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W. Jeffrey Kinney

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THE HAGEN SITE, 24DW1:
A REVIEW OF HISTORICAL DATA AND A REASSESSMENT OF ITS CERAMIC ASSEMBLAGE AND POSITION IN NORTHERN PLAINS PREHISTORY.

by

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B.A. The University of North Dakota, 1976

presented in partial fulfillment of the requirements

for the degree of

Master of Arts

The University of Montana

1996

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5-20-96
Date
The Hagen Site, 24DW1: A Review of Historical Data and a Reassessment of Its Ceramic Assemblage and Position in Northern Plains Prehistory.

The Hagen site, 24DW1, is important for understanding prehistoric Northern Plains cultural dynamics, particularly regarding the "Crow-Hidatsa Schism".

The original Hagen site ceramic analysis indicates the site's cultural history is complex. This analysis was comprehensive for its time but is not easily comparable to collections from other sites. There were problems with excavation and laboratory techniques used from 1936 to 1939 by the WPA archeologists. Primary among these was the total lack of vertical provenience for the artifact assemblage.

Three goals were pursued for this thesis. First, a history of early excavations and analyses was compiled involving archival research, locating small collections from the site, and incorporating them into the main collection. Second, a detailed review of the modern ceramic analysis by Ahler and Swenson (1993) was presented. Ahler and Swenson (1993) included a sample of Hagen pottery in their analysis of ceramics from many sites in the Knife-Heart region of North Dakota. A brief summary of their work and hypotheses concerning the Hagen site cultural history is included. Third, a spatial analysis of ceramic attributes was conducted.

A modified version of Ahler and Swenson's (1985) ceramic attribute coding format was used for the spatial analysis. A sample of ceramics was coded with horizontal provenience data included as a variable. The frequency of cord-impressed, S-shaped rims, and rainbow motif variables strongly suggest close cultural ties to Early and Late Scattered Village complex sites in North Dakota. Higher frequencies of S-shaped rim vessels with cord-wrapped-tool-impressions indicates possible contact with groups from the northwest, north, and northeast, a region now encompassing southeastern Saskatchewan and southwestern Manitoba.

CALFORM, a computer program that produces shaded, conformant maps, was used to create maps illustrating distributions of various ceramic attributes. Hypothetically, ceramic attribute distribution maps could indicate areas of occupation by distinct cultural groups or possibly settlement pattern variations as ceramic traditions changed through time.

The spatial analysis maps indicate no definite patterning of ceramic attributes is evident except for increased densities of pottery near the known features (house, mound, and cache pits). This homogeneous distribution is possibly due to the lack of vertical provenience as the entire site was excavated as one single stratigraphic level, effectively collapsing the artifact assemblage into a single, homogeneous collection representing several occupations or cultural groups.
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CHAPTER 1
INTRODUCTION

The Hagen site, 24DW1, is an open-air occupation site located on a river terrace on the north bank of the Yellowstone river a few miles upstream from Glendive, Montana (see Figure 1). The excavations conducted in 1938 by the Montana Archaeological Survey, and funded by the WPA (Works Progress Administration), produced one of the largest ceramic collections from a single site in the region. The Hagen site ceramic collection is very similar to that found within the Knife River region of the Missouri Valley and in particular at known Heart River phase sites (Wood and Downer 1977:85).

Ahler (1993:157) reports that many authors have suggested that "the site represents a settlement of some subgroup of Crows after they separated from Hidatsa subgroups near the Knife River" in present day North Dakota (Mulloy 1942:99-103; Wood and Downer 1977:85). However, there are several ceramic attributes such as cord-wrapped-tool-impressed ceramics from this collection that suggest more complex archeological relationships between the Crow and Hidatsa than originally posited. This decorative technique is also common to Blackduck horizon and Mortlach complex ceramics as well as others and suggests contacts between Hagen and peoples to the north, northwest, and northeast (Ahler 1993:158).

Given the importance of the Hagen site to the understanding of the cultural
Figure 1. Portion of U.S.G.S. 7.5' Forest Park, Mont. Quadrangle showing the location of the Hagen site, 24DW1. T. 15 N., R. 55 E., Section 21.
dynamics of the Northern Plains, I felt that a more detailed, comprehensive, and readily comparable analysis should be conducted. The original ceramic analysis was conducted by Dr. James Griffin in 1940 (Griffin 1940). The complete manuscript was not published and its present location is unknown; however, at least by 1942, a copy was on file at the Montana Archaeological Survey at Montana State University in Missoula. William Mulloy condensed this manuscript and compiled the ceramic discussion for the Hagen site report (1942:11-38). Many ceramic attributes were quantified but they were not directly nor easily comparable to ceramic attributes of collections from other sites. At that time, a large and consistent multi-site data base of ceramic attributes from this region did not exist. Therefore it would be difficult to compare attributes recognized in 1938 to those from a modern ceramic analysis.

The goals of this thesis are to conduct a "modern" analysis of a large sample of the Hagen ceramic collection. An analysis format developed by Ahler and Swenson (1985) was selected for this purpose because they had utilized it to analyze ceramic collections from numerous sites in North and South Dakota. The similarities between the Hagen site ceramics and ceramics from this region has long been recognized and a discussion of these relationships, as presented by Ahler (1993) is included. Although vertical provenience for the entire Hagen artifact assemblage is lacking, I coded the horizontal provenience of each sherd. Using these data, I used a specialized mapping program to plot the horizontal distribution of various ceramic attributes. These spatial distributions of ceramic attributes and combinations of attributes could suggest several scenarios including multiple occupations by culturally distinct groups or an occupation by
a single cultural group as they acquired various ceramic attributes through time.

Before a new ceramic analysis can be conducted on this collection and interpreted, it is important to understand the history of the Hagen site excavation and of the original laboratory and analytical procedures. Prior to the initiation of the 1938 WPA excavation, ceramics from the site were studied and identified as "Middle Missouri ceramics" and the site was considered to represent a single cultural component. As such, the site was excavated as a single stratigraphic level with no vertical provenience recorded for any artifacts, although the depth below surface was recorded for many features, including cache pits and post molds. After the excavation, the artifact collection was moved to several laboratory locations where management and security problems and lack of oversight resulted in labeling and cataloging inconsistencies. In addition, portions of the collections became lost during subsequent moves. By the time Mulloy arrived on the scene in 1940, there were almost no known field notes, maps, drawings, or photographs in existence to assist in the analysis and publication of the Hagen site data.

Due to these analytical shortcomings, it is evident that special consideration must be given when attempting to reinterpret the data. Chapter 2 presents a brief and detailed history of the scientific investigations of the Hagen Site.

As stated above, the present analysis closely follows a ceramic coding format developed by Swenson and Ahler (1985) allowing direct comparisons between the Hagen site ceramic collection and any collections to which this ceramic coding format is applied in the future. This technique provides a standardized format to allow for consistent ceramic assemblage comparisons.
When I coded a 1,060 sherd sample from the Hagen site in 1983-1984, my original goals were to compare my results with Ahler's and Swenson's work and to conduct a spatial analysis for selected ceramic attributes. However, it became obvious that it would be some time before their research would be completed and published. Instead, Ahler and Swenson (University of North Dakota) selected a sample of 299 sherds (representing 299 vessels) from my Hagen site sample and compared them to collections from approximately 59 sites located in the Middle Missouri area of the Missouri River Trench and in eastern North Dakota. They incorporated this data into their recently published analysis (Ahler and Swenson 1993). Chapter 3 provides a description of the ceramic coding format and discusses the results of the Ahler and Swenson (1993) analysis.

Because the Hagen site was excavated as a single stratigraphic level, the only provenience data available is the horizontal. I incorporated a field into the ceramic coding format which recorded the horizontal provenience of each sherd. These data allow the use of CALFORM, a computer-aided mapping program, to generate maps which illustrate the horizontal distribution of ceramic attributes within the known excavation units. These spatial analyses are presented and discussed in Chapter 4.

The primary focus of this thesis is descriptive because of the lack of provenience data, field notes, and other supportive data. However, the ceramic attribute coding format incorporated here will allow future researchers to compare their data with those from the Hagen site. The discussion in Chapter 3 of Ahler and Swenson's (1993) analysis and interpretation of a small ceramic sample from this site illustrates the type of information
this analysis system can yield. Chapter 5 includes a summary of the previous chapters and attempts to correlate the intersite and intrasite data.
CHAPTER 2
HISTORY OF THE HAGEN SITE. 24DW1

The Hagen site, as previously stated, is an open-air occupation site located on the second river terrace on the north bank of the Yellowstone River, approximately five miles upstream from Glendive, Montana (Figure 1). The physical setting of the site was best described by Mulloy is his 1942 monograph:

The site lies on a high bluff formed by a river terrace on the north bank of the Yellowstone River. The bluff, about one hundred feet in height, declines abruptly to the river bottoms which extends several hundred feet to the present channel. This area, slightly rolling, overlooks a large expanse of the river and surrounding territory. A small arroyo carrying an intermittent stream enters the river somewhat to the north of the village. This originates near the southern end of the site on the west side, to extend northward and then sharply eastward to the river, thus bounding the site on two sides while the edge of the river terrace defines a third (Mulloy 1942: 3).

At present, portions of the site area are native grassland; however, areas to the west, south, and southwest have been cultivated. The back dirt piles from the 1938 WPA excavations were located to the west of the site and were still evident in the 1950s. However, the landowner leveled them shortly thereafter prior to cultivation (Johnson 1982).
Initial Discovery and Early Excavations

The site was originally discovered by Oscar T. Lewis, a local rancher, and a very capable and avid "semi" professional archaeologist. Oscar Lewis served as a field supervisor for several projects conducted by the Montana Archaeological Survey in the late 1930's (Beasley and Purcell 1963). Lewis, in May of 1942, wrote a letter to Nels C. Nelson of the American Museum of Natural History, reporting that he discovered the Hagen site in 1935 when he found a bison pelvis with a small side-notched projectile point embedded in it in a cache pit (Lewis 1942).

National Youth Administration (N.Y.A.) Test Excavations

The following year, 1936, the first organized excavations at the Hagen site were conducted by Lewis and a crew of N.Y.A. (National Youth Administration) students during September and October. An incomplete set of field notes describes some of these excavations, although no provenience data were recorded for the N.Y.A. excavations. These notes are referenced throughout this thesis as "Lewis 1936-1938" and are not paginated. Cultural material recovered from several apparent cache pits includes: ceramics, scrapers, broken points, "engraved" bead (bone?), hammer stones, bison bone, and "clam" shells. They then tested a "slightly raised circular place, about 45 feet in diameter and perfectly rounded that looks like it was built up with gravel" to a depth of about 14 inches. A "fire bed" was found in the center of the mound and many highly fragmented human bones were recovered although the exact location is not known. By the end of the N.Y.A. test excavations, the N.Y.A. crew had been recovered "pieces of
jaws of 16 individuals and ... over 120 human teeth" (Lewis 1936-1938). Most of this material came from a 15 foot in diameter area within the 45 foot circular mound, probably the same one described by Mulloy (1942: 9-10).

Lewis (1936-1938) also mentions that he located two more of the "raised circles" and he "tested in the center and found fire beds in both of them".

The following year, 1937, Lewis returned to the Hagen site with a few assistants and excavated two probable cache pits. The cultural material recovered includes: projectile points, ceramics, bison bone, fish bones, hematite, a stone knife, a bone ornament, scrapers, human teeth and mandible fragments, and two bison scapula hoes. No photos, sketches, or other descriptions of these artifacts exist and it is unknown if these artifacts were incorporated into the artifact assemblage from the 1938 WPA excavation. Lewis's notes do mention, however, the dimensions of the cache pits.

1938 WPA Excavations

In 1937, specifically to acquire WPA funds to conduct archaeological investigations, the Montana Archaeological Survey was formed under the directorship of Professor Melville H. Sayre of the Montana School of Mines in Butte.

Permission to excavate was acquired from Mr. Thomas Hagen, the landowner, and in April, 1938, operations were to begin. Oscar T. Lewis was appointed as the initial field supervisor by Professor Sayre. On April 11, 1938 Lewis arrived in Glendive and began to find his crew, get material to make screens, and find excavation tools (Lewis 1936-1938). Excavation at the Hagen Site started the next day after a north-south base
line was established. This base line began at Station 1, the location of a large cache pit that was excavated by Lewis in 1937. The initial excavation trench was located along this line.

Several excavation units were established off this base line (Figure 2) and Lewis and his crew discovered numerous cache pits, one and possibly two house locations, a raised mound, many post molds, and many artifacts. The horizontal provenience of these features and artifacts was recorded, but unfortunately, the vertical provenience was only recorded "if it happened to be a pit or something that ran either higher or lower in average placement of artifacts" (Phelan 1938: 52). Again, there are no existing records which describe the actual depths of excavation nor at what depth cultural materials were encountered.

Some of the more significant artifacts recovered during this period include: numerous bison scapula hoes, human bones and teeth, fleshing tools, two squash or pumpkin seeds, dentalia beads, charcoal, and wooden post fragments. The scapula hoes and the squash or pumpkin seeds are the only direct evidence of horticulture represented in the entire artifact assemblage. Interestingly, Mulloy only suggested the possibility that the Hagen peoples were horticulturalists. He was only aware of the presence of a few scapula hoes and states, "Horticulture is not proven here, though scapula hoes suggest it" (1952: 132). Obviously, he did not have access to Lewis' field notes which specifically mention the squash seeds.

On April 21, 1938, Lewis's tenure as field supervisor for the Hagen project ended and he was transferred to the Pictograph Cave project to serve as field supervisor
there. Mr. B. Wahle Phelan became the new Hagen site field supervisor on April 20, 1938 and held that position until he resigned in April of 1939. During this period, excavation continued at the site until the fall of 1938. After the departure of Oscar Lewis from the Hagen excavations, there are no known field notes in existence. Nor are there any known photographs, maps, catalogs, drawings, or profiles. The only known provenience data is that which was written on each individual artifact in the lab which identifies which ten by ten foot square the artifact was recovered from. In some cases, the location is more precise if the artifact came from a cache pit or post mold.

During the fall of 1938, Mr. Phelan (1938) did submit a "General Report of Field Season". It contains very little archaeological detail but it does discuss changes made to the surveying system and describes the grid system used to map the site. He also described the amount of the site excavated:

During field season on the Hagen site 317,000 square surface feet were moved. At the average of eighteen inches of digging depth we moved 11,766 cubic yards of earth which, according to scale, that ground weighs approximately 15,884 tons of earth. As to the future digging left at this scarcely scratched area, to be dug, there is possibly in the neighborhood of six times that amount yet to move (1938: 52-53).

All matrix was screened through quarter-inch mesh screen.

Phelan (1938: 53-59) describes some of the seasons findings including: 33,571 fragments of pottery, 10,284 fragments of animal bones, 1,174 human bone fragments, 459 human teeth, unspecified number of lithic artifacts, and a single small piece of charred leather. It should be noted that when Snodgrass reported his analyses of the human skeletal remains (Mulloy 1942: 92-98) he had recognized a total of 23 individuals.
Figure 2. Extent of 1938 WPA excavations (Mulloy 1942: 4).
based on cranial fragments.

Little else is known about the actual Hagen Site excavations. There are a few personal letters in existence which contain general descriptions of the project. One of these is from Edwin Lewis (a crew member in 1938) to Thad Hecker of the State Historical Society of North Dakota. Will and Hecker (1944: 15) refer to this letter with the following descriptions of the houses (or lodges):

"14 feet to 16 feet in diameter with polygonal sides, apparently made of short logs held in place horizontally by upright posts. The floor levels were 8 to 10 inches below the present surface level with a small fireplace in the center of the lodge floor. Several posts (with no distinct pattern for the several lodge ruins excavated) held up the roof. The potsherds and artifacts recovered were taken from the lodge floor and from refuse-filled cache or storage pits which were dug just outside the lodge floor. The cache pits were plastered with clay and in size were from 2 feet to 3 1/2 feet in depth and averaged 3 feet in diameter."

Lewis also informed Hecker that decayed wood was found in some of the post holes and that the WPA took samples and that "most of the pottery and artifacts were taken" from the refuse-filled cache pits (Lewis, E. 1941).

Laboratory Analyses and Publication 1938-1942

In October of 1938 (Malouf 1961: 9), all of the artifactual material was moved to Lewistown, Montana for analysis and labeling. The lab at this time was to be under the supervision of Raymond Thompson, a student of Sayre's from the Montana School of Mines. In February of 1939 Professor Sayre resigned from the Montana Archaeological Survey and died shortly thereafter. Thompson also soon left the project. Oscar Lewis became supervisor again with Wahle Phelan as his assistant and plans were made to move
the Hagen Site lab from Lewistown to Eastern Montana Normal School (now Eastern Montana College) in Billings (David Schwab, Personal Communication, 1995). This lab operated under the direction of Mr. Phelan until April, 1939. All work on the project was discontinued that autumn (Mulloy 1941: 8). Malouf (1961: 9) reports that what notes that existed and many artifact specimens became lost or widely scattered after the closure of the Lewistown laboratory.

At this time, the new project sponsor became Eastern Montana Normal School with President L.B. McMullen as supervisor and Dr. Harry H. Turney-High of the Montana State University (University of Montana) serving as technical advisor of the Montana Archaeological Survey.

Between July and August of 1940, a foreman and five assistants were hired by the WPA to attempt to "arrange, analyze, and clean and restore the specimens" from several WPA sponsored digs. Also, attempts were made to recover notes, photos, and maps of the sites that had become scattered or lost.

In October, 1940, William T. Mulloy was hired as State Supervisor of the WPA sponsored projects through the Montana Archaeological Survey (Purcell 1963: 13). He expended great effort attempting to repossess and organize the artifacts and notes from the WPA excavations. However, by 1941 Mulloy (1941: 13-14) had been unable to obtain a single map, drawing, photograph or profile from the site. Various classes of cultural materials were sent to several distinguished professionals (Mulloy 1942: vii-ix) and Mulloy incorporated the results of these analyses to produce the final monograph for the Hagen Site. Indeed, "Mulloy's chief contribution was not the excavation of sites, but
in the herculean task of bringing the material together" (Malouf 1961: 10). As an example, due to the lack of any maps, photographs, drawings, or profiles from the Hagen Site, Mulloy (1942: 13-14) sorted through tens of thousands of artifacts, copying the provenience which was written on each artifact on to a square piece of brown paper. He then assembled these paper squares according to their coordinates, thereby producing the most accurate reconstruction of the actual size and shape of the excavation units (Malouf 1982).

The analysis of the human skeletal remains was conducted by Mr. Richard M. Snodgrasse of the University of Chicago with the cooperation of Dr. Wilton Krogman. Snodgrasse's work, reported in the Hagen site monograph (Mulloy 1942: 92-98) was apparently focused on skeletal material recovered from only the mound area. The skeletal remains, mentioned earlier, consisted of a quite large and highly fragmented sample. Very few complete elements were present. A few of the cranial and appendicular skeletal fragments exhibited cut marks and some of the bone fragments were charred. Snodgrasse recognized conclusively at least 23 individuals although there may have been as many as 40 or more.

Mulloy probably completed his manuscript of the Hagen Site report in the latter part of 1941, shortly before he was drafted into the military (Malouf 1979: 115). The first printing of the Hagen site report was done by the University of Montana Publications in the Social Sciences (Mulloy 1942). It was reprinted in 1976 by the J & L Reprint Company of Lincoln, Nebraska.

Mulloy (1942: 99-103) recognized the potential of the Hagen site to help answer
questions regarding what has come to be known as the "Crow-Hidatsa Schism" and he
put forth three hypotheses concerning the Hagen site's position in the archaeological
sequence of the Upper Missouri area.

In his first hypothesis he recognizes the Crow and Hidatsa legends which
indicate that they once lived together on the Missouri River and that the Crow had later
moved west. Mulloy (1942:101) states that:

It would appear to be a simple explanation to state that the Hagen Site
is a prehistoric Crow site occupied by these people shortly after they
left their relatives on the Missouri and while the cultural influences of
the Mandan-Hidatsa type were still strong in the pattern".

Due to the approximately A.D. 1776 date that Hayden (Hodges 1912: 367) suggested as
the date that the Hidatsa separated from the Mandan, Mulloy felt that this hypothesis
might well be an oversimplification. This late separation date would leave little time for
the Crow to have split from the Hidatsa, moved west and established the Hagen site, and
developed a "full blown horse-buffalo economy" by historic times (Mulloy 1942: 101).

His second hypothesis requires the acceptance of Hayden's suggestion that the
Hidatsa and Mandan separated in about 1776, and the Crow separated from the Hidatsa
shortly thereafter (Hodges 1912: 367). He posits that "under the proper stresses economic
patterns may change with extraordinary rapidity" (1942: 101-102). In other words, given
the proper conditions and the acquisition of the horse, it may have been possible for the
Crow to change from a horticultural to a horse-buffalo economy in a very short time.
Mulloy (1942: 102) recognized that if this hypothesis were true, it would argue for a very
late prehistoric date for the establishment of the Hagen site.
Mulloy's third and last hypothesis, and the one he seemed to favor, posits that the split between the Crow and Hidatsa peoples may have taken place on many occasions during the prehistoric period. He recognized that the ceramic assemblage from the Hagen site appears to indicate an occupation by a generalized Mandan-Hidatsa people. However, an explanation was needed for the relatively high numbers of cord-wrapped-rod impressed and dentate stamped sherds present, as these two decorative techniques were not common within known Mandan or Hidatsa ceramic collections. Mulloy suggests the “Hagen site complex may have stemmed from some prehistoric division closely related to the Mandan and Hidatsa in which wrapped-rod and dentate stamped decoration were present...” (1942:102). Mulloy further hypothesizes that if an earlier date for the this group can be assumed, it is possible that they acquired some of the non-Mandan/Hidatsa ceramic attributes such as cord-wrapped-rod impressions and dentate stamping which are prevalent in the Hagen ceramic collection through contact with other groups among whom those decorative ceramic attributes were important (1942: 102-103).

**Subsequent Studies, 1942-1980**

After the publication of Mulloy's 1942 monograph, virtually no research on the Hagen Site artifact assemblage was undertaken. In fact, for almost 20 years, very little attention was paid to Crow sites in general (Johnson 1979:19). However, the Hagen site was recognized as important to the understanding of the cultural developments in the region and it has been cited extensively in the literature since the publication of Mulloy's report.
Shortly after the publication of the Hagen Site, Will and Hecker (1944) published an article entitled "The Upper Missouri River Valley Aboriginal Culture in North Dakota". This article contains some of the first references to the Hagen Site report to appear in the literature. In fact, as I mentioned above, Thad Hecker actually visited the Hagen site in 1940 with Edwin Lewis (one of the original Hagen Site crew members) to make observations and take notes, probably as background research for his 1944 publication. During this visit Hecker observed the remains of several lodge "ruins" (1944: 15). His observations of the site area and some of its features are among the most complete that exist today. Shortly after his visit, Hecker acquired a small sample of Hagen Site pottery for the comparative collection at the State Historical Society of North Dakota. This sample has recently been reincorporated into the Hagen ceramic collection.

Eighteen years later, Forbis and Huscher (1961) published a brief report concerning their findings at the Cluny site in Alberta. The Cluny site ceramics were similar to those from the Hagen Site and were considered to be Crow. Forbis (1977) later presented a more complete site report in which he stresses a more Middle Missouri influence by a "non-specific Hidatsa-related group" (Byrne 1979: 123).

During the 1960s and 1970s, several sites were investigated and were considered to be Crow in origin. Among them are: the Piney Creek Site (Frison 1967, 1976), the Big Goose Creek Site (Frison, Wilson, and Walker 1978), Ludlow Cave (Wood 1971), and a site on East Redwater Creek (Taylor 1960). Johnson (1979: 20) has noted that "Frison's identification of these ceramics as Crow is based on his perception of ceramic similarities with Hagen site pottery and his knowledge, from the ethnographic record, that
the Crow Indians lived in these areas" This same observation applies to most analogies drawn between the "Crow pottery" from the Hagen site and ceramics from other sites in the region. Seldom has anyone physically examined the actual Hagen collection or considered the lack of temporal control before making assumptions of its relationships to other sites. The ceramic coding format and the spatial analysis of ceramic attributes presented in the following chapters will facilitate more accurate comparisons and assumptions in the future.

In the late 1970s much was written about the Crow-Hidatsa separation and the problems in the identification of Crow pottery. A symposium in *Archaeology in Montana* focused on these topics included papers by Frison (1979); Johnson (1979); Taylor (1979); Forbis (1979); Alex (1979); and Heidenreich (1979). Again, there were many references and comparisons to the Hagen Site ceramics and several important observations and recommendations were made concerning future research. However, it is unlikely that any of the researchers, with the exception of Ann Johnson (Personal Communication, 1982), had physically examined an appreciable portion of the ceramic collection.

An important observation by George Frison (1979:10-14) reminds us that perhaps the origins of Crow pottery may be too complex to attribute to a single source. He posits that cultural and ecological conditions may have encouraged the movement of many groups west of the Missouri River at the time period that the Crow were known to be there. What we recognize archeologically as Crow may be an aggregate of a number of these groups. Indeed, some groups may actually represent other separations and migrations of Hidatsa into areas to the south and southwest in South Dakota and eastern
Dr W. Raymond Wood (1982) contacted the University of Montana to obtain charcoal samples. Three samples consisting of large fragments of charred wood posts were obtained (Ramos 1975) although the provenience of each within the site is unknown. These charcoal samples were collected by the WPA archaeologists from the earthlodge and the cache pits in 1937 or 1938. Wood forwarded the samples to the University of Wisconsin in late 1975 for analysis and obtained these three radiocarbon dates (Wood and Downer 1977: 87):

Table 1.

Three radiocarbon dates from the Hagen site, 24DW1. * Corrections calculated by L.B. Davis on the basis of the MASCA curve (Ralph, Michael, and Han: 1973).

<table>
<thead>
<tr>
<th>Laboratory Number</th>
<th>Age BP</th>
<th>Corrected Age BP*</th>
<th>Age A.D.</th>
<th>Corrected Age A.D.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wis- 863</td>
<td>490±55</td>
<td>540±65</td>
<td>1460</td>
<td>1410</td>
</tr>
<tr>
<td>Wis-864</td>
<td>780±55</td>
<td>740±65</td>
<td>1170</td>
<td>1210</td>
</tr>
<tr>
<td>Wis-865</td>
<td>775±55</td>
<td>740±65</td>
<td>1175</td>
<td>1210</td>
</tr>
</tbody>
</table>

Dr. Wood has recently returned the charcoal samples and a small sample of Hagen Site ceramic sherds to the curation facility at the University of Montana.

At about this same time, Dr. Leslie Davis (1982) of Montana State University, obtained a small fragment of obsidian from Ann Johnson and was asked to do a obsidian hydration measurement and age analysis. Ann Johnson (Personal Communication 1982).
during a 1973 visit to the Hagen Site, recovered the obsidian flake from a cultivated area in the western portion of the site. The exact provenience of the obsidian flake is unknown and there are no known spatial relationships between this flake, the charcoal samples, and the artifact assemblage. The sample had a hydration rim of 2.36 microns thickness. Davis calculated the rates of hydration according to the two corrected radiocarbon dates for Hagen. These rates are 11.3 at A.D. 1410 (corrected from A.D. 1460) and 7.1 at A.D. 1210 (corrected from A.D. 1170 and 1175). Davis concluded, based on his experience and assuming that the obsidian flake actually dates the ceramic components of the site, that both hydration rates, in particular the 7.1 rate, are quite compatible with other rates for that time period in the Northwestern Plains (Wood and Downer 1977:87-88). The obsidian hydration rates tend to reinforce the radiocarbon dates but do not provide an independent date for the site. It should be noted that the varying radiocarbon dates tend to support Mulloy’s third hypothesis which suggests that Crow and Hidatsa peoples may have split on several occasions.

By 1980, much was known but more was inferred about the Hagen Site. We knew that it was a large occupation or village site with at least one earthlodge-like feature, one low, circular, truncated mound, many smaller features including cache pits and post molds, and a large artifact assemblage consisting of a very complex ceramic collection, a large lithic collection, faunal remains, and a large amount of human remains. Many researchers were aware that there were provenience problems with the artifact assemblage although they were probably not aware of the degree of the shortcomings. Absolute dates for the site were published, but the provenience of the dated materials
were unknown and the dates cannot be reliably used to date ceramic components. The Hagen Site was still considered to be a "proto-Crow" occupation site in spite of there not being a definitive definition of Crow pottery.

**Research: 1981 to the Present**

In 1981, the research that forms the basis for this thesis was begun. I chose to reanalyze the Hagen Site ceramics in order to present the data in a format that is readily comparable with current ceramic analyses. Specifically, I chose to code stylistic and other data on the individual vessels using a coding format developed by Ahler and Swenson (1985) to conduct a comparative analysis of ceramic collections from the Knife River Indian Villages, the upper Knife-Heart region, and in selected adjacent areas in the Northern Plains. This analysis also included coding the provenience of each vessel and using these data to produce computer-generated maps illustrating the horizontal distribution of various ceramic attributes within the excavation units. The following chapters discuss these analyses in detail and include a discussion of Ahler's and Swenson's (1993) analysis of a smaller sample of the Hagen ceramics.
CHAPTER 3
CERAMIC ATTRIBUTE CODING FORMAT AND ATTRIBUTE ANALYSIS RESULTS

As previously stated, the original Hagen Site ceramic analysis as prepared by James B. Griffin and presented by Mulloy (1942) was comprehensive and entirely adequate for its time. Today, there are many more comparative collections and analytical tools available to the ceramic researcher than Mulloy had at his disposal in 1940-1942. In addition, much more is known archeologically about the cultural dynamics of the Northern Plains and adjacent areas. By combining this knowledge with new tools and techniques, it may be possible to achieve better understanding of the cultural chronology of this site and region.

One of the primary goals of this research was to code a sample of the Hagen site ceramic collection using the comprehensive and quantifiable ceramic attribute coding format developed by Ahler and Swenson (1985) for use on the Knife River Indian Villages National Historic Site (KNRI) and the upper Knife-Heart region and to compare and contrast the Hagen collection with those included in Ahler’s work on the Knife River Indian Villages (1993). To accomplish this, a sampling strategy first had to be devised. The methods and rational used to arrive at this sample are describe in the following section. Following this section is a description of the ceramic attribute coding format
developed by Ahler and Swenson (1985) that I used to code the Hagen ceramic sample. The horizontal provenience of each sherd included in my sample was also coded allowing the conduct of a spatial analysis of various decorative and nondecorative ceramic attributes. The results of the spatial analyses are discussed in Chapter 4.

All ceramic data from the analyses were compiled onto computer printouts and 3½ inch diskette. These have been forwarded to the Department of Anthropology, University of Montana for inclusion into the Hagen site files.

Initially, I had hoped to incorporate the coded Hagen site data into Ahler and Swenson’s (1985) data but their project was a very large and long term task involving the coding of more than 7,000 vessels from more than 40 sites in their study area. As such, their research was not yet complete and their data was not available for comparative purposes when the coding of the Hagen collection for this thesis was completed. However, while I was coding my sample from the Hagen site, Ahler and Swenson selected a small sample of 299 sherds from the larger sample which I coded and included it with their data. Ahler has recently published the results of their analyses (Ahler and Swenson 1993) and I have included a discussion of their results at the end of this chapter.

**Sampling Technique**

The ceramic collection from the Hagen site originally consisted of 29,230 sherds, five restored vessels, and nine restored neck fragments (Mulloy 1942:12). Presently, small numbers of this collection are missing and are probably in various small museum collections as well as private collections.
After the initial inspection of the collection, it was obvious that a large portion were small, fragmented body sherds and/or were not identifiable by zone. A “zone” is a distinct part of a vessel defined by inflection points. A detailed description of zones and other variables is provided in the following sections. During the initial sort of the Hagen collection curated at the University of Montana, I selected all decorated sherds, rim sherds, and sherds with a known horizontal provenience that could be identified by zone. This sort yielded approximately 3,000 sherds, five restored vessels, and nine restored neck treatments. After closer inspection, I found that sherds smaller than size grade 2 (½ inch or less) were too small to be accurately identified by zone unless the vessel lip was present. The initial ca. 3,000 sherd sample was then size graded through grade 2 (½ inch) hardware cloth and the final sample of 1,060 sherds was obtained. Various ceramic attributes were coded utilizing a slightly modified version of the coding format described below. Care was taken so that individual sherds that were obviously part of the same vessel were coded as such. Data derived from this analysis technique were used to develop the spatial analyses of the Hagen site as presented in Chapter 4.

The 299 sherd sample selected and used by Ahler and Swenson (1985, 1993) was derived from the 1,060 sherd final sample. Specimens were selected that were large and complete enough to facilitate the identification of vessel zones and various decorative and nondecorative ceramic attributes. The focus of their study was on individual vessels rather than on individual sherds. Therefore, they attempted to select only one sherd per vessel for their sample. The selection process involved careful examination of decoration, paste characteristics, and vessel form.
Ceramic Attribute and Variable Coding Format

The coding format used for this research was developed by Ahler and Swenson (1985:33-52). A few minor modifications were incorporated to allow the recording of additional provenience data and are discussed below. The following discussion is a brief summary of the basic tenets central to the coding system. It should be stressed that sole credit to the development of this system goes to Ahler and Swenson (1985, 1993).

The existence of specific vessel zones is central to the ceramic coding format. Ahler and Swenson (1985, 1993:3-5) developed a system which recognizes seven distinct vessel zones. Following the general definition of Shepard (1968:226), Ahler and Swenson (1993:3) recognize a zone as a distinct portion of a vessel defined by junctures, which are defined by inflection points, or points at which the direction of curvature reverses itself, a pattern that is particularly evident between zones 1, 2, 3, and 4. Thus, a zone can be defined as:

- a subpart of the vessel which is continuous around the full circumference of the vessel when the vessel is positioned in a vertical, upright position. If a vertical cross-section through the vessel is considered, each zone represents a segment of this cross-section or a segment of the vessel surface observed in this cross-section, with the boundaries between zones being formally defined (Ahler and Swenson 1985:5).

The presence or absence of these zones defines the overall vessel and rim form and allows recording of specific surface treatments, decorative techniques and patterns, and metric data according to specific zones of a vessel. Figure 3 illustrates various rim form shapes zones, and zone junctures. Table 2 offers a definition of each zone.

Ahler and Swenson (1993) considered three types of variables for their coding
format including: nominal variables, metric variables, and typology variables. Nominal variables include data on basic vessel form; additive features including braces, fillets, handles, and spouts; lip shape; exterior surface treatment; decorative technique and pattern; general paste characteristics, i.e. residues and temper; site area; archeological context or unit excavation unit; time period; and horizon or excavation level or feature number.

Metric variables include measurements of the width and spacing of trailing/incising and

Table 2.

Definitions of vessel zones (Ahler and Swenson 1985:5).

<table>
<thead>
<tr>
<th>Zone</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>the vessel body</td>
</tr>
<tr>
<td>2</td>
<td>the neck and the vertical to outflared rim area</td>
</tr>
<tr>
<td>3</td>
<td>the s-rim area</td>
</tr>
<tr>
<td>4</td>
<td>the recurved or double s-rim area</td>
</tr>
<tr>
<td>5</td>
<td>the brace area</td>
</tr>
<tr>
<td>6</td>
<td>the fillet area</td>
</tr>
<tr>
<td>7</td>
<td>the lip area</td>
</tr>
</tbody>
</table>

cord impressions; vessel wall thickness of various zones; height of rim and zones 2,3, and 5; zone 2 and 3 inflection; and vessel orifice diameter. The typological variables include various type and ware classifications. For detailed descriptions of all of the above variables, the reader should refer to Ahler and Swenson (1985).
Figure 3. Examples of rim form shapes which are common in the Knife-Heart region of the Middle Missouri subarea, showing vessel zones present and zone junctures for each rim form. Exterior to the right. (Ahler and Swenson 1985:6)
By using a ceramic analysis system which focuses on vessel attributes it is possible to easily compare intersite stylistic and technological variations. This is the focus of Ahler and Swenson's (1993) work.

Ahler and Swenson's Interpretation of Hagen Site Ceramics

As previously stated, Ahler and Swenson (1993) coded and analyzed a sample of 299 sherds from the Hagen site. This sample of sherds was derived from the 1,060 sherd sample I had selected from the total Hagen collection to use in the spatial analysis presented in Chapter 4. To select their 299 sherd sample, Ahler and Swenson included sherds that were obviously from separate vessels and were large and complete enough to provide data on several ceramic attribute variables.

The three radiocarbon dates that Ahler and Swenson (1993) considered for their interpretations are the same as those (see Table 1) used by Wood and Downer (1977:87). In the study, Ahler and Haas (1993:130) applied certain statistical tests:

"to determine if any of the series of multiple dates thought to be from single archeological contexts in fact differ significantly from each other in a statistical sense. The goal is to test the hypothesis that samples from the same archeological context are in fact representative of a single chronological event. Procedures outlined in Ward and Wilson (1978) are used to test this hypothesis."

Ahler and Haas (1993:130) tested this hypothesis for all the sites included in his study by:

"following procedures presented by Ward and Wilson for “Case II” situations, in which two or more samples under consideration are known to be and cannot be assumed to be derived from the same object or piece of dated material."

They used formula (7) from Ward and Wilson (1978:23) to compute a test statistic $T'$.\footnote{\textit{\cite{Ward:1978}}}
which had a chi-square distribution under the null hypothesis that all dates are dating the same event. He used chi-square distribution tables and \( p=0.05 \) to test the null hypothesis for each group of dates.

Of all of the sites thus tested by Ahler and Haas (1993:130), only for the Hagen site samples was the null hypothesis rejected. The test gave no indication which sample(s) could be considered to be erratic or "outliers" to be excluded from the group. Therefore, Ahler and Haas (1993:130) write:

"Inspection of the three dates from the Hagen site and general knowledge of the pottery collection from the site led to the decision to consider the most recent date (WIS-863) as the one most likely to be associated with the ceramic sample, thereby excluding the two older dates from further consideration."

It must be stressed that all that is known concerning the provenience of the charred posts from which the radiocarbon samples were obtained is that they came from the Hagen site. It is not known if the samples were derived from a single charred post or if they came from separate posts. It is possible that the two early dates, WIS-864 and WIS-865 (see Figure 1) were derived from post fragments from a structure from an earlier occupation.

Ahler selected the calibration curves developed by Struiver (1982) to correct all of the radiocarbon dates used in his analysis (Ahler and Haas 1993). Table 3 illustrates the age range computed for the Hagen site.

The following discussion presents Ahler and Swenson's interpretations of the ceramic data derived from the sample. Ahler and Swenson (1993:157) found that almost the entire collection was not classifiable according to recognized type and ware classes for the Upper Knife-Heart region and selected adjacent areas in the Northern Plains.
Table 3.

Summary of Hagen site chronometric dating information
(Ahler and Haas 1993:137, 155). All dates are AD.

<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Corrected Radiocarbon Years BP t $\frac{1}{2}$=5568</th>
<th>C-14 Calender Age Range Midpoint</th>
<th>C-14 Correction Curve Crossing Point</th>
<th>Estimate* of Age Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>WIS-863</td>
<td>490±55</td>
<td>1460</td>
<td>1425</td>
<td>1450-1600</td>
</tr>
</tbody>
</table>

*Basis for Estimate: radiocarbon dates, ceramic typology, seriation, cross-dating.

They found that only 3 percent of the sample can be classified as Le Beau S-Rim ware, a finely made ware commonly associated with Heart River Phase sites and usually dating to the mid to late 1500's (1993:140). Seventy two percent of the sample was Unnamed S-Rim ware and 25 percent was Unnamed Straight Rim ware. Considered as a whole the sample was composed of over 70 percent S-rim ware, about 4 percent recurved S-rim ware with zone 4, and about 4 percent of the remaining straight rim forms exhibit bracing (a technique where the lip and rim are folded over and molded together thereby thickening and strengthening the vessel rim). Ahler and Swenson (1993:157) observe that:

This rim form composition, distinguished by high frequencies of S-rim, moderate amounts of straight rim, little bracing, and presence of some recurved S-rim forms is highly similar to samples from the study area classified as Scattered Village complex or Heart River phase.

These time period designations are the most relevant to the Hagen site and are defined as (1993:84-85):
A.D. 1400-1450. Early Scattered Village Complex

Ahler and Meher (1984) studied pottery and other artifacts from 32ME413, 414, 415, and 407 as part of the KNRI program. The results form the basis for the type examples for the Scattered Village complex. "Distinctive ceramic characteristics for this period include relatively high frequencies of both Unclassified S-Rim and Straight Rim pottery wares, relatively low frequencies of Riggs and Fort Yates wares, considerable diversity in decorative technique (type) and lip form, and a low but consistent occurrence of check-stamping in body sherd treatment" (Ahler and Swenson 1993:84-86).

A.D. 1450-1525. Late Scattered Village Complex.

The ceramic characteristics of this group are similar to those from the Early Scattered Village complex. However, there are a few minor distinctions including a higher frequency of Le Beau ware, more cord-impressed decoration and round lip forms, higher frequencies for curved zone 3 shape, and less check-stamping (1993:85).

A.D. 1525-1600. Heart River Phase.

The ceramic attribute which are distinctive for this period are: "a high frequency of Le Beau ware and low frequencies of all other wares, high frequencies of S-shaped rim forms, predominance of cord-impressed decoration, relatively high frequencies of inslanted lip forms, very low frequencies of angular shape in zone 3, low frequencies of check-stamped surface treatment, very low thickness measurements at several places on the vessel, and relatively high frequencies of diagonally oriented decorative patterns" (Ahler and Swenson 1993:86).

Other vessel shape characteristics, including: zone 2 and 3 form, zone 3 height and inflection values, brace height, and lip form. occur in frequencies and within ranges that best bracket the Early and Late Scattered Village complex. In particular, Ahler and Swenson (1993:157) found that 48 percent of the zone 3 occurrences are angular rather than round. This figure is within the 42 percent and 88 percent range which brackets the Early and Late Scattered Village complex. They also found that the zone 3 height and
inflection values for the Hagen sample are higher than Scattered Village complex but lower than the means for Heart River phase samples. The brace height for Hagen (mean of 11.9mm) was found to be much lower relative to Missouri Valley samples and was suggested to indicate that the Hagen "sample definitely dates prior to A.D. 1600 when all brace heights increase to 18mm or greater" (1993:157). A variety of lip forms in varying frequencies were present within the sample. Ahler and Swenson noted the following lip forms and frequencies: round (65 percent), flat (23 percent), L- and T-shaped (6 percent), pointed (3 percent), inslant (2 percent), and outslant (1 percent). They noted that this lip form composition is most similar to the Late Scattered Village complex and also generally similar to the Late Scattered Village complex (1993:157).

Several other variables were considered in this study, including the occurrence of check-stamped body sherds and the mean values for cord spacing and cord diameter. The values for each of these variables correlated well with Late Scattered Village complex sites samples from the Missouri valley (1993:157-158).

The researchers found that decorative technique is the single attribute variable which most vividly distinguishes the Hagen ceramic collection from samples from sites in the Missouri valley (1993:158). They found that 53 percent of their Hagen sample are sherds which exhibit cord-wrapped-tool-impressed decoration. The frequencies of other decorative techniques observed within their sample includes: cord-impressed (21 percent), tool-impressed (11 percent), trails/incised (8 percent), and plain (4 percent). This variety in decorative techniques is again reminiscent of Scattered Village complex sites. However, the high frequency of cord-wrapped-tool-impressed decoration is very
unusual and not common in Missouri valley samples.

Ahler and Swenson (1993:158) then looked at combinations of rim form and decorative technique and found that the most common combination at Hagen consists of S-rim vessels with cord-wrapped-tool-impressed decoration (see figure 3: d and e) making up 43.3 percent of the classifiable vessels in their sample. They compared this combination to the other sites in their study and found that although it does occur in many Early and Late Scattered Village complex, Heart River phase, and Knife River phase sites it is rare in all Missouri valley sites. They found that this combination of ceramic attributes seem to appear in the general Missouri valley area by about the beginning of the Scattered Village complex which dates at about AD 1400. This combination of attributes seem to have been used for about 200 years thereafter.

Two other sites which are outside of the Missouri valley were included in Ahler and Swenson’s research. The Hintz Site, 32SN3, located on the James River in Stutsman County, North Dakota (Wheeler 1963) and the Sharbono Site, 32BE419, located near Devils Lake in Benson County, North Dakota (Schneider 1983) each contain the S-rim/cord-wrapped-tool-impressed attribute combination in significantly greater frequencies than sites in the Missouri valley. At Sharbono (32BE419), it comprises 25 percent of a small sample. At the Hintz Site (32SN3) which probably dates at about AD 1600, it comprises 9 percent of the sample. Origin traditions for the Awaxawis and Hidatsa-proper indicate that the area around Devils Lake and other areas in eastern North Dakota may have early Hidatsu sites which could predate their migration to the Missouri Valley (Bowers 1965).
Ahler and Swenson (1993:158) note that the rim form and manufacturing technique similarities between Hagen and many of the Missouri valley sites, particularly in the Knife-Heart region, indicates close cultural ties. They conclude that:

... Hagen is highly similar to other assemblages classified here as Late Scattered Village complex which date in the period circa AD 1450-1525. A similar age is suggested for Hagen on the basis of ceramic evidence. The single radiocarbon date from the site which is thought to be associated with the ceramic assemblage is in agreement with that assessment (corrected range midpoint of AD 1460 and corrected cross point of 1425; see Chapter 8). The only unusual attribute at Hagen relative to other Late Scattered Village complex components lies in the use of cord-wrapped-tool-impressed decoration at Hagen (1993:158).

This use of the cord-wrapped-tool-impressed decorative technique suggests possible contacts and influences from peoples in the north, northwest, and northeast. In their concluding paragraph, Ahler and Swenson (1993:159) mention this and discuss the hypothesis that Hagen represents an early Crow settlement. They found that the evidence from their analysis tends to support this and suggest that:

Hagen could easily have been occupied by a Mountain Crow group in the late 1400s following their separation from the Awatixa Hidatsas who resided in the upper Knife-Heart region and who we recognize archeologically there in the Early and Late Scattered Village complex components. The ceramic evidence suggests that the Hagen potters may have separated from the Missouri valley groups early in the 1400s. Such a date would allow time for interactions to develop with peoples farther north and west and for the distinctive decorative elements in the Hagen assemblage to be applied relatively uniformly to ceramics still made in the general fashion of Missouri valley, Scattered Village complex pottery (1993:159).

After viewing the Hagen collection, Leigh Syms (Personal Communication 1984) observed that the ceramics were very similar to collections from sites in southwestern Manitoba. Cord-wrapped-tool-impressions are a very common decorative
attribute of Blackduck horizon ceramic assemblages and dates from the period approximately AD 800-1500 in Minnesota and Manitoba (Syms 1977:102). Syms (1977:107) also suggests that Blackduck horizon ceramics may be associated with an as of yet unidentified Algonquian group.

It is interesting to note that the two earlier radiocarbon dates (WIS-864 and 865) obtained by Wood (Wood and Downer 1979) lie at about the mid-range of the dates for Blackduck horizon ceramics suggested by Syms (1977:102). Again, it is possible that these two radiocarbon samples may represent an earlier occupation of the Hagen site by peoples among whom Blackduck-like, cord-wrapped-tool-impressed ceramics were common.

Ahler and Swenson (1993:158) have noted that the cord-wrapped-tool-impressed decorative technique is also commonly present at sites assigned to the Mortlach complex (Wettlaufer 1955:19-23). Due to poor control over geographic and temporal parameters, the classification unit Mortlach Aggregate was suggested as more appropriate by Schneider and Kinney (1978:33-37) based on our work on the Evans site (32MN301) in northwestern North Dakota. A single radiocarbon date of AD 1555±50 (I-7358), corrected by the Damon and others (1974) method to AD 1520 dates the Mortlach Aggregate at the Evans site. This date overlaps with the age range for the Hagen site as suggested by Ahler and Haas (1993:155). Although there are decorative similarities between Mortlach Aggregate ceramics and that from the Hagen site, Malainey (1991:368) indicates that at least in the southern Saskatchewan region, vessels with straight rim and wedge-shaped rim profiles are more common in Mortlach Aggregate.
ceramic collections and that the S-rim profile is rare or totally absent (1991:306: Johnson 1977:46). Ahler and Swenson (1993:158-159) also mention that while cord-wrapped-tool-impressed ceramics also occur at sites assigned to the Old Woman’s complex (Forbis 1962), and the Cluny complex (Forbis 1977; Byrne 1973:335-338), they are not positing specific linkages between these sites and Hagen. Rather, they point out that there is a very large “cultural reservoir in the region north of and outside of the Missouri valley from which the cord-wrapped-tool decorative technique at Hagen may have been borrowed” (1993:159).

Indeed, after reviewing reports of ceramics from the region surrounding the Hagen site, it is obvious that there is a vast store of ceramic decorative technique and motifs from which the Hagen potters could have been influenced. Unfortunately, due the lack of vertical control during the Hagen excavations, we don’t know how the various vessel shapes, decorative techniques, motifs, and other ceramic attributes are related stratigraphically. The ceramic attribute spatial analysis presented in the following chapter will attempt to discern if any these attributes or combinations of attributes cluster in specific areas of the excavated area of the site. If clustering does occur, several hypotheses may be suggested including: multiple but spatially distinct occupations by peoples with differing ceramic traditions or an occupation by a homogeneous group over a long period of time as they adopted various decorative ceramic attributes through trade or contact with other cultural groups.
From the previous chapters, it is obvious that there is a complex cultural history reflected in the Hagen site ceramic collection. A brief summary of various hypotheses concerning this cultural history is necessary before the discussion of the spatial analyses of various ceramic attributes is presented.

In Mulloy's work on the Hagen site (see Chapter 2), he presented three hypotheses which may account for the diversity of the cultural and technological patterns represented in the artifact assemblage (1942:101-103). His third and possibly more realistic hypothesis simply suggests that the Crow movement to the west and the occupation of the Hagen site may have occurred on several occasions rather than a single migration. Based on ceramic evidence, "the Hagen complex may have stemmed from some prehistoric division closely related to the Mandan and Hidatsa in which wrapped rod and dentate stamped decoration were present" (1942:102-103). He further suggests that if an earlier date for the separation of the Crow and Hidatsa and the subsequent westward migration of the Crow can be assumed, "it is possible that the wrapped rod decoration technique was obtained after the Hagen site people left the immediate influence of the Mandan-Hidatsa pottery tradition, possibly from the Cheyenne or some
related group among whom wrapped rod pottery is important” (1942:103). This final hypothesis has also been suggested by the author (Kinney 1984) and is closely supported by Ahler and Swenson’s (1993) findings based on their comprehensive ceramic attribute analysis. In summary, Ahler and Swenson suggest that a group of Mountain Crow peoples could have occupied the Hagen site during the late 1400s, after their separation from the Awatixa Hidatsas. The Awatixa Hidatsas, at that time, lived in the upper Knife-Heart region of the Missouri valley in present day North Dakota, and are recognized archeologically as components of the Early and Late Scattered Village complex. Based on evidence from their ceramic attribute analysis (Ahler and Swenson 1993), they suggest that the Hagen potters may have left the Missouri valley groups in the early 1400s, allowing time for contact with peoples from the north and west. The Hagen potters appear to have borrowed various distinctive decorative techniques (ie. cord-wrapped-tool-impressions) from these contacts and applied them, often in traditional motifs such as chevron and rainbow designs, to ceramics still made in the general form of Missouri valley, Scattered Village complex pottery (1993:159).

Unfortunately, the excavation methods used at the Hagen Site is such that it is not possible to determine stratigraphically when the Hagen peoples arrived or when contact with outside ceramic influences took place. As discussed earlier, the vertical provenience of cultural materials was apparently not recorded during the 1938 WPA excavations. However, the excavation unit (ie. a 10 foot by 10 foot square) from which each artifact was found, regardless of depth, was recorded on each individual artifact during the laboratory work, presumably done in 1939. It is this horizontal provenience data which
Mulloy (1942:4) used to construct the plan map of the 1938 Hagen site excavation. These horizontal provenience data are used as the basis for the spatial analyses of various ceramic decorative attributes which is the focus of the present chapter.

The primary goal of the research for this thesis is three-pronged: 1.) To compile a brief history of archeological investigations of the Hagen Site; 2.) To code various ceramic attributes of a large sample of the Hagen collection using Ahler and Swenson’s coding format (1985) enabling intra-site comparisons to be made; and 3.) To code the horizontal provenience of each sherd in the sample so that the spatial distribution of various ceramic attributes can be plotted.

By plotting the horizontal distribution of these attributes and concentrations of attributes, spatially distinct concentrations may be evident that suggest multiple occupations by culturally distinct groups or an occupation by culturally homogeneous group as they acquire and adopt various decorative ceramic attributes through time. If such concentrations exist, they may explain in part the diversity and frequency of various ceramic decorative attributes.

In order to assign each sherd an excavation unit number, I first had to reconstruct an accurate map of the Hagen excavation units. Mulloy’s (1942) map (see Figure 2), was enlarged and carefully measured. Horizontal and vertical lines were then added to form the borders of the 10 foot square excavation units (see Figure 4). The next step was to determine that the original coordinate system reckoned the provenience of each excavation unit from the southeast corner of each square. Finally, each excavation unit was assigned its own number, starting with #1 in the southwest corner of the main
excavation unit and numbering down that row of ten foot square excavation units then up the next. This sequence was carried through consecutively for both the north and south excavation areas for a total of 1,093 ten foot squares. As the rim form, decorative, and other morphological attributes of each sherd was coded, the provenience of that sherd was also entered within the data base. Upon completion of this task the next step was to compute the frequencies of virtually all coded ceramic attributes. For the nominal-scaled variables cross-tabulation of variable code frequencies (e.g., rim form class frequencies, decorative type frequencies, etc.) was accomplished using the program CROSSTABS in SPSSX (SPSS, Inc.1983:287-301). In addition, the frequencies of all variables were calculated using the command FREQUENCIES ALL in SPSSX (1983). Once the frequencies of various ceramic attributes and attribute combinations were computed, the data were ready to be combined with the horizontal provenience data. Maps illustrating the horizontal distribution of the selected attributes and attribute combinations within the excavated areas at the Hagen site could then be generated. To accomplish this a specialized mapping program known as CALFORM was used.

CALFORM

CALFORM is a computer plotting program that produces shaded, conformant maps. A conformant map depicts a study area that has been subdivided into a number of data zones. The data values assigned to each data zone are represented by gray scale shading symbolism. The shading entirely covers and "conforms" to the shape of each zone (White 1979:217-221).

To produce a conformant map the user controls CALFORM's basic functions through the use of data packages. The first step was to define the coordinates of each data
Figure 4. Map of 1938 Hagen Site excavations illustrating individual 10 by 10 foot excavation squares.
zone (ten foot square excavation unit) with the POINTS package in which each corner of the excavation unit was identified as a point. The POLYGON package then uses these coordinates to define the boundary of each data zone using the vertices defined in the POINTS package. Once each data zone or polygon is defined, each is assigned a unique identification number. This number is used to identify which polygon to assign various data values to. The next step is the VALUES package which contains numerical data for each data zone. In this case, the VALUES package contained the frequencies of various ceramic attributes or combinations of attributes for each data zone along with its unique identification number. In the MAP package shaded maps were selected and the types of shading symbolism were chosen to represent the various ceramic variables. The data value range scheme utilized were “user-specified intervals” meaning the user determined the minimum and maximum value range for each subrange. In the LEGENDS package the type and content of the map legends for each map were specified. The program was then run on the University of North Dakota main frame computer (IBM 3081).

**Spatial Analyses of Ceramic Attributes**

When the data were finally compiled, a series of distribution maps were generated. Again, the reader is advised that the following figures illustrate the frequencies of ceramic vessels. Care was taken during the coding process to account for multiple sherds belonging to individual vessels. The first map, Figure 5, illustrates the distribution density of the total number of ceramic vessels of all rim forms and decorative techniques present within the ceramic sherd sample. When comparing this map to that in
Figure 2, it is evident that the ceramics tend to cluster around the mound in the northern area, near the house in the central area, and in the southern area where cache pits were plotted. Unfortunately, the precise coordinates of these cache pits is unknown and they could not be accurately plotted on these maps. However, it is likely that at least some of the very darkly shaded squares represent the locations of a cache pits.

Figure 5 illustrates relatively high occurrences of vessels throughout large areas of the excavated area, much of which are some distance from the recorded and plotted features. Lewis (1936-1938) mentions other occurrences of post molds than the ones which represent the house reported by Mulloy (1942:5). Will and Hecker (1944:15), based on a 1940 visit to the site by Hecker accompanied by Edwin Lewis (crew member), mention “the houses” indicating the possible existence of more than the single house feature reported by Mulloy. Although we cannot conclusively identify multiple houses at present, it is possible that others did exist which may account for the dense concentrations of ceramics throughout the site area.

The two decorative technique variables selected for use in my spatial analyses include cord-impressed and cord-wrapped-tool-impressed. These techniques, and in particular the cord-impressed technique are common attributes of Scattered Village complex sites found in the Knife and Heart River regions of the Missouri valley in North Dakota. Cord-impressions (16 percent) and cord-wrapped-tool-impressions (37 percent) are also the most common decorative techniques represented in the Hagen site ceramic sample used for these analyses. The occurrence and frequency distribution of these two decorative techniques within the site may represent occupations by different cultural
Figure 5. Map of 1938 Hagen site excavations illustrating the distribution density of ceramic vessels of all rim forms and decorative techniques per excavation unit.
groups. It may also represent multiple occupations by the same group, first when the cord-impressed technique was more important, and then later when the cord-wrapped-tool technique had become more important.

Figures 6 illustrates the distribution and frequency of the cord-impressed decorative technique within the Hagen site excavation area. As shown, cord-impressed vessels are widely dispersed throughout the site area with concentrations in the southern area, northeast of the house, and in the northern area around the mound feature. It should be noted that sherds from at least one cord-impressed vessel occur in the interior of the house.

Figure 7 illustrates the distribution and frequency of cord-wrapped-tool-impressed vessels within the same area. It is evident that this decorative technique occurs more frequently and is slightly more widespread throughout the site area than is the cord-impressed decorative technique. No cord-wrapped-tool-impressed vessels were found within the house interior.

A comparison of Figures 6 and 7 indicates that the distribution and density of cord-wrapped-tool-impressed vessels is greater than cord-impressed vessels. Cord-impressed vessels also occur within the house interior. If one accepts Ahler and Swenson's (1993:159) hypothesis that the site was initially occupied in the late 1400s by a group of Mountain Crow shortly after their separation from the Awatixa Hidatsas (among whom the cord-impressed decorative technique was more important), then the house may represent a structure from near the initial occupation, before the cord-wrapped-tool-impressed technique became more important. Differential clustering of the
Figure 6. Map of 1938 Hagen site excavations illustrating the distribution density of ceramic vessels which exhibit the cord-impressed decorative technique.
Figure 7. Map of 1938 Hagen site excavations illustrating the distribution density of ceramic vessels which exhibit the cord-wrapped-tool-impressed decorative technique.
two decorative techniques is not evident when comparing these two maps. There are several locations where one technique was observed and not the other but this is probably due to general scattering of the cultural material. There is overlap for several of the black squares indicating high frequencies of vessels. Again, these probably represent cache pit locations, which unfortunately cannot be plotted with any greater degree of accuracy on these maps.

The next pair of maps, Figures 8 and 9, illustrate the distribution density if cord-impressed and cord-wrapped-tool-impressed vessels with an S-shaped rim profile. This combination of attributes was selected for several reasons. The S-shaped rim profile is the most common (46 percent) rim profile represented in the Hagen ceramic sample and it is also a very common attribute of Scattered Village ceramic vessels. In addition, cord-impressed and cord-wrapped-tool-impressed S-shaped rim sherds at, 27 and 51 percent respectively, are the predominant combination of attributes represented in the Hagen collection. Differential clustering of vessels with cord-impressed S-shaped rims versus vessels with cord-wrapped-tool-impressed S-shaped rims could be revealed on these maps. If so, there are several scenarios that this may represent. First, the initial occupation may have been by the group of Mountain Crow shortly after their separation from the Awatixa Hidatsa, as suggested by Ahler and Swenson (1993:159), when cord-impressed S-shaped ceramic vessels were more important. Clustering of vessels with S-shaped rims and cord-wrapped-tool-impressions may represent an occupation by the same peoples, but after they had borrowed the cord-wrapped-tool-impression technique from other peoples and influences. It may also represent an occupation by a group of people
culturally distinct from the initial inhabitants of the Hagen site.

When comparing Figures 8 and 9 it is evident that the ceramics tend to cluster in the southern, central and northern portions of the excavated site area in much the same pattern as illustrated in Figures 5-7. Again, only cord-impressed sherds were found within or near the house feature (although these impressions had been made on vessels with an S-shaped profile). No vessels with an S-shaped rim profile and cord-wrapped-tool-impressions were recorded within or near the house feature. Again, this may suggest that the house feature represents an early or perhaps the initial occupation of the site when cord-impressions were the more important decorative technique in use by the inhabitants of the site. However, a clustering is evident at the southern end of the excavated site area. This area has higher frequencies of cord-wrapped-tool-impressed ceramics (Figure 9) than cord-impressed ceramics (Figure 8). Figure 1 also indicates that this area had a significant number of cache pits. The clustering of this attribute combination may represent a later occupation by a group of Mountain Crow after they had adopted the cord-wrapped-tool decorative technique. It could also be attributed to an unrelated group among whom the cord-wrapped-tool technique was popular.

The last two maps, Figures 10 and 11, illustrate the distribution density of vessels which exhibit a rainbow motif applied with either multiple cord-impressions or cord-wrapped-tool-impressions. The rainbow motif consists of concentric rows of angular or curvilinear impressions placed in a semicircular pattern. A common and simple "rainbow" motif often has the rainbow placed on the four opposing sides of the vessel rim with multiple rows of horizontal impressions placed between them, although there are
Figure 8. Map of 1938 Hagen site excavations illustrating the distribution density of ceramic vessels which exhibit an S-rim and the cord-impressed decorative technique.
Figure 9. Map of 1938 Hagen site excavations illustrating the distribution density of ceramic vessels which exhibit an S-rim and the cord-wrapped-tool-impressed decorative technique.
Figure 10. Map of the 1938 Hagen site excavations illustrating the distribution density of ceramic vessels which exhibit the cord-impressed rainbow motif.
Figure 11. Map of the 1938 Hagen site excavations illustrating the distribution density of ceramic vessels which exhibit the cord-wrapped-tool-impressed rainbow motif.
many variations. This combination of attributes was considered important because the cord-impressed-rainbow motif can be observed in Late Scattered Village sites (A.D. 1450-1525) and is an important and distinctive attribute during the subsequent Heart River Phase (A.D. 1525-1600) at sites in the Heart and Knife River regions in North Dakota. Therefore, it is not surprising to find this combination of attributes in the Hagen collection. However, the occurrence of the rainbow motif executed with the cord-wrapped-tool-impressed decorative technique may indicate influences from cultural contacts with peoples not related to the original inhabitants of the site.

When comparing Figures 10 and 11, there is very little, if any evidence, of clustering of vessels with cord-impressed rainbow motifs as opposed to cord-wrapped-tool-impressed rainbow motifs. Again, both attribute combinations tend to be more common in the vicinity of the house and mound features and near the cache pits plotted in the south end of the site (Figure 2).

The results of the Hagen site spatial analysis of select ceramic attributes is somewhat inconclusive. The preceding Figures, 5 through 11, do not indicate definite differential clustering of attributes which could suggest subsequent occupations by culturally distinct groups. Rather, what is suggested is a somewhat homogenous occupation by a single cultural group who adopted and applied new ceramic decorative techniques in traditional motifs.
CHAPTER 5
CONCLUSIONS

The history of the Hagen site, 24DW1, is a complex and disturbing one. It is well known that it has long been considered to be a very important site in the interpretation of the archeology of the Northwestern Plains. As initially stated, Ahler and Swenson (1993:157), and many other authors through the years, have suggested that the site represents a settlement of some group of the Crow after they had separated from the Hidatsa subgroups in the Knife River area in present day North Dakota. More specifically, based on their ceramic analyses of a Hagen pottery, Ahler and Swenson (1993:159) suggest that the Hagen site represents a late 1400s occupation of Mountain Crow shortly after their separation from the Awatixa Hidatsa who lived in the Upper Knife-Heart region and who are recognized archeologically as Early and Late Scattered Village complex components. They and others (Mulloy 1942; Wood and Downer 1977; Kinney 1984) have suggested that this separation took place sometime in the early 1400s allowing time for the Hagen potters to acquire from other cultural contacts some of the unusual ceramic decorative technique combinations that occur in the ceramic collection. The primary goals of this thesis are to review the archeology of the Hagen site, in particular the ceramic collection, and to subject a sample of it to a spatial analysis. As only the horizontal provenience of the artifact assemblage is known, an analysis of two dimensional spatial relationships is all that is possible.
Before the discussion of the results of the spatial analysis, a brief synopsis of the history of the Hagen site is necessary.

The work that most people are familiar with concerning the Hagen site is that done by William Mulloy (1942) when he was associated with the Montana Archaeological Survey. He accomplished a monumental task in getting this report compiled and published. However, Mulloy apparently didn't have access to much information about the site and the fieldwork conducted there.

My research revealed the Hagen site had been discovered in 1935 by Oscar T. Lewis, a local rancher and avid "semi" professional archeologist. In 1936, Lewis directed the first excavations at the site with a crew of N.Y.A. (National Youth Administration) students. Only a very incomplete set of field notes Lewis (1936-1938) describing this work are in existence. During this season Lewis and his crew excavated several cache pits and recovered ceramics, lithic artifacts, a variety of faunal remains, and an engraved bead. They then excavated part of a slightly raised (but flat) circular mound, presumably the one mentioned by Mulloy (1942:9-10) and found a "fire bed" and large amounts of human teeth and jaw fragments. Lewis also mentions that he found two more of the "raised circles" and found "fire beds" in the center of them too. Mulloy apparently had no record of this, as he only mentions the existence of one mound in his report.

In 1937, Lewis returned with a few assistants and excavated two cache pits recovering projectile points, ceramics, faunal remains, hematite, a bone ornament, stone tools, human teeth and mandible fragments. Two scapula hoes were also found and are the first indication that horticulture was practiced at the site. No provenience data exists for these first two years of work.
at the site, and it is unlikely that Mulloy knew of the existence these field notes.

The Montana Archaeological Survey was also formed in 1937, and in 1938 acquired funding from the WPA to conduct large-scale excavations at the Hagen site. Excavations began in April, 1938 under the direction of Oscar Lewis after establishing a base line and a grid system. From this point on, at least the horizontal provenience of artifacts was recorded (although only to within a ten foot square). Vertical provenience was only recorded “if it happened to be a pit or something that ran either higher or lower in average placement...” (Phelan 1938:52).

Lewis supervised for only about ten days and then was transferred to Pictograph Cave. During this period, many significant artifacts were recovered, among them: numerous scapula hoes, human bones and teeth, two squash or pumpkin seeds, dentalia beads, and wooden posts fragments. The hoes and seeds clearly indicate horticultural practices at the site. Apparently, Mulloy did not have access to these field notes, as he does not mention the seeds in his 1942 report. Wahle Phelan replaced Lewis as supervisor at the Hagen project and directed it until it ended in the fall of 1938. There are no existing field notes, photographs, maps, drawings, or profiles recording any of the work done during this period. Phelan (1938) did write a brief “General Report of Field Season” where he described some of the season’s findings.

Little else is known about the actual excavations. However, I did locate a few personal letters by Hagen site crew members or people who had visited the site. These contain brief descriptions of some of the features, in particular the house and cache pits, and appear to suggest the existence of more than just the one house describe by Mulloy (1942).

After the 1938 field season, all artifactual material was taken to a lab for analyses and labeling. There was some confusion during this process and several people served as
supervisors. The labs location was also moved during this period, and apparently notes and some specimens were lost. Fortunately, the horizontal provenience (to within a ten foot square) was written on each artifact at this time. This is the only provenience data which survives to this day.

In 1940, William T. Mulloy was hired as State Supervisor of the WPA sponsored projects through the Montana Archaeological Survey. Mulloy was given the task of compiling all the known data from the Hagen excavations and analyses and producing a report. He attempted unsuccessfully to locate and acquire all the artifacts and field notes, and he sent out various classes of artifacts to other professionals for analysis. He then compiled these analyses and produced the 1942 Hagen site monograph.

Mulloy (1942:99-103) formulated three hypotheses concerning the place of the Hagen site in Northern Plain prehistory. As described earlier, Mulloy considered the first two hypotheses to be possibly oversimplistic. His third hypothesis posited that the split between the Crow and Hidatsa may have taken place on many occasions during the prehistoric period rather than just once as suggested by the first two hypotheses. He recognized that the ceramics were similar to a generalized Mandan/Hidatsa ceramic assemblage, except that the Hagen pottery had much more cord-wrapped-tool-impressed and dentate stamped as opposed to cord-impressed pottery than was common in Mandan or Hidatsa ceramic collections. Mulloy (1942:102-103) offered two suggestions. The first, that the Hagen site may have been inhabited by a group closely related to the Mandan-Hidatsa "in which the wrapped-rod and dentate stamped decoration were present, rather than directly from Hidatsa as it appears in very late prehistoric and early historic times." The second, that if an earlier date for this group can be assumed, it is possible that they acquired some of the non-Mandan/Hidatsa attributes such as the cord-wrapped-rod impressions from
contact with other groups among whom those techniques are important. The primary goal of this thesis is to investigate this last hypothesis.

Since the 1938 field season and the publication of Mulloy's monograph, there have been no systematic investigations at the Hagen site. In the early 1940s the site was visited by Thad Hecker as he was conducting research for another publication (Will and Hecker 1944). I located correspondence between Hecker and George Will (of the State Historical Society of North Dakota) in the ND State Archives where Hecker mentions observing the remains of several lodge "ruins" (1944:15). Again, this was information that Mulloy apparently did not have when he prepared the Hagen site report. No records exist that indicate that Mulloy ever visited the Hagen site.

Since then, the Hagen site is most often referenced as an enigmatic example of a Crow village occupied some time after the Crow-Hidatsa schism. A few individuals have visited the site and collected small samples of ceramics and obsidian but no systematic research has been done.

In 1975, Dr. W. Raymond Wood obtained charred wood posts from the site during the WPA or N.Y.A. excavations and submitted three samples for radiocarbon dating. The exact provenience of these samples within the site is unknown, although it is assumed that they came from the house feature report in Mulloy (1942). However, it is possible that these samples came from three separate posts and possibly from individual features. Three radiocarbon dates were obtained with corrected ages of A.D. 1410, 1210, and 1210. Corrections were calculated by L.B. Davis on the basis of the MASCA curve (Ralph, Michael, and Han 1973).

This brings us close to the present. Until I began the research for this thesis, no recent,
comprehensive analyses have been done on any of the artifacts from the Hagen site. The ceramics, faunal and floral remains, lithic artifacts, bone and stone tools are curated at the Anthropology Department at the University of Montana in Missoula, Montana. However, small amounts of this material are still unaccounted for. In the course of my research on the ceramic component of this collection, I contacted many individuals, historical societies, and museums that may possibly have had small samples of Hagen site artifacts. I succeeded in getting a few small samples returned to the collection. If modern analytical techniques were applied to the analyses of other classes of Hagen site artifacts, much information would be acquired to augment what we know about the site.

During my ceramic analysis, I was allowed to take the ceramic sample I had selected to Grand Forks, North Dakota. While I was working there, Dr. Stanley Ahler acquired permission to include a sample of it in his study of ceramics from the Knife River Indian Villages (KNRI) and sites in the upper Knife-Heart region in North Dakota. The ceramic attribute coding format I used had been developed by Ahler and Swenson (1985) for the KNRI study. It allowed Hagen site ceramic data to be compared to that from over 40 other sites in the region. Their interpretation of the Hagen site ceramics forms an important part of my interpretation of the cultural dynamics of the site.

Briefly, Ahler and Swenson’s (1993) analysis involved coding various morphological and decorative ceramic attributes on 299 sherds (representing 299 vessels) from the Hagen site. They compared this data and the radiocarbon dates with those from over 40 other sites in their study area. They observed that although most of the Hagen site ceramics could not be classified into recognized type and ware classes for the upper Knife-Heart region, it very closely resembled
pottery from Early (A.D. 1400-1450) and Late (A.D. 1450-1525) Scattered Village sites in the Knife-Heart region in North Dakota. The single attribute that distinguished the Hagen pottery from the Scattered Village sites was the high frequency of the cord-wrapped-tool-impressed decorative technique. In fact, this decorative technique and the S-shaped rim profile were the most common attribute combination in the Hagen sample. This attribute combination does occur in Scattered Village sites much less frequently, and it is quite rare in all areas of the Missouri valley. In contrast, the cord-impressed/S-shaped rim profile is a much more common attribute combination in Scattered Village sites.

Ahler and Swenson (1993:158) concluded that close cultural ties between the Hagen site and Late Scattered Village sites in the Knife-Heart region are indicated, due to the similarities in rim form and pottery manufacturing techniques. Late Scattered Village sites date from the period circa A.D. 1450 to 1525 and Ahler and Swenson suggest a similar age for the Hagen site based on ceramic evidence. The single Hagen site radiocarbon date they used in their interpretation lies within this range. The high frequency of the cord-wrapped-tool-impressed decorative technique, again, is the sole attribute which sets the Hagen site off from Late Scattered Village sites and this may indicate possible contacts and influences from peoples from the north, northwest, and northeast. Ahler and Swenson (1993:159) further suggest that the Hagen site could have been occupied by a group of “Mountain Crow in the late 1400s following their separation from the Awatixa Hidatsa... in the upper Knife-Heart region and who we recognize archeologically there in the Early and Late Scattered Village complex components.” They suggest that this separation took place in the early 1400s which would have allowed time for adoption of the cord-wrapped-tool-impressed technique from other cultural contacts while still applying it to ceramics made in
the general fashion of Missouri valley, Scattered Village complex pottery.

This leads to the final focus of this thesis. A spatial analysis of certain ceramic attributes and combinations of attributes could provide evidence that indicates multiple occupations. For example, if a spatially distinct area is discovered where the predominant attribute combination is S-rim vessels with cord-impressions, then one could assume that this may have been an occupation shortly after the split from the Awatixa Hidatsa where this combination was important. Conversely, if an area was found with the S-shaped rim and cord-wrapped-tool-impression combination prevalent, then this may indicate an occupation by a different group or possibly a later occupation, after the cord-wrapped-tool-impressed technique was adapted.

In the previous chapter I presented a series of maps which illustrate the spatial distribution of several ceramic attributes. In the first series of maps (Figures 6 and 7) I chose to plot and compare the distribution of cord-wrapped-tool-impressed sherds to that of cord-impressed sherds. The results of this comparison were not as conclusive as I had hoped. There do not appear to be distinct spatial variations between these two decorative attributes. Sherds exhibiting these two attributes appear to be dispersed in similar areas of the site. Concentrations are evident near the house feature, in and around the area of the mound feature, and in the southern area of the site where many cache pits were found (see Figure 2). It should be noted that no sherds with the cord-wrapped-tool-impressed decorative technique were found within the house feature.

The next series of maps (Figures 8 and 9) illustrate the spatial distribution of a combination of attributes. In Figure 8 and 9, I plotted the distribution of S-rim sherds which exhibit the cord-impressed decorative technique and the cord-wrapped-tool-impressed technique
respectively. Again, other than the obvious concentrations in the vicinities of the two features and the cache pit area in the southern portion of the site, no unusual patterns are evident, except that there are no cord-wrapped-tool-impressed sherds within the house feature. These combinations of attributes were chosen because the cord-impressed S-rim theme occurs very commonly in Scattered Village complex sites and the cord-wrapped-tool-impressed S-rim theme has been suggested to indicate possible contact with other peoples. The presence of an S-rim vessel with cord-impressions inside of the house feature suggests that the house originated from an early occupation of the site before the use of the cord-wrapped-tool-impressed technique became prevalent.

The final two spatial distribution maps illustrate the distribution of vessels with a cord-impressed rainbow decorative motif (Figure 10) and vessels with a cord-wrapped-tool-impressed rainbow motif (Figure 11). As indicated before, these combinations were plotted because the cord-impressed rainbow motif is observed at Late Scattered Village sites (A.D. 1450-1525) and became a distinctive and important motif during the subsequent Heart River Phase site (A.D. 1525-1600) in the Heart and Knife River regions of North Dakota. It is not unexpected to find pottery with the cord-impressed rainbow motif at the Hagen site, considering all the other similarities between the Hagen site and Scattered Village ceramics. However, the occurrence of the rainbow motif executed with cord-wrapped-tool-impressions suggests that this pottery was made some time after the cord-impressed technique had been replaced by the cord-wrapped-tool-impressed technique. When comparing these two maps, it is evident that there are no distinct or unusual concentrations of either set of attributes. Again, the pottery tends to occur more densely near the house and mound features, and in the southern portion of the site area near the reported
cache pits (Figure 2).

To summarize, the spatial analyses indicates that there are no differential concentrations of these ceramic attributes or combinations of attributes evident. Instead, it appears that the Hagen site ceramics are generally scattered throughout the site area. However, the presence of cord-impressed pottery to the exclusion of cord-wrapped-tool-impressed pottery within the house feature suggests that the house represents an early occupation at the site. The general scatter of ceramics suggested by these maps may actually be due to the manner that artifact provenience was recorded at the site. It is important to remember that there is no vertical provenience data and the horizontal provenience was only recorded, in most instances, to within a 10 foot by 10 foot excavation unit.

Although the spatial analysis does not conclusively indicate temporally or spatially distinct occupations, the data from the final two maps (Figures 10 and 11) suggests that Ahler and Swenson’s (1993:159) interpretation of the site is quite viable. It can be suggested that in the early 1400s, a group of Mountain Crow separated from the Awatixia Hidatsa while living in the upper Knife-Heart region of North Dakota. Among these peoples at this time, some common ceramic attributes included: S-rims, cord-impressions, the rainbow motif, and small occurrences of the cord-wrapped-tool-impression technique. After the separation and probably before they settled at the Hagen site, the Mountain Crow adopted cord-wrapped-tool-impressions as their dominant decorative technique. They did, however, retain the S-shaped rims and rainbow motifs common to Scattered Village complex sites.

The Hagen site warrants more research. Although the original investigators had good intentions, a great deal of information has been lost through the years. The “state of the art” of
the original Hagen excavations does not lend itself to scientific reanalyses of the cultural material, largely due to the lack of fine provenience data. However, the collection should at a minimum be recataloged and the other classes of artifacts such as the lithics and faunal remains should be reanalyzed. Ideally, test excavations should be conducted to determine the full extent of the site. This could at least establish possible stratigraphic variation within and between various classes of artifacts. New radiocarbon samples need to be found (with vertical provenience) and dated. The site area should be resurveyed and accurately mapped to determine, if possible, how many house and mound features actually exist.
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