collection, and a small portion of sherds from the 2018 collection. However, in order to keep some form of continuity, the author decided to reanalyze the entirety of the collection, except for those sherds analyzed by Dr. Geib himself. Since Dr. Geib taught the author how to do these analyses, his work was used by the author to ensure accuracy and understanding. With that said, work from the students in the course was occasionally referenced by the author in cases where he was unsure of something, and in need of an opinion. The author himself conducted the analyses on the majority of the 2018 collection, but both collections will be treated together below.

As mentioned in the previous chapter, the 2017 and 2018 field seasons at the Humphrey site were conducted alongside History Nebraska. Rob Bozell, State Archaeologist of Nebraska, was incredibly generous to the author. Mr. Bozell allowed the author to conduct a summer internship with History Nebraska in connection with this thesis, during which time the author both excavated at the Humphrey site as a GTA on the field school, and then aided in lab analysis for the remainder of the summer on the collections that were returned from the site. Mr. Bozell also provided the author with space in History Nebraska’s archaeology laboratory in which to conduct his analyses for
the following year. As such, these analyses were conducted at History Nebraska’s archaeology building. Due to the presence of other archaeologists in the building, the author occasionally received opinions and aid from other History Nebraska archaeologists. These notes are mentioned in order to provide complete transparency as to the working conditions and aid received by the author in the process of conducting this analysis.

Methods

With the working conditions and aid received by the author duly noted, it is best to move onto the specific methods used to conduct the analysis. Dr. Geib compiled a series of analysis points, which he modified from the work of Dr. Trabert (2015). This document, in full here in Appendix A, was used to guide the analysis, both by Dr. Geib’s class, and subsequently for continuity purposes, in the following analysis. A brief description of how this document was used will be provided here, and the full document can be consulted as well. Equipment utilized for the analysis was provided both by Dr. Geib, and by the lab of History Nebraska. This equipment included a 10-35x binocular microscope, a Wentworth scale, metric digital calipers, and a digital scale, measuring to the nearest 0.1g. Description of the full process utilized for analysis of each sherd is below.

The database created was made in Google Sheets, as the author did not have access to Microsoft Excel, or Microsoft Access at the History Nebraska Lab. This database was created and kept on the author’s Macbook Pro, and then converted to an excel file for subsequent analysis which was conducted on a computer provided by the
Anthropology Department for the author’s use. For each sherd, the provenience, bag, and item numbers were each documented in the database, after which point the sherd was weighed, in grams, on the digital scale. Then, using the calipers, length, which is defined here as the longest edge of the sherd, as well as thickness, were measured in millimeters and subsequently documented. The size class field, which is documented in the analysis, was determined using the length measurement.

There are a couple points worth noting in regards to methods. First, the length measurement was a field added by the author in order to have a more full understanding of sherd size. Having a specific thickness measurement, but no documentation besides a wide size range for length was too imprecise, and as such, the length field was added. With that said, the size class field will be utilized primarily in analysis, as it a helpful way of grouping a wide variety of numbers. Still, the specific length measurements will be referenced, and will be very useful for future research of these sherds. Also, as the length field was added after the class conducted their analyses, sherds analyzed by Dr. Geib do not contain a length measurement, and instead only have a size class. It is also worth noting that, while the analysis document noted the size classes in inches, the subsequent analysis was conducted using calipers measuring in millimeters. As such, the size class fields were converted. Table 1 shows the converted measurement values.

After the basic measurements were conducted, temper was carefully inspected and analyzed. In most cases, a fresh break was created in order to benefit temper analysis. Without a fresh break, it is far more difficult to see the actual temper, and the temper that is visible could have varied from that further inside of the sherd. Breaks were very small,
and typically initiated simply using a fingernail, as these ceramics were quite fragile with a friable, crumbly paste. However, in some cases fresh breaks were impossible, as the size of the sherd was far too small. Otherwise, there were some cases where a broken edge was already exposed, or where the previous student analysts had already provided a break. While the fresh break was the main window through which temper analysis was conducted, the unbroken edges were also examined and taken into consideration. Temper type and size were determined at the same time. While the temper type only focused on the presence of sand, sand and mica, or crushed rock temper, temper size was conducted on a scale of 0-8, all of which is shown in Appendix A. Numbers 1-4 correspond to the categorizations on the Wentworth scale from very fine to coarse. The remaining numbers are various mixtures of these size categories, including number seven which combines very coarse and very fine.

<table>
<thead>
<tr>
<th>Size Class</th>
<th>Measurement (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>&gt;50.8</td>
</tr>
<tr>
<td>2</td>
<td>25.4-50.8</td>
</tr>
<tr>
<td>3</td>
<td>12.7-25.4</td>
</tr>
<tr>
<td>4</td>
<td>6.35-12.7</td>
</tr>
<tr>
<td>5</td>
<td>&lt;6.35</td>
</tr>
</tbody>
</table>

After these measurements and analyses, each sherd was inspected, largely without the microscope, with the intention of determining interior and exterior surfaces as well as the vessel form. The main surface treatments were smooth, rough, smoothed over simple stamping, simple stamping that had not been smoothed, and cord roughened. If a surface did not appear to be intact, the surface treatment would be listed as indeterminate. For example, due to the fragility of these sherds, it was relatively common to find sherds
where one surface, often the exterior, was relatively intact, while the interior had been worn away leaving only the exposed interior paste. Also, there were situations where the sherd was too small to allow for the determination of whether a surface was interior or exterior. In this case, if the two surfaces had different treatments, they would both be listed as indeterminate.

Vessel form as a category was challenging to determine. The main way of determining whether a vessel was a jar, bowl, or pipe, largely relied on intuition. A rule of thumb was used, wherein if the interior, meaning the concave, surface was more or equally as finished as the convex, or exterior, surface, the sherd was considered part of a bowl. If the opposite was true, the vessel was considered a jar. Whereas a sherd was considered to be part of a pipe in a case where it demonstrated a very tight diameter. Of course, these rules are not hard and fast, and many sherds were labeled indeterminate due to uncertainty on the part of the author. With that said, it seemed more prudent to err on the side of caution in this respect. At this point, the sherd was also examined for coil joints, typically visible as a line running horizontally on the sherd with a slight separation visible. This line was not enough to show light, but enough to show that the two portions were not originally one piece, as is the case with lump molding. Any body decorations, typically in the form of fingernail impressions, were also noted. These fields were documented for every sherd. Rim sherds, as well as shoulder or neck sherds, received special treatment and extra documentation.

Rim, neck, and shoulder sherds received further measurements and documentation as was possible and necessary according to the following protocol. The
special measurements conducted for these sherds included lip thickness (in millimeters), rim diameter, rim height, and shoulder thickness. The specifics of these measurements are shown in Appendix A. Lip decoration was determined and documented using those decorations shown in Appendix A, and any new lip decoration forms were given a new number and noted in the comments of the database. The percent of the rim present was determined simply by judging based on the curve of the rim. The rim and neck were also visually inspected to determine the rim/neck form, whether it was upright, flared, or inverted. Worth noting here is that the original document contains a typographical error, in which these categories are numbered as 1, 2, and 2. This analysis remedied that, and labeled any sherd having a rim/neck form that was inverted as a three. Comments about anything unique, troubling, puzzling, or otherwise noteworthy were then included in the comments section at the end of the database. The above section fully outlines the methods used to conduct the ceramic analysis of the ceramics from the 2017 and 2018 excavations of the Humphrey site. The following section contains the results of those analyses as well as a discussion of their meanings.

**Analysis**

One of the key factors in determining whether or not a piece of ceramics is Dismal River is the color of the sherd itself. While this specific variable was not documented on each and every sherd, the analysis of \( n=2073 \) ceramic sherds, and research concerning Dismal River sherds from other sites has left a clear picture of what the majority of these sherds look like. In general, the Dismal River sherds from 25HO21, like those at all of the other sites discussed in Chapter 3, are dark gray to black in color,
with occasional buff colored sherds present as well. The paste of these sherds typically was the same as the surface, though there were some exceptions. Throughout the database, there are mentions of sherds that had an especially dark streak through the paste, even when the surfaces themselves were of a different color. This feature was not the most common, but it certainly appeared frequently enough to warrant a mention as something that might be found in Dismal River ceramics at the Humphrey site. While these specific traits can only be discussed generally, due to the fact that data was not directly recorded concerning them, there are many important traits that were specifically documented, and can thus be directly enumerated.

One of the most noteworthy aspects of Dismal River ceramics is their temper. This aspect has been long discussed throughout the literature in practically any work that discusses Dismal River archaeology. There are two main temper types that are typically mentioned in regards to Dismal River ceramics. The first, and by far most common, is sand temper. The other, that has long been discussed in regards to Dismal River ceramics and possible connections with the American Southwest is micaceous temper. While these are the most common, there were also several sherds that are identified as having crushed rock temper. The numbers are shown in table 2. While these numbers are clear, it is important to briefly discuss how these tempers manifest themselves in these ceramics.

Sand temper was far and away the most common in the ceramics from the Humphrey site, with 98.9% of the total ceramics having sand temper. This temper was most commonly made up of quartz and feldspar grains of varying sizes that were typically somewhat rounded. This pattern was seen constantly throughout the whole
process. There were also occasionally sherds that, along with the translucent quartz grains and pinkish feldspar, had a black grain. This material was typically smaller and more angular, though its exact identity is unknown to the author at this time.

Micaceous temper in Dismal River ceramics is something that is frequently discussed, despite the fact that its actual presence is typically relatively small compared to the overall collections from each site (Gunnerson 1960; Trabert 2015). The Humphrey site is no exception in this regard. First, it is critical to define micaceous temper. The ceramics at this site that include mica are not what archaeologists typically think of as micaceous temper. Instead, it is better to think of the micaceous presence as inclusions as opposed to true temper. The flecks of mica are not at all concentrated, to the point that they are typically very difficult to even identify. In the remainder of this piece, I will try to avoid calling the micaceous inclusions from Dismal River sites micaceous temper. Unlike the micaceous ceramics found in some parts of the Southwest, the mica in these ceramics is likely incidental, and not intentionally added, just based on the scarcity.

Out of the total 2073 ceramic sherds, only 15 of them were documented as having some mica inclusions. This material was typically very limited in scale, and only existed in and among other sand temper. The mica itself was generally flat and thin with sharp

<table>
<thead>
<tr>
<th>Temper Type</th>
<th>Number Present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indeterminate</td>
<td>2</td>
</tr>
<tr>
<td>Sand, no mica</td>
<td>2051</td>
</tr>
<tr>
<td>Sand with mica</td>
<td>15</td>
</tr>
<tr>
<td>Crushed Rock</td>
<td>4</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
</tr>
</tbody>
</table>
angles of varying colors, the main three of which were gold, silver, and black. This material was most notably identifiable by its shimmering nature and sharp angles, though reliance on solely the shimmering nature of a sherd is very misleading, as quartz grains also often cause a shimmery quality in the sherd itself. This means that, in the 2017 and 2018 collection from Humphrey, less than 1% of all the ceramics had micaceous inclusions in them. So while this quality is certainly present, it is certainly not prevalent in any way. There were also four sherds which contained a crushed rock temper, visibly distinct from the other types by the large angular grains that typically resulted. So, while sand temper is certainly the most prevalent, mica and crushed rock tempers were also present and, while only making up a small minority of the collection, are certainly still worth mentioning and keeping in mind for future excavation and research of Dismal River ceramics.

While the actual temper types were rarely diverse, the temper sizes showed at least somewhat more distinction. These measurements were made using a Wentworth scale for sand grains, which breaks up the sizes as follows. Very coarse sand is 1 mm and above, coarse grains are between 1 and .5 mm, medium goes down to .25 mm, with fine sand starting at .125 mm. Finally, very fine sand grains are labeled as anything between 0.625 and .125 mm. The scale that the author used had samples of the grain sizes for each category, so those samples were visually compared with the sample in the specific sherd under examination at the time. Table 3 displays the different sizes of temper based on size class as seen in Appendix A. Looking at the distribution of these temper sizes, it is clearly visible that the majority of sherds at Humphrey had relatively fine temper in them. In
fact, when all of the categories that contain grains no larger than .125 mm are combined, there are 1,733 sherds with this size temper, meaning that nearly 84% of the ceramics at the Humphrey site have grains smaller than .125 mm. With that said, there is another category that also includes some grains of this small size in the medium and fine category, with 223 sherds in it, as well as the very coarse and very fine group with 67. Combining all of these together gives 2023 sherds out of 2073 with at least some grains smaller than .125 mm.

While it is very clear that small grains of temper are by far the most prevalent at this site, significant numbers of larger grains were present, and should be considered in Dismal River ceramics.

The presence of both medium and very coarse grains is particularly noticeable from this collection of ceramics from 25HO21. As mentioned previously, very large grains did occasionally signify crushed rock temper, but it was also present simply as sand temper. There were very coarse grains of both feldspar and quartz present at times in these sherds, which in one case, in a sherd from catalog number 25HO21-111-7-0, appeared in the form of a quartz grain 4.8 mm in size. This was certainly not the only example of a very coarse grain, but it is likely the largest one that was visible during the analysis. So while much of the tempering was small in size, there were certainly

### Table 3. Temper Sizes.

<table>
<thead>
<tr>
<th>Temper Size</th>
<th>Number</th>
</tr>
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<tbody>
<tr>
<td>Indeterminate</td>
<td>5</td>
</tr>
<tr>
<td>Very Fine</td>
<td>932</td>
</tr>
<tr>
<td>Fine</td>
<td>165</td>
</tr>
<tr>
<td>Medium</td>
<td>23</td>
</tr>
<tr>
<td>Coarse</td>
<td>12</td>
</tr>
<tr>
<td>Medium and Fine</td>
<td>223</td>
</tr>
<tr>
<td>Fine and Very Fine</td>
<td>636</td>
</tr>
<tr>
<td>Very Coarse and Very Fine</td>
<td>67</td>
</tr>
<tr>
<td>Mixed, Other</td>
<td>10</td>
</tr>
</tbody>
</table>
examples of quite large grains present in the temper of these ceramics. Through this analysis, it has become very clear that, like other Dismal River ceramics, sand temper is far and away the most common, and while it is generally small in size, there are a relatively decent number of situations in which significantly larger grains are present.

While the temper of ceramics at the Humphrey site shows very clear patterns, it is now time to discuss the size and form of the sherds themselves in hopes of understanding the composition of these sherds entirely. Table 4 provides the distribution for sherds of the five different size classes as shown in the table. This information is very important for understanding Dismal River sherds, and how they are understood and analyzed. One very important thing to note about these sherds is that they are quite fragile and breakable. The quality of the clay that these people were working with was not particularly high. They were also firing their ceramics at relatively low temperatures. So while it produced perfectly functional ceramics, it did not produce ceramics that were especially long lasting or durable. During analysis, it was quite clear that many of these sherds had been broken or worn until they were only very small, fractured pieces, some of which no longer had any sign of their original interior or exterior surfaces, as those surfaces wore

<table>
<thead>
<tr>
<th>Size Class (mm)</th>
<th>Number of Sherds</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;50.8</td>
<td>8</td>
</tr>
<tr>
<td>25.4-50.8</td>
<td>128</td>
</tr>
<tr>
<td>12.7-25.4</td>
<td>686</td>
</tr>
<tr>
<td>6.35-12.7</td>
<td>1086</td>
</tr>
<tr>
<td>&lt;6.35</td>
<td>165</td>
</tr>
</tbody>
</table>
away. These crumbles do not provide the same kind of information that more intact sherds can provide, thus impacting the analyses that are even possible with the majority of sherds at the Humphrey site. This is visible when looking at the sherd sizes in the table above. While there are only eight sherds of the largest size, there are 165 of the smallest. This comparison continues with the second largest and the second smallest, where the smaller sherds far outnumber the larger. The most prevalent size class for sherds is the fourth category, measuring between 6.35 and 12.7 mm. This category alone makes up 52% of the sherds from the site collected in 2017 and 2018, with another 33% coming from the size class only one step larger. When the average length is calculated from the entire database, the number that appears is 13.4 mm, which falls in the low end of size class three, further demonstrating that these sherds are, overall, quite small, typically falling within size class three or four.

Further analysis of the typical weight, and thickness of sherds from the site also support the above claims concerning the relatively small size of sherds at the site. In regards to thickness, there are a wide variety of sherd sizes. While the thinnest sherd was only 1.2 mm thick, the thickest one was 15.8 mm. Obviously, that is a very wide difference, but that is to be expected when the analysis concerns over 2000 individual sherds. What is especially interesting in this regard is the average thickness, which is 4.9 mm. This is clearly much closer to the minimum than the maximum, and is another demonstration of the general size in these sherds. It also indicates that Dismal River people were crafting thin vessels, which would lead to the prevalence of breakages seen in their pottery. Likewise, while the lightest sherd weighs in at less than .1 g, which is the
lightest measurement that the scale could recognize, the heaviest was 26.8 g. Still, the average weight was 1.1 g. The analyses from both of these categories clearly demonstrates the small size of these ceramics.

Another important aspect of Dismal River ceramics relates to the ways in which they were made, finished, and used. Each of these factors can be approached through the analysis that was conducted on the Humphrey site ceramics from 2017 and 2018. There is a discussion above concerning the complications and difficulties present in determining vessel form from these sherds specifically. So, with the note that these estimates are very conservative, it is worth briefly discussing what they mean, and how it relates to Dismal River ceramics overall. Table 5 shows the number of sherds that fall within specific vessel forms, the results of which will be discussed below. Besides the high number of indeterminate entries, this information is still very valuable, and does generally align with the patterns observed. Dr. Trabert reports that the ratio of bowls to jars at the Dismal River sites in her dissertation research showed a definite prevalence of jars, whereas more bowls might have been found at a Puebloan site (Trabert 2015, 250). While this current research does not speak to Puebloan examples directly, it definitely verifies Dr. Trabert’s finding that Dismal River potters more commonly utilized jar forms over bowls. From

<table>
<thead>
<tr>
<th>Form Type</th>
<th>Number of Sherds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indeterminate</td>
<td>1760</td>
</tr>
<tr>
<td>Jar</td>
<td>279</td>
</tr>
<tr>
<td>Bowl</td>
<td>32</td>
</tr>
<tr>
<td>Pipe</td>
<td>2</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
</tr>
</tbody>
</table>
this data, 313 sherds were labeled as having an identified vessel form, whether that be a jar, pipe, or bowl. Of this group of identified vessel forms, 89% of them are jars, and only 10% are bowls. It is worth noting here that jars are typically larger than bowls, so they would leave more evidence behind. With that said, the data clearly shows the prevalence towards jar forms. Likewise, while the number is very limited, there were two sherds that appeared to show the form of a ceramic pipe, concurrent with findings reported at other Dismal River sites (Gunnerson 1960; Trabert 2015). While the number is not large, whether at Humphrey or other comparable sites, these artifacts are typically present at Dismal River sites, and this is reflected in the Humphrey collection.

While the general form of each individual vessel is critical to our understanding of these ceramics, it is equally important to understand how exactly each vessel was made. It is worth stating a reminder here about types of Dismal River ceramic surface treatments. Hill and Metcalf (1942) during their report of excavations at the Lovitt site identified three different ceramic surface treatments for Dismal River pottery, identifying Lovitt Plain, Lovitt Simple Stamped, and Lovitt Micaceous. This typology has been used frequently throughout Dismal River literature, as for example in Gunnerson (1960). However, this work will take the direction of Trabert (2015) in that, while it recognizes that these divisions were used in the past, and while these features are surely still visible and present in Dismal River ceramics, the division of these into specific typologies only serves to obscure other potential variations in the hopes of creating and maintaining clean typologies. As such, the features themselves will be discussed as they are seen on the ceramics themselves, but these typologies themselves will not be specifically utilized.
With that in mind, it is still important to examine the methods by which these ceramics were created, and one excellent way of finding evidence for that is in the surface treatments of this pottery. Overall, the interior surfaces of these ceramics provided minimal information, especially when compared to that gleamed from the exterior surface treatments. Much of this stems from points made above about how breakable these sherds were. Frequently enough, the interior surface had been destroyed, or the sherd was so small that interior and exterior surfaces could not be distinguished. The main feature that the interior surface helped identify was vessel form which was already discussed above. As such, interior surfaces will not be discussed besides to say that they were almost entirely smooth or indeterminate. The exterior surfaces of these ceramics, on the other hand, proved to be incredibly informative.

Table 6 examines the numbers of sherds that displayed various surface treatments. What is immediately clear is that, while a smooth exterior surface is still far and away the most common surface treatment, found on 60% (n=1252) of the total number of ceramics, a combination of both variations of simple stamping shows that at least 8.6% (n=179) of the ceramics were thinned by paddle and anvil. This technique was used, not as a general construction method, like lump modeling or coiling, but as a thinning method that can be, and was, used in conjunction with both techniques. In addition, simple stamping is far and away the most common decorative surface treatment. Of the 204 sherds that showed some sort of exterior surface treatment (cord roughened, simple stamped, smoothed over simple stamped, and burnished), 87.7% were some form of simple stamping. With that said, smoothed over simple stamping was certainly the most
common method overall, making up 84% of these decorative surface treatments. What this clearly demonstrates is how common the paddle and anvil technique was in Dismal River pottery construction. It is also worth noting that some of the smooth or burnished surfaces were also likely made with paddle and anvil, but then smoothed, removing visible exterior traces. It is likely that this is, as Trabert (2015) says, evidence that the primary method of ceramic construction in Dismal River groups was lump modeling with paddle and anvil thinning. However, this is not a guarantee.

It is worth noting that there is some evidence, at the very least, of limited coil pottery construction, in which coils are made and then placed in a stack, and then smoothed together to form the pot itself (Banning 2000). This is visible to the modern researcher through the presence of coil joints on the surface of the ceramic sherds found in archaeological contexts. At the Humphrey site, 21 sherds were identified as having coil joints present on them. Of course, this number is not a large one, making up only 1% of the entire ceramic assemblage. However, the author is not confident enough in the commonality of the presence of these joints in sherds, especially those as small and fragile as those at Humphrey, to state that the remaining sherds could not also have been

<table>
<thead>
<tr>
<th>External Surface</th>
<th>Number of Sherds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indeterminate</td>
<td>590</td>
</tr>
<tr>
<td>Smooth</td>
<td>1252</td>
</tr>
<tr>
<td>Smooth with Wiping</td>
<td>0</td>
</tr>
<tr>
<td>Smoothed Over Simple Stamped</td>
<td>172</td>
</tr>
<tr>
<td>Simple Stamped</td>
<td>7</td>
</tr>
<tr>
<td>Cord Roughened</td>
<td>4</td>
</tr>
<tr>
<td>Burnished</td>
<td>21</td>
</tr>
<tr>
<td>Polished</td>
<td>0</td>
</tr>
<tr>
<td>Rough</td>
<td>26</td>
</tr>
</tbody>
</table>
formed through this coiling technique as opposed to lump modeling. Of course, coil joints can be smoothed out through the paddle and anvil method which was clearly utilized at the Humphrey site, so further investigation would have to be done into the construction methods used on these ceramics before any further conclusions than these could be comfortably made. The above discussion has covered the analysis for the whole group of ceramic sherds at the Humphrey site. However, it is worth briefly discussing the rim sherds alone, as they help tell their own stories, often even more clearly than body sherds can.

While rim sherds do generally provide a significantly greater opportunity for in depth analysis due to the greater amount of information that they generally hold, there is typically a significant lack of such artifacts when compared with the overall number of body sherds or otherwise unidentifiable sherds. The Humphrey site of course is no exception. While the entire collection of sherds from the site is 2073 strong, only 65 of those are rim sherds, meaning that only 3% of all of the ceramics from the site are identifiable rim sherds. Also, for the record, rim sherds here includes any sherd that is not just from the body, so some of these sherds are actually classified as shoulder or neck sherds, but differentiating them in that way would be unnecessary, as it would not really gain anything. If the sherd did not have a rim to measure, it was not considered in measurements considered specifically with the rim. However, some sherds that do not have individual rims still have features that were recorded as part of the rim sherd measurements, such as the thickness of the shoulder. With that said, the measurements that will be thoroughly discussed in this section do all relate to the actual rim sherds, as
those measurements are the ones that provide the most information pertinent to this overall discussion.

Much like the previous discussion for the overall collection of sherds, rim sherds are very beneficial for understanding how ceramics were made, and how a whole vessel might have looked. They also can demonstrate the quality of the ceramic itself. The rim sherds in this collection demonstrate the same quality in regards to sherd size as the overall collection did, as shown in table 7. This table shows the percent of the rim that appeared to be present. Now, it was mentioned previously that this datapoint is particularly subjective, as it was merely determined by feel based on the curve of the

<table>
<thead>
<tr>
<th>% Rim Present</th>
<th>Number of Sherds</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;5%</td>
<td>39</td>
</tr>
<tr>
<td>5-10%</td>
<td>20</td>
</tr>
<tr>
<td>10-20%</td>
<td>5</td>
</tr>
<tr>
<td>&gt;20%</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 7. Percentages of rims present.

sherd. With that said, it still gives a sense of how many of these rims were large portions of the vessel, and how many were only small fragments. In accordance with what Dismal River sherds usually demonstrate, the majority of the fragments were quite small, likely due to the fragility of the pots in general. While this specific set of datapoints demonstrates the fragility of these ceramics, the following points go into further discussion of form or decoration, as this is generally more evident on rim sherds than it is on body sherds.
Based on this ceramic analysis, it is clear that the ceramic sherds from the Humphrey site, while definitely showing some variation, are generally quite consistent. This trait is visible throughout the above discussions, and continues to appear throughout. The variation that does exist is typically only between one or two main options with very few other outliers. This is made quite clear in the following discussion of lip form as well as rim and neck form. Table 8 clearly demonstrates that, in regards to the formation of the lips of these vessels, there were only two main variations, and the other types were significantly less common. When considered together, the two most common options, rounded and flattened, make up 58, or 89%, of the total number of rim sherds, with the remaining three variations making up the other 11%. This clearly demonstrates that, at least in this sample, the majority of Dismal River potters were creating vessels with either rounded or flattened rims, while other variations were very much less common. It is also worth noting that, due to the fragility of these sherds, it is far from impossible to imagine that rims that were once flat became rounded over time, whether from use or from their time in the ground, meaning that it is possible that an even larger portion of these sherds may have originally had flat rims, though this is only conjecture, and would require significantly more work to be definitely proven. Much like with the rim shape, rim and neck form is also quite consistent at the Humphrey site.

Rim and neck form, as demonstrated in Appendix A, refers to the shape that is created where the neck portion of the vessel ends, and the rim begins. The three

<table>
<thead>
<tr>
<th>Lip Form</th>
<th>Number of Sherds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rounded</td>
<td>24</td>
</tr>
<tr>
<td>Flattened</td>
<td>34</td>
</tr>
<tr>
<td>T-Shaped</td>
<td>2</td>
</tr>
<tr>
<td>L-Shaped to exterior</td>
<td>3</td>
</tr>
<tr>
<td>L-Shaped to Interior</td>
<td>1</td>
</tr>
</tbody>
</table>
variations that were listed, all of which were noted at least once, were upright, flared, and inverted. Table 9 clearly demonstrates the consistency found in these ceramics in regards to this point. 83% of the rim sherds from 2017 and 2018 are upright, meaning that they have little to no curve where the neck and rim meet. This could simply relate to a style choice, but perhaps this also relates to how the ceramics themselves were made. In a system where a paddle and anvil is used, creating a curve or bend at the rim would likely be significantly more difficult than creating a vertical connection. This does not mean that flared or inverted rims are in any way impossible with a paddle and anvil method. Instead, it would simply be easier to make these upright connections. This may also relate to the use of lump modeling. The use of coils should make the creation of a curve much simpler. One would simply create a wider or narrower coil where they wished to initiate the curve. But with lump modeling, the clay would have to be forcibly curved, making it more difficult when using this method. Finally, it is time to briefly discuss the decorative properties of Dismal River rim sherds.

Rim sherd decoration is not particularly common at the Humphrey site, as is made clear in table 10, where 53 of the 65 total rim sherds were undecorated in any way. However, the remaining 12 sherds show some sort of a pattern, though with such a small sample size, it is important to take caution in drawing wider patterns from it. The decorations that correspond with the numbers in the table are shown in Appendix A, but

<table>
<thead>
<tr>
<th>Rim/Neck Form</th>
<th>Number of Sherds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upright</td>
<td>54</td>
</tr>
<tr>
<td>Flared</td>
<td>7</td>
</tr>
<tr>
<td>Inverted</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 9. Rim and Neck forms.
each relevant decoration will be briefly described. With that said, Appendix A does have pictures demonstrating exactly how the decorations look, so the verbal description here will be very general. Decorations 1 through 3 are all some version of incised diagonal lines. The difference between them solely relates to size, class 1 being the finest lines, and class 3 being very wide and deep lines. When combined together as making up a series of decorations considered diagonal, incised lines, they contain 7 of the 12 decorated rims.

This is quite a significant portion. Decorations 8 and 9 are also relatively similar, made of either oblong or rounded punctates respectively. Decorations 15 and 21 are largely unique, though 15 is still a diagonal marking, but is a rectangular stamp as opposed to incised lines.

Decoration 21 is not shown in Appendix A, as it appears to be unique to the Humphrey site, or at the very least was not encountered by Trabert (2015). Appendix B contains illustrations of two rim sherds that were especially unique that were done by the author. The top illustration shows the sherd in question here, and carefully shows the pattern on the rim, which essentially forms an indented “V” shape. The other sherd illustrated in Appendix B, which is also shown here in figure 4 is also worth noting here in closing. This sherd is unlike anything else that was found during the excavations at Humphrey. Not only does it have a body/shoulder decoration that was not seen in any other sherd, but it contained crushed rock temper which was very rare at the site. As such,

<table>
<thead>
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<th>Lip Decoration</th>
<th>Number of Sherds</th>
</tr>
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<tbody>
<tr>
<td>0</td>
<td>53</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>15</td>
<td>1</td>
</tr>
<tr>
<td>21</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 10. Lip Decorations.
it is worth noting that this specific sherd may not be an example of a Dismal River sherd. The most likely other group to which this sherd might belong would likely be Upper Republican, but the author is in no way comfortable making that a concrete claim. Suffice it to say that this sherd is very unique and does not display the qualities that are present in almost all of the other Dismal River sherds. As such, it should be researched further to
determine whether or not it is Dismal River in origin and, if it is not, whether it is Upper Republican or something else entirely.

The above discussions have thoroughly covered the ceramic analysis that was conducted here in relation to the 2017 and 2018 field seasons at 25HO21, also known as the Humphrey site. These data have underlined several patterns, most of which were also seen in the other Dismal River sites outlined in Chapter 3. The vast majority of Dismal River sherds contain a sand temper, and a much smaller minority can contain mica. The temper generally varies in size, but is most commonly relatively finely grained. This could very well demonstrate that the sand was not intentionally added as a tempering agent, but was instead naturally in the clay. Paddle and anvil thinning is likely the most common form of vessel thinning as evidenced by the prevalence of simple stamping on the exterior surfaces of vessels, in accordance with what has been determined at other, previously discussed, sites. With that said, there is evidence for at least a few cases where vessels were made by coiling as opposed to only using lump modeling. Further research needs to be done on these construction methods. Overall, the sherds at the Humphrey site are relatively similar in form and construction. They are made of a material that is quite fragile, leading to small sherds appearing in the archaeological record far more often than large ones. Rim forms and formation demonstrates continuity as well, typically showing a prevalence of only one or two variations with just a few outliers, at least one of which may not even be from Dismal River people. With this ceramic analysis complete, the following chapter will discuss the OSL analysis that was conducted as part of this study.
Chapter 5: OSL Analysis

**Background**

With the standard ceramic analysis concluded, and alongside a deeper understanding of the ceramic sherds from the Humphrey site, it is now time to discuss the process and results of the OSL analysis conducted at the Humphrey site by the author. The following chapter intends to discuss an analysis conducted on two ceramic sherds from the Humphrey site while also discussing the functionality of OSL as an absolute dating method, especially when used in the Sand Hills of Nebraska, as well as its potential in the future. As such, it will begin by contextualizing the term OSL, and how exactly this method functions. After this, the methods used in this specific analysis will be explained, after which point the results will be discussed in depth.

OSL, or Optically Stimulated Luminescence, is an absolute dating method that involves the use of a sample, typically taken from either sediments or ceramics, and the analysis of electrons that were trapped in that sample. The discussion here will be a very brief synthesis, but for far greater depth than what is here, please see Aitken 1998, Greiman 2016, Greiman et al. 2019, and Huntley et al. 1985. All of these works are excellent, and the authors have incredibly deep knowledge of, and great amounts of experience with, OSL analysis. Both Greiman works are also excellent examples of how OSL is being used to great effect in the Sand Hills of Nebraska. Before discussing the minutiae of the process, it is critical to first understand the overall goal of OSL.

While saying that OSL is an absolute dating method captures the basic concept very well, it does not give any sort of context. What dates does the analysis actually
capture? Why is OSL even worth conducting in general? These general questions are critical, and must be discussed before continuing on. Radiocarbon dating is typically the first method of dating that comes to mind in archaeological contexts, and these dates are incredibly valuable. In fact, nine radiocarbon dates from the Humphrey site already exist. These were analyzed by the DirectAMS Lab in Washington, and table 11, from Greiman et al. (2019) shows these dates. These dates are incredibly valuable, and indicate occupancy in the mid to late 1600s, if not very early 1700s, at the Humphrey site, in accordance with what is typically, though not always, the case at Dismal River sites (Gunnerson 1960; Hill et al. 2017). With that said, OSL dates provide strengths that radiocarbon cannot cover and vice versa. For example, while radiocarbon dates must come from organic materials such as bone, posts, or carbonized seeds, OSL dates come from inorganic materials such as sediments and ceramics. As such, OSL is possible in places where radiocarbon is not. There is more explanation below as to why OSL was chosen for a site that already has radiocarbon dates, but it is important to understand the method more generally before going into site specifics.

### Table 11 Greiman et al. 2019. Calibrated radiocarbon dates from the Humphrey Site.

<table>
<thead>
<tr>
<th>Site</th>
<th>Lab ID</th>
<th>Material</th>
<th>Provenience</th>
<th>$^{14}$C age (BP)</th>
<th>$2\sigma$ Calibrated Age Range (BP1950)</th>
<th>$2\sigma$ Calibrated Age Range (Cal AD)</th>
<th>Original Sample Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humphrey</td>
<td>D-AMS 024463$^b$ Charcoal Feature 12 (earthlodge)</td>
<td>295±24</td>
<td>446-452 (0.009)</td>
<td>1498-1504 (0.009)</td>
<td>This report; 96.4±0.29 pMC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humphrey</td>
<td>D-AMS 024464$^b$ Charcoal Feature 12 (earthlodge)</td>
<td>266±24</td>
<td>376-428 (0.296)</td>
<td>1522-1574 (0.296)</td>
<td>This report; 96.74±0.29 pMC</td>
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<tr>
<td>Sample ID</td>
<td>Type</td>
<td>Feature</td>
<td>(earthlodge)</td>
<td>Radiocarbon Dates</td>
<td>Age Range ( cal BC)</td>
<td>Age (cal BC)</td>
<td>pMC</td>
</tr>
<tr>
<td>-----------</td>
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</tr>
<tr>
<td>D-AMS 024465b</td>
<td>Charcoal</td>
<td>Feature 12</td>
<td>191±28</td>
<td>260-299 (0.237)</td>
<td>1551-1690 (0.237)</td>
<td>1651-1690 (0.237)</td>
<td>97.65±0.34 pMC</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>140-221 (0.588)</td>
<td>1729-1810 (0.588)</td>
<td>1925-1950* (0.175)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0-25 (0.175)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D-AMS 024466b</td>
<td>Charcoal</td>
<td>Feature 13</td>
<td>228±23</td>
<td>272-307 (0.530)</td>
<td>1643-1678 (0.530)</td>
<td>1729-1810 (0.530)</td>
<td>97.20±0.28 pMC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>177-185 (0.018)</td>
<td>1765-1773 (0.018)</td>
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<td></td>
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<td>150-174 (0.383)</td>
<td>1776-1800 (0.383)</td>
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<td>0-10 (0.069)</td>
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<td>244-281 (0.167)</td>
<td>1669-1706 (0.167)</td>
<td>1719-1781 (0.346)</td>
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<td>131-152 (0.033)</td>
<td>1824-1825 (0.033)</td>
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<td>67-118 (0.184)</td>
<td>1832-1883 (0.184)</td>
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<td>Charcoal</td>
<td>Feature 14</td>
<td>236±22</td>
<td>278-309 (0.635)</td>
<td>1641-1672 (0.635)</td>
<td>1778-1799 (0.327)</td>
<td>97.11±0.26 pMC</td>
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<td>151-172 (0.327)</td>
<td>1942-1950* (0.037)</td>
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<td>0-8 (0.037)</td>
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<tr>
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<td>Charcoal</td>
<td>Feature 14</td>
<td>167±27</td>
<td>253-287 (0.179)</td>
<td>1663-1697 (0.179)</td>
<td>1725-1815 (0.553)</td>
<td>97.94±0.33 pMC</td>
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<tr>
<td></td>
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<td>135-225 (0.553)</td>
<td>1835-1877 (0.077)</td>
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<td>73-115 (0.077)</td>
<td>1917-1950* (0.191)</td>
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<td>97.94±0.33 pMC</td>
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<td>1835-1877 (0.077)</td>
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<td>73-115 (0.077)</td>
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<td>1652-1685 (0.237)</td>
<td>1731-1808 (0.590)</td>
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<td>272-307 (0.530)</td>
<td>1643-1678 (0.530)</td>
<td>1729-1810 (0.530)</td>
<td>97.20±0.28 pMC</td>
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<td></td>
<td>177-185 (0.018)</td>
<td>1765-1773 (0.018)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>150-174 (0.383)</td>
<td>1776-1800 (0.383)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0-10 (0.069)</td>
<td>1940-1950* (0.069)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
OSL is a part of a suite of two dating techniques that are referred to as Luminescence Dating (Aitken 1998, 6). The other of these two techniques, Thermoluminescence (TL), uses heat to stimulate luminescence as opposed to the beam of light used in OSL. The basic concept here is actually relatively simple, but of critical importance. The main materials that are of concern here are the quartz grains present in sand. As is well understood after the discussions in the previous chapter, Dismal River ceramics are sand tempered, and the sand that they were using was made primarily of quartz and feldspar grains. This is greatly beneficial for the use of OSL. The basic idea here is that quartz grains trap free electrons naturally at a given rate. Those free electrons are produced by various forms of radiation, specifically alpha ($\alpha$), beta ($\beta$), gamma ($\gamma$), and cosmic rays (Greiman et al. 2019). However, the traps in the quartz crystals that collect these electrons will release them when exposed to sufficient amounts of light and or heat, resulting in luminescence. So, quartz can only collect these electrons consistently when it is not exposed to significant heat or light. What this means for archaeologists and geologists is that, the last exposure to sufficient light or heat effectively zeros the clock on the electron traps in quartz crystal. This is referred to as the bleaching event, and it is this event that results in luminescence (Aitken 1998, 6). After the bleaching event, the material is buried and the natural radiation in the ground produces those free electrons which are then collected by the crystalline material, in this case the quartz grains, at a steady rate. So, this effectively means that, by measuring those electrons in the quartz grains, it is possible to date back to the original date of firing of a ceramic, or deposition for sediments. For an archaeologist, this is incredibly valuable, as it allows one to date
back to when a ceramic was fired which would bring us back to a time when people were certainly inhabiting the site.

One point that is worth briefly mentioning relates to the cause of luminescence for the ceramic samples at the Humphrey site. As I mentioned above, the date that we are attempting to date using this method is the date at which the ceramics underwent the firing process. However, based on the archaeological remains at the Humphrey site, there was another high heat event at the site when the structures were burnt to the ground. There is no real way to know at this point whether the sherds that are under consideration here were last bleached due to firing or the fire that burnt down feature 12. Scholarship on the topic is also divided, with Finley, Ideker, and Rittenour (2017) reporting evidence of a forest fire bleaching ceramics, while Yu, An, and Lai (2016) found that ceramics directly under a hearth did not undergo luminescence. This topic is in its infancy, and needs further research. With that said, it is not particularly critical in the case of the Humphrey site which event caused luminescence. The date ranges are narrow enough, and occupancy in each structure appears short enough that either event would provide a very similar date.

The way in which this date is calculated is somewhat more complicated, but it involves knowledge of the paleodose, also called the dose equivalent ($D_e$), as well as the dose rate ($D_r$) (Aitken 1998, 7; and Greiman et al. 2019). The paleodose, calculated in Grays (Gy) refers specifically to “the laboratory dose of nuclear radiation needed to induce luminescence equal to that acquired subsequent to the most recent bleaching event” (Aitken 1998, 7). In other words, the $D_e$ is a laboratory sample that contains the
same levels of radiation that were necessary in the actual sample to recreate
luminescence, or to date back to that original dating event. This is then used in
conjunction with the dose rate to calculate the original date of deposition. The very basic
equation for this process is Age = D_e/D_r, though in practice it requires far more numbers
and equations than this (Aitken 1998, 7).

Dose rate refers, in Aitken’s words, to “the rate at which energy is absorbed from
the flux of nuclear radiation” (7). Again, the rate at which this radiation is collected
allows researchers to effectively turn back the clock to the firing event for ceramics.
However, dose rate for ceramics is typically calculated by summing two different values,
the internal and external dose rates (Greiman et al. 2019). It is worth noting that the
process of summing these two values is not required for sedimentary dating. The external
dose rate is designed to measure the radiation in the area in which the sherd or sediment
is buried. In the case of dating ceramic sherds, external dose rate is typically calculated
using a soil sample from the site where the ceramic samples were collected. This work
borrows in part from the works of Greiman 2016, and Greiman et al. 2019, in which they
also conducted OSL analyses at the Humphrey site as well as two other sites in the Sand
Hills. As the author of this work no longer had access to soil samples from 25HO21, the
samples analyzed from the same site by Greiman and colleagues were used instead.
Internal dose rate refers directly then to the radiation present in the actual ceramics meant
for dating which, in this case, are two ceramic sherds from 25HO21. In order to calculate
the internal dose rate for these samples, ICP-MS analysis was conducted to calculate
these numbers. Further details on this process are in the methods section.
Methods

The following OSL analysis was conducted under the help and tutelage of Dr. Paul Hanson, a Quaternary Geologist and the Associate Director of the University of Nebraska-Lincoln’s School of Natural Resources. The work was conducted in the UNL Luminescence Geochronology Laboratory. The first major step in this process was to determine which samples should be tested. As OSL is a destructive form of analysis, the choice of ceramics from 25HO21 was incredibly important. There were multiple criteria that had to be met for a sherd to be a fitting sample for analysis. First of all, the original goal for the OSL analysis in this project was twofold. While receiving a date for the study is important, as it helps to further narrow the chronology of the site, while also connecting well with the works of Greiman and colleagues (Greiman 2016; Greiman et al. 2019), there was also the hope that this work might help reveal relative chronology at the site.

As of now, there are three known structures at the Humphrey site, as discussed in previous chapters. One of the major questions of the site relates to the makeup and use of the site. Were these houses all inhabited at the same time by multiple groups, or are they perhaps one small group continuously returning to the site? Making this distinction would allow researchers to better understand how these Dismal River people were living. The error range for OSL is generally comparable with that of radiocarbon, but does not have the same issues with calibration curves as radiocarbon does. While it will be shown in more detail below, it is worth noting here that the 1σ range for the following OSL dates is between 30 and 40 years, while the 1σ error range for the History Nebraska radiocarbon
dates are between 21 and 28 years, but the OSL dates do not have the issue of the
calibration curve. With this date range in mind, and the knowledge that Greiman and her
colleagues had shown the effectiveness of OSL at the Humphrey site already, the author
decided to collect a sample from the floor of each of the three structures at 25HO21.

At this point, samples were identified and selected from the collection of 2017
and 2018 sherds at History Nebraska. However, this was where a major issue arose. The
only feature that received truly extensive excavations at this point was feature 12.
Features 13 and 14 had mainly just been tested. Of course, due to the destructive nature
of this analysis, and the typically small nature of sherds at the site as previously
discussed, it was important to find sherds large enough for analysis, but not so large,
unique, or part of a rim/neck/shoulder/base, that their partial or total destruction for this
analysis would impact a sherd that was especially identifiable or able to provide even
wider answers than those answered by OSL. They also had to be from the perfect context,
meaning they had to be from the feature fill of the unit, otherwise they would not provide
the proper information after analysis. Features 12 and 14 provided sufficient sherds to
these purposes, but feature 13 was problematic. While there was one large sherd from its
feature fill, it was an excellent rim sherd, and as such was not available for destructive
analysis. The only other option was a very small sherd, number 25HO21-79-4-0, which
was only 7 mm thick and 14.9 mm long. This sherd simply was not thick enough for
analysis. As such, it was not used, and so feature 13 could not be analyzed in this way.

With that said, the two sherds that were selected were taken on loan from History
Nebraska, and delivered to the Luminescence Lab. Table 12 shows the analytical data
collected from the two chosen sherds. As a brief note, the author also created 3D models using photogrammetry at the request of the History Nebraska Collections Committee as part of the agreement for conducting destructive analyses on said sherds. These models are currently held by the people of History Nebraska for use in their own collections. These models are excellent as they largely preserve the way that the sherds existed before analysis. Once the sherds were delivered to the lab, preparation could begin.

The processing these two sherds took place under amber lights in the Luminescence Lab to avoid causing luminescence in the sherds before they could be properly analyzed. First, the sample sherds were divided, with one portion retained for OSL analysis, and the other for ICP-MS. The remainder of this section only discusses the processing for the OSL analysis. Discussion of the ICP-MS analysis will follow. The outermost 2-3 mm of sherd was removed from each of the two samples in order to remove any sample that had already been exposed to light during the extraction processes using a dremmel tool with a grinding wheel attachment. This was done under a fume hood in the lab, so this portion was entirely lost. After this, each sherd was crushed up using an agate pestle and mortar. The crushed samples were dry sieved with the goal of

<table>
<thead>
<tr>
<th>PN</th>
<th>Bag</th>
<th>Item</th>
<th>Wt (g)</th>
<th>Length</th>
<th>Size Class</th>
<th>Temper</th>
<th>Temp Size</th>
<th>Form</th>
<th>Ext. Surface</th>
<th>Int. Surface</th>
<th>Max Thickness</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>161</td>
<td>1</td>
<td>0</td>
<td>4.2</td>
<td>25.6</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>3</td>
<td>2</td>
<td>8.2</td>
<td>For Analysis. Dark Center. Slightly bumpy on interior. UNL-4482.</td>
</tr>
<tr>
<td>294</td>
<td>1</td>
<td>3</td>
<td>3.5</td>
<td>25</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>8.2</td>
<td>For Analysis. Light grey one surface, dark grey the other. Thicker shed, being used for analysis. UNL-4483</td>
</tr>
</tbody>
</table>
collecting all grains that were 90-212 µm. Anything smaller than 90 µm was gathered and is currently held in the lab in case there was a problem with the analyses, or in case future work needs to be done on these same samples. Once the sherds were ground and sieved, they were then treated to remove impurities. This process generally mimics that used by Greiman 2016 and Greiman et al. 2019, except that their work retained all grains 90-250 µm as opposed to 212 µm.

At this point, the samples were treated in a solution of hydrochloric acid (HCl) in order to remove any carbonates, and were then placed into a 2.7 g/cm$^3$ sodium polytungstate solution in order to float the quartz and feldspar grains so that they could be removed for further processing. At this point, the samples were placed in a 10% hydrofluoric acid (HF) solution for 20 minutes, followed by 30 more minutes in an HCl treatment. The goal of these two treatments was to entirely remove any feldspar grains or any other remaining impurities in order that the quartz grains alone would remain and could be analyzed. Quartz grains were then mounted on the innermost 2 mm of 1 cm disks, called aliquots, using a medical grade silicone spray called Silkospray. These treatments are far more conservative than standard procedure calls for, as seen for example in Greiman et al. 2019. The reason for this is that the sample sizes that were recovered and used for this analysis were very small, and there were no backup alternatives. If they had been left in the HF treatment for much longer, it likely would have completely destroyed the sample. The 2 mm sample size was used again because of the minimal sample size, as opposed to using a 5 mm sample. This method, while generally following the UNL standard procedure like that of Greiman et al. 2019, it does
somewhat mirror how Hood and Schwenninger (2015) used minimal HF treatments as part of their minimum extraction technique. The aliquots were then placed in a Riso automated OSL Dating System and processed in said machine.

ICP-MS analysis was conducted by Activation Laboratories (Actlabs) in Ontario, Canada. The samples for their lab were merely ground in a pestle and mortar as discussed above and then placed in a bag and mailed to the laboratory. There, they analyzed the sherds for traces of Potassium (K), Uranium (U), and Thorium (TH) for use in our calculations of the internal dose rate. The gamma radiation values for the external dose rate were calculated by averaging the 5 sediment samples taken previously from the Humphrey site (UNL-3790-3794) from the work of Greiman et al. (2019). Again, as their work had collected sediments from the Humphrey site, and the author did not have access to any such samples of their own, they decided to utilize the data compiled by Greiman et al. (2019). The proportion of external to internal gamma dose rates was calculated using equations from Aitken (1985). After all of this was done, the analysis was conducted, which is discussed below.

**Results**

The following section provides an in depth discussion of the results from the aforementioned OSL analysis. Table 13 contains the results from the analysis conducted on the two sherds from the feature fill of features 12 and 14 at the site. In fact, both of these ceramic samples come from a depositional context of 50 cm below the surface. This demonstrates a consistency in the stratigraphy for the house floors at the site while providing an excellent opportunity for this analysis. Both sherds were from the same site
and approximately the same depth, with the only major difference being the house from which they came. It is standard with OSL analyses to report the results in terms of 1σ error values, as this allows a relatively high chance of accuracy without creating too wide of a window to work with. UNL-4482, catalog number 25HO21-161-1-0, is the sherd taken from feature 14, while UNL-4483, catalog number 25HO21-294-1-3 came from feature 12. Also worth noting, the sherd from feature 14 was excavated in 2017, while the sherd from feature 12 was excavated in 2018. Table 12 shows their analytical information in full. OSL age is presented here as years ago. To calculate the age in AD, subtract that number from 2019, the year in which the analysis was conducted. The 1σ range, which is the standard for OSL, for feature 14 (UNL-4482) in calendar years is AD 1620-1680, where as UNL-4483, or the sherd from feature 12, dates slightly older, between AD 1550 and 1630. Radial plots for each of these calculations are in Appendix C, and demonstrate the relative strength of these dates. These dates do fall within the generally accepted date range for Dismal River people, though the low end of UNL-4483 would be quite early, especially for the Humphrey site itself.

<table>
<thead>
<tr>
<th>UNL Lab #</th>
<th>Feature #</th>
<th>Depth (m)</th>
<th>U (ppm)</th>
<th>Th (ppm)</th>
<th>K2O (wt %)</th>
<th>Water (%)</th>
<th>Dose Rate (Gy/ka)</th>
<th>Camc De (GY) ± Std. Err.</th>
<th>Aliquot s (njd)</th>
<th>OSL Age Yrs ago ± 1σ</th>
<th>OSL Age AD ± 1σ</th>
<th>O.D.e</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNL-4482</td>
<td>14</td>
<td>0.5</td>
<td>2.8</td>
<td>10.3</td>
<td>3.1</td>
<td>5.0</td>
<td>3.43 ± 0.21</td>
<td>1.28 ± 0.06</td>
<td>11/24</td>
<td>370 ± 30</td>
<td>1620-1680</td>
<td>5.7</td>
</tr>
<tr>
<td>UNL-4483</td>
<td>12</td>
<td>0.5</td>
<td>1.3</td>
<td>5.2</td>
<td>2.2</td>
<td>5.0</td>
<td>3.18 ± 0.19</td>
<td>1.36 ± 0.08</td>
<td>19/30</td>
<td>430 ± 40</td>
<td>1550-1630</td>
<td>18.0</td>
</tr>
</tbody>
</table>
Discussion

The above date ranges for these two ceramic sherds, as mentioned before, are dating the last time that each sample was exposed to a sufficient amount of light or heat that would have caused luminescence, as opposed to radiocarbon dating which dates the time that the organic material died. This means that the above dates should, in effect, provide dates of when each ceramic was originally fired, which would have required people to be living there. But how does this information compare to dates calculated in the past for the Humphrey site? Fortunately, as mentioned above, Greiman et al. (2019) conducted OSL analyses on ceramics from the Humphrey site. Those, along with radiocarbon dates provided by History Nebraska, provide an excellent context for the newly calculated Humphrey OSL dates presented here.

Figure 5, adapted from Greiman et al. (2019) to include my own dates, gives a clear representation of all of the dates that they calculated for the Humphrey site alongside the radiocarbon dates from History Nebraska and the OSL dates from this study. This figure displays the entire probability curves of the various dates. If only 1σ or 2σ values are shown in the figure, only the peaks are visible. These data are very interesting, and raise some questions about the various dates that have been gathered for the Humphrey site. The date ranges from the present study of AD 1620-1680 and AD 1550-1630 respectively have a slight overlap with one another around the early 1600s. So, while this may mean that both sites were inhabited at approximately AD 1620, there is a greater probability that they represent sequential use of the site. Rather than the Humphrey site representing multiple households present at once in a single occupation
event, we actually have a site that was inhabited by small, perhaps single, households
over around 100 years or more. Of course, these two date ranges alone cannot possibly
provide all of these answers. That is where figure 5 factors into the discussion.

The OSL dates reported by Greiman et al. (2019) and the radiocarbon dates from
History Nebraska are very interesting, in that there is some discrepancy between the two.
All of the OSL-sherd dates, and two of the sediment dates, fall in approximately the mid
to late AD 1700s. This would be very interesting, as that is at the most recent end of what
is typically reported for Dismal River chronology. The radiocarbon curves do show a
peak on all of the dates at approximately that same time. However, the new OSL dates
from this study are significantly earlier than the mid to late AD 1700s. With that said, there are also radiocarbon peaks that would align with these new OSL dates in the early to mid AD 1600s. One reason that OSL dates are so useful relates to the nature of radiocarbon dates. Radiocarbon dates naturally fluctuate, meaning that radiocarbon analysis does not produce a single date range, but rather a series peaks and valleys. The peaks correspond to a potential date. Of course, some dates are obviously impossible based on the archaeological context of a site, such as the most recent peaks in figure 5. OSL dates return only a single curve as opposed to a series of them. So, when comparing radiocarbon dates and OSL dates, it is important to look for places where all of the peaks line up.

This earlier date does align with the very limited amount of trade goods that have come from the Humphrey site, as opposed to somewhere like White Cat Village that held a whole trade axe. The sample size for this study was admittedly limited, both in terms of the number of sherds sampled, and the sizes of those individual sherds. With that said, these dates do still appear to be quite accurate based on the overdispersion values and the radial plots. The only way to truly determine the accuracy of these and the dates from Greiman et al. (2019) would be to conduct further OSL studies on this particular site. However, the date ranges at this site are relatively tight, even with these differences in mind, so perhaps it is unnecessary to go further on this line, unless it is to determine issues of relative chronology as mentioned further below.

The above OSL study from the feature fill of features 12 and 14 has provided significant information that must be considered in further studies of the chronology, both
absolute and relative, at the Humphrey site. The dates that were received from this study are significantly earlier than those reported by Greiman et al. (2019), but do align with a peak in the radiocarbon curves in each of the History Nebraska radiocarbon dates. Based on the evidence presented above, this study suggests that the Dismal River people present at the Humphrey site inhabited that location over 100 years or more, and likely consisted of a singular household, or at least a very small group. It also shows evidence that feature 12 was the earliest inhabited structure, and that feature 14 was inhabited later. It could be valuable to conduct further OSL analyses on the structures at the Humphrey site using larger sherds from feature fill contexts. With that said, ceramics that are utilized for OSL are partially, if not entirely, destroyed. As such, these analyses must be conducted with caution and care. The overall dating at the Humphrey site, if somewhat disparate, is still relatively similar. Future studies will have to grapple with the costs of future analyses in relation to the information that could be gained by further analysis.
Chapter 6: Conclusions and Future Research

The following section will pull together the pieces that have been laid down throughout this work with the hopes of demonstrating the importance of each of these topics, both individually but, more importantly here, how they work together as a whole to clearly demonstrate how Dismal River people lived, how we know about them, when they lived, and what parts ceramics played in their lives. On top of all that, this work has hopefully demonstrated the importance of this specific group of Apache people, and how knowledge of them continues to aid us in our understanding of the lifeways of the past. It also demonstrates the importance of retaining a human focus during archaeological research, as well as demonstrating the utility of OSL dating in the present, and how it can be used as a relative dating method in the future.

Each of the chapters above sought to enlighten the reader concerning a specific portion of Dismal River life, whether that was their historical identity, their archaeological signatures, the importance of their ceramics, or the dates at which they lived at the Humphrey site. When these are all combined together, a picture emerges. This picture contains not only an academic story weaved together from various previous scholars, but a picture of a group of people surviving in the Sand Hills of Nebraska. These people were likely present near the Scott County Pueblo when Ulibarri visited El Cuartalejo, learning how to cope with this new colonizing presence, or perhaps even joining together to try and escape that presence. These Apache people, who had likely inhabited the area around this site for years before the Puebloans built a pueblo and took up residence there, were now forced to cope, not only with a new indigenous group, but
with these Spanish colonizers and the missionaries that always followed closely behind. While the people of 14SC1 are the ones most obviously impacted by these colonizing forces, the occupants of many other Dismal River sites felt the impacts as well.

Though iron and brass might not appear as threatening at first, these along with other trade goods were also very clear signals of a more indirect form of colonization. Old forms of tools were being replaced, or at least used alongside, those tools that made up their traditional ways of life. Surely, stories of the Spanish and the French reached Dismal River people along with their goods through whatever trade routes were active. All of these things would have significant impact on these people, and yet they coped and adapted at least until the early to mid 1700s. This humanization of what is often only considered an archaeological phenomenon is critical to this field moving forward, and the Dismal River people provide an excellent opportunity for visualizing this.

While there are a great plethora of Dismal River sites, certain sites have generally provided more to the knowledge of these people than others. The main ones that were include here were Ash Hollow Cave, the Lovitt site, 14SC1, White Cat Village, and Humphrey itself. Each of these sites provided something incredibly valuable for the future of Dismal River research. Ash Hollow Cave placed Dismal River people into a stratigraphic record, demonstrating their presence in the longer habitation of what is now the state of Nebraska. Lovitt was the first excavation of a Dismal River site, and was incredibly valuable in many ways. The ceramic collection from Lovitt in large part identified Dismal River pottery, specifically naming the ceramics as two groups, one Lovitt Plain, the other Lovitt Simple Stamped. These distinctions, while often without
these specific titles, are still part of what help clearly identify Dismal River ceramics today. Overall, Lovitt provided a framework and a vocabulary for discussing these types of sites, and the importance of that cannot be overstated. White Cat Village also helped define Dismal River. For one, the axe in the hearth at the site clearly demonstrated that there was some connection between these people and a colonizing force. White Cat Village also helped researchers understand Dismal River architecture, as well as aiding in the demonstration of what features and artifacts to expect at these sites. Humphrey helped fulfill this same role as well, but it is now taking another important role as an example in the usefulness of OSL dating in the Sand Hills, as well as a demonstration of the importance of careful, thorough, modern styled excavations.

Ceramics at the Humphrey site further demonstrate the continuity that is present between Dismal River sites. These ceramics are typically a dark grey, though occasionally buff, with sand temper. Sparse mica inclusions exist at this site, much like other sites of this type, but it is not prevalent at all, and none of the sherds are conventionally “micaceous tempered.” The sherds themselves are typically quite small, likely due to the quality of these ceramics and the frequency and ease with which they break up. All of these factors measure similarly to the ceramics present at other Dismal River sites. Likewise, this analysis demonstrated that, while decorations are present on Dismal River sherds, they are not particularly common. Analysis of this site did provide two rim sherds in particular that appear to be quite unique. One of these has a very unique shoulder decoration and crushed rock temper. This specific sherd needs further analysis to determine whether it is a unique Dismal River sherd, or perhaps an Upper Republican
sherd. The other has a unique rim decoration, forming almost a “v” shape. This rim decoration appears to be previously unknown at Dismal River sites, and should be further documented and researched.

OSL research at the Humphrey site has already proven valuable from the work of Nora Greiman, but this analysis has further demonstrated the value of this type of analysis, while also raising potential questions between these dates and those of Greiman and her colleagues (Greiman 2016; Greiman et al. 2019). The early dates that this study produced are valuable in that they further demonstrate the importance of studying chronology at Dismal River sites. They also provide a really strong case for a long term occupation of a small household over some 100 years at the site.

So, where should this research go from here? Well, many of the next steps are actually already in progress. For one thing, the Humphrey site materials need to be fully analyzed. Fortunately, that process is well under way, and this thesis is only one part of that larger project. But what else should be done? Where else can this project lead? For one thing, it would be very valuable to do a larger OSL study with the intention of determining relative chronology at the site. This, along with other dating methods such as fluoride dating as done by Schurr and Gregory (2002) might prove to be incredibly valuable for determining relative chronology at archaeological sites where radiocarbon dates are just too imprecise to provide such information. In order to do a larger study of this type, further excavations would be required at the Humphrey site, especially of feature 13, in order to acquire sufficient materials from ideal contexts for this type of work. Likewise, it would be useful at the Humphrey site to further excavate the structures
at the site, perhaps uncovering approximately a quarter of each house. This could provide invaluable information concerning Dismal River architecture, examples of which are mainly only present from Lovitt and White Cat Village. It would also be valuable to source the natural materials from the Sand Hills that are critical for ceramic production. As of now, scholars assume that the clay Dismal River potters are using is local, but nobody knows where those materials are coming from.

Finally, it would be very valuable to synthesize all of the work that has been done on the Humphrey site into one concise work. Instead of continuing to have fragmented information such as here, where only the 2017 and 2018 excavations were considered, the entirety of the work at the site should be studied together. The ceramics from the 40s should be considered alongside those studied here. And the same goes for all other artifact and feature types as well. The work done by Kivett and his team is incredibly valuable, and it should be more readily available. Combining it and considering it together with the work that was done here, and the rest which is all still in process would be incredibly useful, and will hopefully be done in the future. This analysis was a useful starting place for such a work, alongside all of the work being done by the author’s colleagues.
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Appendices

Appendix A: Ceramic Analysis Document

25HO21 Ceramic Attributes (modified from S. Trabert system)

- A) PN

- B) Bag

- C) Item

- D) Weight (Mass), 0.1 g

- E) Size Class  1) > 2”;  
  2) 1-2”  3) 1/2 -1”  4) 1/4- 1/2”  5)< 1/4”

- F) Temper  
  0) Indeterminate  1) Sand, no mica  2) Sand with mica  3) Crushed rock  4) other

- G) Temper Size  
  0) Indeterminate  
  1) very fine  
  2) fine  
  3) medium  
  4) coarse  
  5) mixed, med & fine  
  6) mixed, fine & very fine  
  7) mixed, very coarse & very fine
• 8) mixed, other

• H) Vessel Form
  0) Indeterminate
  1) Jar
  2) Bowl
  3) Pipe
  4) Other

• I) Exterior surface
  0) Indeterminate
  1) Smooth
  2) Smooth with wiping
  3) Smoothed over simple stamped
  4) Simple stamped
  5) Cord roughened
  6) Burnished
  7) Polished
  8) Rough

J) Interiorsurface
  0) Indeterminate
  1) Smooth
  2) Smooth with wiping
  6) Burnished
  7) Polished
  8) Rough

K) Coil joints?  0 (no)  1 (yes)

L) Maximum Thickness (0.1 mm)

M) Lip thickness (0.1 mm)
N) Lip form
1) Rounded
2) Flattened
3) T-shaped
4) L-shaped to exterior
5) L-shaped to interior
Other

O) Body Decoration
1) finger nail impression

P) Lip Decoration
1 thru 20) See Illustrations

Q) Rim Diameter (nearest 0.5 cm)

R) Rim % Present
1) < 5%  2) 5-10%  3) 10-20%  4) > 20%

S) Rim/Neck form  1) Upright  2) Flared,  2) Inverted,
T) Rim height (0.1 mm)
U) Shoulder thickness (0.1 mm) V) Comments

Draw profiles of all rims where rim diameter and rim/neck form can be identified.
Lip Thickness
Mid-rim Thickness
Rim Base Thickness
Shoulder Thickness
Upright 95-85°

Everted \(< 85°\) or Flaring

> 95°

Dismal River Ceramic Decorative Motifs (only found on lip portion of vessel) (table format and rim shape adapted from Page 2009: Table 5-2)
<table>
<thead>
<tr>
<th>ID</th>
<th>Motif</th>
<th>Application Description</th>
<th>Site Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><img src="image1.png" alt="Motif 1" /></td>
<td>Incised; very fine diagonal lines</td>
<td>25CH1; 25HN37; 25HO21; 14SC1</td>
</tr>
<tr>
<td>2</td>
<td><img src="image2.png" alt="Motif 2" /></td>
<td>Incised; fine diagonal lines</td>
<td>25CH1; 25HO21; 14SC1; 48CA557</td>
</tr>
<tr>
<td>3</td>
<td><img src="image3.png" alt="Motif 3" /></td>
<td>Incised; wide deeply cut lines</td>
<td>25CH1; 25HN37; 25HO21; 48CO2844</td>
</tr>
<tr>
<td>4</td>
<td><img src="image4.png" alt="Motif 4" /></td>
<td>Incised; fine triangles or v shapes</td>
<td>25CH1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>5</td>
<td><img src="image" alt="Incised; nested triangle lines" /></td>
<td></td>
<td>25HO21</td>
</tr>
<tr>
<td>6</td>
<td><img src="image" alt="Punctates; oval impressions" /></td>
<td></td>
<td>25CH1; 25HN37; 25BN2; 14SC1; 14BT404</td>
</tr>
<tr>
<td>7</td>
<td><img src="image" alt="Punctates; oblong impressions" /></td>
<td></td>
<td>25CH1; 25HN37</td>
</tr>
<tr>
<td>8</td>
<td><img src="image" alt="Punctates; oblong diagonal impressions" /></td>
<td></td>
<td>25CH1</td>
</tr>
<tr>
<td>9</td>
<td><strong>Punctates; large rounded impressions</strong></td>
<td>25CH1; 25HO21; 14SC302</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>----------------------------------------</td>
<td>-------------------------</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td><strong>Punctates; small impressions on both sides of lip</strong></td>
<td>25CH1</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td><img src="image" alt="Diamond Shaped Impressions" /></td>
<td>Punctates; diamond shaped impressions</td>
<td>25CH1; 14BT404</td>
</tr>
<tr>
<td>----</td>
<td>-----------------------------------</td>
<td>--------------------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>12</td>
<td><img src="image" alt="Tear Drop Impressions" /></td>
<td>Punctates; tear drop impressions</td>
<td>25CH1</td>
</tr>
<tr>
<td>13</td>
<td><img src="image" alt="Impression with Pendant" /></td>
<td>Punctate; impression with side “pendant” created by hollow tool</td>
<td>25CH1</td>
</tr>
<tr>
<td>14</td>
<td><img src="image" alt="Dentate stamp" /></td>
<td>Dentate stamp</td>
<td>25HO21; 5OT143; 5EL120</td>
</tr>
<tr>
<td>15</td>
<td><img src="image" alt="Dentate stamp; diagonal" /></td>
<td>Dentate stamp; diagonal</td>
<td>25HO21; 14BT404</td>
</tr>
<tr>
<td>16</td>
<td><img src="image" alt="Trailed; open rectangles with horizontal lines" /></td>
<td>Trailed; open rectangles with horizontal lines</td>
<td>25HN37; 25HO21</td>
</tr>
<tr>
<td>17</td>
<td><img src="image" alt="Incised; herring bone" /></td>
<td>Incised; herring bone</td>
<td>25CH1</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------------------------------------------------------</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Hoof print impressions</td>
<td>25HO21</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Punctates; rope-like lip with short tear drop impressions</td>
<td>25CH1</td>
<td></td>
</tr>
</tbody>
</table>
Step 1: Draw the rim profile (using the sherd, a countour guage, and thickness measurments)
Step 2: Orient the sherd using a flat surface
(n=19)

Central value = 1.359 ± 0.077 (1\(\sigma\))

Dispersion = 18 %
Step 3: Draw a line along the edge of the ruler following the orientation of the sherd.

I

: 95°
Step 4: Draw a line along the rim to intersect with the orientation line. Measure the angle where the two lines intersect.

**Examples of common Dismal River aspect surface treatment**

<table>
<thead>
<tr>
<th>Surface Treatment Description</th>
<th>Site and Institution Origin</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Smooth</td>
<td>25CH1, Nebraska State Historical Society</td>
</tr>
<tr>
<td>Smooth</td>
<td>25HO21, Nebraska State Historical Society</td>
</tr>
<tr>
<td>Simple stamped (lip rolled towards exterior; surface damage)</td>
<td>25CH1, Nebraska State Historical Society</td>
</tr>
<tr>
<td>Smoothed over simple stamped</td>
<td>25HO21, Nebraska State Historical Society</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>------------------------------------------</td>
</tr>
<tr>
<td>Simple stamped</td>
<td>25CH1, Nebraska State Historical Society</td>
</tr>
</tbody>
</table>
Appendix B: Select Ceramic Illustrations

25H021 - 205-004-0
Profile

Indented 'U' shape

Rim Decoration

25H021 - 277-003-0
Profile

Body Note: □ = Painted Decoration
Appendix C: OSL Radial Plots

(n=11)

Central value = 1.282 ± 0.061 (1σ)
Dispersion = 5.7 %

UNL-4482
(n=19)

Central value = 1.359 ± 0.077 (1σ)

Dispersion = 18 %