Testing Contemporaneity: The Avonlea and Besant Complexes on the Northern Plains

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by
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Abstract

The purpose of this thesis is to critically reexamine the notion, first put forth by Reeves (1983), that the Besant and Avonlea complexes were broadly contemporaneous on the northern plains. To achieve this goal, I examine three lines of archaeological evidence. Specifically, I examine the data produced by the radiocarbon dating of Besant and Avonlea components, the stratigraphic relationships that can be observed between Besant and Avonlea components when they occur within the same site, and any evidence of cultural interaction between the two complexes. As a case study, I describe and analyse the archaeological resources encountered at site EdNh-35; a site where both Avonlea and Besant artifacts were found within the same excavation level.

I conclude that, despite an overlap between their respective radiocarbon age ranges, the Besant and Avonlea complexes did not coexist within the same geographic region of the northern plains for any significant amount of time. I also discuss various scenarios in which all three lines of evidence can be explained. Ultimately, it seems most likely that Besant groups occupied the eastern periphery of the northern plains (consisting of Manitoba, North Dakota, and South Dakota) while Avonlea groups inhabited the central and western portions of this area.

The significance of this thesis to the study of plains archaeology lies with its rethinking of the established culture history of the Late Plains Period. In particular, it demonstrates that radiocarbon dates can occasionally be misleading and that more caution needs to be taken before assigning a radiocarbon date to a particular archaeological complex.
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1.0 Introduction

1.1 Background

In the fall of 2001 a multi-component archaeological site, EdNh-35, was discovered northeast of the city of Moose Jaw, Saskatchewan. During the following winter I was given the opportunity to participate in the excavation of this site. We recovered diagnostic materials indicative of both the Besant and Avonlea archaeological complexes throughout the course of this excavation. However, we were unable to identify two stratigraphically separate components. This gave the appearance that both sets of diagnostic materials came from the same occupational level. While this is not unheard of in the case of Besant and Avonlea components, the question was raised whether this should be taken to mean that both groups occupied the site at roughly the same time or if it was simply an illusion of such a coexistence created by slow rates of soil deposition.

I decided that this was a topic that could have a significant impact on our current perception of culture history groups within plains archaeology and was therefore worthy of further research. I subsequently devised a research methodology to adequately explore this topic.

1.2 The Problem

It has been said that “any useful discussion should begin with a clear understanding of what it is to be discussed” (Foor 1988:257). Therefore I will give a brief description of the dilemma that exists concerning the relationship between these two archaeological entities.

Both the Besant and Avonlea archaeological complexes are well represented across the grasslands of southern Saskatchewan (Walde et. al. 1995). It is not uncommon for a single archaeological site in this region to
produce diagnostic artifacts from both complexes. Often both Besant and Avonlea artifacts are found within the same component. This lends credence to the suggestion that they both were present on the northern plains concurrently. However, in the majority of these instances the stratigraphy is “compressed” (Morlan 1988:307), meaning that the strata are too closely bunched or too indistinct to successfully separate. When stratigraphic conditions do permit the two to be separated into distinct occupations, as in the case of the Sjovold site (Dyck and Morlan 1995), the Besant component invariably precedes the Avonlea component in the same stratified mass (Morlan 1993:40; Walde et. al. 1995:19).

Adding to the dilemma of how these two groups relate to each other temporally is the apparent overlap in radiocarbon dates. When comparing published radiocarbon dates for both Besant and Avonlea components it becomes apparent that, while Besant dates begin earlier and the Avonlea range of dates continues on well beyond the upper range of Besant, the two sets of dates are largely contemporaneous (Morlan 1988:291).

1.3 My Objectives

My objectives in this matter are twofold. First, it is my intention to critically re-examine the long accepted theory that Besant and Avonlea groups occupied the northern plains concurrently. I will be examining the current set of radiocarbon dates with regards to the effect ever changing laboratory procedures have had on the accuracy of these dates. I will also examine the stratigraphic relationship that exists between Besant and Avonlea components at several multicomponent archaeological sites. It is my intention to examine the literature for any mention of an Avonlea component preceding a Besant component in terms of stratigraphic ordering. If no such instance exists, then the continued reference to Besant and Avonlea as being contemporaneous needs to be justified.
Second, I will discuss the data recovered from the excavation of EdNh-35, a site with a mixed Besant/Avonlea component. Once I have presented the data from this site, I will compare it to sites of a similar nature that have been excavated on the northern plains. I hope to be able to determine if this site is anomalous among sites with mixed components or if it is fairly representative of such sites. It is my intention to use this site as a case study of mixed component sites. Thus any hypotheses I may draw from the analysis of EdNh-35 may be extended to other such mixed component sites.

1.4 Chapter Synopsis

In the second chapter I discuss my objectives in more detail as well as outlining the methodology I will be pursuing in tackling this topic. Within this chapter, I also define all of the terms that will be used in this thesis. This includes a discussion of which term is best suited to describe the archaeological entities known as Besant and Avonlea.

The third and fourth chapters consist of an overview of the Besant and Avonlea complexes respectively. In each chapter I review our current understanding of the archaeological complex in question and discuss some of the theories concerning its origins and termination.

The fifth chapter consists of a discussion of both the relative and absolute dating techniques typically employed in plains archaeology. I focus my discussion primarily upon radiocarbon dating and stratigraphic analysis. As these two dating techniques are the most common methods used by archaeologists, these two methods have been used to present two different scenarios concerning Besant and Avonlea interaction on the northern plains.

In the sixth chapter I discuss the archaeological resources of EdNh-35. I describe the excavation methodology we employed as well as give a detailed description of the artifacts and features we uncovered. I also present an interpretation of the various activities that occurred at this site.
The seventh chapter consists of a general discussion of the notion that the Besant and Avonlea complexes were contemporaneous with each other. It will make specific reference to three lines of evidence: the radiocarbon data, stratigraphic observations, and evidence for cultural interaction between the two groups. This discussion will also draw upon evidence presented by the analysis of EdNh-35. In this chapter, I also compare the site EdNh-35 recoveries to other sites found on the Canadian plains with a mixed Avonlea/Besant component. This comparison will demonstrate whether the co-occurrence of both Avonlea and Besant diagnostics within the same component is more likely the result of interaction between these two groups or simply poor stratigraphic conditions.

The eighth and final chapter summarizes the conclusions that can be drawn from this thesis. It also discusses what impact these conclusions might have on subsequent research concerning the Besant and Avonlea complexes.
2.0 Methodology

2.1 Introduction

Robert Dunnell (1971:6) once stated that: “one cannot count apples until one knows what apples are, what numbers are, what relationships exist between numbers, and what the point of counting apples is”. As such it is my intent here to define what terminology I intend to use throughout this thesis, as well as outline the means by which I will be examining the archaeological data for evidence of Besant-Avonlea interaction. Included in this discussion will be a brief statement on what I hope to achieve with this analysis. I will also describe the main tenets of the critical theory paradigm; the theoretical framework I will be using to interpret this data.

2.2 Taxonomy

There are several taxonomic systems currently used by archaeologists to classify patterns of archaeological materials. Each of these systems consists of a set of terms that defines different levels of archaeological groupings (tradition, complex, phase, etc.). Some terms (such as “phase”) get used in multiple taxonomic systems and may have a different meaning in each system. Thus, I consider it worthwhile to define these terms and also to rationalize why I have chosen to use these definitions consistently throughout this thesis and not some of the alternative definitions for the same term.

One unavoidable problem with using any of the taxonomic terms currently in vogue is that these terms often share the same name with their chief diagnostic artifact. Under such a system the term “Besant” can be applied to a projectile point style, a pottery style, as well as the entire material
expression of a particular precontact hunter-gatherer adaptive strategy. This serves to confuse the issue when a “Besant point” is found associated with materials that clearly have no relationship to what we call the Besant complex. This is a problem that is recognized by many researchers, but no alternatives have yet been implemented (Morlan 1990:4). As a single projectile point style often gets associated with more than one complex, it would be preferable to use separate names for the projectile point style and for each of the complexes associated with it.

One of the most basic groupings of archaeological materials is the component. A component has been defined as “a culturally homogenous stratigraphic unit within a site” (Fagan 1995:46). A component is usually taken to represent a single occupation at the site. However, it can also represent a series of occupations made by the same cultural group that are so close together stratigraphically (either due to very brief time intervals between occupations or due to very slow soil deposition at the site) that they cannot be reliably differentiated from each other and are thus referred to as a single component (Gregg 1985:71).

An archaeological complex has been defined as “a group of similar and distinctive material remains with repeated co-occurrence demonstrated by inter-component analysis” (Gregg 1985:73). This grouping can be quite large and encompass a broad area, but a complex still maintains a readily definable geographic distribution and temporal range (Dyck and Morlan 1995:41). Thus, Besant and Avonlea with their pan-prairie distribution of diagnostic traits could perhaps best be considered complexes.

A phase was first defined as an archaeological entity by Willey and Phillips. They defined a phase as “an archaeological unit possessing traits sufficiently characteristic to distinguish it from all other units similarly conceived, whether of the same or other cultures or civilizations, spatially limited to the order of magnitude of a locality or region and chronologically limited to a
relatively brief period of time” (Willey and Phillips 1958:22). A more recent condensation of this definition could simply read “a regional expression of cultural tradition” (Gregg 1985:72). A key concept to this term is that a phase is a distinctive regional variation of a broader adaptive strategy. Thus, while the materials of a particular phase may be similar to materials found elsewhere, there will be a series or a combination of attributes particular to this phase that are unique. This combination of attributes should have a very clear set of boundaries, both geographically and temporally, in the archaeological record. While the term “phase” has been applied to both Besant and Avonlea elsewhere in the literature, it is my opinion that in both cases the geographic distribution is too broad and encompasses too much variation to allow either of these entities to be classified as a phase. However, phases do exist within each of these complexes. Walde and Meyer (2003) have defined several phases of the Avonlea complex based upon the presence of distinctive ceramic wares. Also, the Sonota assemblages described by Neuman (1975) can probably best be described as a phase of the Besant complex.

A horizon has been defined as a grouping that “links a number of phases in neighboring areas that contain rather general cultural patterns in common” (Fagan 1995:46). In this sense a horizon is one order of magnitude larger than a “phase” and is thus very similar to the concept of an archaeological complex, as both deal with interregional cultural patterns. It may even be possible that these two terms are ultimately interchangeable. Whatever the case, I have chosen to use the taxonomic term “complex” consistently throughout this thesis.

2.3 Objectives of Research

The objective of this thesis is to assess the archaeological record of the northern plains for evidence of Besant-Avonlea co-occupation. This would primarily be determined by three lines of evidence: First, there must be a substantial overlap in the radiocarbon dates of both complexes. Second, this
contemporaneity must also be born out by the stratigraphic analysis of Besant and Avonlea components at sites where both are present. Third, there should also be considerable evidence for cultural interaction between these two complexes.

If such evidence is either lacking or does not corroborate the supposition that Besant and Avonlea were broadly contemporaneous, then a strong case could be made for rejecting this notion of contemporaneity. If, however, there is sufficient evidence to support this notion, then the lack of examples where the Avonlea component precedes the Besant component in a stratified mass needs to be explained.

No matter what the outcome of my research is, it has the potential to prove useful to the study of plains archaeology in several ways. If the notion of contemporaneity is to be rejected, then we need to explain why the radiocarbon evidence indicates the opposite. Also, an in-depth analysis of cultural interaction on the northern plains will serve to broaden our understanding of the culture history of this area. My proposed research may serve to raise, or bring attention to, other questions that need to be answered. For indeed, if Besant and Avonlea did not exist side by side, then we need to determine where the Besant groups were when Avonlea was the dominant archaeological complex on the plains.

2.4 Theoretical Framework

Archaeologists working within the critical theory paradigm are often concerned with “building a case for rejecting or revising entrenched views of the past” (Wylie 1985:141). Thus, critical theory would make an excellent theoretical basis for my thesis as challenging the entrenched notion of a Besant-Avonlea coexistence is exactly what I am proposing to do.

One of the main tenets of critical theory is that our reconstructions of the past often reflect the biases and preconceptions of the present. This belief
originated in the discipline of cultural anthropology where there has been a slow realization that "the whole enterprise of systematically investigating other cultures is itself a culturally specific social enterprise, one that is always rooted in and shaped by the specific interests and belief structures that constitute the context of the researcher" (Wylie 1985: 134). This is equally applicable to the discipline of archaeology, as the artifacts do not speak for themselves. It is the researcher who must give them meaning and that meaning is always couched in our own biases and underlying agendas (Wylie 1985: 143). Thus, critical theorists argue that in order to arrive at an objective or unbiased interpretation of the past, the archaeological community needs to adopt a "tradition of rational empirical criticism"(Wylie 1985: 135) whereby any claim about the past can and probably should be subjected to a critical reexamination of its supporting evidence. In addition, archaeologists have tended to seek out "comfortable solutions" (Duke and Wilson 1995:10) to complicated situations and in doing so may have oversimplified their explanations of pre-contact cultural dynamics.

In archaeological critical theory, revision of entrenched viewpoints or archaeological interpretations often relies on the same science based methods and empirical observations that were used to create and support the original interpretation (Wylie 1985:143). For example, archaeologists using this paradigm often re-examine the same artifacts and other forms of evidence used to make the original interpretation or examine new data gathered from archaeological sites similar to the ones used in the original analysis.

In keeping with the methods outlined by the critical theorists, I have structured this thesis such that it will rely upon new evidence garnered from the excavations at EdNh-35 to reevaluate the notion that Besant and Avonlea coexisted on the northern plains. Ultimately I wish to determine whether the contention that the Avonlea and Besant complexes are contemporaneous has arisen out of placing an undue amount of importance on the radiocarbon data
because it is the most “scientific” and thereby objective of the three main lines of evidence I am looking at in this thesis.

2.5 Methods

As I intend to examine the archaeological record for evidence that might support or refute the idea of Besant-Avonlea co-existence on the Canadian plains, an essential prerequisite to discussing this problem would be a detailed overview of what we currently believe to be true about both archaeological complexes. I will deal with each of these complexes separately and discuss them in terms of their diagnostic tool assemblages, home ranges, and chronology. In addition to providing background information on these two complexes, I will attempt to identify characteristics other than projectile points and pottery that may be used to differentiate between Besant and Avonlea assemblages. It has been suggested that mundane utilitarian items may be more useful in determining pre-contact social boundaries than the more traditional diagnostics (Stark et. al 1998:211). If such items or features can be identified for either the Besant or Avonlea complexes, this would enable us to tentatively assign a cultural affiliation to an occupation level wherein no diagnostic projectile points were recovered. Or, as in the case of EdNh-35, provide us with a means of assigning cultural affiliation to a level where it is uncertain which of the two cultures it is associated with.

Once I have presented both summaries, I will present and discuss the potential evidence for the co-existence of Besant and Avonlea peoples on the Canadian prairies. I will be focussing on three independent lines of evidence: the radiocarbon evidence, the stratigraphic relationship that can be observed between Besant and Avonlea components, and the degree of cultural interaction that can be demonstrated between these two complexes. In terms of the radiocarbon and stratigraphic evidence, I will be examining the scientific principles upon which each of these is based. I will also review the strengths
and weaknesses of each method as well as discuss what approach to take when these two lines of evidence contradict each other.

In the case of demonstrating cultural interaction, my main argument is that if these two archaeological complexes were indeed based in the same geographic region at the same time, as the overlap in site distribution and radiocarbon dates suggests (see Figure 2.1), then we could expect to see some archaeological evidence for interaction between the two groups. The distribution of diagnostic artifacts of any archaeological complex reflects a sphere of social interaction between multiple ethnic groups (Maceachern 1998:109). Thus if both of these complexes existed side by side in the same time and place, we could expect them to interact with each other. This could be represented in the archaeological record in one of two ways. Firstly, the diagnostic artifacts of one archaeological complex could be found within the assemblages of another. This would seem to imply that some degree of trade occurred between the two groups. Secondly, stylistic attributes distinctive to one complex could be implemented by another complex, similar to the situation observed in the assemblages of Selkirk and Mortlach along the Saskatchewan parkland/boreal forest boundary (Wondrasek 1997). Likely this was achieved through intense interaction between the two groups, possibly including intermarriage.

It seems likely that pottery will prove to be an important issue in this discussion. Ceramics are highly malleable and would therefore be likely to show evidence of contact between cultures in the form of the incorporation of foreign stylistic or manufacturing techniques into the local pottery style. Thus, I will examine the possibility of Avonlea traits appearing on Besant ceramic vessels and vice-versa.

Cultural diffusion can be demonstrated archaeologically in other instances where two distinct cultural groups are living in relatively close proximity with each other. I intend to explore these other examples of cultural
Figure 2.1: Geographic distribution of the Besant and Avonlea complexes.
diffusion to illustrate how this principle works and under what conditions we could expect it to occur. In this explanation, I will draw upon ethnographic examples of this phenomenon, such as the role of in-gatherings among pre-contact groups (Meyer and Thistle 1995; Wondrasek 1997). Whatever the method, it does seem that both Avonlea and Besant peoples adopted some traits from their woodland neighbors. If this is the case, we should expect to see a similar diffusion of traits between Besant and Avonlea groups if they were indeed both co-occupying the prairies. In order to demonstrate this, I will first need to clearly define what are Besant traits and what are Avonlea traits. As I have already mentioned, pottery might serve as one such diagnostic trait.

Also in this discussion of possible evidence for coexistence, I will examine the accepted range of radiocarbon dates currently associated with each of these archaeological cultures. I also intend to compare and contrast relative vs. absolute dating techniques with specific reference to my thesis topic. In particular I wish to examine the problematic process of establishing association between the radiocarbon sample and the diagnostic artifact.

Once I have outlined what we could expect to see if these two cultural groups were coexisting on the grasslands, I will discuss the data recovered from EdNh-35. This site is a previously unpublished multicomponent site discovered near the confluence of the Moose Jaw and Qu'Appelle rivers. This site has produced numerous diagnostic projectile points of both the Besant and Avonlea complexes, some pottery, numerous hearths and bone uprights, and has several radiocarbon dates associated with its various cultural components. I will discuss these data with regards to which features can be attributed to the Besant occupation and which can be assigned to the Avonlea occupation. I will also be examining this collection for any artifacts which may be interpreted as a hybridization of Besant/Avonlea artifactual traits and may thus offer support for cultural diffusion between these two groups.
Subsequently, I will extend this careful analysis of EdNh-35 to other sites in the same basic geographic region (ie: the Canadian grasslands). Not only will I be looking for indications of possible coexistence, but I will also examine how EdNh-35 relates to other Besant/Avonlea mixed component sites in this region. I will therefore assess whether EdNh-35 is typical of Avonlea/Besant sites or whether it is an anomaly.

The final stage of this thesis will be a discussion summarizing what I was able to conclude based on the evidence I presented in this thesis. I will discuss whether or not there is a reasonable amount of evidence to support the idea that these two groups co-inhabited the northern plains or whether the evidence indicates that they followed one another sequentially.
3.0 Besant

3.1 Introduction

The Besant complex marks a period of significant innovation on the northern plains. It is during this time period that we see the first appearance of pottery in archaeological assemblages in this region, the transition from dart thrower to bow and arrow, as well as the use of increasingly sophisticated bison hunting techniques such as the pound and corral method. It is my intention in this chapter to review what we have come to know about the culture that produced the Besant projectile points. This will include an examination of the range of radiocarbon dates currently associated with the Besant complex, its geographic distribution as marked by the distribution of Besant Series projectile points on the northern plains, and its salient features such as projectile point morphology and pottery attributes. In particular I wish to examine the numerous projectile point styles associated with the Besant complex such as Sandy Creek, Bratton, Outlook Side-notch, and Samantha as outlined in Reeves (1983), Dyck and Morlan (1995), and others. I would like to verify that these projectile point styles are represented in Besant archaeological assemblages other than the ones in which they were originally defined. For instance, I am interested to see if the Bratton point style as defined by Dyck and Morlan (1995) from the excavations at the Sjovold site can be readily recognized in other Besant assemblages.

In addition, some of these projectile point styles, such as Sandy Creek and Samantha appear to occur in distinct time periods. The possibility exists then for these projectile point styles to represent separate archaeological phases of the Besant complex. I will explore whether these arguments can be substantiated given the current archaeological evidence.
I will also examine the evidence that suggests interaction between Besant groups and their neighbouring contemporaries who did not inhabit the northern plains, such as the peoples behind the Laurel composite and various Eastern Woodland cultures. I will also discuss some of the current theories on the origins of the Besant complex as well as who their cultural descendants might have been.

3.2 Range of Dates

The current timeframe associated with the Besant complex is based entirely on radiocarbon dates associated with Besant materials. No other dating method has yet been applied to dating Besant components. Difficulty was encountered in synthesising the various radiocarbon dates present in the literature as some dates are represented in calendric years with no indication whether they were calibrated or normalized or both.

The current accepted range of dates for the Besant complex on the northern plains extends between 2300BP-1100 rcybp (Hjermstad 1996:26, Scribe 1997:41). This has changed significantly over time, and indeed, continues to change as more radiocarbon dates are acquired and the techniques involved in obtaining these dates continue to be refined. As more radiocarbon dates become associated with the Besant complex, it should become easier to identify those dates which are suspicious or anomalous.

Recently Reeves (2002) has observed that there are regional variations in the range of dates associated with the Besant complex. Reeves sees Besant first appearing in North Dakota (2500-1000 rcybp), then in Montana slightly later (2000-1000 rcybp), followed closely by it’s first appearance in Saskatchewan (2000-1400 rcybp). These variations seem to suggest that Besant originated in the North Dakota region then spread north and west through Montana and into the Saskatchewan basin. However, a review of the Canadian Archaeological Radiocarbon Database (CARD) compiled and
maintained by Richard Morlan (2003), suggests almost exactly the opposite. Besant sites in Saskatchewan and Alberta have been associated with radiocarbon dates ranging from 2600-1535 rcybp and 2500-1410 rcybp respectively (see appendix A). Meanwhile, Besant/Sonota sites in North Dakota have produced radiocarbon dates ranging from 2000-1070 rcybp (Morlan 2003). These radiocarbon dates are presented in Figure 3.1.

The CARD database is not an exhaustive list and does not include all radiocarbon dates from these regions; however a fairly large sample size of between 31-46 radiocarbon dates exists for Besant sites in each of these regions. The discrepancy between Reeves estimation and the CARD data could be a result of all the CARD dates being normalized. Another possibility is that Morlan considers the Sandy Creek projectile point style to be a part of the Besant Series (Dyck and Morlan 1995:398). Sandy Creek appears only to have been recognized in Saskatchewan and generally occurs in the 2500-2000 rcybp range. The inclusion of these dates would obviously generate an earlier start date for the Besant complex in Saskatchewan.

There seems to be general agreement that the Besant complex persisted in North Dakota for about 300 years after it had been replaced by Avonlea on the rest of the northern plains (Walde et. al.1995:19). This region may have had special significance to the Besant people as it was the source location for Knife River flint, a material that dominates the archaeological assemblages of many Besant sites.

3.3 Geographic Range

One of the pre-requisites for defining an ethnic identity based on archaeological assemblages is establishing the distribution limits of a particular cultural trait, such as projectile point or pottery styles (Greaves 1982:7). The Besant complex's geographic range, then, is the region in which the Besant assemblage occurs. However, not all of Besant's diagnostic artifacts share the
Figure 3.1: Besant radiocarbon dates adapted from the Canadian Archaeological Radiocarbon Database (Morlan 2003)
same geographic distribution. The distribution of Besant projectile points, in particular Besant side-notch, encompasses a much broader area than the distribution of Besant pottery or any other cultural trait of the Besant complex. It seems to be the general consensus to accept the distribution of the Besant projectile points as the limit of Besant’s geographic distribution.

This can be problematic as the process of comparing projectile point morphology is largely subjective. It seems that other varieties of side-notch points, in particular Early side-notch and Mummy Cave points (Dyck 1983:92), are occasionally mislabeled as Besant points. In addition, many points manufactured by woodland cultures are stylistically similar to Besant points, and could potentially be misidentified as such, particularly when encountered in a disturbed surface context (Dyck 1983:120). Reeves has noted that several projectile points form sites along Lake Athabaska in Northern Alberta were originally classified as Besant Side-notch projectile points (Reeves 1983:8), though he rejects this classification. Similarly, projectile points recovered from the salvage excavations at South Indian Lake in Northern Manitoba have also been assigned to the Besant complex (Scribe 1997). In Saskatchewan, Forsman (1979) identified an undisturbed Besant component during his excavations on the north end of Montreal Lake in the boreal forest.

In my opinion, the discovery of Besant series projectile points in contexts outside of the northern plains stresses the need to start implementing names for projectile point styles that are independent from the complex (or complexes) that the projectile points are associated with. In addition to a set of distinctive projectile point styles, the Besant complex is also defined by an affinity for Knife River flint and a dependence on bison as the main food resource (as evidenced by bone beds, boiling pits, bone uprights, processing areas, etc.). Thus, I would argue that despite morphological similarities between the projectile points encountered in the boreal forest and those of the Besant complex, the forest assemblages should not be included in the Besant complex as they do not
display any of the other traits associated with the Besant complex. Most likely the points that were recovered from the forested environments represent an entirely different archaeological complex. The erroneous classification of such points as belonging to the Besant complex may well be a consequence of the researcher being more familiar with plains based archaeological complexes than with woodland complexes.

If we define the geographic range of Besant by only including sites which contain Besant series projectile points as well as evidence for a plains adapted subsistence strategy, the Besant complex can be seen to encompass a large portion of the northern plains region (see figure 2.1). This is composed of the prairie and parkland regions of Alberta, Saskatchewan, Manitoba, Montana, Wyoming, North Dakota and South Dakota (Forbis 1992:57).

The northern limit of the Besant complex is defined by the parkland/boreal forest boundary. Besant is represented in the parkland by several excavated sites across Saskatchewan and Manitoba. Similarly, the eastern limit of the distribution of Besant projectile points is likewise limited by the long grass prairie/forest boundary in North and South Dakota.

The southern boundary of the projectile point distribution extends from South Dakota through the northern half of Wyoming. The southernmost sites include the Ruby and Muddy Creek bison kill sites in Wyoming (Frison 1978:219). The eastern boundary of the Besant distribution seems to occur along the plains/foothill transition zone in Alberta.

The geographic distribution of Besant pottery reflects another pattern altogether. In this case, the pottery is most common in the south-east corner of Besant’s geographic range, specifically in North Dakota. This area is known for a unique regional expression of the Besant complex known as Sonota. The Sonota culture produced many burial mounds which were rich in Besant projectile points and pottery. As one travels north and west from this area, pottery becomes increasingly scarce. Some researchers have suggested that
this distribution can be perceived as a gradient slope (Hjermstad 1996:53), with the densest concentration in the south east corner of Besant's projectile point distribution area and a scarcity of pottery in the Alberta, the north west corner of the same distribution area. Thus pottery is found at some, but not all Besant sites. Also, the area where it is found is entirely subsumed within the area generated by the projectile point distribution.

3.4 Salient Features

The Besant complex possesses a number of distinctive traits that make it unique among plains cultures and readily identifiable in an archaeological context. The most ubiquitous of these traits is projectile point morphology. Currently, the literature suggests that there could be as many as five identifiable point types in Besant phase assemblages: Besant Side notch, Outlook Side notch, Sandy Creek, Bratton, and Samantha. The Outlook Side notch and Bratton point types are relatively recent distinctions defined by Dyck and Morlan (1995) during their work at the Sjovold site. From the data they gathered at this site they were able to distinguish between Sandy Creek, Bratton, and Outlook Side notch points based largely on basal morphology. They refer to the multiple types of Besant projectile points as the "Besant series" (Dyck and Morlan1995:537).

3.4.1 Projectile Point Morphology

According to the original definition, the Besant side-notch point is a mid-sized projectile point with side-notches about twice as wide as they are deep (Vickers 1994:9). The notches are low on the point sometimes removing the lateral basal edge, giving the point a "corner removed" appearance. Kehoe defined this point type as ranging from 26mm to 55 mm in length, 20-26.5 mm wide and having an internotch width of between 15-20 mm (Kehoe 1974:108). A more recent assessment of their metric attributes describes them as being
between 30-78mm long, 19-23 mm wide, and having an internotch width of between 14 -16 mm (Vickers 1994:9). This is the classification that gets the most used in the literature and can perhaps be seen as an all-encompassing term used to refer to all variants of the Besant projectile point. This is reflected in the rather large range of variation in overall point length.

Some researchers have attempted to subdivide the Besant side-notch point type into a series of more distinct point types. In their analysis of the Sjovold site, Dyck and Morlan (1995) defined two new point styles (Outlook side-notch and Bratton) for their “Besant series” of projectile points. They also revived the utilization of two other point types (Samantha and Sandy Creek) and firmly placed them within the Besant series. The most common variety of Besant projectile point in this proposed Besant series is the Outlook Side-notch point. This point is either straight-based or slightly convex or concave. In the later two instances the depth of concavity or the height of convexity does not exceed 1mm. The side notches on this point are located low on the point, usually within 2mm of the base. These notches are described as “U” or “V” shaped, shallow and wide. The lateral edges on points of this style are usually slightly convex (Dyck and Morlan 1995:437).

The Outlook side-notch point seems very similar to the older definition of the Besant side-notch point as defined by Kehoe (1974:108). Dyck and Morlan (1995:437) have stated that they intend this new classification to be applied to all straight based “Besant side-notch” points, which are produced throughout the temporal range of the Besant complex

The Bratton variety of Besant projectile point is identifiable by its convex basal edge which ranges from 1mm to 7mm from the base line. This point has two notches which typically are either within 1 mm of the basal-lateral edge or encompass it completely. Thus, Bratton points can have either side notches or corner notches or a combination of both on the same point. Furthermore, the lateral edges are either straight or slightly convex (Dyck and Morlan 1995:379).
Another projectile point that gets placed within the Besant Series by Dyck and Morlan (1995:398) is the Sandy Creek point. This projectile point has the familiar broad shallow side notches typical of all Besant projectile points. However, this point is basally concave with the concavity always exceeding 1mm from the base line. Morphologically, it bears a strong resemblance to an Oxbow projectile point and it has been argued that this point form is characteristic of a transitional period as oxbow evolved into Besant (Vickers 1994:11, Reeves 1983:14). Chronologically, this variant is distinct from the rest of the Besant Series, appearing only between 3000 - 2000 rcybp.

Sandy Creek projectile points are found mostly in Saskatchewan with one instance of them being identified in south-central Alberta (Morlan 2003), this at the Cranford site. Sites in Saskatchewan with Sandy Creek points include the Mortlach site (where it was first defined by Wettlaufer in 1955), the Walter Felt site (Kehoe 1974), and the Sjovold site (Dyck and Morlan 1995:398). At all three of these sites the Sandy Creek components have been found interspersed with Pelican Lake components (Reeves 1983:14). Such juxtaposition suggests that Sandy creek was contemporaneous with the terminal phase of the Pelican Lake complex. This is further supported by the radiocarbon evidence which places the Pelican Lake complex at around 3300-1850 rcybp (Dyck 1983:108). The Lebret site in the Qu'Appelle Valley also contains a Sandy Creek component which is associated with a radiocarbon date of 2980 +/- 105 (S-2792) (Smith 1986:78).

Originally thought to represent a transition between the Besant and Avonlea points, the Samantha point is now described as simply a smaller version of the Besant side-notched point (Vickers 1994:9). Very few cultural occupations have been found with any of these points. As a result, the term “Samantha” is seldom used in the literature (Scribe 1997:30). This point is sometimes fashioned from a unifacially worked flake, with the ventral side having few to no flake scars. In addition, the side notches on this point tend to be symmetrical and more narrow than those typically found on the other Besant
Series projectile points (Dyck and Morlan 1995:300). It has been suggested that this point represents a new style of lightweight high-impact atlatl dartpoint (Gregg 1994:76) or alternatively, that the Samantha point represents the transition from Besant atlatl technology to Prairie side-notch bow and arrow technology (Vickers 1994:20).

Two radiocarbon dates have been associated with the Samantha projectile point style. The occupation wherein Kehoe (1974:111) defined the Samantha point has been dated to around 1535 rcybp. A more tentative association comes from Layer VII of the Sjovold site which contained a point that could be classified as Samantha and was occupied somewhere between 1800-1300 rcybp (Dyck and Morlan 1995:285). Samantha, though lacking a description based on metric attributes, seems to occur in the terminal or most recent assemblages of the Besant complex.

The Sonota complex has long been considered by some researchers to be a regional variant or a “mortuary expression” of the Besant complex (Reeves 1983, Scribe 1997). Located primarily in North and South Dakota and extending into southwestern Manitoba, the Sonota complex consists of a series of low mound burials rich in grave goods. Artifacts recovered from these sites include projectile points, pottery, exotics such as copper, as well as the interred remains of whole bison (Neuman 1975:40). The projectile points recovered from Sonota sites have been described as being morphologically identical to Besant side-notch. Many authors have lamented the lack of metric data in the literature dealing with either the points recovered from the Sonota sites or Besant points in general (Ramsay 1991; Scribe 1997; Syms 1977). As such it is impossible to statistically compare the metric attributes of each point to determine if significant morphological differences exist between the two. For the purposes of this discussion on projectile point morphology, Sonota projectile points will be considered to be identical to the Besant side-notch variety as defined above.
Not all researchers agree with the sub-classifications of Besant points proposed by Dyck and Morlan. Ramsay (1991:118) in particular considers the idea of separating Besant points into sub-types based on basal morphology as being "of little use". This is perhaps because there was a great deal of basal variation among the points recovered from the Melhagen site. Out of over sixty projectile points there were nearly equal numbers of concave (28%), convex (32%) and straight (37%) based points (Ramsay 1991:117). With other evidence such as radiocarbon dates suggesting that there were only two separate occupational episodes at this site, perhaps it was felt that basal morphology could not possibly reflect distinct ethnic groups. Also, seeing as how the objective of her research was to separate the collection into two varieties (Besant and Sonota), basal morphology with its three variants would have availed her little in this task.

Instead of relying on basal morphology to separate points into subgroups, Ramsay makes use of the Principle Component Analysis of key metric attributes (such as point length, basal height, etc) to assess the Melhagen artifact assemblage for significant patterns of projectile point morphology. While her analysis did not produce two groups that could be identified as either Besant or Sonota, some other patterns were observable. It was observed that the projectile points in the Melhagen collection followed a general trend: that as they became larger overall the basal portion of the point increased in size relative to the blade length (Ramsay 1991:235). In addition, there were three groupings of projectile points that shared similar sets of metric attributes. One grouping of points were large overall, with relatively small basal heights compared to their blade length. Ramsay interpreted these points as being spear points or perhaps halfted knives (Ramsay 1991:131). Another group of points all displayed small overall sizes with small blade lengths and relatively large basal heights. These points could be interpreted as being points which had been extensively reworked. Another grouping consists of just two points
that were small but had large body lengths as compared to their basal heights. Ramsay (1991:132) notes that these two points are consistent with the current definition of Samantha points.

More recently, Hjermstad has attempted to test the validity of the classifications put forth by Dyck and Morlan (Hjermstad 1996:56). Using the collection of seventy diagnostic artifacts recovered from the Fitzgerald site, Hjermstad attempted to independently confirm if the classifications of "Bratton" and "Outlook Side-notch" were applicable to the Besant culture as a whole and not just the sites Dyck and Morlan used to define their projectile point subtypes. Hjermstad concluded that 93% of the projectile points from the Fitzgerald site could be classified as "Outlook Side-notch". The remaining 7% of the projectile points could be considered Bratton points (Hjermstad 1996:66). And while all of the points from the Fitzgerald site did fall into one of the proposed categories, Hjermstad wondered if, considering the obvious dominance of Outlook side-notch, Bratton and the other newly proposed projectile point types were simply not abundant enough to be considered a significant variant of the Besant projectile point. From his examination of photographs of projectile points from twelve other excavated Besant kill sites, Hjermstad found that Outlook side notch dominated the other assemblages as well. Including the projectile points from the Fitzgerald site, a total of 22 Bratton points were identified. Given the scarcity of other varieties of projectile points and that Bratton and Outlook side notch seem to completely overlap temporally and spatially, Hjermstad (1996:98) thought that the division of Besant into four sub-types of projectile points might have been premature.

3.4.2 Raw materials

One key feature of the Besant complex is the domination of some lithic assemblages by Knife River flint. Knife River flint is a chalcedony that can only be found in its natural setting in the North Dakota region. The hard siliceous
bed from which it originated can still be found in outcrops throughout west-central North Dakota. And while erosional processes have likely redistributed it in a broader area, it seems unlikely that it would be encountered in any substantial quantity outside of western North Dakota (Clayton et. al. 1970:289).

Due to its suitability as a workable material for flintknapping, Knife River flint was sought after by many pre-contact groups on the northern plains. This is reflected in the archaeological record, as Knife River flint can be found in varying concentrations in the assemblages of nearly all archaeological cultures on the plains from as early as 10,000 years ago up until the proto-contact period. Besant is unique among these groups in that Knife River flint is the dominant material at many of its sites (Hjermstad 1996:102; Reeves 1983:146).

On the Canadian plains, Besant sites seem to fall into one of two categories in terms of lithic raw material composition. The first type of Besant site are those that are dominated by Knife River flint and other materials that can only be acquired at southern latitudes, such as fused shale and Tongue River silicified sediment (Walde et. al. 1995:18). The majority of such sites are kill sites, and a good number of them have evidence of pound structures (Ramsay 1991:124). The second type of Besant site found on the Canadian plains are those sites wherein local materials dominate the lithic assemblages. These sites tend to be habitation locales and likely represent groups that lived year round on the Canadian plains (Walde 1995:18).

This dichotomy is interesting in that it raises the question: why is it that such large quantities of Knife River flint are found at communal bison kill sites many hundreds of kilometres from the source quarries while the majority of the other sites in this same region used predominantly local materials? It could be argued that an extensive trade network existed with the southern Besant groups; however it is thought that the percentage of stone tools made from Knife River flint is too high to be attributed to acquisition of this material through trade (Hjermstad 1996:253). It was also apparent that the Besant hunters did
not make much of an effort to recover the material after the pounding activities were completed (Ramsay 1991:139). Both of these factors seem to indicate that the groups who built these sites had secure and ready access to deposits of Knife River flint. It seems likely that this represents either a group of locals that traveled south on yearly pilgrimage to the quarries and then returned or the reverse situation wherein groups from North Dakota annually traveled north to engage in communal bison hunting activities (Hjermstad 1997:253; Walde et. al.1995:19).

One could infer from these observations that there were two separate Besant groups inhabiting the plains: locally based groups who only had access to Knife River flint through trade routes, and groups who were occupants of the North Dakota region where they had easy and reliable access to the Knife River flint quarries.

Another possibility is that Knife River flint was used strictly as a ceremonial item, to be used only for ritualized activities such as communal bison hunting. Examples of ritual behaviour are known from other Besant sites such as the Ruby site in Wyoming wherein eight adult bison cranium were arranged within a oval structure in the middle of the bison pound (Frison1978:220). It has been suggested that the large communal bison hunts such as those represented by the Fitzgerald site and the Melhagen site were relatively rare events, perhaps occurring as infrequently as once every 25 years (Frison 1978:244), thus making such an event a significant occurrence in the lives of the Besant people. Clearly there is precedent for ceremonial activities being associated with communal bison hunting. Perhaps the use of tools made from Knife River flint has some deeper ritual significance than simply being an excellent flintknapping material. In such a scenario, the habitation sites using predominantly local materials and the kill sites where large quantities of Knife River flint were used could be attributed to the same people. However, without further archaeological evidence of the ritual importance of Knife River flint, or
perhaps oral histories presenting evidence to the same effect, such a claim is untenable.

3.4.3 Pottery

Besant pottery is most prevalent in the southeastern portion of the Besant distribution area. This encompasses the North Dakota region where Besant is represented by the Sonota phase. The Sonota phase employs the same lithic assemblages as the rest of the Besant complex, but it exhibits a number of Eastern Woodland characteristics including low domed burial mounds, post-in-hole style dwellings, and pottery (Neuman 1975:84). The pottery itself is seen as a relatively recent introduction into the Sonota phase. It is believed to represent technological diffusion between the Sonota groups and the contemporary Middle Woodland Period groups in the adjacent woodlands (Scribe 1997:57). Besant pottery found at Sonota sites is said to be so similar to some woodland varieties of pottery as to be considered identical (Scribe 1997:27) and, indeed, the pottery produced by Besant groups has often been referred to as “Plains Woodland” pottery (Johnson 1977:37; Wood and Johnson 1973:64). The Sonota phase, then, is representative of a period of significant plains-woodland interaction referred to in the literature as the Middle Plains Woodland Period (Gregg and Picha 1989:42). Scribe suspects that the diffusion of pottery technology could have been achieved through intermarriage between these two groups. It is less clear how the diffusion of pottery further westward and northward occurred. This could have been the result of trade between Besant groups, or the diffusion of ideas, or simply by the southeastern groups travelling further west (Scribe 1997:57)

The vessels themselves have an elongated conical shape and are shoulderless (Scribe 1997:61; Walde et al. 1995:18). The temper usually consists of sand or grit. These vessels are believed to have been manufactured using the “paddle and anvil” method of pottery construction
This method consists of using a cord-wrapped paddle to press the clay against a hard surface to give it its shape. Vessel size can vary considerably. The capacity of reconstructed vessels recovered from the Sonota burial mounds range in size from 4 litres to 33 litres (Neuman 1975:93).

Besant vessels have two varieties of exterior surface finish: the most common is a cord-marked or cord-roughened exterior, but smooth surface vessels have been found as well (Neuman 1975:93; Walde et. al. 1995:18). The cord-roughened exterior is believed to be the direct result of employing a cord-wrapped paddle to shape the vessel. These cord markings can cover the entire exterior surface of the vessel; occasionally this cord roughening is evident on parts of the interior of the vessel as well. There are other instances wherein the cord roughening on the lower half of the vessel has been obliterated by smoothing (Scribe 1997:60). When present, these cord markings tend to be parallel and orientated vertically on the upper portion of the vessel and crisscrossed on the lower portion. Instances of horizontal or diagonal orientations have also been found, though they are not common (Neuman 1975:93).

Decoration of Besant vessels is typically sparse and usually only occurs on the rim or lip portion of the vessel (Walde et. al 1995:18). This decoration most frequently consists of a line of punctates or bosses around the rim exterior. Neuman (1975:93) recognized three decorative techniques among the pottery vessels he examined from the Sonota burial mounds. The most popular technique was a single horizontal row of punctates, produced with either a finger or the end of a stick. Another technique was a row of alternating bosses and punctates. The third technique he observed was a single row of punctates above a band of arched diagonally orientated dentate stamps. The lips of the vessels sometimes bear single cord, cord wrapped object, or sharp edged tool impressions (Walde et. al. 1995:18).
As we can see, there is some variety within the Besant complex in terms of pottery styles. The cord roughened surface finish seems to be a byproduct of the paddle and anvil technique of pottery manufacture. I am assuming then that those few Besant vessels which display a smooth surface finish, that are not simply vessels where the cord markings have been obliterated by smoothing, were manufactured by a smooth paddle method. The decorative technique seems to vary considerably but we do see the consistent use of punctates and bosses. The only attribute that seems to be consistent with all Besant vessels is their overall conical vessel shape. Despite this range of variability, Besant pottery is distinctive enough to be considered a diagnostic artifact when found within a plains artifact assemblage (Hjermstad 1996:53).

This range of variability is not unique to the Besant complex but rather it is a characteristic of pottery as a whole. The process of making pottery exposes the potential vessel to a near limitless range of variables ranging from aesthetic decisions made by the individual potter to environmental variables such as the quality of the source materials and firing conditions. As such pottery is susceptible to “endless variation” (Greaves 1982:13) wherein no two vessels are entirely identical. This intrinsic tendency for variation makes pottery an ideal medium with which to demonstrate culture change over time (Scribe 1997:63). It can also be an indicator for contact between two cultures, as the individual potter may incorporate styles or techniques he or she has seen on foreign pots. This can be demonstrated in the archaeological record by ceramics bearing the decorative techniques of two different complexes.

3.5 Origins of Besant

An understanding of which, if any, preceding archaeological complexes gave rise to Besant would enable us to better understand the role the Besant complex played in shaping later archaeological complexes. Unfortunately, while this topic has been discussed at some length, a consensus never seems
to have been reached. The last twenty years of research has seen the development of several hypothesis on this topic. Many have been concerned with finding an ancestral relationship with one of the resident plains groups such as Pelican Lake or Oxbow, but some effort has also been put into looking for a possible ancestral complex among the Eastern Woodland groups with whom Besant peoples obviously had some interaction. Other groups, such as those inhabiting the boreal forest, have been considered but it does not seem likely that Besant derived its origin from such groups (Reeves 1983:158).

A good candidate for an ancestral complex to Besant would have similar diagnostic features as Besant. Also, there should be intermediary forms of some of the diagnostic artifacts present in the archaeological record. Ideally, the transition from one culture to the next should be a gradual shift that is demonstrable archaeologically.

The eastern woodland groups have been considered likely to produce a clear ancestor for the Besant complex given the similarity in pottery styles and projectile points (Neuman 1975:84; Reeves 1983:151). However, the ceramics associated with the Besant complex are easily encompassed within a “trait complex” of ceramics that “occurs over a broad geographical expanse of the mid-continent during the 1st millennium BC” (Gregg and Picha 1989:40). Thus they can not be tied to any one group nor can the presence of these ceramics in more than one archaeological complex be taken as evidence of an ancestor-descendant relationship. For instance, the ceramics associated with the Sonota phase of the Besant complex are similar to ceramics from Nebraska (Valley ware), Iowa (Rowe ware) and South Dakota (Scalp ware) though it does not seem likely that these groups would have been related culturally, given their broad geographic distribution and dissimilarities in the rest of their respective material cultures (Gregg and Picha 1989:42). Similarly, subsequent analysis of the projectile points of the Sonota phase have indicated that, while they are similar to the projectile points of the eastern woodlands, they should still be...
considered a product of plains groups (Gregg and Picha 1989:47).

Furthermore, if the Besant complex originated in North or South Dakota with the Sonota Phase, we should expect the earliest radiocarbon dates assigned to the Besant complex to also come from this region. This is not the case. More likely the eastern woodland groups, including the Malmo culture of the Valley complex identified by Reeves (1983:151) as being a possible ancestor for the Besant complex, are best viewed as groups that interacted with the Besant groups in the adjacent plains of North and South Dakota. Contact with these woodland groups, possibly as part of the Hopewellian Interaction Sphere (Gregg and Picha 1989:45), likely caused the diffusion of Woodland cultural traits such as pottery and mound building and woodland trade goods such as copper and shell across the Plains woodland boundary. This interaction likely began in the millennia prior to the appearance of the Besant complex, as evidenced by the Early Plains Woodland Period which consists of pottery bearing Pelican Lake components such as those found at the Naze site in southeastern North Dakota (Gregg and Picha 1989:40).

It has also been suggested that the Oxbow complex could have been a possible ancestor for the Besant complex. A link can be established between the two complexes based on the similarity in basal morphology between the Oxbow and Sandy Creek projectile points. However, other than projectile point morphology, there is little evidence to suggest a link between the Besant and Oxbow complexes. Oxbow projectile points are not found in components younger than 3860 rcybp (Morlan 1993:38), which is still a millennia prior to the oldest dated component containing Sandy Creek projectile points. In this intervening millennia, the northern plains are inhabited by McKean and Pelican Lake groups whose diagnostic projectile points bear very little resemblance to either Sandy Creek or Oxbow.

There are also many dissimilarities between the Oxbow and Besant complexes. While both exploited bison as a food resource, there has never
been any evidence for communal bison hunting at Oxbow sites. Nor does Knife River flint form a significant percentage of the raw materials used by Oxbow on the northern plains. It should be noted, though, that Sandy Creek is not well understood as there are currently only four sites on the northern plains where Sandy Creek projectile points have been identified. Thus our concept of the Sandy Creek projectile point as well as its associated range of radiocarbon dates, may change over time.

The Pelican Lake complex immediately precedes the Besant complex across much of the northern plains, and while Pelican Lake components are often found below Besant components, there are also numerous examples of Pelican Lake points found in association with Besant Series projectile points. Components containing both types of projectile points have been found interspersed between Besant components at the Sjovold site (Dyck and Morlan 1995:350), the Mortlach site (Wettlaufer 1955) and the Walter Felt site (Reeves 1983:14) Dyck and Morlan (1995:538) have argued that archaeologists have erroneously identified all corner-notched atlatl points as being Pelican Lake projectile points. They argue that it is likely that several styles of corner notched atlatl points exist and at least one style belongs within the Besant Series. Thus, if there is a corner-notched projectile point that was manufactured by Besant groups, then perhaps a continuity exists between the Pelican Lake complex and the Besant complex. However, the Pelican Lake projectile point, and corner-notched atlatl points in general, need to be studied in much more depth before such a claim can be made.

3.6 The Fate of Besant

It is also important to know what happened to Besant after 1200 BP. As Avonlea succeeded Besant on the plains, it is important to this discussion to know if Besant merged with Avonlea, developed into an entirely new archaeological complex, or was displaced elsewhere.
A comparison of projectile point morphology between Besant and later projectile point styles indicates that there are some strong similarities between Besant and Prairie side-notch points. Prairie side-notch is a projectile point style that was manufactured on the plains between 1400 - 470 rcybp (Morlan 1993:40), a timeframe which begins during the terminal Besant period. Thus it is conceivable that Besant developed into Prairie side-notch.

Prairie side-notch points have a few non-metric attributes that are reminiscent of the Besant complex. Their notches are generally wider than they are deep and are placed asymmetrically on the point. In general these points most resemble the Samantha variant of the Besant Series. Prairie side-notch points differ from those of the Besant Series in that they have an irregular body outline, a base that is narrower than the body of the point, and generally display poorer bifacial flaking than is typical of Besant points (Vickers 1994:20). Also, while Prairie Side-Notch has been associated with large kill sites such as the Tschetter site in central Saskatchewan (Linnamae 1988), there is not a high percentage of points made of Knife River flint.

Ceramics associated with Prairie side notch point have been categorized as being part of the Old Womans Phase (Vickers 1994:21; Walde et. al 1995:58). These ceramics are also found in association with Plains side-notch points, a projectile point tradition that overlapped with and superseded Prairie side-notch on the plains. Vessels of this ceramic tradition tend to have elongated globular or “rounded” forms (Linnamae 1988:112; Vickers 1994:21). Most vessels bear fabric or cord-roughened impressions on their exterior surfaces. Similar to Besant, punctates are the most common form of decoration; however incisions and impressions are also used (Vickers 1994:21).

It has also been suggested that the Old Womans Phase might have arisen out of a merger between both the Avonlea and Besant complexes
(Reeves 1983:18; Vickers 1994:22). This is an issue I will examine in more
depth in Chapter 7.

3.7 Contemporaries of Besant

Overlooking Avonlea for the time being, I am interested in examining
what other cultures were contemporaneous with Besant and with whom Besant
may have had some interaction. I believe that by examining the relationship
between Besant and adjacent contemporary cultures as expressed in the
archaeological record we may gain some insight into what to look for in terms of
Besant - Avonlea Interaction.

I have already discussed the evidence for interaction between the
Besant complex and Eastern Woodland groups. The presence of shell, copper,
and catlinite within Besant components and the presence of Knife River flint
and obsidian within more easterly Middle Woodland Period assemblages
indicates that Besant was contemporaneous with such groups and was likely on
the fringe of the Hopewellian Interaction Sphere (Gregg 1985:121). The
Hopewellian Interaction Sphere represents an extensive trading network that
existed in the eastern woodlands during the Middle Woodland Period. Gregg
and Picha (1989:46) have expressed the possibility that the Sonota groups may
have acted as middlemen: trading plains goods such as Knife River flint and
obsidian from the Yellowstone region for woodland goods. Syms (1977:95)
noted that while there is no archaeological evidence of major trade centers
(such as the later Missouri River villages or Hopewellian trade centers found
further east) the presence of foreign trade goods within Besant components and
the presence of Knife River flint in the assemblages of neighboring woodland
groups (such as the Laurel configuration) indicates that trade occurred none the
less.

It is clear that Besant did interact with Eastern Woodland groups and
through this interaction acquired the knowledge of how to create ceramics as
well as adopting and adapting their mortuary practices. Such cultural diffusion could be the result of intermarriage between Besant and Eastern Woodland groups. Intermarriage has long been seen as a byproduct of both trade and warfare between Hunter-Gatherer groups, used to seal alliances and strengthen trade networks (Scribe 1997:164). Intermarriage between two groups can lead to hybridization where a new culture emerges that has some of the traits of both previous groups. The Sonota phase of the Besant complex may be one such hybrid culture.

Laurel is another archaeological complex partially contemporaneous with Besant. Laurel was present in the boreal forest of Saskatchewan, Manitoba, Ontario, Quebec, and also in the forested regions of Minnesota from approximately 100 BC to 900 AD (Meyer and Hamilton 1994:102). During this time period, Laurel is seen as expanding north-westward across the boreal forest of Manitoba, with a late entry into Saskatchewan around AD 750 (Meyer and Hamilton 1994:116). In southeastern Manitoba, Minnesota, and North Dakota Laurel is known to have briefly occupied the parkland in order to exploit the bison resources present there during the winter (Meyer and Hamilton 1994:110; Scribe 1997:152).

This is not the case in Saskatchewan and southwestern Manitoba. It has been suggested that Laurel groups were prevented from expanding into the parkland in this region by the presence of multiple Besant or Avonlea groups. Archaeological research along the Saskatchewan River has indicated that the parkland ecoregion was inhabited largely by plains groups during the last 1500 years and any contact between Plains and Woodland cultures would have occurred within the southern fringe of the boreal forest (Meyer and Epp 1990:323).

Our understanding of the geographic distribution of Laurel is based almost entirely on the presence of Laurel pottery. Laurel vessels are conical in shape and manufactured using the coiling technique. Laurel vessels can have a variety of decorations. The most distinctive is the pseudo-scallop shell
stamping technique; however linear stamping and stab and drag stamping were also used (Meyer and Hamilton 1994:102). At around 750 AD dentates and punctates made their way into the repertoire of decorative techniques used by Laurel groups. All Laurel vessels found in Saskatchewan bear this decorative technique, leading to the assumption that all Laurel sites in Saskatchewan post date 750 AD (Meyer and Hamilton 1994:116). Thus Besant-Laurel interaction in Saskatchewan seems unlikely, as Besant had disappeared from the Canadian plains by around 500 AD (Walde et.al.1995:19). The lithic assemblages for this archaeological complex have been shown to contain some Knife River flint, but in very minute amounts (Meyer and Hamilton 1994:106).

We would expect to find evidence of Besant/Laurel interaction along the forest parkland transition in the parkland ecoregion as this forms the geographic boundary between the two complexes. Such evidence might take the form of Laurel pottery being used by Besant groups or hybrid vessels being produced that bear both Laurel and Besant traits. No such evidence exists in Saskatchewan, and only limited evidence exits in Manitoba.

In west central Manitoba two Besant sites, the Wapiti Sakihtaw and the Pinew Watci site, have produced pottery that display a number of Laurel traits including coil breakage (an indication that the vessel was manufactured using the coiling method) and incised tool impressions (Scribe 1997:152). The excavator of these sites noted that the vessels in question are also similar to Besant pottery in some respects (Scribe 1997:153). This is a difficult observation to quantify as both complexes made use of dentate stamps, punctates, and bosses as a means of decoration.

Laurel ceramics have been found in association with some of the Sonota materials as well. It remains unclear whether this apparent association is the result of trade or is simply the result of component admixture. Laurel Components within the Sonota distribution area have not been adequately dated (Gregg and Picha 1989:42).
3.8 Discussion

Clearly there are a number of issues worthy of discussion relating to Besant. Foremost in my mind is what to make of the sheer variability expressed in the projectile point morphology. Several researchers have attempted to sub-divide the Besant point type into multiple groupings of similar points. Most notably Dyck and Morlan (1995) have defined three separate groups (Sandy Creek, Bratton, and Outlook Side-Notch) based on basal morphology. Generally, these groupings work well within the context of the assemblages used to define them but seem to be less useful when applied to the Besant complex as a whole. This is evident in Hjermstad's attempt to apply the Bratton designation to other archaeological assemblages (Hjermstad 1996). Other sub-classifications such as "Samantha" are subjective and ill-defined, making it much more difficult to reliably apply them elsewhere.

If we are going to use these or any other sub-classifications for the Besant point, we first need to determine if these sub-classifications are applicable to Besant as a whole. One method would be to do a metric analysis of a statistically significant sample of Besant projectile points. Then using an analytical technique designed to recognise patterns such as Discriminant Function Analysis or Principle Component Analysis a scattergram could be generated and groups of similar points defined. A similar method was employed by Walker (1988:69) in defining sub classifications of the Mummy Cave complex. If it is possible to define each subclassification in terms of its range of metric attributes, or at least come up with an objective way to differentiate between subclassifications, they would be easier to apply to other collections. However, prior to the 1990's it was not common practice to include the kind of metric data required to do such an analysis in the site monographs (Ramsay 1991). To acquire a representative and statistically valid sample of Besant projectile points would involve revisiting some of these older collections and re-measuring the metric attributes of all the points. The amount of
travelling and the sheer volume of work involved in such a venture has been described by other authors as “astronomical” to the point of being prohibitive (Ramsay 1991:96).

It must also be questioned whether it is worthwhile to distinguish between variants of Besant projectile points. It has not yet been firmly established that these differences in metric attributes are indicative of separate phases of the Besant complex. If these different point forms did represent separate phases then we would expect them to be restricted to a specific geographic local or temporal range.

There is evidence in the form of radiocarbon dates and stratigraphic profiling to suggest that the Sandy Creek point type occurs slightly earlier than the more common Outlook side-notch. Also, it was initially thought that Sandy Creek might have been confined to the parkland (Reeves 1983:14), but with instances of it occurring at the Sjovold site, the Mortlach site, and the Walter Felt site in south-central Saskatchewan, this seems unlikely. Despite existing in the literature for almost fifty years, no Sandy Creek points have been identified outside of southern Saskatchewan and southeastern Alberta. Nevertheless, there seems to be a strong case that Sandy Creek represents a slightly earlier phase of the Besant complex that was confined to southern Saskatchewan and southeastern Alberta.

It might be possible to create a case for Samantha along similar lines. Although what constitutes a Samantha point is poorly defined, when the term has been used it has been applied to points that can be demonstrated to occur quite late in the Besant sequence. Often these points are intermixed with materials from later complexes such as Avonlea (Dyck and Morlan 1995:285). However, there are no sites with a component dominated by Samantha points. It may be that few points get designated as Samantha due to the difficulty in distinguishing between heavily resharpened Outlook side-notch points and these small, squat Besant points. It is appealing to have a point typology that
represents a transitional phase between Besant and Prairie side notch, but the definition of Samantha needs to be refined before it can be reliably applied.

Sonota is obviously a geographically distinct variant of the Besant complex, but the projectile points associated with this phase are morphologically identical to Besant Side-Notch. Conversely, the proposed Bratton variant is obviously morphologically distinct, but can be neither geographically nor temporally isolated from the rest of the Besant series (Hjermstad 1996).

There may be some merit in keeping Sandy Creek and Sonota as distinct entities within the Besant complex as they represent specific phases of the Besant culture: the first appearance of the Besant complex on the northern plains and the culture change resulting from interaction with Eastern Woodland groups respectively. And, if it can be concluded that a transitional form exists that represents the development of Besant into Prairie Side-notch, than it should also be separated from the rest of the Besant series.

I am not sure if there is any use in discussing the other morphological variants as separate entities. There currently does not appear to be enough evidence to suggest that these are more than just arbitrary distinctions created by the archaeologist. We must also keep in mind that variation can be accounted for by factors other than ethnicity, such as the whim of the individual flintknapper (Greaves 1982:11; Scribe 1997:63).

Another issue worth discussing is the introduction of pottery into the Besant complex and its subsequent diffusion across the northern plains. It seems that pottery was first introduced into the Besant complex in southeastern North Dakota. It was adopted from the Middle Woodland Tradition along with the practice of building post-in-ground dwelling structures and low domed burial mounds. It seems that the concept of ceramic manufacture was widely disseminated across the plains while these other cultural phenomenon remained confined to eastern North Dakota.
Pottery likely held great appeal for hunter-gatherer groups. Its advantages included vermin proof food storage as well as a host of new food preparation options (Scribe 1997:56). Once a particular Besant group was exposed to pottery usage, there would be no real incentive to remain aceramic. In this way pottery may have slowly caught on as more and more Besant groups became exposed to pottery through trade or interaction with groups who were already making use of the technology.

On the topic of Besant peoples interacting with adjacent contemporaries, it seems obvious that there was some interaction with the Eastern Woodland cultural groups, and possibly with Pelican Lake and Laurel as well. In the case of the Laurel composite, evidence for interaction with the Besant complex is particularly sparse. There may be a few sites in the Manitoba parkland that suggest that these two complexes were interacting, but on the larger scale there appears to have been very little contact between these two groups. Knife River flint is quite rare in Laurel assemblages (Meyer and Hamilton 1994:106), but it does exist. This does not in of itself translate into evidence for Laurel groups trading with Besant groups. However, seeing as Besant groups were occupying the quarries in North Dakota at this time, it does seem likely that the Knife River Flint originated with a Besant source even if it ultimately reached Laurel groups through a woodland trade network.

3.9 Summary

Besant groups existed in various locations on the northern plains from between approximately 2500 -1400 rcybp. During this time they occupied portions of the prairie and parkland regions in Alberta, Saskatchewan, Manitoba, Montana, Wyoming, North Dakota, and South Dakota. While this area marks the maximum extent of the Besant complex, not all of these areas were occupied for the entire duration. In particular, for the period from 1400 to
1100 r.c.ybp the Besant complex seems to be confined to the North and South Dakota region.

In terms of fitting the Besant complex into the chronological sequence of plains archaeology, there is compelling evidence to suggest continuity between the Besant series of projectile points and the later Prairie Side-notch point. This evidence comes in the form of a marked similarity in projectile point morphology between the Samantha point and its immediate successor on the northern plains: the Prairie side-notch point.

It appears the people of the Besant complex in North and South Dakota interacted with the Eastern Woodland groups. This is represented by the Sonota phase of the Besant complex which is defined by a mix of Besant and Middle Woodland traits. There may also have been some peripheral interaction between Besant and Laurel in the Manitoba parkland or in the Dakotas, but to date this evidence is inconclusive.
4.0 The Avonlea Complex

4.1 Introduction

The Avonlea complex is significant to plains archaeology for a number of reasons. The people that produced this archaeological complex were the first group on the northern plains to adopt bow and arrow technology as their main hunting weapon. The Avonlea complex also marks the first widespread use of pottery on the plains, as ceramics are encountered much more frequently at Avonlea sites than they are at Besant sites (Vickers 1994:14). Duke (1988:266) has suggested that the Avonlea complex may be best be described as "an overlapping set of different subsets of cultural information (projectile points, ceramics, burial styles, etc) each with differing space time boundaries". And while this definition works well in describing the Avonlea complex, it could equally be applied to Besant or other complexes.

It has been observed by other researchers that while Avonlea projectile point morphology is largely homogenous across its distribution area, the rest of the Avonlea assemblage varies regionally, particularly the pottery (Walde et. al. 1995:21; Walde and Meyer 2003:139). It is my intention then to examine each of the diagnostic features attributed to the Avonlea complex in some detail. This will include a discussion of projectile point morphology, ceramic styles, and raw lithic materials as well as a discussion of the geographic and temporal boundaries of the Avonlea complex. Similar to what I have done in my examination of the Besant complex, I will discuss the evidence for interaction between Avonlea and contemporary complexes in the adjacent woodlands. I also intend to examine the various theories on the origins of the Avonlea complex and what preceding complexes it may have been related to in some
way. As well, I will be examining what relationships may have existed between Avonlea and the later plains archaeological complexes such as Old Women’s.

4.2 Geographic Distribution

When I refer to the geographic range of the Avonlea complex, I am essentially referring to the distribution of sites that have produced diagnostic Avonlea projectile points. Sites bearing these points have been discovered in the southern half of the provinces of Alberta and Saskatchewan, southwestern Manitoba, the extreme western edge of North and South Dakota, Montana, and Wyoming (Roll 1988:247, Reeves 1983:101) (see figure 2.1). Some researchers think it likely that Avonlea projectile points could also be found in southeastern British Columbia and Northern Idaho (Roll 1988:247).

The northern boundary of the Avonlea distribution area is approximately marked by the southern portion of the boreal forest (Meyer and Hamilton 1994:108, Meyer et. al. 1988:33). Avonlea components have been identified at several sites within this mixed-hardwood forest ecozone. Such sites include: the Yellowsky site, the Wallington Flat site, and the Gravel Pit site (Meyer and Hamilton 1994:108).

The eastern boundary of the distribution area is more abstract as it does not wholly coincide with a marked transition in ecozones. This boundary encompasses southwestern Manitoba as well as the western periphery of North and South Dakota. Sites along the eastern boundary in Manitoba include surface finds in the Swan River Valley as well as the Miniota, Stott, and Avery sites (Joyes 1988). In North and South Dakota, very few Avonlea sites have been recorded (Gregg 1985:130). These sites include the Lightning Spring site in South Dakota and the Evans site in North Dakota. Even in adjacent eastern Montana, Avonlea sites are rare. Conversely Besant sites are quite common in this area (Fraley 1988:130).
The southern boundary of the Avonlea distribution area is marked by a significant number of Avonlea sites discovered in northern Wyoming, including two burials: the Leah Burial site and the Billy Creek site (Reeves 1983; Smith and Walker 1988).

The western boundary is marked by the foothills of the Rocky Mountains and the Kootenei Trench area (Reeves 1983). Similar to the sites along the southern boundary of the boreal forest, these sites indicate that those who made Avonlea projectile points were capable of exploiting multiple environments.

4.3 Range of Avonlea Radiocarbon Dates

As might be expected, the radiocarbon evidence from dated Avonlea components suggests that there are "regional differences in the span of occupation for people using Avonlea projectile points" (Foor 1988:261). Thus, the entire geographical span attributed to the Avonlea complex was not inhabited by Avonlea people concurrently. The period from roughly 1350 rcybp to 950 rcybp marks the most widespread simultaneous use of the Avonlea projectile point on the northern plains (Roll 1988:247). The accepted range of dates for the Avonlea complex conforms closely to this period of widespread distribution. The acceptable range for radiocarbon dates from Avonlea components on the Canadian plains is from approximately AD 400 -AD 900 (Meyer and Epp 1990:329; Reeves 1983:16; Walde et. al. 1995:20) or, as expressed in radiocarbon years, from around 1750 to roughly 1150 rcybp (Peck and Ives 2001:164).

A search of the Canadian Archaeological Radiocarbon Database compiled by Morlan (2003), indicates relative conformity throughout the Canadian Prairies and into Montana and Wyoming. The earliest dates appear to occur in the grassland areas of southern Saskatchewan and northern Montana with radiocarbon dates ranging from 1700 -1500 rcybp. However
dates in this range have also been reported from Avonlea components in Manitoba (the Miniota site), South Dakota (the Lightning Spring site), and Alberta (Head-Smashed-In site). Most other sites in the Canadian prairies and the states of Wyoming and Montana fall within the 1500-1100 rcybp range. There also seems to be a trend for sites located along the aspen parkland/boreal forest ecozone transition to produce later dates, suggesting that the Avonlea complex may have only been present in this area during the period from 1100 rcybp to the end of its presence on the plains, roughly around 700 rcybp (Morlan 2003). These dates are presented in Figure 4.1.

4.4 Salient Features

The Avonlea complex is most easily identified in an archaeological context by the presence of the distinctive Avonlea projectile point. This is not the only diagnostic feature of this complex, but it is the only one that is wholly unique to Avonlea. Ceramics are also encountered in Avonlea components and have recently been classified into four identifiable wares. There are other less obvious features of the Avonlea complex such as choice of raw material types and the presence of large basin shaped hearths which warrant discussion as they contrast with what one might expect to find in other archaeological complexes.

4.4.1 Projectile Point Morphology

The morphology of the Avonlea point seems to remain relatively constant throughout the temporal and geographic range of the Avonlea complex. It is easily distinguished from the projectile point styles of both earlier and later complexes. The Avonlea point is triangular, exceedingly thin, and has small shallow side notches very close to a usually concave base. The average length of an Avonlea point is around 21 mm with an average width of 13mm and an internotch width of approximately 10mm (Vickers 1994:15).
Figure 4.1: Avonlea radiocarbon dates adapted from the Canadian Archaeological Radiocarbon Database (Morlan 2003)
Some attempts have been made to recognize different Avonlea projectile point styles. The first attempt was made by Thomas Kehoe and was based upon the variation found within the assemblage he recovered from the Gull Lake site. Kehoe defined three projectile point styles based on this data: “Gull Lake / Classic Avonlea”, “Timber Ridge Sharp-Eared”, and “Carmichael Wide-Eared” (Kehoe 1966:829).

The Gull Lake or Classic Avonlea variety is distinguishable by its concave base and very minute ears. This projectile point is the smallest of the three variations proposed by Kehoe, with a maximum length of 33mm. This projectile point style is also thought to be the most common variety of the Avonlea point as it accounts for nearly two-thirds of the Avonlea projectile points recovered from the Gull Lake site (Kehoe 1966:829).

The Timber Ridge Sharp-Eared variety is slightly larger than the “Classic” variation and has a straight or rectangular base (Kehoe 1966:829). The base represents the widest portion of the point and the length of the blade is considerably longer than in other Avonlea point styles (Adams 1975:153). This projectile point style is thought to be a very minor variety of the Avonlea projectile point (Kehoe:1988:8).

The Carmichael Wide-Eared variety is a larger point with markedly inferior workmanship. This variety has prominent rounded ears at its base. Roughly a quarter of all Carmichael points found by Kehoe had a straight base, the rest were concave (Kehoe 1966:829).

Reeves also created a subdivision of the Avonlea projectile point that was independent of the one created by Kehoe. In his (1983:161) dissertation Reeves recognises two “trial” point typologies within the Avonlea complex: the Head Smashed In corner-notch point and the Timber Ridge side-notch point. He does not describe either of these in any great detail other than to mention that the Head Smashed In variety appears to have been an earlier and rather
minor variant and that the Timber Ridge variant is at all times the dominant point type of the Avonlea complex.

It seems unlikely that the Timber Ridge side-notch point style proposed by Reeves and the Timber Ridge sharp-eared point proposed by Kehoe are the same point. Kehoe treats this point style as a less common variety whereas Reeves states it is the most common Avonlea point style. Through my examination of the figures presented in Reeves' work and in Kehoe's it seems likely that the Timber Ridge side-notch point is equivalent to the "classic" or Gull Lake point style under Kehoe's typology.

It should be noted that neither the typologies proposed by Kehoe nor the typologies proposed by Reeves have succeeded in gaining preference over the term "Avonlea point" in the literature (Roll 1988:244). It is rare to find these terms being used outside of the respective authors' own work, despite having been available for at least twenty years.

In addition, not all Avonlea points can be readily placed within one of these proposed subdivisions. At the Avery site in southwestern Manitoba, roughly two thirds of the Avonlea points recovered could not be placed within the projectile point styles proposed by either Reeves or Kehoe (Joyes 1988:230). Furthermore, subsequent research has indicated that these projectile point styles do not seem to correspond to a particular time period or geographic region and can be found throughout the geographic range of the Avonlea complex (Foor:1988:260).

4.4.2 Ceramic Wares

The varieties of ceramics commonly found in association with Avonlea points have recently been classified into four ceramic wares: Rock Lake Net/Fabric Impressed ware, Truman Parallel Grooved ware, Ethridge ware, and Avonlea Plain ware (Walde and Meyer 2003). None of these wares are found exclusively in Avonlea components and it is thought that each of these wares
could represent external influences from different areas of North America (Walde and Meyer 2003:139). On the whole, pottery is much more common in Avonlea components than it is in Besant components (Vickers 1994:14).

Rock Lake Net/Fabric Impressed ware is characterized by simple profile (ie: conodial shaped) vessels with net/textile impressed exteriors. The lips of these vessels are either flat or ridged with little or no thickening. Decoration is common on vessels of this kind recovered in Alberta, though it is significantly less common in other areas of this ware’s distribution. When decoration is present it usually consists of one or more rows of punctates, bosses, or finger pinches on the exterior rim surface below the lip. Another decorative technique is a variety of tool impressions on the lip surface (Walde and Meyer 2003:140).

The distribution of net-impressed pottery encompasses a large area from “the eastern woodlands through to central Minnesota and northwest to southern Alberta” (Walde and Meyer 2003:139). Furthermore, most of the instances of this ceramic ware in Avonlea components have been recovered from sites on the periphery of the plains ecoregion, particularly in the parklands of Manitoba and Saskatchewan (Walde and Meyer 2003:140). Also, Walde and Meyer (2003:140) have proposed that the Alberta archaeological components where Avonlea projectile points and Rock Lake Net/Fabric Impressed ware coincide be assigned to the Morkin phase of the Avonlea horizon.

Truman Parallel Grooved ware is characterized by a series of equidistant and parallel ridges and intervening troughs that encircle the vessel and cover the entire exterior (Johnson 1988:137, Walde and Meyer 2003:141). The troughs are usually 5mm wide and the ridges are typically the same size or smaller. This surface treatment is particularly visible on the upper portion of the vessel. The grooves are not continuous but rather they extend for 5-10 cm before being terminated by an overlapping set of parallel grooves that run at a slightly different angle (Johnson 1988:138).

These vessels have a simple profile with walls that gradually thicken towards the base (Johnson 1988:137). The lips may be either flat or rounded.

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Ceramics of this ware are usually not decorated but when decoration does exist it usually consists of diagonal cord impressions on the lip of the vessel or punctates along the upper rim (Johnson 1988:139).

Truman Parallel Grooved ware has predominantly been found in association with Avonlea components on the open grasslands in Canada, Montana and South Dakota (Walde and Meyer 2003:141). In this sense there is some overlap with the distribution of Rock Lake ware, though the two are usually mutually exclusive in Avonlea components (Johnson 1988:141; Walde and Meyer 2003:141).

Similar to Rock Lake ware, Truman Parallel Grooved ware seems to have originated outside of the plains in a non-Avonlea context and thus could be seen as representing a migration of people or ideas on to the plains. Components where Avonlea projectile points and Truman Parallel Grooved ware are found in association have been assigned to the Sjovold phase of the Avonlea horizon by Walde and Meyer (2003:141).

Ethridge ware is another ceramic variety sometimes associated with Avonlea projectile points. This ware is characterized by complex profile vessels with cord roughened or plain exterior surfaces. Ethridge ware vessels are sometimes decorated using a variety of techniques. These can include punctates, cord wrapped object impressions, and incisions made with pointed tools (Walde and Meyer 2003:141). It is thought that these vessels were constructed using the cord-wrapped or plain paddle and anvil technique similar to the method used to construct Besant ceramics. It should be noted that cord-roughened Ethridge ware and cord-roughened Besant ceramics are distinguishable from each other in that Ethridge ware vessels have a complex profile and Besant vessels do not.

The distribution of this ware within the Avonlea complex seems to be restricted to southern Alberta and northern Montana. Components where both Ethridge ware and Avonlea projectile points can be demonstrated to be in
association have been assigned to the Upper Kill phase of the Avonlea horizon by Walde and Meyer (2003:143). This phase is thought to have occurred somewhat after the Morkin phase proposed by the same authors.

Ethridge ware itself seems to have originated in Avonlea times and persisted up until the time of contact. Thus, this particular ware is believed to have some relevance to the discussion on the transition between the Avonlea complex and the subsequent Old Women’s phase (Walde and Meyer 2003:142).

Avonlea Plain ware seems to be the least well understood of the four ceramic wares associated with the Avonlea complex. This ware is characterized by thick walled plain surfaced vessels. The researchers who proposed this ware have cautioned that each case must be considered individually and more data need to be collected before any further discussion can ensue (Walde and Meyer 2003:143).

4.4.3 Other Features

Aside from projectile points and ceramics, there are a few other features that have been encountered within Avonlea components frequently enough to be considered attributes of the Avonlea complex. One such feature consists of large basin shaped hearths, typically containing thick deposits of bone and ash, but occasionally filled with rocks (Reeves:1983:161). These hearths have been found in the Avonlea occupational levels of the Miniota site (Landals et. al. 1994:39), the Sjovold site (Dyck and Morlan 1995:260), EdNh-35, and at some of the Avonlea sites reviewed by Reeves for his 1983 publication. Multiple explanations have been proposed for the purposes these hearths might have served. However, the most commonly held belief is that these were “boiling pits” used to render bone grease from large quantities of bison bone. If this were the case, we could expect to find these large basin shaped hearths in other plains archaeological complexes that were equally reliant on bison. And
indeed Gregg (1985:119) considers such large oblong hearth features to be a diagnostic feature of the Besant complex in North Dakota.

Reeves (1983:17) had once noted that Avonlea lithic assemblages were characterized by a "Microlithic punched blade-core tradition involving small conical and hemi-conical cores and the production of prismatic bladelets". However this observation has not yet been confirmed elsewhere in the literature, nor does it appear be valid in reference to the lithic collection recovered from EdNh-35.

It has also been observed that Avonlea lithic assemblages are predominantly made from local materials. This is hardly an uncommon situation in plains archaeology, but it is in sharp contrast to a number of Besant sites (especially Besant bison kill sites) where Knife River Flint is clearly the preferred lithic material.

4.5 Origins of the Avonlea complex

There have been several theories on where the Avonlea complex may have originated. The archaeological entities of Pelican Lake, Besant, and the Brainerd phase have all been suggested as possible candidates for being ancestral to the Avonlea complex. All three have various lines of evidence supporting them.

When defining the Avonlea point type as a horizon marker on the northern plains, Kehoe and McCorquodale (1961:188) proposed that southwestern Saskatchewan was the apparent "homeland" for the Avonlea complex. This theory involves the Avonlea projectile point being developed in southwestern Saskatchewan, possibly arising from the Besant complex with the Samantha projectile point being an intermediary point form (Kehoe 1974:104). This is based largely on their perception that the Classic/ Gull Lake variety of Avonlea projectile point is the earliest Avonlea point form and that it is found predominantly in southwestern Saskatchewan. However both the notion that
the Avonlea point form is derived from Besant and that the Classic/Gull Lake variety is found only in southwestern Saskatchewan have been largely dismissed by later researchers as current evidence suggests neither one is accurate (Foor 1988:260). However, to date the southwestern portion of Saskatchewan has produced some of the earliest radiocarbon dates for the Avonlea complex. Another theory espoused by Reeves is that the Avonlea complex developed out of the Pelican Lake complex and that this occurred in the foothills region of Alberta or even in the Kootenie trench locality in British Columbia. There have been no examples of intermediary point forms between the two complexes but Reeves claims that Pelican Lake points have occasionally been found within Avonlea components in the foothills of Alberta (Reeves 1983:165). Reeves postulates that the Avonlea peoples migrated east to replace Pelican Lake in Saskatchewan and elsewhere on the plains at around 150-250 AD (Reeves 1983:102). A common criticism of this theory is that in the twenty years since this particular theory appeared in the published literature, no researcher has yet come forth with evidence of a Pelican Lake to Avonlea transitional phase anywhere in the northern plains. Furthermore, the list of shared or similar attributes between the two complexes remains sparse. As such, Pelican Lake is not a clear ancestral complex for Avonlea.

Another theory on the origins of the Avonlea complex has recently been suggested by Walde and Meyer (in press). In their reclassification of Avonlea pottery into ceramic wares, they identified Rock Lake Fabric/Net Impressed ware, Truman Parallel Grooved ware, and Plain ware in certain non-Avonlea contexts. Specifically, these wares were identified within the Brainerd phase assemblages of northern Minnesota and the “Bed H” component of the Lockport site in south-central Manitoba (which Walde and Meyer classify as the “Rock Lake phase”). Both the Brainerd phase and the Rock Lake phase (which may be regional variations of the same phase) pre-date the oldest accepted date for the Avonlea complex by 500-1000 years (Walde and Meyer, in press). Thus
Walde and Meyer have indicated that the subsequent presence in Avonlea components of these three ceramic wares contained within the Brainerd and Rock Lake phases may indicate a movement of population east to west, from the parklands/eastern woodlands onto the plains. Under such a model, the populations of the Brainerd/Rock Lake phases may be ancestral to Avonlea. An alternate interpretation or a criticism of this theory is that the western introduction of these ceramic wares may simply be the result of culture contact between these two groups. Thus, rather than be the result of an incursion onto the plains by woodland groups the ceramics may have become incorporated into the Avonlea complex through cultural diffusion or the transition of ideas between these eastern groups and the populations already in residence on the plains.

4.6 Contemporaries on the Plains and Adjacent Regions

Avonlea projectile points have been found in seeming association with a number of artifacts from other archaeological complexes, such as the previously discussed Pelican Lake example (Reeves 1983), Besant (the subject of Chapter 8), and Old Women’s assemblages. This, in of itself, does not necessarily translate into evidence for contemporaneity or even temporal overlap between these cultures. Kehoe (1988:8) has suggested that “cultural deposits containing both Avonlea and other types of projectile points are as a rule either unstratified or disturbed”.

The claim of contemporaneity with Avonlea would be strengthened if in addition to the overlap in radiocarbon dates and the occasional mixed assemblage there was also evidence for interaction in the form of trade or the dissemination of ideas between the two cultures. This interaction could be demonstrated archaeologically by the traits common to the artifacts of one culture being adopted by the other.
4.6.1 Laurel as an Avonlea Contemporary

Data from radiocarbon assays appear to indicate that Laurel and Avonlea coexisted for approximately 500 years in the later part of the first millennia AD (Meyer and Epp 1990:328). The highest degree of geographical overlap between these two complexes appears to be in Saskatchewan as Laurel is absent in Alberta and Avonlea is scarce in Manitoba. During this time of overlap Avonlea cultural groups occupied the plains and woodland areas while the Laurel groups occupied the adjacent boreal forest. It is thought that the interaction between these two groups occurred within the southern fringe of the boreal forest. This is supported by the presence of a number of Avonlea sites in this region that either have Laurel artifacts within their assemblage or have Laurel cultural influence reflected in the stylistic features of otherwise unmistakably Avonlea artifacts, or both of the above.

One such site, the Yellowsky site located on the east shore of Turtle Lake, has produced one Avonlea point and 1339 pottery sherds thought to represent four separate vessels. Three of these vessels exhibit a smoothed net impression on the exterior surfaces (thereby possibly being classifiable as Rock Lake Fabric/Net Impressed ware), and one vessel exhibits a completely smooth exterior surface. In addition one of the vessels appears to manufactured by the coiling method, a trait more commonly associated with Laurel ceramics (Meyer et. al 1988:35).

Another site of similar attributes is the Gravel Pit site located along the north side of the Saskatchewan River, approximately 8 km southwest from the town of Nipawin (Klimko 1985:5). While it was not possible to achieve vertical separation between occupations at this site, four occupation areas were defined. Two of these areas (Occupation Areas 1 and 3) produced predominantly Avonlea artifacts (Klimko 1985:75). Occupation Area 1 produced three Avonlea projectile points (Klimko 1985:57; Meyer et. al 1988:38). In this same occupation sherds from at least two coil manufactured vessels were
recovered. Both vessels are considered to be Avonlea by the excavators (Meyer et. al 1988:38).

Occupation Area 3 produced sherds from three ceramic vessels considered to belong to the Avonlea complex as well as an adze and two adze preforms (Klimko 1985:63). The adze, thought to be used predominantly in woodworking tasks, is common in the Laurel toolkit but normally entirely absent in Avonlea assemblages. One vessel has a smoothed textile impressed exterior and appears to have been manufactured using the coiling technique. It is also decorated with bosses, a trait more common to Laurel vessels. The second vessel has a textile impressed exterior and is also decorated with bosses, but was not manufactured by coiling. The third vessel has a plain exterior finish, no bosses, nor was it made by coiling. In addition to these ceramics, one Laurel vessel was found associated with this Avonlea component (Meyer et. al 1988:38).

Both the Yellowsky site and the Gravel Pit site are thought to represent Avonlea groups interacting with and being influenced by people of the Laurel culture (Meyer et. al 1988:39). The single Laurel vessel at the Gravel Pit site is thought to represent trade between these two cultural groups rather than being viewed as an intrusive artifact. Component mixture is thought to be unlikely in this case as the rest of the ceramics, though they are Avonlea, also display some Laurel traits.

The data on seasonality acquired from both Avonlea and Laurel sites along the southern boreal forest periphery indicate that much of this interaction was taking place in the spring/early summer (Meyer and Epp 1990:332). Both Laurel and Avonlea groups can be demonstrated to have occupied this area during the spring/early summer, whereas it is thought that Avonlea groups retreated to the parkland during the fall/winter to exploit the migrating bison herds and that winter also marks a period of maximum population dispersion among forest based groups.
4.6.2 Other Possible Contemporaries

There are few additional examples of Avonlea groups interacting with neighboring groups. One case may exist along the eastern periphery of the Avonlea distribution. There is some evidence that Avonlea groups may have encountered an expanding Blackduck population in the Pembina River Valley and the adjacent parkland/long grass prairie of southwestern Manitoba. This evidence comes in the form of Avonlea points being encountered in association with Blackduck materials at both the Stott and Avery sites. At the Stott site, ten Avonlea projectile points were found among the prairie side-notched points that characterize the Blackduck component at this site (Joyes 1988:230). A similar situation exists at the Avery site where Avonlea points are found among Blackduck as well as other components. However, it has been noted that “a great deal” of component mixing had occurred at this site (Joyes 1988:231). It may be that these two complexes were entirely contemporaneous with each other, but rarely interacted as their geographic distributions only overlapped in southwestern Manitoba, an area which has produced very few Avonlea sites. It is possible that Avonlea groups were prevented from migrating into Manitoba in any significant numbers by the presence of a large resident Blackduck population.

There have also been cases reported of Avonlea points found within Pelican Lake or Old Women’s components. A strong argument against the possibility of a Pelican Lake-Avonlea coexistence is the apparent 500 year gap in radiocarbon dates between the end of the Pelican Lake complex and the beginning of the Avonlea complex. Also, in cases where well defined stratigraphy is present, there is frequently an intermediary Besant complex component between the two.

In the case of the Old Women’s phase, it seems likely that these two archaeological entities enjoyed an ancestor-descendant relationship, wherein the Old Women’s phase emerged out of the Avonlea complex or out of a merger
between the Avonlea and Besant complexes and gradually replaced Avonlea across the plains (Vickers 1994:22). Thus, it seems likely that both complexes were the product of a single hunter-gather population.

4.7 The Fate of Avonlea

The prevailing consensus in the literature seems to be that the Avonlea complex played a significant role in the formation of its successor on the plains: the Old Women’s phase. It is also thought that the Old Women’s phase inherited traits from the Besant complex as well. This suggests that there may have been a merger between the Avonlea and Besant complexes resulting in the creation of this new phase (Duke 1988:268, Vickers 1994:22).

Strong similarities have been noted between the Avonlea projectile point and the equally delicate and well crafted Plains side-notch point of the later part of the Old Women’s phase (Reeves 1983). While it has been suggested that these similarities lend themselves to the notion that the Avonlea point style developed into the Plains side-notch point style, it may also be the case that the Plains side-notch point originated elsewhere and was brought onto the plains by later groups. It has also been proposed that while the Prairie side notch arrow point most closely resembles the Samantha point of the Besant complex, the impetus to switch from a dart point to an arrow point may have come from contact with Avonlea groups (Duke 1988:268).

There is also evidence for continuity in pottery styles between the Avonlea complex and the Old Women’s phase (Vickers 1994:22, Walde and Meyer 2003:142). Specifically, Ethridge ware is present in certain late Avonlea assemblages but is also the dominant ceramic ware in the Old Women’s phase. This implies that there was cultural continuity between the two groups (Walde and Meyer 2003:142) and also suggests the possibility that they were in fact the same population that simply modified their projectile point style over time.
4.8 Discussion

There are many aspects of the Avonlea complex, as I have outlined it here, that I wish to discuss in more detail. First among them is the peculiar location of the eastern boundary of Avonlea’s distribution. As previously mentioned the easternmost Avonlea sites are found along the western edge of the province of Manitoba and the states of North and South Dakota. Unlike northern and western boundaries, the eastern one does not coincide with a major geographical boundary such as the foothills of the Rocky Mountains nor with a major ecological shift such as the transition from parkland to boreal forest. There is no reason to believe that Avonlea groups were incapable or poorly suited to exploit the parklands and long grass prairies of the central portions of Manitoba and North and South Dakota, for Avonlea sites have been found in the parklands of both Alberta and Saskatchewan. Indeed, the areas immediately to the east of the eastern boundary would have had an equal if not greater amount of biodiversity of animal species, including the mainstay of Avonlea subsistence: bison.

It is reasonable to propose that there were other cultural groups present in Manitoba and the Dakotas and that they were present in such numbers as to discourage Avonlea expansion eastward. A likely candidate for this resident population seems to be the Besant complex as Besant sites are numerous in these areas. If the Besant occupation of these areas was concurrent with the Avonlea occupation of the plains, than we could expect to find some evidence of peripheral interaction between these two groups, similar to what we have seen between Avonlea groups and Laurel groups in the southern limit of the Saskatchewan boreal forest. However, no such evidence has been put forth. This is an issue I will readdress in chapter seven.

In a somewhat similar situation, the Avonlea complex may have only expanded into the Saskatchewan parklands towards the end of its occupation on the plains (Meyer et.al.1988:40). This is counter to what we might expect,
for if large herds of bison have always migrated into the parkland during the fall and winter, then Avonlea groups should be present in the parkland from the onset of the Avonlea complex. It might seem reasonable to propose (as we did in the case of the eastern boundary) that another cultural group such as Besant was occupying this area and thus denying Avonlea groups access to the parklands. However Besant sites are not as common in the Saskatchewan parkland as they are further east. Nor does it seem likely that parkland resources were ever exploited in any major way by boreal forest groups. Thus, there is no obvious candidate that could have prevented Avonlea from occupying the parkland from the time of its first appearance on the plains onwards. Perhaps, instead of a late Avonlea occupation of the Saskatchewan parkland, we are dealing with an incomplete or biased sampling of the full span of Avonlea radiocarbon dates in the parkland.

Another topic worthy of discussion is the variation found within the projectile points manufactured during the Avonlea complex. To date it seems that the variation in Avonlea projectile point styles is very poorly defined. The morphological differences between some of the proposed styles seem so minute that it is difficult to conceive of these variations as representing differences in ethnicity. Furthermore, none of the proposed point styles can be demonstrated to be temporally or geographically distinct from the main suite of Avonlea archaeological traits. As such, none of these point styles can be classified into a separate phase of the Avonlea complex. Therefore I question the usefulness of continuing to sub-divide the variation present within the Avonlea projectile point form into separate point styles.

The projectile point styles proposed by Kehoe and Reeves were based on a rather limited sample size. Kehoe based his typology upon the variation of Avonlea projectile points found within a single site, the Gull Lake site (Kehoe 1966), and Reeves (1983) physically examined Avonlea points from two sites: Head Smashed In and the Timber Ridge. By current standards, this seems like
an inadequate sampling size to generate a typology of Avonlea projectile points that could be useful throughout the entire geographic range of the Avonlea complex. By way of comparison, Peck and Ives (2001) examined 2327 projectile points from multiple sites in their reevaluation of the projectile points associated with the Old Women's phase. Perhaps then a reevaluation of Avonlea projectile point styles is in order, one that would incorporate a great deal of the data that has come forth since Reeves's 1983 work was published. The alternative is to continue using the generic term "Avonlea projectile point" without identifying trends in morphological variation.

Another point of interest is the appearance of Ethridge ware within the Avonlea complex. Ethridge ware vessels are believed to have been manufactured using the paddle and anvil technique; the same technique used to make Besant ceramics. The result of which is that both Ethridge ware vessels and Besant ceramics have a similar exterior surface finish referred to as "cord-roughened". Walde and Meyer (2003) have classified Avonlea components where this ceramic ware is present as belonging to the Upper Kill phase. If we view the paddle and anvil technique as a Besant trait, then there seems to be a possibility that Upper Kill phase groups may have had contact with or were otherwise influenced by Besant complex groups. And while Besant is not the only archaeological complex to have used the paddle and anvil technique, the other examples of this technique are largely only present in the Eastern Woodlands and usually date to an earlier time period: the Early Woodland period (Gregg and Picha 1989:40). Thus the Besant complex with its geographic distribution well out onto the plains seems to be the only possible source to have transmitted this pottery style to the Upper Kill phase groups. An alternative theory is that the Upper Kill phase groups developed this technique internally and were not influenced by outside populations.

Ethridge ware is also the dominant ceramic ware in the Old Women's phase. There seems to be a prevailing opinion among researchers that the Old Women's phase represents a merger between the Avonlea and Besant
complexes. Perhaps then, the Upper Kill phase of the Avonlea complex with a ceramic style that was possibly influenced by the Besant complex marks the beginning of the gradual transition into the Old Women's phase (Meyer and Walde n.d.). Evidence that lends itself to this argument includes the late appearance of Ethridge ware in the Avonlea complex. It only occurs after the Morkin phase has terminated. This would place it towards the end of the temporal range of the Avonlea complex, exactly where a predecessor to the Old Women's phase would be expected to appear.

The issue of which preceding archaeological complex gave rise to the Avonlea complex is also an issue worth discussing. The most convincing of the three arguments put forth seems to be the suggestion that the Avonlea complex is related to the Rock Lake phase of south central Manitoba (Meyer and Walde in press). In turn, the latter is related to the Brainerd phase of northern Minnesota. For indeed, it seems as if there is continuity in ceramic styles between the Avonlea complex and these two groups. However, the issue of where the Avonlea projectile point originated is not addressed under this model. The projectile points from the components bearing Brainerd or Rock Lake phase materials are decidedly non-Avonlea. Nor is there an obvious precursor among the other woodland groups in this area. It would seem then that the Avonlea projectile point was a completely new innovation developed internally among groups that had migrated onto the plains. Perhaps it was developed as a response to the shifting environmental pressures and new subsistence strategies were required as a result of moving from a woodland environment out onto the open grasslands.

Whatever the case, there is still no indication of an earlier projectile point that is remotely similar to the Avonlea point. Nor is there any indication of a transitional form existing between Avonlea and a preceding archaeological complex on the plains or adjacent woodlands. If the Brainerd/ Rock Lake phase is ancestral to the Avonlea complex, then we should be able to find transitional forms between the side-notched projectile points used by the woodland groups
and the Avonlea point either in the parkland of Manitoba or Minnesota, or out in the open grasslands.

4.9 Summary

Avonlea groups existed in various locations throughout the plains from approximately 1700 to 900 rcybp. During this time period Avonlea groups occupied portions of the prairie and parkland regions in Alberta, Saskatchewan, Manitoba, North and South Dakota, Montana, and Wyoming. There appears to be some discrepancy in radiocarbon dates from region to region. The earliest dated Avonlea components (1700 -1500 rcybp) appear in southeastern Alberta, southwestern Saskatchewan, northern Montana, southwestern Manitoba, and northwestern South Dakota, while most other sites fall in the 1500 -1000 rcybp range.

There is evidence for continuity of ceramic wares between the Brainerd phase of Minnesota and the Avonlea complex. There also appears to be a clear continuity between the Upper Kill phase of the Avonlea complex and the subsequent Old Women's phase. This suggests that these groups could have been related in terms of ethnicity.

Avonlea groups seem to have interacted with Laurel groups in the adjacent boreal forest. Most of this interaction appears to have taken place within the southern limits of the boreal forest in Saskatchewan. Evidence for interaction between Avonlea and other groups remains unclear.
5.0 Relative and Absolute Dating

5.1 Introduction

There are two fundamentally different ways to obtain an age estimate for an archaeological event such as a component or a feature: the archaeologist can employ a relative dating technique such as comparing the stratigraphic relationship between two events or the archaeologist can attempt an absolute dating technique such as a radiocarbon assay. It stands to reason that an archaeologist would strive to employ all dating techniques that were available, both relative and absolute, in order to ensure the greatest accuracy in the age estimate of the event in question. However, in the case of the Avonlea and Besant complexes on the northern plains, relative and absolute dating techniques illustrate two very different scenarios of Besant-Avonlea interaction. Simply put, absolute dating suggests an almost complete temporal overlap between the two complexes, whereas relative dating tends to indicate that the Besant complex precedes the Avonlea complex.

Therefore, I feel that it would be relevant to this thesis to include a discussion of these two main categories of dating methods. I intend to discuss the underlying principles of each as well as the types of errors intrinsic to each method that might allow for the age of an archaeological event to be misrepresented.

There are also some fundamental principles concerning dating archaeological components in general which should be discussed prior to dealing with the individual dating methods. For one, it should be noted that the “dated event” for which a date is produced (the point at which a strata is closed, or when an organism stops absorbing radiocarbon) is not necessarily the same as the “target event” (the formation of the archaeological site) which the
archaeologist is attempting to ascertain. The reasons for this can vary, but it mostly deals with the strength of the association that is established between the materials being dated and the archaeological component. In addition, this uncertainty results in there being two terms used for discussing the usefulness of an age estimate: accuracy and precision. Accuracy describes the relationship between the estimated age and the actual age of the archaeological event. Thus, an accurate date is one where there is good reason to believe that the estimated age generated is very close to the age of the archaeological component. Precision refers to the reproducibility of the results of the dating method. This is a measurement of how close repeated dating attempts come to the same value. Thus, a precise date is one that has been collaborated by multiple radiocarbon assays using materials from the same component or by observing similar stratigraphic relationships at other sites. However, a precise date need not necessarily be an accurate date, and vice versa (Nash and Dean 2000:8).

5.2 Relative Dating

Relative dating has been defined as “the production of a series of events where no fixed or calendric dates exist” (O’Brien and Lyman 1999:V). Thus with relative dating the archaeologist would be able to place two or more occupational levels, features, or even artifacts in relative chronological order but would not be able to determine where on the calendric scale these archaeological events fit in. Other limitations of relative dating include the inability to discern the duration of an archaeological occupation and being unable to determine how much time elapsed between the events placed in a relative chronological sequence.

There are several methods that can be employed in establishing a relative chronological sequence between two or more archaeological events. The most common method (and the most universally applicable) is stratigraphic
analysis: the interpretation of the stratigraphic relationship between the archaeological events that are to be dated. Other techniques exist, but are somewhat less applicable to plains archaeology. These techniques include seriation, cross-dating, dating by rates of sediment accumulation, and dating by rates of chemical change in sediments (O'Brien and Lyman 199:6). Of the preceding methods, I will discuss only stratigraphic analysis, seriation, and cross-dating as they are techniques which are commonly applied in plains archaeology.

5.2.1 Stratigraphic Analysis

In the discipline of archaeology, stratigraphic analysis has been defined as "the archaeological evaluation of the significance of stratification to determine the temporal sequence of data within stratified deposits using the laws of superpostion and context analysis" (Stein 2000:17). Thus defined, stratigraphic analysis is primarily used as a method of relative dating, both by itself and in conjunction with the seriation and cross dating methods. Observing the stratigraphy of an archaeological site also provides information about how the depositional layers present at the site were formed. This can play a key role in the overall interpretation of the site.

The establishment of a relative chronological ordering is achieved by interpreting the stratigraphy of a site using the Law of Superposition. This geological principle states that in any given mass of undisturbed stratified sediments, those sediments that were deposited first will be on the bottom and those that were deposited last will be on the top (Harris 1989:39; O'Brien and Lyman 1999:140). In order to be able to use stratigraphy to sort archaeological components chronologically, certain requirements must be met during the excavation of the site. This is done either by recording the relationship between artifacts and natural stratigraphy as the excavation progresses or by observing the stratigraphy present in a wall profile after the excavation is complete (Stein
2000:15). Archaeological components are then assigned a relative age based on their stratigraphical or “superpositional” relationship with other archaeological components within the same stratigraphic sequence. Only two superpositional relationships are possible: either the two archaeological components are located within the same strata, or one is above the other. In the case where two archaeological components are found within the same natural strata, it is considered likely that they are of similar ages. In all other cases, an archaeological component is considered to have occurred after any component located in the stratum beneath it and before those components located in the stratum above it (Harris 1989:34; O’Brien and Lyman 1999:11). Obviously then, the accuracy of the relative dates generated in this manner is only as good as the criteria used to distinguish between one strata and the next (O’Brien and Lyman 199:147).

There are a multitude of factors which can lead to incorrect interpretations of the stratigraphy. There are three major issues that have been identified as the primary causes of error with this method of relative dating: identifying disturbances within the stratigraphic sequence, interpreting layer interfaces, and the inherent differences between natural and man-made stratigraphy.

The majority of the problems and inaccuracies encountered in using the stratigraphic dating method seem to stem from the difficulty in identifying when the stratigraphic sequence has been disturbed by either natural or man made events. All stratum are subject to disturbances, be it disturbances caused by burrowing animals, forces of nature (erosion), or works of man (the digging of ditches, holes, etc)(Harris 1989:52). It is well documented that these disturbance factors can result in the artifacts of one archaeological strata making their way into the assemblage of another strata located elsewhere in the stratigraphic sequence. Taking this into account, Harris (1989:121) has created three categories of artifacts which may be found within any given archaeological
component. The first artifact type has been classified as “indigenous remains” and includes all artifacts which were manufactured at approximately the same time as the formation of the strata in which they were found. The second type of artifact has been termed “residual remains” and encompasses all those artifacts were made at a significantly earlier time period than the formation of the strata in which they were found. The third category of artifacts are the “infiltrated remains” and include all objects which were made at a significantly later time period than the formation of the strata in which they were found.

Regardless of whether archaeologists use the terms outlined by Harris, it remains crucial for the stratigrapher to identify which artifacts are indigenous to the strata before assigning a date or a cultural affiliation of any sort to it. Distinguishing between indigenous and infiltrated or residual artifacts is particularly relevant to the interpretation of a level containing both Besant and Avonlea materials where it is debatable whether both diagnostic artifacts were deposited at the same time or if there was some component admixture that took place.

Some researchers have suggested that a great deal of the difficulty encountered in interpreting stratigraphy stems from treating strata created as the result of human activities in the same fashion as strata created through natural processes. Harris (1989:48) maintains that strata which are created by human manufacture are “formed without regard for the laws which result in natural stratification”. In particular, stratigraphy formed by natural processes follows topographical contours, whereas strata created artificially by human activities tend to have areas of preferential use and may be localized entirely within areas not conducive to the formation of natural stratigraphy (ie: on the top of hills). Also, strata created by human activity may include materials that would not have otherwise become incorporated into the strata. This includes materials from lower strata that have been exposed by erosional events and then transported uphill and incorporated into human activity areas.
In addition, archaeological strata tend to be created much more quickly than geological strata (O'Brien and Lyman 1999:180). The result of which is that archaeological strata may be more difficult to identify or to separate from one another. Also there is the inclination to assign multiple archaeological strata located in the same geological strata to the same relative age, which may be an erroneous assumption if the geological strata was formed over a long period of time. Ultimately, the process of stratigraphic phasing (the process by which it is determined which strata belong to which period of occupation) is arbitrary and relies largely upon the experience of the archaeologist attempting to interpret the stratigraphy (Harris 1989:108).

Further complicating the establishment of a relative chronology through stratigraphic analysis is the issue of layer interfaces. A layer interface refers to where one strata ends and another one begins. Typically this represents a undetermined gap in time wherein the upper surface of the bottom strata existed as a usable surface (ground level) for a period of time. There is, however, no method by which we may ascertain the length of time that the surface of the lower strata lay exposed before it was finally buried by the subsequent strata. It may have been possible for certain portions of the lower strata to remain exposed and used as a ground surface while other portions were buried, particularly if the strata is not flat (Harris 1989:55). It may therefore be possible that two archaeological strata can be distinct from one another in some wall profiles, but share the same living floor at other portions of the site.

It should be clear then that while stratigraphic analysis is of enormous use in establishing the relative chronological ordering of the components in an archaeological site, it is far from being foolproof. There are many exceptions and factors specific to archaeological or strata of predominantly human origin that must be taken into account. Thus the Z axis or depth of an artifacts provenience does not necessarily correlate to its relative age. Nor are artifact's found at the same depth necessarily contemporaneous with each other (Harris 1989:124).
5.2.2 Seriation Dating

The process of seriation dating has been defined as “a descriptive analytic technique the purpose of which is to arrange comparable units along a line such that the position of each unit reflects its similarity” (O’Brien and Lyman 1999:60). The result is the creation of a linear series of variations within a single artifact type (such as pottery) that also implies the passage of time. Thus by comparing the attributes of an artifact to those within a seriation of the same artifact type from the same geographic area, the relative age can be ascertained. The comparison between artifacts is based on such attributes as artifact form and decorative technique. In order to create a series that can be used for relative dating, the artifact type must have attributes that change over time and that can be demonstrated to remain static for a brief period of time (O’Brien and Lyman 1999:28). Furthermore, seriation requires that all artifacts come from the same local area, thus ensuring that the archaeologist is dealing with change over time and not contemporaneous regional variation of the same artifact (O’Brien and Lyman 1999:140).

There are a number of assumptions upon which seriation is based. This method assumes that artifact types follow the pattern of “descent with modification” wherein so called “descendant” forms of an artifact share traits with “ancestral” versions of the same artifact (O’Brien and Lyman 1999:65). This supposedly represents the same or culturally related groups of people gradually altering the way in which they produce a certain artifact type as time progresses. Thus the more similar the artifacts are to each other, the more closely together in time they were probably manufactured, and vice versa. The potential difficulty in this reasoning is that two artifacts may share similar attributes but have no ancestor-descendant relationship as they were made by two different groups of people who arrived at making similar artifacts independently. Therefore, because two artifacts can be placed within a series does not in and of itself prove a relationship between the makers of the two
artifacts; rather, such a connection must be established before the seriation
method of relative dating can be employed.

Seriation offers advantages over stratigraphic analysis in that the
seriation method establishes a date for the artifact itself as opposed to simply
establishing a relative date for the strata in which the artifact was found. Thus
seriation removes the problem of establishing an association between the
object actually being dated and the artifact you want to date. However, it has
been observed that there seem to be many more ways to arrive at an incorrect
conclusion using the seriation method than there are in stratigraphic analysis
(Rowe 1961:330). In addition to its own problems, seriation relies upon
stratigraphic analysis to “guide the seriation process” (Stein 2000:39), meaning
that the relative stratigraphic position of the artifacts to be serialized determines
which artifact is ancestral and which is descendant. Thus the two dating
methods are linked and any errors in the stratigraphic analysis may cause
errors in the seriation.

It would appear that seriation does not play as large a role on the
northern plains as it does elsewhere on the continent, such as in the American
Southwest where it has long been used to great effect. This is perhaps
because pottery, which forms the basis for a good number of seriations,
appears to remain static for long periods of time, as is the case with Ethridge
Ware which originates in the Avonlea complex and persists relatively
unchanged through the Old Women’s phase up until the time of contact. Thus
northern plains pottery does not seem to meet the requirements for seriation
dating.

It may be possible to create a seriation of artifacts using projectile point
styles, particularly if one examines the variation within projectile points assigned
to the same complex. The Besant complex is a good example of this. Therein
a great deal of variability lies, and several point types have been identified. If
these point types can be arranged into a series that follows the gradually

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changing size and shape of Besant points and also flows from oldest point types to the youngest point types, then an archaeologist would be able to place Besant components into a relative chronological framework based on the morphology of Besant points indigenous to each component. However, even while it may be possible to arrange such projectile points into a series where they display a logical progression of attributes, I believe that it cannot at present be demonstrated that these projectile point styles follow one another chronologically.

5.2.3 Cross-Dating

Cross dating has been defined as “the temporal correlation of geographically separate archaeological manifestations” (O’Brien and Lyman 1999:190). This correlation between archaeological components at sites in different geographical regions is achieved primarily by the use of “index artifacts”. An ideal index artifact is one that has a relatively brief duration and one that is difficult to confuse with earlier or later versions of the same artifact type (O’Brien and Lyman 1999:189). The reasoning is that any two components that contain the same index artifact must be close together in age. When a component contains a suite of such artifacts, it is sometimes referred to as an archaeological “Horizon” and can be used to synchronize the stratified masses of multiple archaeological sites. Obviously, the likelihood of contemporaneity between two components increases with the greater number of index artifacts they have in common. This is particularly true if the shared artifacts have an extremely limited temporal distribution (O’Brien and Lyman 1999:214).

There are some problems associated with using this method of relative dating. Foremost is the difficulty encountered in designating index artifacts. Great care must be taken to select one that is easily distinguishable from preceding and antecedent forms. Besant series projectile points, for example, are not well suited for such a role as they can be difficult to distinguish from
Early Side-notch or Middle Woodland projectile points. Misidentification of an index artifact would lead to a miscalculation of the relative age of that particular component. Similarly, artifacts with a broad temporal and geographic range make poor choices for cross dating as it is unlikely that they occupied their entire distribution area simultaneously (O'Brien and Lyman 1999:185). Thus, it would be erroneous to assume that each instance of widely dispersed phenomenon shares the same relative age. Furthermore, it should also be noted that even if it can be demonstrated that two sites share many similar artifacts and are likely contemporaneous, it still does not necessarily imply that they share an ethnic link as well. Two separate groups of people may come to utilize the same suite of artifacts by means of peripheral interaction and trade (O'Brien and Lyman 1999:214).

5.3 Absolute Dating

In contrast to relative dating which “merely” places events in the order in which they occurred, absolute dating generates dates that are tied into a quantifiable scale, typically the calendric system. There are some useful advantages to using this type of dating method. Since the absolute date is expressed in terms of its position on the calendric scale, this allows the elapsed time between two dates to be measured, be it the elapsed time between two archaeological components or the elapsed time between an archaeological component and a known event (such as the arrival of Europeans, the present, etc). Furthermore, absolute dates can be compared between sites without relying on either index artifacts or the context of the archaeological strata.

There are multiple techniques used in absolute dating. Of particular relevance to plains archaeology are the techniques of radiocarbon dating, thermoluminescence dating, and dendrochronology (for the purposes of calibration). In this respect, I will focus primarily on radiocarbon dating as it
forms the basis for the argument that the Avonlea and Besant complexes were contemporaneous.

5.3.1 Radiocarbon Dating

My main interest lies in examining the circumstances that might result in a misleading or erroneous radiocarbon date. However, before such a discussion can take place it is important to understand how radiocarbon dates are generated and what effect calibration has on the accuracy of such a date.

5.3.1.1 Basic Principles Involved

The salient points regarding $^{14}$C production and distribution are that it is produced naturally in the upper atmosphere and then distributed worldwide in the form of $^{14}$CO$_2$. In that form $^{14}$C becomes absorbed into living organisms. The metabolic processes of these living organisms keep the amount of $^{14}$C within their bodies in equilibrium with the atmospheric $^{14}$C. When the metabolic processes of the living organisms cease, the $^{14}$C present within their bodies begins to decay at a fixed rate (Taylor 1987:2). Radiocarbon dating measures the $^{14}$C present within the material remains of an organism and compares it with the percentage of $^{12}$C, the most common variant of carbon. Assuming that the ratio of $^{14}$C to $^{12}$C in living organisms is the same now as it was in the past, the age at which the organism died can be calculated by comparing how much $^{14}$C there is left in the sample to how much should have been present when the organism died.

Due to the randomness of atomic decay (the release of electrons is not necessarily constant from one second to the next), a radiocarbon date does not indicate a specific point in time, rather “it expresses the time interval within which there is a given probability that the $^{14}$C age is correct” (Taylor 1987:125). Thus radiocarbon dates are typically expressed as a date accompanied by a standard deviation which encompasses the time interval with the highest
probability of containing the correct age. The age put forth in the radiocarbon date has the highest probability of being the actual age of the sample, with the probability decreasing as the limits of the standard deviation are approached (Aitken 1990:80). However, there are some researchers who disagree with that assessment and claim that the odds of the sample being the exact age of the radiocarbon date actually approaches zero (Taylor 1987:123).

5.3.1.2 Calibration

It is now recognized that while the rate of decay of $^{14}$C has always remained constant, the rate of $^{14}$C production in the upper atmosphere has fluctuated over time. As a result, there is a discrepancy between the years measured by radiocarbon dating and true calendar years. Thus, some of the radiocarbon years are longer or shorter than an actual calendar year, depending on the amount of $^{14}$C that was produced in the atmosphere that particular year. This discrepancy has been termed “secular variation” (Taylor 1987:20). There is no means by which to account for secular variation prior to or during the laboratory procedure that produces the radiocarbon date. However, a date expressed in radiocarbon years can be converted into the calendric scale by means of a process known as calibration.

Calibration of a radiocarbon date is usually achieved by comparing radiocarbon dates to samples of wood for which there is a known dendrochronological date (expressed in calendar years)(Aitken 1990:4). Such comparisons result in the creation of a “calibration curve” which can then be used to convert an age expressed in radiocarbon years into calendar years. In the eventuality that the two dates differ, the radiocarbon date is brought into synch with the date generated by dendrochronology. Radiocarbon dates fluctuate between being younger than their corresponding dendrochronological dates and being too old. The maximum divergence between radiocarbon and dendrochronological dates occurs at 4500-5000 BC and consists of a deviation
of between 650-800 years (Taylor 1987:24). However, for the period
encompassing both the Besant and the Avonlea complex, there is a tendency
for the radiocarbon dates to consistently indicate an older age than the actual
age of the sample they are dating, but to a maximum of 150 years (Aitken
1990:98).

The process of calibration can have an unpredictable effect on the
accuracy of the radiocarbon date. Due to secular variation, the calibration
curve of radiocarbon dates vs. dendrochronological dates has an up and down
or “wiggly” nature. There are three possible consequences of this. First, a
single radiocarbon date can intersect the calibration curve at multiple locations,
thus a single radiocarbon date can generate multiple calibrated dates, all of
which are equally valid. Second, if the radiocarbon age intersects the
calibration curve as its angle approaches zero (a “plateau”), then the time
interval expressed by the radiocarbon age is increased as a result of
calibration (Aitken 1990:98). The opposite is also possible: if the radiocarbon
age intersects the calibration curve when its angle is between 45 and 90
degrees, then the time interval of the calibrated date is narrower than the
original radiocarbon date. Third, the calibration curve itself has an associated
margin of error. Thus, the error margin of the calibration curve is combined with
that of the radiocarbon date resulting in a calibrated date with a larger margin of
error than the original radiocarbon date (Aitken 1990: 99).

It should be clear then, that calibrating a radiocarbon date does not
usually result in a smaller time interval than the raw radiocarbon date. However
there are multiple reasons why an archaeologist would want to calibrate. For
one, calibration allows comparisons to be made between dates generated
through the radiocarbon dating method and dates generated by other absolute
dating methods such as thermoluminescence, which returns dates in calender
years (Aitken 1990:93; Taylor 1989:134). Calibrated radiocarbon dates can
also be compared to events recorded in the historical record whereas
uncalibrated dates cannot. This could be used for such applications as correlating archaeological remains with distinct historic ethnic groups. Furthermore, as there are sometimes discrepancies between the time interval of an archaeological complex that is indicated by the raw radiocarbon dates and the time interval indicated by the calibrated equivalent, calibration may therefore produce a more correct assessment of the time interval being measured (Aitken 1990:93).

5.3.1.3 Problems Associated with Radiocarbon Dating

Beyond the statistical error intrinsic to all radiocarbon dating due to the randomness of atomic decay (also called “Count Sampling Error” [Long and Rippeteau 1974:205]), there are a number of factors which can contribute to making the radiocarbon date less accurate. These elements can be divided into three categories that are relevant to plains archaeology: sample provenience factors, sample composition factors, and experimental factors (Taylor 1989:15).

Experimental factors include errors that can be made while collecting the sample in the field as well as errors that can occur while processing the sample in the laboratory. Field errors can consist of careless sample storage (such as the use of inappropriate sample containers) which may cause the sample to become contaminated from contact with a modern carbon source. There are also known instances of the sample being mislabeled, which could lead to the radiocarbon date generated from the sample being assigned to a component other than the one from which it originated (Taylor 1989:107, Aitken 1990:92). Often these errors are only discovered after the sample has been processed and the date returned is either much younger or much older than expected. Laboratory errors mostly involve the insufficient removal of contaminants. These contaminants can include organic material that originated from sources
other than the object to be dated or carbonates that have precipitated out of the groundwater (Taylor 1989:107).

Another aspect of experimental factors leading to misleading radiocarbon dates involves the periodic adoption of new techniques for determining the $^{12}$C to $^{14}$C ratio. The general trend is that radiocarbon dates have become more accurate over time as new techniques have been developed. Taylor (1989:111) has indicated that “dozens if not hundreds of cases exist where later research with more advanced methods demonstrated that the earlier date thought to have good association with the event in question was incorrect by a large margin”. This is especially true in instances where the original radiocarbon date was generated from a composite sample of charcoal or bone fragments. Similarly, as procedures vary between laboratories, which lab the radiocarbon sample gets sent to can have an impact on the date returned. At the Fitzgerald site, for example, four radiocarbon samples were collected from the same bone bed and were sent to two different laboratories. Each lab returned a pair of dates that were fairly close together, but were not consistent with the dates returned from the other lab (Hjermstad 1996:26). Thus it would be wise to assume that some of the radiocarbon data I am using in this thesis to compare the chronological placement of the Besant and Avonlea complexes is erroneous.

Problems arising from sample composition factors deal mostly with the contamination of the sample submitted for radiocarbon dating. Contamination is described as “a process involving the incorporation of non indigenous organics into a sample matrix”(Taylor 1989:39). This can occur through the mixing of components as the result of animal or geological activity. These reworked or eroded deposits can contain organic material or even artifacts that are non indigenous to the archaeological component they have become associated with. Thus, a sample taken from such a component may include or consist entirely of a carbon source that is in no way contemporaneous with the archaeological materials. Obviously, if modern carbon becomes incorporated into a sample,
the date returned will be younger than the archaeological component. Furthermore, the older the indigenous sample is, the more extreme the effects of contamination are likely to be (Aitken 1990:86). Similarly, contamination by a fossil carbon source would have the opposite effect, making the radiocarbon date appear much older than it is.

Problems with radiocarbon dates arising from sample provenience factors involve the certainty of association that can be established between the material submitted for radiocarbon dating and the archaeological component to be dated. Aitken (1990:90) has identified four different degrees of association certainty. The strongest degree of association certainty is when the material used to generate the radiocarbon date was from an archaeological artifact such as a bone upright and there is no question that it is an indigenous artifact. Less certain, but still highly probable are the instances where a direct functional relationship can be demonstrated between the materials being dated and the diagnostic archaeological artifact. Examples of this include a hearth feature in the living floor of a component or the charcoal from the interior of a ceramic pot. Still less likely are the instances where there is not a direct functional link, but the sheer quantity and size of the fragments of organic material suggest an association between them and the archaeological materials. Examples of this would include numerous large fragments of charcoal concentrated in one area of an occupational level. The least likely degree of association that can still be deemed acceptable are instances where the fragments of charcoal are small and scattered randomly throughout the occupational level (Aitken 1990:90).

### 5.3.2 Thermoluminescence Dating

Thermoluminescence dating has predominantly been used to date pottery, though burnt flint and volcanic materials have also been dated. This dating method measures the quantity of electrons that have accumulated in a material since it was exposed to an extreme heat source (in excess of 500°C),
which causes the material to release the stored electrons in the form of visible light. Materials such as pottery accumulate electrons at a nearly constant rate, thus the quantity of stored electrons is directly proportional to the time that has elapsed since the most recent firing of the object (Aitken 1990:142).

Thermoluminescence (TL) has an advantage over radiocarbon dating in that it returns a date in calendar years. Thus no calibration is needed. However, for the time period up to 1000 before present, TL dates generally have a greater margin of error than do radiocarbon dates, thereby making the time interval expressed by a TL date much less accurate than that of a calibrated radiocarbon date. For the time period from 1000 years BP to 300 years BP, the accuracy of TL is comparable to that of radiocarbon dating, and for dates in the last 300 years, TL dates are far more accurate (Aitken 1990:141). Another advantage TL has over radiocarbon dating is that TL is a direct dating method, meaning that TL dates the artifact directly, not a material believed to be in association with the archaeological remains. Thus there are no problems establishing the relationship between the object being dated and the archaeological component.

Problems associated with thermoluminescence dating include the assumption that the material you are dating has not been fired since it was created. This is not always the case, as the materials could conceivably have been exposed to extreme temperatures through natural circumstances (forest or grass fires) or though human intervention (such as being tossed into a campfire by a group subsequent to those that originally made the pottery). Also worth considering is whether the pottery fragment being dated is an indigenous or non indigenous artifact within the context of the archaeological component.

5.4 Discussion

While I have presented relative and absolute dating as separate dating techniques, they are not mutually exclusive and in actual practice they are used
in tandem. To assign a radiocarbon date to a strata and then infer the relative ages of strata above and below that dated strata seems to be a common practice.

In both the absolute and relative dating approaches, the most crucial element is establishing an association between the object being dated (be it a sample of carbon or an entire strata) and the artifact you are trying to establish a date for. In the case of stratigraphic analysis, the archaeologist must ensure that the artifacts are indigenous to the strata he or she is dating. In absolute dating, the archaeologist must establish that the sample came from an object or feature that is contemporary with the component to be dated. Given the limitless variation in spatial relationships that can occur at an archaeological site, it is difficult to set in stone what constitutes an acceptable degree of association. Thus, determining the strength of association is a largely subjective process that relies heavily on the judgement of the archaeologist. Besides the degrees of association set out by Aitken, it is generally agreed that the size of the excavation plays a role in the reliability of the age assessments, regardless of the dating method used. Larger and prolonged excavations are considered more likely to produce reliable dates than smaller excavations (Aitken 1990:90).

Both dating methods ultimately serve the same purpose, as they are primarily used to relate archaeological components to one another. This essentially establishes the chronological ordering of a series of archaeological components. There are few historical events for which we have a firm calendar date for the period during which the Besant and Avonlea complexes were present on the northern plains. Thus, the ability of radiocarbon and thermoluminescence dates to be expressed in calendar years is of little to no use during the period of plains archaeology that I am dealing with in this thesis.

There are, however, other advantages to using the absolute dating method. Absolute dates are universally comparable, in that an archaeologist
can compare two dates from different portions of the continent. This is perhaps where the true strength of absolute dating lies. In this sense, I could compare dates generated from Besant components to dates generated by Middle Woodland components in an attempt to establish that there was some degree of contemporaneity and that trade between the two groups was possible. This would not be possible using relative dating unless both sites were in the same region.

Given that radiocarbon dating is the more objective and “scientific” of the two main dating techniques used in plains archaeology, it is often seen as lending an “air of authority” (O’Brien and Lyman 1999:13) to a dating attempt. However, this can inspire a false sense of confidence or an overestimation of the accuracy of radiocarbon dating. A single radiocarbon date has little value, considering the numerous means by which the date returned on a radiocarbon sample can be rendered erroneous. To be considered reliable, it is recommended that several radiocarbon dates be taken from the same context. If all the dates overlap within one standard deviation, the dates are considered valid. Furthermore if it is believed that they all represent the same instant in time, they can be averaged and a new age determined that will have a significantly smaller standard deviation (Long and Rippeteau 1974:206).

If the dates do not overlap even at two standard deviations, then one or more of the dates likely have problems associated with them. A good example of this is the difficulty encountered at the Lost Terrace site in north-central Montana. At this site, eleven radiocarbon samples were taken from a thin single occupation Avonlea midden and returned dates ranging from 2,240 +/-90 to 845 +/-80 rcypb (Davis et. al. 2000:55). Fortunately four of the radiocarbon dates clustered closely together at around 1200 rcybp and the average of those four dates was the age proposed by the excavators for the Avonlea occupation. However, had they done fewer radiocarbon samples, it is easy to see how they
might have decided to accept a date closer to 2000 rcybp or 1000 rcybp as the time of occupation.

When dealing with the date returned from a single radiocarbon sample, the date is often compared against what the archaeologist considers is an acceptable age for the component. If the radiocarbon date falls considerably outside the established age range for components of the cultural complex in question, the radiocarbon date is often rejected out of hand. However, unless it can be explained how the sample came to be contaminated, this is an example of inductive reasoning and should be considered "poor science". The danger lies in rejecting dates that accurately reflect the true age of the sample, but do not conform to our mental template of what an acceptable date should be.

With reference to the discussion of possible Besant-Avonlea coexistence on the northern plains, neither dating method is particularly well suited to solving this dilemma. In the case of stratigraphic analysis, the data presented in the literature does indeed suggest that where both complexes are represented by separate components in a stratified mass, Besant components are invariably found beneath Avonlea components. However, there are also numerous examples of both complexes being found in what appears to be the same strata. Often it is suggested that this is a result of compressed stratigraphy or lack of sediment deposition and does not necessarily reflect contemporaneity. At the same time, other researchers have indicated that in the case of their site, there is no reason to suspect that the stratigraphy is compressed (e.g. Reeves 1983:167) and they offer this as evidence for Besant-Avonlea coexistence.

In the case of radiocarbon dating, dates attributed to Besant and Avonlea components seem to overlap for a considerable period of time (See Figure 5.1). However, given the myriad of problems associated with radiocarbon dating and the likelihood that some of the data is erroneous, it is not difficult to see how even a short period of transition between the Besant and Avonlea complexes on
the northern plains could give rise to an apparently long period of comparable radiocarbon dates between the two complexes. To take the overlap in radiocarbon dates at face value as an indication that the two complexes were indeed contemporaneous is to assume that all the radiocarbon dates are accurate despite the well documented evidence to the contrary. In my opinion this places an undue amount of faith in our ability to accurately interpret the radiocarbon data and to weed out erroneous or misleading dates. It is certainly a possibility that the two complexes coexisted; I do not think we can or should rule that out, but it is also possible that the two complexes only had a brief period of coexistence or missed each other entirely by several decades.

5.5 Some Conclusions

It is obvious that neither dating technique is infallible and that each dating attempt must be evaluated on a case by case basis, taking into consideration the factors unique to the each archaeological site that could contribute towards producing an inaccurate date. While misleading or erroneous radiocarbon dates are still being produced, radiocarbon dating is seen as becoming increasingly more accurate as time progresses. Furthermore, in some instances where earlier radiocarbon dating attempts have been reevaluated, it has been demonstrated that the original age assignment was in error (Taylor 1989:111). This seems to suggest that we should approach some of the earlier radiocarbon dating attempts with caution. Thus it might be worthwhile to revisit the currently accepted time spans for the archaeological complexes of the northern plains using only radiocarbon dates generated in the last ten or fifteen years (presumably the period with the most accurate radiocarbon dates).

Dating by means of stratigraphic analysis has an advantage in this regard as its fundamental principles have not been subject to revision. Thus, stratigraphic observations made fifty years ago are just as valid today as they
were then. But even stratigraphic analysis is becoming increasingly more accurate as we better understand site formation processes and how to identify various disturbance factors. Considering that there are simply no exceptions to the Law of Superposition, in any case where the chronological ordering of archaeological complexes produced by stratigraphic analysis differs from that produced by radiocarbon assays, I think the former should be considered the more correct. Basically, the stratigraphic evidence should be given much more weight than the radiocarbon data in the matter of determining whether the Avonlea and Besant complexes were contemporaneous.

With reference to the problem of the range in dates for the Besant and Avonlea complexes overlapping without any supporting stratigraphic evidence, I would argue that there is good reason to suspect that the radiocarbon data is in error or is greatly exaggerating the period of actual contemporaneity. Ideally, the sites that have produced some of the more anomalous or suspect dates should be revisited for the purposes of acquiring a new suite of radiocarbon dates. Failing that, we should scrutinize the radiocarbon dates that are already in existence much more closely and perhaps weed out those where the association is suspect or where contamination is likely.
6.0 The Archaeological Resources of Site EdNh-35

6.1 Introduction

In this section, I will discuss the archaeological resources of site EdNh-35. In doing so, I hope to be able to discern whether the discovery of diagnostics from both complexes within the same arbitrary levels is likely the result of component admixture due to compressed stratigraphy or if it is acceptable to interpret such an occurrence as evidence for Besant-Avonlea coexistence.

Site EdNh-35 was discovered in the fall of 2001 during a heritage resource impact assessment of a proposed oil pipeline. The initial testing of the site indicated that there were significant archaeological resources present and the site was subsequently mitigated. During the first phase of the mitigation a total of 21m$^2$ was excavated in three 2m$^2$ blocks (Areas A, B, and C) and one 3m$^2$ block (Area D). A large boiling pit was uncovered in Area D and it was recommended that more excavations take place. Thus, the second phase of the mitigation involved expanding Area D into a 5m by 8m excavation block. When the excavation was complete, a total of 54m$^2$ had been excavated.

The units were excavated primarily by shovel shaving, with trowel work being reserved for the excavation of the more delicate features, such as the numerous bone uprights and hearth features that were encountered. All excavated materials were passed through a 1/4 inch mesh power screen. The units were excavated in 10cm arbitrary levels, although it was noted that this was fairly approximate to the natural stratigraphy. When it was observed that both Avonlea and Besant materials were being encountered in level two, all
subsequent excavations of that level were done in 5cm increments (levels 2a and 2b) in an attempt to achieve the stratigraphic separation of the two archaeological components.

One consequence of excavating according to this methodology is that point provenience on most of the artifacts was not possible. Thus, all artifacts recovered from the same arbitrary level of the same unit share the same provenience. This coarseness of measurement limits the ability to identify activity areas and helps to obscure the differences in the relative depths of the Besant and Avonlea diagnostics. Nevertheless, it is still possible to make many valid observations regarding the spatial relationships that exist between the features and artifacts that were encountered at this site.

6.2 Physical Environment
6.2.1 Regional Environment

EdNh-35 is located within the Regina Plain ecozone of the Moist Mixed Grassland ecoregion (Padbury and Acton 1999:160). Soils of this region are described as dark brown chernozoic and typically consist of a dark A horizon, a brownish B horizon and a grayish C horizon with carbonate accumulation (Thorpe 1999:131). The regional vegetation is dominated by northern wheatgrass and June grass with a variety of deciduous shrubs including snowberry, saskatoon, chokecherry, and willow. Valley complexes in this ecoregion, such as the one in which EdNh-35 is located, commonly support trees such as poplar, aspen, and ash. Local wildlife includes both Mule and White Tail deer, coyote, red fox, richardson’s ground squirrel, and jack rabbit (Thorpe 1999:135).

6.2.2 Local Environment

EdNh-35 is situated on the second terrace of the deeply incised valley of the Moose Jaw River. The site is located on the east side of the valley some
3.4 km upstream from the confluence of the Moose Jaw and Qu’Appelle rivers. The valley itself has several wooded coulees running from the valley lip down to the river. One such coulee is located less than 100m from the site. The nearest water source is the Moose Jaw river some 600m west of the site in the bottom of the valley.

This site itself is situated primarily in native prairie, on a fairly level terrace approximately 450 m to the west of and 40m below the lip of the valley. There are some nearby disturbance factors including a dirt trail, an existing buried oil pipeline, and some areas of modified pasture. During the excavation, Area A was the only excavation block to exhibit any indication of disturbance. In this block there seemed to be a ploughzone consistent with modified pasture extending to a depth of 10-15 cm below the surface.

6.3 Site Description

The excavation units at this site were excavated to a depth of between 40 and 80 cm, depending on the point at which sterile components were encountered. As Area D was the most productive area, all the units of this main excavation block were taken down to a depth of 80 cm.

Two archaeological components were encountered during the course of the excavations: a component that contained both Besant and Avonlea materials and a Pelican Lake component. The Avonlea/Besant component begins in level one and extends down to the bottom of level three. The bulk of the features encountered during the excavation were associated with this component. The Pelican Lake component begins in level five and probably extends into level six where several features were encountered. This discussion will describe the materials and features encountered in each of these components.
6.3.1 Stratigraphy

I have chosen to illustrate the stratigraphic profiles of the first phase of excavations conducted in excavation block D. This consists of a three by three metre block around the central boiling pit. It is my belief that these profiles represent a cross section of the core activity area revealed by the excavations at block D. Many more buried soils, protruding bone fragments, and features are evident in these profiles than are present in the profiles of the outer 5m by 8m block. In this sense, the profiles I have chosen to present better illustrate the stratigraphic relationship between the various upper paleosols which produced the Besant and Avonlea materials. In addition, these wall profiles demonstrate the stratigraphic relationship between the Besant/Avonlea occupation(s) (as represented by the band of faunal elements and fire broken rock protruding from the wall) and Pelican Lake occupation of the site (as represented by features nine and ten).

The upper archaeological component can be traced along all four walls by the presence of faunal remains protruding from the walls at approximately the same relative depth. These remains are usually in apparent association with either a buried soil or a feature. The north wall (Figure 6.1) is of particular interest as it illustrates four distinct buried soils within the upper 30cm of the stratified mass. The protruding faunal elements appear to be originating alternately from the second or third paleosol, or in some cases, the first. While the second paleosol is not present on all four walls, features two and seven as well as all the protruding faunal elements and fragments of fire broken rock are consistently found beneath the first paleosol and above the tan coloured sandy-silt strata.

The south wall (Figure 6.2) is of interest as it displays the cross-section of feature seven: one of the many bone uprights associated with the upper archaeological component. Assuming that the top of this feature was at ground level when it was constructed, the living floor used by its builders would have
Figure 6.1: Stratigraphic profiles of the North and East walls of excavation block D during the first phase of excavations.
Figure 6.2: Stratigraphic profiles of the South and West walls of excavation block D during the first phase of excavations
been just above the tan sandy silt strata. In close proximity to this feature is an unusual protrusion of the brown sandy silt into the lower strata. This protrusion does not appear to be a rodent burrow and may represent an attempt at producing another bone upright or be associated with feature seven in some way. Feature seven also extends into paleosol five which may be associated with the lower component at this site. Nothing that was recovered from feature seven suggests that component admixture occurred.

The lower component is also represented in the wall profiles by feature nine appearing in the corner of the north and east walls (Figure 6.1) and by feature ten appearing in the west wall (Figure 6.2). Both have the same approximate relative depth, though feature nine is associated with paleosol six and feature ten appears to be associated with the upper surface of a large lens of grey sand.

Another anomaly is present in the west wall where sediments from paleosol one are seen to dip into paleosol five. The shape of this anomaly and the lack of any associated archaeological materials suggests that it is a rodent burrow or some other natural phenomenon.

As these profiles indicate, there was a fair amount of rodent disturbance and while great care was taken to identify rodent burrows and to label artifacts found within them accordingly, they should not be ruled out as a potential disturbance factor leading to component mixture.

### 6.3.2 Radiocarbon Dates

Three radiocarbon samples were submitted for analysis. Two were taken from features believed to be in association with the Besant/Avonlea component, and one was composed of materials believed to be in association with the Pelican Lake occupational level. One of the samples from the Besant/Avonlea component was composed of bone fragments from the main hearth feature (feature one) and returned a date of 1378 +/-45 rcybp (BGS-2340) (date has
been corrected for C\textsuperscript{13}). As the sample was taken from bone fragments within the hearth feature, there is a direct relationship between the material being dated and the archaeological feature. Thus, using Aitken's (1990:90) criteria for assessing the accuracy of radiocarbon dates, there is a strong likelihood that the sample material is of the same age as the archaeological feature.

The second radiocarbon date from this level was obtained on a bone sample taken from a right metatarsal recovered from a bone upright (Feature 13). This second radiocarbon assay returned a date of 1283+/- 60 rcybp (BGS-2341) (corrected for C\textsuperscript{13}). As the sample was taken directly from a part of the archaeological feature, under Aitken's criteria, it is almost certain that this assay reflects the actual date at which the archaeological feature was formed.

The third date, one pertaining to the Pelican Lake occupation, was generated using a composite bone sample of faunal elements from level six. This dating attempt returned a date of 3678 +/- 80 rcybp (BGS-2342) (not corrected for C\textsuperscript{13} due to impure CO\textsubscript{2} not suitable for the analysis of the C\textsuperscript{13}-C\textsuperscript{12} ratio).

Of particular interest is that both the dates put forth for the Besant/Avonlea component overlap at one standard deviation. Thus even though more than one occupation may be represented in this upper component, both of the radiocarbon assays appear to date the same occupation. It is also worth noting that these two dates would be considered extremely late for a Besant occupation (see Figure 3.1), but would fit in seamlessly with dates generated from other Avonlea components (see Figure 4.1).

6.3.3 The Besant/Avonlea Component

6.3.3.1 Features

A total of twenty-three features (see Figure 6.3) were encountered in levels two and three and are believed to be associated with either the Besant or Avonlea occupation of this site. While features twelve and seventeen were
Figure 6.3: Features associated with the upper component of site EdNh-35 at excavation block D
identified as bone uprights, no data exists concerning which faunal or other artifactual elements formed their composition. Apparently, these artifacts were mislabeled in the field. Likely the artifacts that formed these two features were mixed in with the other artifacts recovered from their respective units for this level.

Feature one consists of a large oval area of blackened soil and ash containing many burned and calcined bone fragments as well as large quantities of fire broken rock. This feature is 117 cm long and 65 cm wide. In cross-section it is basin shaped and extends to a depth of 9 cm at its thickest point. The majority of the artifacts recovered from this feature consisted of small bone fragments (n = 4,695) of which 4,423 (94%) were either burned or calcined. While only twenty-two of the bone fragments were large enough to be identified as bison, it seems probable that the majority of the others were from the same species.

In addition to the faunal elements, there were twenty-six sherds of pottery found within this feature. All of the pottery appears to consist of body sherds, two of which (catalogue numbers: 8520 and 8521) had a plain surface finish and one (catalogue number: 12366) appears to have a fabric impression. The rest of the sherds were either too small or too badly exfoliated to identify properly.

Also associated with this feature were two projectile points and four formed lithic tools. One of the projectile points (Cat. no: 8524) is clearly an Avonlea point while the other (Cat. no: 11479) is simply an unidentifiable projectile point tip. The formed tools consist of two biface fragments and two retouched flakes.

Given the large quantities of burned and calcined bones, it seems likely that this feature was primarily used as a hearth. The presence of numerous small fragments of fire broken rock (n = 284, collectively weighing 1.2 kg) suggests that this feature was also used as a boiling pit at one time. The other
artifacts (ceramics, points, and debitage) associated with this feature were likely discarded into the hearth as a means of disposing of broken or unwanted items.

Feature two is also an oval shaped area of oxidized soil approximately 25 cm long and 15 cm wide. Similar to feature one, the majority of artifacts encountered were small bone fragments (n = 212), 80 of which were either burned or calcined. Only two of these fragments could be confidently identified as bison. Also encountered in this feature were four tiny ceramic sherds, one utilized flake, and 11 pieces of lithic debitage. This feature has been identified as a hearth on the basis of the oxidized soil and numerous burned bone fragments.

Feature three consists of several bone elements, including a partial tibia, a partial rib, a badly fragmented scapula, and thirty-seven unidentifiable bone fragments. All of these faunal elements are believed to be bison. This feature was identified as a bone upright on the basis that all of these elements were clustered together and orientated vertically.

Feature six is another grouping of faunal remains, consisting of a complete metapodial, a rib fragment, a vertebrae fragment, three fragments from an unidentifiable longbone, and nineteen small unidentifiable bone fragments. All of these faunal elements are believed to be bison. This feature was also identified as a bone upright based on the vertical alignment of the larger faunal remains.

Feature seven consists of a cluster of vertically orientated faunal elements, including a left radius found in articulation with its six carpals, six scapula fragments, a metapodial, a middle phalanx, and 45 bone fragments too small to be identified. All of these bone elements are bison. In addition, twelve pieces of lithic debitage were found associated with this feature. This feature has been identified as a bone upright on the basis of the vertical orientation of the faunal remains.
Feature eight consists of a vertically oriented grouping of faunal elements, including one bison rib fragment, five fragments from an unidentified bison longbone, and seventeen bone fragments too small to be identified. There is also one piece of lithic debitage associated with this feature. This feature has been identified as a bone upright on the basis of the vertical orientation of the faunal remains.

Feature eleven consists of a close grouping of vertically oriented faunal elements, including one rib fragment, four fragments of an unidentified bison longbone, and 58 bone fragments too small to be identified. Also, a middle phalanx of an immature bison was incorporated into this feature. In addition to the faunal elements, one core and four pieces of debitage were recovered in association with this feature. This feature has been identified as a bone upright on the basis of the vertical orientation of the faunal remains.

Feature thirteen consists of a close grouping of vertically oriented faunal elements, including two distal tibia fragments, one proximal radial fragment, one calcaneus, one left mandible fragment, four fragments from an unidentified longbone, and one right metatarsal which was submitted as a radiocarbon sample. There were also twenty-three bone fragments too small to be identified. All of the faunal elements associated with this feature are believed to be bison. This feature has been identified as a bone upright on the basis of the vertical orientation of the faunal remains.

Feature fourteen consists of a close grouping of vertically oriented faunal elements, including one carpal, one rib fragment and fourteen bone fragments too small to be identified. All of these elements are believed to be bison.

Feature fifteen is an area of oxidized soil 30 cm long and 20 cm wide. Artifacts associated with this feature consist of two bison rib fragments, twelve fragments of unidentifiable bone (seven of which have been burned), five pieces of burned wood (charcoal), and two pieces of debitage. This feature has
been identified as a hearth based on the presence of oxidized soil, charcoal and burned bone. Feature sixteen was encountered solely in the lower half of level 2 (i.e.: level 2b). It consists of an area of oxidized soil and charcoal staining 25 cm long by 22 cm wide and 4 cm deep. Faunal elements associated with this feature consist of one bison molar/premolar, one metapodial fragment, the distal portion of the first phalanx of a bison, six fragments of an unidentified bison long bone, and 822 small unidentifiable bone fragments. Also found were three potsherds, two of which (catalogue numbers: 14421 and 14422) appear to have a plain surface finish. Lithic materials consist of seventeen pieces of debitage and one projectile point preform (catalogue number: 13780). The preform appears to be consistent with the manufacturing of an Avonlea projectile point. This feature is similar to feature one in that the high numbers of processed and burned bone fragments indicate that it was likely used as a cooking hearth. Also, the other artifacts were likely discarded into the hearth as a means of disposal for broken or unwanted items.

Feature eighteen consists of a close grouping of vertically oriented faunal elements, including faunal elements of bison and a medium sized canid. The bison elements consisted of fragments of the first and third phalanx, thirteen fragments of a rib, three cranial fragments and 53 small unidentifiable bone fragments, three of which were burned. The sole canid element was a small rib fragment. This feature has been identified as a bone upright based on the vertical orientation of the faunal elements.

In direct association with this feature were six body sherds, five of which (catalogue numbers: 1955-1959) appear to have a fabric impression on their exterior surfaces. The sixth sherd was indeterminate. Also recovered from this feature were two pieces of lithic debitage and one small shell fragment.

Feature nineteen is a semi-hemispherical area of oxidized soil and charcoal staining that likely extends beyond the boundaries of the excavation.
block. No artifacts were recovered from this feature. It has been identified as a hearth feature based on the presence of oxidized soil and charcoal staining.

Feature twenty is an oval shaped area of oxidized soil and charcoal staining that is 30 cm long and 25 cm wide. Materials recovered from this feature consist of one piece of lithic debitage, one left astragalus from a bison, a middle phalanx also from a bison, and 79 unidentifiable bone fragments, seven of which were burned. This feature was identified as a hearth on the basis of oxidized soil and burned bone being present.

Feature twenty-one is an hourglass shaped area of oxidized soil and charcoal staining that is 38 cm long and 20 cm wide. Materials recovered from this feature consist of four pieces of lithic debitage, a metapodial fragment from a bison, and 147 unidentifiable bone fragments, 29 of which were either burned or calcined. This feature was identified as a hearth on the basis of oxidized soil and burned bone being present.

Feature twenty-two is a semi-circular area of oxidized soil and charcoal staining that extended only 20 cm into the excavation block and appears to extend beyond the excavated area. Two pieces of lithic debitage were the only artifacts recovered in direct association with this feature. This feature is likely a hearth feature, given the presence of oxidized soil and charcoal staining.

Feature twenty-three is a small circular area of oxidized soil and charcoal staining approximately 22 cm in diameter. Faunal materials recovered from this feature consist of one bison molar/premolar, seven bison rib fragments, seven fragments from an unidentifiable bison longbone and 641 small unidentifiable bone fragments, 36 of which were burned.

Other material recovered from this feature includes twenty-one pottery sherds. Twelve of the sherds were too small to analyse, but eight of the others appear to be body sherds with one rim sherd. Six of the body sherds appear to have fabric impressions on their exterior surfaces. Also found in direct...
association with this feature were ten pieces of lithicdebitage and one utilized flake.

This feature was identified as a hearth on the basis of oxidized soil and burned bone being present. The other artifacts were likely discarded into the hearth as a means of disposing of broken or unwanted items.

Feature twenty-four consists of a single vertically orientated bone fragment. This element has been identified as the proximal end of a bison tibia. Also recovered from this feature were two exfoliated pot sherds. This feature is considered to be a bone upright on the basis of the vertical orientation of the bone fragment.

Feature twenty-five is a semi-circular area of oxidized soil and charcoal staining protruding from the north wall. Faunal elements recovered from this feature consist of one right bison metacarpal, one right and one left bison metatarsal, two bison rib fragments, a section of a bison femur shaft, seven fragments of an unidentified longbone, and thirty bone fragments too small to be identified, ten of which were burned. Also associated with this feature were three pieces of lithic debitage, two of which appear to be tertiary or pressure flakes. This feature was identified as a hearth on the basis of oxidized soil and burned bone being present. The other artifacts were likely discarded into the hearth as a means of disposing of broken or unwanted items.

Feature twenty-seven is a small oval area of oxidized soil and charcoal staining 20 cm long and 10 cm wide. Faunal elements recovered from this feature consist of five rib fragments, two fragments of a metapodial, one fragment of a phalanx, eight fragments of an unidentified longbone, and 74 bone fragments too small to be identified, four of which were calcined. All of the faunal remains are believed to be bison. There was also one piece of lithic debitage associated with this feature. This feature was also identified as a hearth featured based on the presence of burned bone and oxidized soil.
Feature twenty-eight is a tightly packed cluster of faunal elements consisting of the distal portion of a femur and fourteen longbone fragments, likely part of the same femur. This element is believed to be bison. This feature has been identified as a bone upright since the faunal elements were encountered in a vertical position.

Feature twenty-nine is another tightly packed cluster of faunal elements consisting of fifteen rib fragments, one middle phalanx, the condyle from a metapodial, a fragment of a mandible, and three fragments from an unidentified longbone. All of these faunal elements are believed to be bison. This feature was identified as a bone upright on the basis of its vertical orientation. Although Feature one and feature twenty-nine overlap spatially, they are believed to be separate features and likely represent separate occupations of this site. This is discussed further in section 6.4.1.

6.3.3.2 Lithic Artifacts
6.3.3.2.1 Projectile Points

There were a total of twenty-five projectile points and projectile point fragments recovered from the upper component of EdNh-35. Fourteen of these artifacts were complete enough to be identified as either Besant series or Avonlea projectile points. Metric data for these projectile points is presented in Table 6.1. The projectile point attributes selected for measurement were based on the guidelines set out in Ramsay’s 1991 thesis on the Melhagen collection (Ramsay 1991:358).

Catalogue number 3500 (Figure 6.4:A) is a nearly complete Besant series projectile point manufactured from Knife River flint. It has large U-shaped side-notches close to its slightly convex base. The base has also been thinned. Only the dorsal surface of the point has been flaked, leaving the ventral surface smooth and unmodified with the exception of a few basal thinning flakes. Based on its morphological characteristics, I propose that this
point most closely resembles the Samantha variety of Besant series of projectile points. The Samantha points are identified by unifacial flaking and small narrow symmetrical side-notches (Dyck and Morlan 1995:300).

Catalogue number 1159 (Figure 6.4:B) is also a nearly complete Besant series projectile point. This projectile point is manufactured from Knife River flint and has been heavily patinated. It has large U-shaped side-notches close to its base. The base has either been reworked or only partially thinned, giving it a slightly concave appearance. Similar to catalogue number 3500, almost all of the flaking on this point occurs on the dorsal surface leaving the ventral surface relatively untouched. Given its morphological similarity to catalogue number 3500, I would argue that this point could also be classified as a Samantha point.

Catalogue number 15240 (Figure 6.4:C) is an intact Besant series projectile point manufactured from Swan River chert and is quite thick. The side-notches are broad and very shallow. The base is relatively straight and does not show much evidence of having been thinned. The shortness of this point and its heavily rounded tip probably reflect repeated resharpening.

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**Table 6.1.** Metric attributes of Besant and Avonlea projectile points from EdNh-35.

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All measurements are in Millimetres. ML=Maximum length, MT=Maximum thickness, LBL=left body length, RBL=right body length, LNH=left notch height, RNH=right notch height, LND=left notch depth, RND=right notch depth, SW=shoulder width, BW=base width, INW=inter-notch width, BH=Base height.
Figure 6.4: Besant Series projectile points recovered from the upper component of EdNh-35. A-B: Possible Samantha projectile points, C-F: Outlook Side-Notch projectile points.

Figure 6.5: Classic Avonlea/Gull Lake projectile points recovered from the upper component of EdNh-35.
episodes. The overall morphology of this point is most consistent with the Outlook Side-Notched variety of the Besant series of projectile points proposed by Dyck and Morlan (1995:437). The definition of this projectile point style is discussed in section 3.4.1.

Catalogue number 16452 (Figure 6.4:0) is a partial base, neck, and shoulder fragment of a Besant series projectile point. Manufactured from Knife River flint, it is thin and displays heavy flaking on both sides. The base is straight and has been thinned. Only the left notch is reasonably intact, indicating that the notches on this point were broad and shallow. Though incomplete, the large width of the base and the internotch distance give the impression that this was a relatively large point. Morphologically, it best conforms to the definition of the Outlook Side-notched variety of the Besant series of projectile points.

Catalogue number 4001 (Figure 6.4:E) is another nearly complete Besant series projectile point manufactured from Knife River flint. The left half of the base and left notch are missing, but the right notch is broad, shallow, and situated near the base. The centre of the dorsal surface remains unflaked, suggesting that prior to any resharpening attempts, this projectile point was flaked on one surface only. Similar to catalogue number 15340, this point is short with a rounded tip, suggesting that it underwent multiple resharpening episodes. Morphologically, it best conforms to the definition of the Outlook Side-notched variety of the Besant series of projectile points.

Catalogue Number 5037 (Figure 6.4:F) is the base of a Besant series projectile point manufactured from Knife River flint. This point fragment has been severed through the middle of both notches. However, the notches appear to have been broad, shallow, and close to the base. The base itself is straight and shows evidence of having been thinned. The point fragment is thin and bears a resemblance to catalogue number 16452 in terms of overall
morphology. Similarly, it best conforms to the definition of the Outlook Side-notch variety of the Besant series of projectile points.

Catalogue number 2097 (Figure 6.5:A) is a complete Avonlea projectile point manufactured from silicified peat. Curiously, it has three side-notches; one on the left side and two on the right. The notches are small, narrow, and U-shaped. It seems unlikely that the upper notch on the right side could have been used to haft the projectile point. Thus, the third notch is possibly the result of an error made during the manufacturing process. The lateral edges of the blade portion of this point are convex. The base is concave and the “ears” are very small. Morphologically, this point best conforms to the “Classic” or Gull-Lake Avonlea projectile point variety proposed by Kehoe(1966:829).

Catalogue number 2098 (Figure 6.5:B) is a nearly complete Avonlea projectile point manufactured from fused shale. The notches are small, shallow and near the base of the point. The edges of the blade portion of this point are straight. The base is concave with the right ear missing. Morphologically, this point best conforms to the definition of the Classic Avonlea point variety.

Catalogue number 2512 (Figure 6.5:C) is a partial Avonlea projectile point manufactured from Knife River flint. The left basal portion of this point is missing, but it appears that another notch and ear were created above the missing section in an attempt to make the broken point haftable. The right notch is small and narrow. The lateral blade edge appears to have been concave in shape. With the majority of the base missing, it is difficult to assign this point to an existing variety of Avonlea projectile point. However, based on the one remaining ear, this point seems consistent with the definition of the Classic Avonlea projectile point variety.

Catalogue number 16271 (Figure 6.5:O) is a nearly complete Avonlea projectile point manufactured from Swan River chert. The pinkish colour of this artifact may be an indication that the raw material was heat treated prior to being flaked. The left basal section and notch are missing. The right notch is
small and shallow and the right lateral blade edge is slightly convex. The
remaining portion of the base appears to be concave. Morphologically, this
point best conforms to the definition of the Classic Avonlea projectile point
variety.

Catalogue number 8524 (Figure 6.5:E) is a nearly complete Avonlea
projectile point manufactured from Knife River flint. The notches on this point
are small, wide, and U-shaped. The lateral edges of the blade portion of this
point are straight. The basal edge is concave and the ears are very small. This
point easily conforms to the definition of the Classic Avonlea projectile point
variety.

Catalogue number 11479 (Figure 6.5:F) is a nearly complete Avonlea
projectile point manufactured from an unidentified chert. The notches and the
majority of the base are missing. However, the remaining section of the basal
dge suggests that it was concave in shape. The lateral edges of the blade
portion of this point are straight. This point seems very similar to catalogue
number 2098, and similarly conforms to the definition of the Classic Avonlea
projectile point variety.

Catalogue number 2372 (Figure 6.5:G) is a nearly complete Avonlea
projectile point manufactured from Knife River flint. The right basal portion and
notch are missing. The remaining notch and basal portion indicate that this
point was corner-notched with a straight base. There is a slight curvature to the
left lateral edge of the blade, but the right edge is straight. The morphology of
this projectile point suggests that it is most similar to the Classic Avonlea variety
of the Avonlea projectile point.

Catalogue number 14568 (Figure 6.5:H) is a nearly complete Avonlea
projectile point manufactured from Knife River flint. The notches on this point
are small and narrow. The base is concave and the ears small. The
morphological characteristics of this point conform to those of the Classic
Avonlea projectile point variety.

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There is also one projectile point tip (catalogue number 438) and one projectile point midsection (catalogue number 1891) that, given their size and thickness, are likely from Avonlea points. However their incomplete nature makes that identification somewhat tenuous.

6.3.3.2.2 Other Bifaces

There are five complete bifaces and twenty-seven biface fragments associated with the upper component of this site (e.g. Figure 6.6). These bifaces were mostly manufactured from Swan River chert (n=18), though silicified peat (n=4) and unidentified cherts (n=4) were also present in some abundance. There were also two biface fragments composed of fused shale and one of Knife River flint. Neither of these two material types can be found locally. The metric attributes for these bifaces are presented in Table 6.2.

Of particular interest is catalogue number 1627: an asymmetrical hafted biface (Figure 6.6: A). It is made from Swan River chert, exhibits usewear along both its lateral edges, and has a heavily ground base. It was recovered from level 4, which also contained a Besant series projectile point. However, while they are not diagnostic of any particular archaeological complex, asymmetrical hafted bifaces are not commonly associated with either Besant nor Avonlea assemblages. This makes the assignment of this artifact to the upper occupation somewhat debatable. It is possible that this artifact may be associated with the lower Pelican Lake component or an as of yet unidentified occupational episode at this site.

6.3.3.2.3 Scrapers

There are eleven end scrapers and two sidescrapers associated with the upper component of this site. Most of the scrapers are manufactured from either Knife River flint (n=8) or Chert (n=3). Catalogue number 6675 (Figure 6.7: E) is made of jasper which is not available locally. Four of the end scrapers
Table 6.2: Metric attributes of bifaces recovered from site EdNh-35

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All measurements are in millimetres. ML=Maximum Length, MW=Maximum Width, MT=Maximum Thickness, Mat=Raw Material, WT=Weight in grams.

exhibited usewear along the worked distal edge. Three of these also showed signs of having been retouched at some point. The metric attributes for these scrapers are presented in Table 6.3.
Table 6.3: Metric attributes of scrapers recovered from site EdNh-35

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All measurements are in millimetres. MI= Maximum Length, MW= Maximum Width, MT= Maximum Thickness, WT= Weight in grams, Mat= Raw Material

6.3.3.2.4 Other Formed Tools

Other formed tools associated with this component consist of an obsidian drill (Figure 6.7:A, catalogue number 17362) and a pièce esquillé (Figure 6.7:B, catalogue number 1073). The drill is 12.5 mm long and exhibits extensive flaking on all its surfaces, possibly indicating that it underwent multiple resharpening episodes. The pièce esquillé is rectangular in outline, manufactured from Knife River flint, and has battering marks similar to those created by bipolar percussion along all four of its edges. These battering marks are a good indicator that this artifact was used as a wedge.

Figure 6.7: Endscrapers and other formed tools recovered from the upper component at EdNh-35. A: Obsidian Drill. B: Piece Esquille. C-H: Endscrapers.
6.3.3.2.5 Expedient Tools

There are 42 retouched flakes and 25 utilized flakes associated with the upper component at EdNh-35. The retouched flakes are made mostly from Knife River flint (n=13) and Swan River chert (n=12), though silicified peat (n=8) and unidentified cherts (n=7) are also represented in the assemblage. Similarly, the utilized flakes are made mostly from Swan River chert (n=8) and Knife River flint (n=6). Other material types selected for the manufacture of utilized flakes include silicified sediment (n=4), silicified peat (n=3), and unidentified chert (n=2).

6.3.3.2.6 Cores

There are 18 cores and core fragments associated with the upper component at EdNh-35. These cores are predominantly of Swan River chert (n=5), Knife River flint (n=4), and unidentified cherts (n=4). Less common material types are quartzite (n=2), silicified peat (n=1), and silicified sediment (n=1).

Kooymann (2000:55) has identified two basic types of cores: bipolar cores and platform cores. Bipolar cores are manufactured by placing the core on an anvil and then striking it with a hammerstone. This method of flintknapping can be identified in an archaeological assemblage by the presence of battering and small flake scars on opposing ends of the core. Often the core exhibits evidence for battering on all four sides, indicating that it had been rotated 90° during the flintknapping process. Bipolar cores also usually have flakes taken off both surfaces of the core, giving them a bifacial appearance (Kooymann 2000:56).

Platform cores are usually larger in size than Bipolar cores and have had flakes driven off of them without the use of an anvil (Kooymann 2000:56). Using these definitions, three of the sixteen cores recovered from the upper
component at EdNh-35 are bipolar cores while the remaining 13 are platform cores.

6.3.3.2.7 Debitage

There are 2259 pieces of debitage associated with the upper component at EdNh-35. Of these, 38 were primary decoritification flakes, 192 were secondary decortification flakes, 1296 were secondary flakes, and 96 were tertiary flakes. There were also 635 pieces of shatter. Swan River chert (n=1039) is by far the most common material, followed by silicified peat (n=407), unidentified cherts (n=203), quartzite (n=158) and Knife River flint (n=136) (see Table 6.4).

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KRF=Knife River flint, SRC=Swan River chert, FSH=Fused Shale, PPT=Silicified Peat, SWD=Silicified Wood, CHR=Unidentified Cherts, JAS=Jasper, SSD=Silicified Sediment, QTE=Quartzite, QTZ=Quartz, CHY=Chalcedony, TRSS=Tougue River Silicified Sediment, CON=Conglomeration, GST=Gronlid Siltstone, AGT=Agate

6.3.3.3 Ceramics

There are 238 potsherds associated with the upper component at this site. The vast majority (n=233) of the sherds recovered appear to be body
sherds, though there are two rim sherds, two lip sherds and one neck sherd. The most complete rim sherd (catalogue number 16451, Figure 6.8:A) has a fabric impressed exterior surface and a flat lip with no thickening. Furthermore, no decorations can be observed on this sherd. The other rim sherd (catalogue number 5016) is similar in that it has a flat lip, but the exterior surface is heavily exfoliated. The two lip sherds consist of a rounded lip (catalogue number 14682) and a flat lip (catalogue number 1893). Neither of these lip sherds included any portion of the outer surface of the vessel. The one neck sherd recovered has two parallel horizontal lines of cord markings. The cords are quite thin and it seems likely that these markings were intended as decoration rather than the byproduct of manufacturing.

Most of the sherds (n=143) are less than 1cm in size and could best be described as “crumbs” or sherdlets. Although it was rarely possible to observe a surface finish on sherds of this size, five sherds clearly display a fabric impression and one sherd has a plain surface finish.

Seventy-three of the larger sherds in this assemblage have a discernable surface finish. Fourty-two of these are fabric impressed. These are mostly amorphous with no visible weave pattern or cord marks. However, in a few instances (Figure 6.8: A, E) the orientation of the fabric strands was apparent. There are also eight sherds where the fabric impression appears to have been smoothed prior to drying. In addition, two body sherds appear to have a net impression. All of these sherds can likely be classified as Rock Lake Net/Fabric Impressed Ware which is characterized by simple profile vessels with fabric/net impressed exteriors.

Sixteen sherds from this assemblage have a plain surface finish with no impressions or evidence of smoothing. There are also five sherds that have a cord-roughened exterior surface finish. Two of these sherds (including Figure 6.8:B) have deeply impressed parallel cord marks, consistent with the cord
Figure 6.8: Fabric impressed and cord roughened ceramic sherds recovered from the upper component at site EdNh-35. A) Rim sherd and profile; B-F: Body sherds

Figure 6.9: Pelican Lake projectile points associated with the lower component at site EdNh-35
wrapped paddle and anvil technique. The cord-roughened exteriors are consistent with those ceramics found in association with Besant components.

6.3.3.4 Faunal

The upper component at EdNh-35 produced 9061 bone fragments. They mostly consist of small unidentifiable fragments. However, 3138 are identifiable down to the level of species. Of the identifiable bone fragments 3096 are believed to be bison. Thus 99% of all the faunal remains that are identifiable are bison. The remainder consist of canid remains, modern rodent remains, and one human tooth.

6.3.4 The Pelican Lake Component

6.3.4.1 Features

There are three features associated with the lower archaeological component at EdNh-35. All of these features were located in levels five and six and at least one (feature nine) appears to be associated with the lower paleosol.

Feature nine consists of a charcoal and ash layer contained within a bowl shaped layer of oxidized soil. This feature is approximately 30 cm in diameter and 9 cm deep at its thickest point. No artifacts were found in association with this feature. It has been identified as a hearth based on the presence of ash, charcoal and oxidized soil.

Feature ten consists of a charcoal and ash layer underlain by a layer of oxidized soil. This feature is 20 cm in diameter and 7 cm deep at its thickest point. Artifacts associated with this feature consist mostly of small unidentifiable bone fragments, 464 in number. Most of these bone fragments (91%) were either burned or calcined. Lithics associated with this feature include one retouched flake and 102 pieces of debitage. This feature has been identified as
a hearth feature based on the presence of oxidized soil and burned or calcined bone fragments.

Feature twenty-six is a thin circular charcoal stain some 40 cm in diameter. It was encountered in the centre of unit 86N 142W and has no artifacts associated with it.

6.3.4.2 Lithic Artifacts
6.3.4.2.1 Projectile Points

One Pelican Lake projectile point and one projectile point tip fragment were recovered from the lower occupation at EdNh-35. Another Pelican Lake point (cat. no. 17366) was found in a rodent burrow on the surface. I will discuss this surface find here, as it seems probable that it originated from either this or an as of yet undiscovered Pelican Lake occupation at this site. This is substantiated by the observation that the surface find is encrusted with carbonate residue common to all the artifacts recovered from the lower occupation.

Catalogue number 12718 (Figure 6.9:A) is a complete Pelican Lake projectile point manufactured from silicified wood. The corner notches are deep and broad while the base is straight. The overall morphology of the point has a slightly asymmetrical look to it.

Catalogue number 17366 (Figure 6.9:B) is a reasonably complete Pelican Lake projectile point manufactured from silicified peat. Only the right corner notch remains intact and it is deep and broad. The base is relatively straight. The left edge of the blade appears deeply concave giving the point a lopsided appearance.

6.3.4.2.2 Other Bifaces

One complete biface and three biface fragments were associated with the lower occupation of this site. Three of these bifaces were manufactured
from Swan River chert, with one being made from Knife River flint. The complete biface exhibits usewear along its two lateral edges as well as some evidence of it having been retouched.

Two unifaces were also found in association with this occupational level. Both are manufactured from Knife River flint and one (catalogue number 12783) has been heavily worked along one lateral edge.

6.3.4.2.3 Scrapers

There are seven endscrapers and one sidescraper associated with the lower occupation at this site. Most of the scrapers are manufactured from either Knife River flint (n=5) or Swan River chert (n=2). One endscraper (catalogue number 3233) appears to have been created from a split chert pebble with only the distal edge having been worked. Of the Knife River flint scrapers, two exhibited heavy patination. None of the scrapers show significant amounts of usewear or retouch.

6.3.4.2.4 Expedient Tools

There are eighteen expedient tools associated with this occupation level. Of these, nine were retouched flakes while the other nine were utilized flakes. The retouched flakes were made mostly from either unidentified local cherts (n=5) or Swan River chert (n=3). There is also one instance of Knife River Flint being used. The utilized flakes are made mostly from unidentified local cherts (n=4) and Knife River flint (n=2).

6.3.4.2.5 Cores

There are six complete platform cores and one core fragment associated with the lower occupation of this site. Material types used to produce these cores are fairly evenly distributed between quartzite (n=3), Swan River chert
All of these material types can be found in local gravel deposits.

6.3.4.2.6 Debitage

There were 917 pieces of debitage associated with the lower occupation of EdNh-35. Of these, 13 were primary decortification flakes, 89 were secondary decortification flakes, 548 were secondary flakes, and 66 were tertiary flakes. There were also 201 pieces of shatter. Material types were dominated by Swan River chert (n=339), unidentified cherts (n=174), and quartzite (n=128). Other material types included silicified peat (n=73), Knife River flint (n=37), and fused shale (n=37).

6.3.4.3 Faunal Remains

There were 334 bone fragments associated with this lower occupation level. All are believed to be bison remains. In addition, twenty-five of the 334 bone fragments were identifiable as specific bison elements. Fifteen of the smaller unidentifiable bone fragments were either burned or calcined.

6.4 Site Interpretation

6.4.1 Identifying Occupation Layers

My primary interest with this site interpretation is the identification of separate cultural occupations within excavation block D. The stratigraphic profiles (Figure 6.1 and Figure 6.2) reveal that there are as many as six separate buried soils in some sections of the main excavation block, and while a buried soil does not of itself signify an occupation layer, there are a number of faunal elements present in the wall profiles which seem to be associated with the upper three buried soils. Thus there is a strong possibility that these three buried soils formed the living floor of three different occupations of this site. In addition, feature nine is clearly associated with the lowest buried soil indicating
yet another occupational level at this site. Thus a conservative estimate would place the number of occupational episodes for EdNh-35 at four: three in the upper component and one in the lower component.

It can also be observed that not all of these cultural occupations share the same intensity of activity. By examining the sheer quantity of artifacts recovered in each of the arbitrary excavation levels, it is readily apparent that the cultural occupations that occurred between 10 and 20 cm below the surface produced more projectile points, scrapers, debitage, faunal remains, and ceramics than any of the other occupations. A secondary peak of artifact production is observed at a depth of between 50 and 60 cm below the surface and can be associated with the Pelican Lake occupation.

As to the cultural identity of the people who occupied the site during these various periods of activity, two artifact types can be considered diagnostic in this regard: projectile points and ceramics. An analysis of the distribution of projectile points indicates that the Avonlea points are found in some abundance (see Figure 6.10) within levels one and two, whereas Besant points are found primarily in level two but also level four. In addition, the Pelican Lake projectile point was found in level five. There were also several projectile point fragments that were too incomplete to identify as belonging to any particular projectile point style. It is my opinion that most of these unidentified points in the upper two levels were Avonlea projectile points given the size and thickness of the fragments, however no definite identifications can be made. I am also quite confident that none of the unidentified projectile point fragments found in level 1 were Besant series projectile points.

Similar to the distribution of projectile points, ceramics at this site are found primarily within levels one and two (see Figure 6.11). The overwhelming majority of the sherds were found within level two, thus providing further indication as to the period of most intense site usage.
Figure 6.8: Fabric impressed and cord roughened ceramic sherds recovered from the upper component at site EdNh-35. A) Rim sherd and profile; B-F: Body sherds

Figure 6.9: Pelican Lake projectile points associated with the lower component at site EdNh-35
Interestingly, a few small ceramic sherds were encountered in levels six and eight. There is little doubt that these tiny sherds are non-indigenous to the lower occupation and were likely "infiltrated" by means of rodent activity or similar disturbance factors. It stands to reason that if these artifacts could be displaced from their original context, the same may be true of other artifacts.

Only one buried soil is associated with level one; thus it seems reasonable to assign this uppermost occupation level to the Avonlea Complex. However, level two contains two buried soils and also two types of projectile points. Upon realizing this complexity while the excavation was still ongoing, this level was subdivided into two arbitrary 5cm levels (levels 2a and 2b) in hopes of distinguishing between a separate Avonlea and Besant component. This goal was not achieved, as only three projectile points were recovered subsequent to the subdivision of level two and they indicated that Besant points were present in levels 2a and 2b while Avonlea points were present in level 2b.

It is my belief that there are at least two occupations present within level two, likely represented by the two buried soils evident in the north wall profile. Furthermore, as these buried soils do not extend throughout the site, there is no certainty that these two occupational layers always retain the same relative depths or even that they always remain as stratigraphically separate entities. It is conceivable that these two cultural strata may have shared the same living floor in some sections of the site. Thus I am inclined to think that the presence of Avonlea and Besant projectile points in level two is more likely the result of component admixture than either the simultaneous occupation of the site by both groups or the presence of an Avonlea component appearing stratigraphically beneath a Besant component.

Given that Avonlea projectile points are present in abundance in level one, it seems reasonable to consider the upper occupational layer in level two as being the source of the Avonlea artifacts in this level. Likewise, it is probable that the lower occupation layer in level two is the source of the Besant series
projectile points, though we were not able to demonstrate this conclusively in our excavation.

Similarly, it seems that the features present in this upper component relate to at least two separate occupations of the site. This conclusion was reached by the observation of the seemingly random pattern of bone upright placement, likely indicating more than one building episode. As well, feature twenty-nine (a bone upright) overlaps spatially with feature one (the main hearth feature) indicating they were not in use during the same occupation.

Features one and feature thirteen have produced radiocarbon dates more consistent with the Avonlea complex than the Besant complex. In addition, an Avonlea projectile point was recovered from feature one. Thus, at least two of the features present in the upper component reflect the Avonlea occupation of the site. The remainder of the features could conceivably have been made by either Besant or Avonlea groups.

The artifacts in level three are not nearly as numerous as those in the upper levels. Nor are there any diagnostics present. In addition, this level contains a portion of the lower buried soil present in level two as well as another thinner buried soil immediately underneath it. This thinner paleosol can be seen to merge with the thicker one on the eastern wall (Figure 6.1). It seems probable that the artifacts recovered from this level are part of the lower occupational level encountered in level two. However, some of them may pertain to a less intense and slightly earlier occupational episode of this site as evidenced by this thin buried soil.

Level four produced relatively few artifacts but did contain one buried soil as well as a diagnostic Besant series projectile point. Likely, this buried soil represents a relatively sparse occupation of the site. I am hesitant to assign this occupation to the Besant Complex on the basis of a single projectile point, especially considering the significant amounts of rodent disturbance and the
demonstrable component admixture involving some of the ceramics from the upper component making their way into level eight.

Levels five through seven represent the lower occupation at this site. There is one buried soil present in level six which seems to be associated with the three hearth features that make up the Pelican Lake component. Levels five and seven contain lesser amounts of artifacts than level six, but they are likely all associated with the same occupation.

6.4.2 Identifying Activity Areas
6.4.2.1 Features

Obviously the 11 hearth features encountered in level two indicate multiple cooking episodes. While the large boiling pit/hearth feature (Feature one) is associated with two Avonlea projectile points and has returned a date most consistent with the range of dates attributed to the Avonlea complex, the other hearth features were not dated and have not produced any materials that could be considered diagnostic of either phase. Thus, the other hearth features do not necessarily relate to the same occupation of the site as feature one and could have been created during either the Besant or Avonlea occupation of this site. The potential therefore exists for these hearth features to represent multiple cooking episodes that occurred during different occupations of this site.

The features identified as bone uprights present more of an enigma. Two interpretations of these features exist in the literature. The most common interpretation is that they are the remains of a post-in-ground structure such as a dwelling or a corral for bison procurement. Clear examples of dwelling structures are found at the LaRoche and the Ruby site in Wyoming (Frison 1975:214). Examples of bone uprights used in the manufacturing of bison corrals are common at Besant kills sites (Reeves 1983, Hjermstad 1996:104) and are always accompanied by bison bone beds. For this interpretation to be
valid the bone uprights should form some recognizable pattern such as a straight line or an arc.

Another popular interpretation of these features argues that in some cases they were used as tie down stakes for tipi structures or any other conceivable instance where a hunter gatherer would need to affix something to the earth such as hide stretching, covering boiling pits, or keeping dogs from disrupting bison procurement activities (Hjermstad 1996:105). In this instance, the bone uprights do not conform to a readily identifiable pattern and may be randomly scattered across the site.

The bone uprights that were identified at the site EdNh-35 seem to be more or less randomly distributed across the site. This distribution seems too sparse and non linear to be indicative of any form of dwelling structure. They are therefore more consistent with the later interpretation of their use; that they were used as tie down stakes.

6.4.2.2 Relative Artifact Densities

Due to the coarseness of the provenience obtained on the artifacts (limited to a 1m² block designation), the effectiveness of identifying activity areas through the process of comparing relative artifact densities among the various artifact types is somewhat reduced. Nevertheless, I have compared the relative artifact densities of significant artifact categories such as debitage, scrapers, ceramics and faunal remains.

The analysis of the distribution of faunal remains across the upper component revealed a large concentration (4946 fragments) in unit 87N 142W. This corresponds with the location of the boiling pit (feature one), and thus is not unexpected. However there was also a medium sized concentration of faunal remains (762 fragments) present in unit 86N 139W, which likely represents activities associated with hearth feature twenty-three. In both cases,
the concentration of faunal remains is an indication of cooking and related activities.

The analysis of the debitage also indicates a major concentration (120 pieces) near the vicinity of the main boiling pit. This could indicate that flintknapping was conducted in conjunction with the cooking activities of feature one. In addition, there are three smaller concentrations in units 85N 139W, 85N 141W and 89N 145W (97, 95 and 92 pieces respectively). No clear relationships can be established between these lesser concentrations of debitage and the various features of the upper component. Likely they represent flintknapping activities of moderate duration.

In both the upper and lower component, the majority of the debitage consisted of secondary flakes. This indicates that the majority of the procurement and initial knapping of the raw materials occurred elsewhere. Thus flintknapping activities at this site were confined to the shaping and/or resharpening of the various tools. Also worth noting is the near absence of any primary decortication flakes among the exotic lithic materials (Knife River flint, fused shale, jasper, and Tongue River Silicified Sediment)(see Figure 6.4). Their absence indicates that the materials were traded in an already partially prepared form.

The spatial distribution of ceramic sherds in the upper component indicates several small concentrations. The largest is in unit 85N 145W (42 sherds) but is not associated with any particular feature. Another concentration (32 sherds) is found in unit 86N 139W and is associated with the same hearth (feature twenty-three) as the second largest bone concentration. Similarly, another small concentration of 28 sherds is associated with the main boiling pit (discussed in the description of feature one). There is also a concentration of 18 sherds associated with the bone upright (feature eighteen) in unit 85N 139W. Two of these 18 sherds seem to have a cord roughened exterior.
surface, likely the result of the cord wrapped paddle and anvil manufacturing technique.

6.6 Some Conclusions

It is my opinion that the site EdNh-35 can best be viewed as having four chronologically distinct occupations. The first two can be affiliated with the Avonlea Complex and are likely associated with the buried soil in level one and the upper buried soil in level two. The third occupational level can be affiliated with the Besant Complex and is possibly associated with the lower buried soil in level two which extends into level three. There also seems to be considerable admixture between the lower Avonlea occupation and the Besant occupation, as it was not possible to separate the two into stratigraphically distinct occupations. A fourth occupational episode can be affiliated with the Pelican Lake Complex and seems to be associated with the buried soil encountered in level six.

The diagnostic artifacts of all three archaeological complexes represented at this site seem to be characteristic of their respective typologies. Unfortunately, due to their badly fragmented and exfoliated nature, the ceramics encountered at this site were not able to play as pivotal a role in differentiating between the Besant and Avonlea occupations as I had hoped. However it was observed that feature eighteen was associated exclusively with cord-roughened ceramics. This can be taken as an indication that some of the features encountered in the upper component are associated with the Besant occupation this site.

Activities at this site are orientated around habitation and food preparation (as indicated by the numerous hearth features, ceramics, and bone uprights). There is also considerable evidence for flintkapping activities, likely related to the later phases of tool manufacture and tool maintenance. Hide working may also have occurred as there were several scrapers found and
some of the bone uprights could have conceivably been used to stretch out the hides on the ground.

This site is best considered a habitation site that was revisited multiple times by Pelican Lake, Besant and Avonlea groups. Bison remains dominated the faunal assemblage, so it is possible that the Besant or Avonlea groups occupying this site also participated in a nearby communal bison hunt, for which the incised Moose Jaw Creek valley would have been ideally suited.
7.0 Discussion

7.1 Introduction

In the previous chapter, I argued that in the case of EdNh-35 the apparent association between Avonlea and Besant materials was likely the result of a combination of factors including compressed stratigraphy and excavating in 10 cm arbitrary levels. I now intend to discuss other multicomponent sites on the northern plains that have either a Besant and an Avonlea component or a component bearing artifacts diagnostic of both complexes. Through this comparison, I hope to better illustrate what the archaeological evidence is actually indicating with regards to Besant/Avonlea contemporaneity.

Throughout this thesis it has been my contention that if both Besant and Avonlea groups co-existed on the northern plains, then we could expect to see this represented in the archaeological record in three ways. First, there should be an overlap in the radiocarbon dates for both complexes. Second, at sites where both complexes are represented, we should expect to see a significant number of instances of an Avonlea component appearing beneath a Besant component in the same stratified mass. Third, there should also be considerable evidence of cultural interaction between these two complexes. Following my discussion of other multicomponent sites on the northern plains, I will review each of these three sets of evidence to determine if there is significant reason to support the notion that the peoples who produced these two archaeological complexes co-inhabited the northern plains.
7.2 Nearby Avonlea and Besant Sites

7.2.1 The Mortlach Site

The Mortlach site is a multicomponent habitation and bison kill site located in the Sandy Creek valley near the town of Mortlach, Saskatchewan. There were eight archaeological components encountered at this site, some representing multiple occupations by the same archaeological complex (Wettlaufer 1955:19). The uppermost component contained Mortlach phase ceramics as well as both plains and prairie side-notched points (Wettlaufer 1955:264). The second component encountered at this site produced cord roughened ceramics likely classifiable as Ethridge ware. Only one projectile point was recovered from the third component. It was originally assigned to the “Caron Culture” but subsequent re-examinations re-assigned the point and this component to the Besant complex (Morlan 1993:17).

The fourth component consists of five stratigraphically separate Besant complex occupations. In addition to Besant series projectile points, many hearth features, faunal remains, and bone uprights were associated with this component (Wettlaufer 1955:39). This seems quite similar to the composition of the upper component at EdNh-35. Also, the two lowest Besant occupations at this site contain Sandy Creek projectile points.

Beneath the Besant component are three components assigned to the Pelican Lake culture. The bottom component (level 8) produced a single Duncan point and can therefore be assigned to the Mckean complex.

7.2.2 The Walter Felt Site

The Walter Felt site is a multicomponent habitation site located on an escarpment of the Missouri Couteau some 13 km south of the town of Mortlach, Saskatchewan. There were twenty stratigraphic layers containing twelve distinct archaeological components at this site (Kehoe 1973:164). Level four produced Plains side-notched projectile points and yielded a date of 400 +/- 40
Levels six and seven produced Prairie side-notch projectile points and yielded dates of 700 +/- 80 (S-203) and 1260 +/- 70 rcybp (S-202) respectively. Level ten produced several Besant series projectile points of the Samantha type. Two radiocarbon dates were taken from this level and were averaged to 1535 +/- 60 rcybp (S-201, S-260). Level thirteen produced Besant series projectile points of the Besant or Outlook side-notch type and a radiocarbon date of 1610 +/- 70 rcybp (S-200). Level fifteen was also ultimately assigned to the Besant complex and thought to be associated with the Sandy Creek type of Besant series projectile point. This level yielded a radiocarbon date of 2430 +/- 90 rcybp (S-279) (Morlan 1993:64).

It is interesting to note that here we have stratigraphic and radiocarbon evidence to support the notion that Sandy Creek was the earliest variant of the Besant series projectile point just as the Samantha variant is the latest, appearing just before the appearance of the Prairie side-notch type. It was also noted that bone uprights were encountered at this site, though the level they are associated with is unclear (Kehoe 1973:164).

7.2.3 The Garrat Site

The Garrat site is a multicomponent habitation site located on the valley bottom of Moose Jaw Creek in the city of Moose Jaw, Saskatchewan. Four distinct archaeological components were identified in the course of excavating the eight natural at this site. The upper two components (levels 1,2 and 4) can likely be assigned to the Old Women’s phase as they mostly produced Plains and Prairie side-notched projectile points. The third component encountered in level six consisted of 48 Avonlea projectile points and one Besant/Outlook side-notch projectile point. Two radiocarbon dates were returned on features associated with this component. The two dates, 1450 +/- 70 rcybp (S-406) and 1280 +/- 60 rcybp (S-408) were averaged to 1352 +/- 46 BP (Morlan 1993:16). While this component does contain both Avonlea and Besant diagnostics, the
ratio of 48:1 can be taken as indicating that the single Besant series projectile point was non-indigenous to this component.

The fourth component was encountered in level eight and has been assigned to the Besant complex. It yielded three Besant/Outlook side-notch projectile points and produced a radiocarbon date of 1990 +/- 75 rcybp (S-409) (Morgan 1979:246).

7.2.4 The Lake Diefenbaker Survey

During the mid 1990’s a reconnaissance survey was conducted in the area surrounding the Lake Diefenbaker reservoir. This survey primarily identified surface sites in the region. Though the Avonlea complex was poorly represented in this survey (Himour 1997:163), several Besant complex sites were identified. Of particular interest were four Besant sites, collectively known as the “Aiktow Besant Sites” (Himour 1997:160), discovered on the western shore of the Qu’appelle arm of the reservoir. Each of these sites had large numbers of Besant series projectile points lying exposed on the surface (representing a total of 144 Besant series projectile points).

Curiously, only four of these projectile points were manufactured from Knife River flint. The most common raw materials used were silicified peat, Swan River chert, and silicified wood ((Himour 1997:161). These same three materials were present in abundance in the debitage assemblage at EdNh-35, suggesting that there must have been a source of silicified peat and silicified wood in the area. In stark contrast to the projectile points, the majority of the endscrapers found at the Aiktow Besant sites were made from Knife River flint. This is similar to the predominant choice of materials for endscrapers found at EdNh-35.
7.2.5 The Sjovold Site

The Sjovold site is a deeply stratified multicomponent habitation site on the west bank of the South Saskatchewan River some 50 km downstream from the "elbow" of the river. The excavations at the Sjovold site identified twenty-one separate archaeological components that were labelled sequentially using roman numerals. Components I-V produced Prairie and Plains side-notched points as well as large quantities of ceramics. Component VI Produced materials diagnostic of the Avonlea complex such as Avonlea projectile points and Truman Parallel Grooved ware ceramics. Component VII produced a Samantha point as well as 185 sherds of net- impressed pottery (Dyck and Morlan 1995:292). Other features included a large rock filled pit and two surface hearths. Components VII - IX did not produce any diagnostics and therefore have not been assigned a cultural affiliation.

Besant complex occupations at this site consist of Component X which is a mixed Besant/Pelican Lake component that contained four Outlook side-notch points of the Besant series and two Pelican Lake projectile points. It was determined that this layer likely represented at least two occupational episodes (Dyck and Morlan 1995:359). Components XI and XII have also been assigned to the Besant complex based on the recovery of both the Bratton (Component XI) and Sandy Creek (Component XII) types of Besant series projectile points. Component XIV marks the earliest Besant component at this site and produced ten Outlook side-notch projectile points.

Earlier occupations at this site that were attributed to a specific archaeological complex consisted of two stratigraphically separate Pelican lake components (components XIX and XX) and one McKean complex occupation in component XXI. Both of these components produced radiocarbon dates that were consistent with the accepted age ranges for their respective complexes.
7.2.6 The Melhagen Site

The Melhagen site is a Besant bison pound located in the Aitkow Sandhills approximately 19 kilometres southeast of the town of Elbow in south central Saskatchewan. The site consisted primarily of a bison bone bed and associated processing area. Of the fifty-five Besant series projectile points recovered from this site, 70% were manufactured from Knife River flint. The 30% that were manufactured from other materials tended to exhibit a higher degree of reworking. As a result these points were much shorter in length and had a “stubby” appearance (Ramsay 1991:138). This is similar to the single non-Knife River flint point found at EdNh-35. In addition, several Samantha projectile points were tentatively identified at this site and Ramsay’s (1991:332) catalogue number 3202 bears a striking resemblance to the two flake points recovered from EdNh-35.

Six radiocarbon dates were recovered from this site. Taken together at the 95% confidence interval, these dates encompass the entire range of dates associated with the Besant complex. However the principle researcher at this site had good reason to suspect that the youngest date returned had been contaminated. The remaining dates cluster into two groups with each group corresponding to a different area of the site. Thus it was reasoned that this likely represents two chronologically distinct occupations of the site by Besant groups (Ramsay 1991:150). Neither of these groups can be identified by means of a morphologically distinct projectile point style.

7.2.7 The Lebret Site

The Lebret site is a multicomponent habitation site located within the Qu’appelle valley in southeastern Saskatchewan. This site consists of seven distinct occupation levels (Smith 1986:71). The upper two occupations have produced both Plains and Prairie side-notched projectile points. The third occupation level is associated with a thick dark brown buried soil and has
produced materials diagnostic of the Avonlea complex. These materials were found within a 15 cm band within this buried soil and likely represent a single occupation or two closely spaced occupations by Avonlea groups. Also associated with this level was a large basin-shaped hearth feature very similar to the main boiling pit at EdNh-35. A bison element from this component returned a radiocarbon date of 1260 +/-115 rcybp (S-2691)(Smith and Walker 1988:82). Both Rock Lake ware and Truman Parallel Grooved ware were represented in this component.

Separated from the Avonlea occupation by an occupation level that did not produce any diagnostics, occupation levels five and six produced Besant series projectile points of the Sandy Creek type. This level returned a radiocarbon date of 2980+/-105 rcybp (S-2791) that is believed to be in direct association with a Sandy Creek projectile point (Smith 1986:78).

7.2.8 The Bakken-Wright Site

The Bakken-Wright site is a multicomponent bison kill site located on one of the upper terraces of the Frenchman River valley near the hamlet of Bakken in southwestern Saskatchewan. Similar to EdNh-35, this site is located on the upper terrace of a major valley complex. A total of eight archaeological components were identified at this site. The upper three components produced exclusively Old Women's phase diagnostics such as Prairie side-notch projectile points and cord-wrapped paddle impressed pottery (Adams 1975:148).

The subsequent three components consisted of a mixture of Avonlea and Prairie side-notch projectile points. Ceramics were only encountered in the upper Avonlea/Prairie component and are similar to the ceramics found in the exclusively prairie levels. The overall morphology of the Avonlea points recovered from these levels is consistent with the definition of the Timber Ridge
type of Avonlea point. The abundance of Avonlea points vs. Prairie side-notch points can be seen to increase proportional to the depth of the component.

Preceding the mixed Avonlea/Prairie components in the stratified mass, is a component that contains Classic/Gull Lake type Avonlea points. No ceramics nor any other diagnostic artifact types were associated with this component.

The eighth and final component identified at this site is considered to be the Besant component by the chief excavator, though no Besant series projectile points were recovered during the excavations he conducted. Besant series projectile points were present in abundance in the disturbed areas of the site and previous excavations conducted by amateur archaeologists had associated them with this same lowest component (Adams 1975:142). It is interesting to note that between the “pure” Prairie side-notch and the pure Avonlea level there are three components with both types of projectile points, whereas no equivalent components exist between the Classic Avonlea and Besant levels.

7.2.9 The Morkin Site

The Morkin site is a multicomponent habitation site located on the lowest terrace of Trout Creek; a small stream flowing eastwards out of the Porcupine Hills in southern Alberta (Byrne 1973:12). During the excavations of this site, enormous difficulty was encountered in identifying natural stratigraphic layers. Ultimately the site was excavated using a combination of arbitrary and natural stratigraphic units (Byrne 1973:12). Five distinct archaeological components were identified using this method, though it was considered likely that there was some cross-contamination between these levels. And, indeed, all five components produced Prairie side-notched, Avonlea, and Besant projectile points in varying concentrations. In addition to the diagnostics, several refuse pits, hearth features, and bone uprights were identified at this site. All three of
these features seem most common in the upper three components (Byrne 1973:608) but given the poor stratigraphic control, it would be difficult to concretely associate any of the three archaeological complexes with these features.

While all three projectile point styles are present in each of the five components, the relative abundance of each point type varies in each level. Besant series projectile points are most abundant in the lowest component and can be seen to decrease in frequency in each subsequent component. Moving from level five to level one, Avonlea projectile points can be seen as becoming increasingly more numerous over time until they become the dominant point style in level three after which the decrease in frequency once more. Prairie side-notch projectile points are most numerous in level two (Byrne 1973:614).

A Plains triangular projectile point form was also identified in each of the five components; however, the two examples photographed by Byrne (1975:729) appear to be preforms of Avonlea projectile points. Their relative frequency in each of the five components follows the same pattern as the Avonlea projectile point, further substantiating this observation.

It can therefore be observed that while some serious problems were encountered in interpreting the stratigraphy at this site, the differing frequencies of projectile points still seem to uphold the same chronological ordering between Besant and Avonlea. In addition, the second and third components at the Morkin site bear a resemblance to the upper component at EdNh-35 in that basin shaped hearth features and bone uprights were encountered together with both Avonlea and Besant projectile points.

7.3 Radiocarbon Evidence

Radiocarbon dating is by far the most common method of absolute dating currently employed on the northern plains. While radiocarbon dating has been employed since the 1950’s, laboratory techniques aimed at accurately
representing the true age of the sample have changed over time as the understanding of the principles involved has increased. As such, radiocarbon dating attempts can be seen as becoming increasingly more accurate over time with regards to errors generated by laboratory procedures and sampling techniques. Thus, not all radiocarbon dates should be given equal consideration when comparing age ranges for archaeological complexes.

It comes as no surprise, then, that the age ranges put forth for the Avonlea and Besant complexes, as well as the estimated length of temporal overlap between the two, have also changed over time. The earliest culture histories of the northern plains estimated the length of co-occupation to be approximately 800 years (Reeves 1983:16). Currently the radiocarbon data taken from the Canadian Archaeological Radiocarbon Database (Morlan 2003) indicates an overlap of about 450 radiocarbon years (from 1750 to 1300 rcybp, see Figure 5.1). Thus, it appears that as radiocarbon dating techniques have been refined, the period of apparent temporal overlap has decreased in length. It may, therefore, be reasonable to expect this period of overlap to decrease further as more accurate methods of extracting and counting C\textsuperscript{14} are developed.

Furthermore, the period of apparent overlap depends on which dates the researcher excludes on the basis that they are anomalous or “outliers”. This is difficult to achieve in an objective fashion as there is a tendency to omit any dates that do not fit into the researchers pre-conceived notion of an acceptable Besant or Avonlea date (Morlan 1993:3). When displaying the range of radiocarbon dates graphically (Figure 5.1), it can be observed that each complex has a central grouping or continuum of dates wherein a large number of dates fall within the same time interval. Difficulties arise in determining where this core grouping of dates ends and the anomalous or suspect dates begin. Clearly any dates that are removed from the core continuum by a large margin are anomalous, but the dates that form the fringes of the core grouping are also suspect. It can be observed in Figure 5.1 that at both ends of the core
grouping of dates the curvature of the line formed by the core grouping of dates curves sharply. The problem resides in determining exactly where along that curvature the radiocarbon dates cease to accurately reflect the period of occupation for either the Besant of Avonlea complexes.

In addition, as discussed in chapter five, there are numerous circumstances that could result in an incorrect or misleading age returned from the radiocarbon sample. It can therefore be assumed that any given sampling of radiocarbon dates (including the one I adapted from the CARD) contains a certain amount of "noise": dates that do not accurately represent the age of the occupation they are associated with.

The recent past presumably represents the period in which the most accurate radiocarbon dates were generated by virtue of the ever-evolving and increasingly accurate laboratory techniques. As such, it seems tempting to recreate the temporal span of both complexes only using radiocarbon dates that were generated in the last 10 or 15 years. However, this is not as straightforward as it might seem. While the most recent dates are more accurate from a statistical and laboratory procedure perspective, they are still subject to sample provenience problems and sample contamination problems which have not necessarily become less of an issue over time. This is evidenced by the radiocarbon dates returned from the upper component at EdNh-35. Even though these are dates that were generated by using contemporary laboratory procedures, it is not altogether clear which cultural occupation (and therefore which complex) they are associated with. In all likelihood they will ultimately be listed as belonging to both the Avonlea and Besant complexes, or simply ignored altogether.

Thus, it might be ill-advised to discard a radiocarbon date that was generated using antiquated laboratory procedures in favour of a date generated by a more accurate method if the original date has excellent association with a diagnostic artifact and the newer date does not. I would argue, then, that the
dates need to be evaluated on an individual basis with regards to such factors as laboratory procedure employed, the strength of association with diagnostic artifacts, and the possibility for contamination. With nearly 350 radiocarbon dates associated with the two complexes, such an endeavour is well beyond the scope of this project.

It shall suffice to say that the current radiocarbon data does indeed indicate a substantial period of overlap between these two complexes. The exact length of the period of contemporaneity is dependent upon which of the "fringe" dates are deemed acceptable as either Besant or Avonlea dates. It should also be noted that, as with all radiocarbon dates, any number of the dates used to demonstrate this overlap could be inaccurate to some degree.

7.4 Stratigraphic Evidence

If the Besant and Avonlea complexes coexisted in the same geographic area, then we should expect to see this reflected by a fairly random pattern of alternating Besant and Avonlea occupational layers in the stratigraphy of various well stratified sites across the northern plains. Under this coexistence hypothesis, any given archaeological site dating to this time period has the potential to have been occasionally occupied by either cultural group in any order. Thus we should expect to see Avonlea components found both beneath and above Besant components in a stratified mass.

However, this does not appear to be substantiated by the stratigraphic observations made at any of the stratified sites containing both Besant and Avonlea components for which a published monograph exists. In his review of 109 Saskatchewan archaeological sites and their associated radiocarbon dates, Morlan (1993:40) states that whenever Besant and Avonlea components are encountered in the same stratified mass, the Besant component invariably occurs beneath the Avonlea component. From my own review of the literature, two stratigraphic situations seem to exist: either the diagnostic materials of the
Avonlea and Besant complexes exist in separate well defined components (in which case the Besant component is lower in the stratified mass) or the diagnostic materials of both complexes are associated with the same component, as is the case with EdNh-35. These two situations are not mutually exclusive and occasionally a site contains several mono-diagnostic components of Avonlea or Besant materials as well as a mixed component including both. In such situations the mixed component always occurs above all the “pure” Besant components and beneath all the pure Avonlea components.

The former situation, where both complexes are represented in separate components and always in the same stratigraphic order, requires little in the way of further discussion and seems to strongly refute the notion that these complexes were contemporaneous. The latter situation, where both sets of diagnostic materials are found in the same stratigraphic contexts, requires further interpretation. At first glance this seems to indicate the possibility of coexistence between the two complexes, but I believe that this co-occurrence of both diagnostics can be explained by other, more probable, means.

For one, if Avonlea immediately succeeded Besant on the northern plains, it is entirely conceivable that terminal Besant complex occupations and the earliest Avonlea occupations could have shared portions of the same living floor without actually being contemporaneous with each other. As discussed in chapter five, it is a frequent occurrence in the formation of a stratigraphic sequence that the upper surface of one strata does not get immediately buried by the formation of the subsequent strata. This is especially likely to happen if the lower strata is uneven or sloped in some way. With regards to archaeology, this allows some portions of the lower strata to continue to act as the ground surface or “living floor” throughout several cultural occupations of the site. Thus, the juxtaposition of two chronologically distinct diagnostic artifact types can be achieved.
Another possibility is that by digging in 10 cm arbitrary levels we may be obscuring some of the finer stratigraphic relationships that do exist. This is of particular relevance when cultural materials are not associated with any visible buried soil, as is occasionally the case (Dyck and Morlan 1995:98). Thus while the diagnostic artifacts of both complexes may in actuality be separated by some small distance in time, they become assigned to the same component by virtue of their being encountered in the same excavation level. In this way the so called “mixed components” may actually be artificial constructs generated by the coarseness of our excavation techniques.

Also worth considering is the possibility for component admixture through disturbance factors such as rodent burrowing and the like. This should be considered when diagnostics of one complex do not seem to fit in with the rest of the assemblage, as is the case at the Garrat site where there were 48 Avonlea projectile points and one Besant side-notched point recovered from the same occupational level. In general the archaeologist should exercise some caution when dismissing artifacts of a suspicious context as being intrusive, as the possibility exists that some of these artifacts may be indicative of trade or other forms of contact between two cultural groups. It may also be the case that some of these artifacts arrived in their current contexts through artifact curation practised by the later of the two groups.

It would seem then that mixed Avonlea/Besant components are more likely the result of differing rates of soil accumulation, disturbance factors, and our penchant for digging in arbitrary levels than they are indicative of a period of coexistence. This is further confirmed by the observation that when both mixed components and “pure”components of these two complexes occur in the same stratified mass, the mixed component is invariably located between the uppermost Besant component and the lowest Avonlea component. If these two complexes were truly contemporaneous, we could expect to find mixed components anywhere within the Besant-Avonlea stratigraphic sequence.
7.5 Evidence for Cultural Interaction

It has long been established that culturally distinct pre-contact native groups interacted with each other through trade, intermarriage and the exchange of ideas. It is believed that the majority of these exchanges were achieved during large semi-regular gatherings referred to in the literature as "trade centres", "rendezvous", or "ingatherings" (Meyer and Thistle 1995:406; Wondrasek 1997:31). Or, if the seasonal rounds of the two groups did not allow for both to be in the same place at the same time, they could still have interacted through long distance trading. This form of interaction involved individuals or families of one ethnic group travelling a significant distance for the purposes of trade or possibly arranging a marriage with members of a second ethnic group (Meyer and Epp 1990:337).

It is generally accepted that regular contact and the exchange of ideas and goods between two groups should leave its mark on the material culture of the participating groups (Wondrasek 1997:51). This can be represented in the archaeological record by either the apparent diffusion of artifact traits from one group to the other or the appearance of tools typical of one complex in the assemblages of the other.

Examples of this are not difficult to find, even within the context of the northern plains. Along the Saskatchewan parkland/boreal forest boundary the ceramic wares of the Lozinsky subphase of the Mortlach phase (Walde 1994) and the Pehonan complex of the Selkirk composite (Meyer 1984) each bear evidence of a mixing of plains and woodland traits. This mixing is believed to represent contact and perhaps even intermarriage between plains and woodland groups (Meyer and Epp 1990:336; Wondrasek 1997:91). The Lozinsky subphase is believed to represent a Late Precontact period plains adapted group that inhabited the parkland region in Saskatchewan. The assemblages of this subphase are characterized by the presence of Mortlach phase pottery which incorporates Selkirk style decorations, such as a single
row of punctates. These assemblages also contain low percentages of southern lithic materials such as fused shale and Knife River flint and an elevated percentage of northern materials such as Gronlid siltstone (Walde 1994:113). It is also not uncommon to find Selkirk vessels associated with these assemblages. While some researchers reject the subphases proposed by Walde (Malainey 1995:182), they still note that the decorative styles on some northern Mortlach vessels clearly reflect Selkirk influences (Malainey 1995:181).

The Pehonan complex of the Selkirk composite essentially represents the reverse situation. It is believed to reflect a Late Precontact period forest adapted group that inhabited the southern periphery of the mixed-wood boreal forest during the spring and summer months (Meyer and Epp 1990:337). The assemblages of this complex are characterized by Selkirk pottery which incorporates decorative styles such as parallel cord wrapped tool impressions around the rim and decorated shoulders which are more commonly associated with ceramics manufactured by plains groups. Other characteristics of this complex include "S" shaped vessel profiles and angular shoulders which are also considered to be plains traits (Meyer 1984:43). Occasionally, Mortlach vessels are also present in these assemblages (Meyer and Epp 1990:336).

Both of these archaeological entities are believed to be the result of a significant period of trade and interaction between Mortlach and Selkirk groups (Wondrasek 1997:91). This type of interaction is hardly unique to these two groups and likely represents an intrinsic part of the hunter-gatherer way of life. It would therefore be reasonable to expect to find evidence for similar interactions anywhere two contemporaneous ethnic groups existed side by side.

Certainly such evidence exists for the Besant complex and contemporaneous woodland groups in eastern North and South Dakota. As discussed in chapter three, there is significant evidence to indicate that the
Besant groups in the Dakotas were linked to the Hopewellian Interaction Sphere, a major woodlands based trading network of the Middle Woodland period (Gregg 1985:121). This interaction is represented in the archaeological record by the Sonota phase of the Besant complex. Features characteristic of this phase include the construction of burial mounds and the appearance of copper, conch shell, and catlinite (Gregg 1985:121). All of these traits are commonly associated with Middle Woodland assemblages involved in the Hopewellian Interaction Sphere; thus the Sonota phase can be seen as produced by a Besant group who were heavily influenced by their contemporary trading partners.

A comparable but significantly different situation exists for the Avonlea complex and its woodland contemporary, the Saskatchewan composite of the Laurel configuration. As discussed in chapter four, in addition to a few examples of Avonlea net-impressed ceramics that exhibit decorative styles typically associated with Laurel ceramics, the co-occurrence of both Avonlea and Laurel artifacts within the same components also suggests that these two groups interacted. Diagnostic artifacts of the River House complex (a late Laurel manifestation) are occasionally found in association with Avonlea Net-Impressed ware at sites along the parkland/forest boundary in the provinces of Manitoba and Saskatchewan (Meyer n.d.). Occasionally, lithic tools indicative of the Laurel configuration such as adze blades and small side-notched points are also found within these assemblages (Meyer et.al. 1988:37). The co-occurrence of these two diagnostic sets of artifacts, as well as some Avonlea vessels exhibiting Laurel traits, has been interpreted as evidence that Avonlea and River House groups interacted through trade (Meyer and Epp 1990:333). This is very similar to the situation observed with the Lozinsky subphase and the Pehonan complex.

Following these examples, we should expect to find similar evidence for interaction between the Besant and Avonlea complexes if these two groups
inhabited the northern plains simultaneously. It stands to reason that if both Avonlea and Besant groups interacted with contemporaneous groups in the parkland, they should also have interacted with contemporaneous groups on the plains (ie: each other). Unlike the interaction between parkland and woodland groups, where the two groups likely only co-inhabited the same region for a portion of the year (Meyer and Epp 1990:332), Besant and Avonlea groups could have potentially come into contact with each other at any point during their yearly migrations (see Figure 7.1). Members from both groups could have regularly participated in the same seasonal ingathering or communal bison hunt, thereby establishing a means for trade and intermarriage between the two groups. In all likelihood, if these complexes overlapped to the degree that their geographic distribution and radiocarbon dates indicate, then the degree of interaction that should have occurred would make the assemblages of either complex nearly indistinguishable from each other. At the very least we should expect to find a reasonable number of instances of Avonlea Net-Impressed ware associated with Besant components in the parkland or Truman Parallel Grooved ware associated with Besant components in the grassland regions.

However, this is simply not the case. While a few instances exist where diagnostics of both complexes are found in the same component, as previously discussed, there is no firm indication that the existence of such components represents interaction rather than component admixture. Besant and Avonlea diagnostic materials are more frequently encountered in separate components and do not have any stylistic traits in common. Thus, in contrast to what we should expect if these two complexes were contemporaneous, the evidence seems to indicate that each complex had its own trading network and marriage universe that did not overlap or interact with the other. Such evidence suggests that these two complexes most likely occupied the northern plains during different time intervals.
Figure 7.1: Geographic distribution some relevant cultural historical groups.
7.6 Discussion

When comparing the archaeological resources encountered at site EdNh-35 to other Besant or Avonlea sites in the area, several significant observations can be made. First, where both Avonlea and Besant components exist in the same stratified mass, the Avonlea components are always located above any of the Besant components. Mixed components exist, but always occur above a Besant component and beneath an Avonlea component, and thus can potentially be the result of any one of several natural processes (as outlined in chapter five) that can cause component admixture. This is different from the relationship that exists between Besant and Pelican Lake components where, as at the Sjovold site, a Pelican Lake/Besant mixed component can be found between two Besant components.

While the radiocarbon data indicates that the Besant and Avonlea complexes existed as contemporaries for a significant period of time, the stratigraphic observations made at a large number of sites as well as the lack of evidence for cultural interaction between these two groups seem to refute this notion. Given the host of factors that can lead to an incorrect age being assigned to a archaeological component, it is likely that the chronology created by the radiocarbon data currently incorporates more than a few misleading dates. It is therefore possible that the period of contemporaneity indicated by the radiocarbon data is much larger than it should be or, in light of the other two lines of evidence, may never have existed at all.

There is some evidence to support the claim that Besant and Avonlea groups occupied different areas of the northern plains during this period of contemporaneity. Almost without exception all of the normalized radiocarbon dates dating to <1400 rcybp are located in Montana and the Dakotas (see appendix A). It could be reasoned, then, that Besant groups abandoned or were pushed out of large portions of the northern plains by Avonlea groups and retreated to an area of the plains which has not produced many Avonlea sites.
This would account for why the geographic distributions of both complexes overlap with no stratigraphic evidence of them being in the same area for any length of time and no evidence of them interacting with each other. However I would caution against relying too heavily upon these radiocarbon dates. Several of these dates have large error margins associated with them and most were generated over 20 years ago. As such I am inclined to believe that several of these dates should be viewed as anomalous rather than an indication of a late Besant complex presence. Nevertheless, there does seem to be a disproportionate number of late Besant dates from the Dakotas and Montana regions. I think it would be worthwhile to test this hypothesis by revisiting these sites and acquiring a new series of radiocarbon dates.

Also worth discussing is that beginning at around 1400 rcybp we see the first appearance of the Prairie side-notch point (Morlan 1993:40). The earliest Prairie side-notch points are very similar to the late variants of the Besant series and some researchers have suggested that this may indicate cultural continuity between the groups manufacturing these points (Duke 1988:269). Also it appears that Prairie side-notch points are encountered in association with Avonlea materials much more frequently than are Besant series projectile points. In Saskatchewan alone there are at least six examples of Avonlea materials and Prairie side-notch points being encountered together in the same component (Morlan 1993:40). Furthermore, while Ethridge ware has its origins in the Avonlea complex, both Ethridge ware and Prairie side-notch points are encountered together with Plains side-notch points during the Old Women's phase. Plains side-notch points are finely crafted arrowheads that are stylistically similar to the Avonlea projectile point. Thus the evidence that was lacking for cultural interaction between Besant and Avonlea groups appears to be present between Avonlea and prairie side-notch groups. The Old Women's phase may be the eventual result of this interaction as it seems to represent a merger between the two material cultures.
There are problems associated with this hypothesis too. First, the components in which both Avonlea and Prairie side-notch points are found in association are not universally accepted as indicating interaction between these two groups. Some of these, it is argued, represent component admixture or compressed stratigraphy similar to the situation I have outlined for Besant/Avonlea components (Morlan 1993:40). Second, the relationship between the Besant complex and Prairie side-notch is poorly understood. While the Samantha point of the Besant series seems to be very similar to the earliest Prairie side-notch points, there are also instances of Besant series projectile points which date to the terminal end of the Besant complex, such as those encountered at the Fitzgerald site, that bear little resemblance to Prairie side-notch points.

All three lines of evidence that I have discussed in this chapter would be more consistent with a succession between the Besant and Avonlea complexes on the northern plains. There may have been a brief period of contemporaneity at the onset of the Avonlea complex, but overall these two complexes are not as broadly contemporaneous as previous culture histories have indicated.
8.0 Conclusions

8.1 Some Conclusions

Following my discussion of the radiocarbon data, stratigraphic observations, and the evidence for cultural interaction, I think it is justifiable that we reject the notion of Besant and Avonlea co-evolution on the northern plains. While the radiocarbon data indicates a large period of temporal overlap, this is simply not supported by either the well-documented and invariable stratigraphic relationship between Besant and Avonlea components, nor by the evidence for cultural interaction between the two complexes (or lack thereof). The stratigraphic evidence simply has more weight in this matter and I would argue, then, that the archaeological evidence is indicating that the Avonlea complex followed the Besant complex sequentially across most of the northern plains with very little temporal overlap between the two.

The exception to this conclusion is the archaeological evidence from the Dakotas and, to a lesser extent, Manitoba. In these areas the Avonlea complex is conspicuously absent or very poorly represented while the Besant complex is represented at a large number of sites. It is conceivable that Avonlea groups were prevented from moving into these areas by a large resident Besant population. Thus, it may be that the Besant complex continued to exist in the Dakotas and Manitoba while Avonlea groups occupied the rest of the northern plains. In this scenario, the presence of some late Besant sites, such as the Fitzgerald site, where the artifact assemblages are dominated by Knife River flint could be viewed as North Dakota groups making forays into the rest of the northern plains for the purposes of communal bison hunting.
The excavations at site EdNh-35 revealed an upper component containing both Avonlea and Besant artifacts in apparent association. A more detailed examination of the stratigraphy has demonstrated that in some areas of the site there were as many as four buried soils associated with this upper component. Two of these buried soils were located within level two, an arbitrary 10 cm level that produced the most Besant and Avonlea artifacts. I, therefore, have considered it likely that this upper component in fact represents multiple chronologically distinct occupations by both Besant and Avonlea groups. The apparent association between the Besant and Avonlea artifacts is more likely due to the compressed stratigraphy and by virtue of our digging in 10 cm arbitrary levels than it is reflective of an actual period of co-occupation at this site.

In my comparison of site EdNh-35 to other multicomponent Besant/Avonlea sites on the northern plains, I noted that where good stratigraphic control can be established, there is no variability in the relative stratigraphic positioning of Besant and Avonlea components. Besant components always precede Avonlea components in a stratigraphic sequence and a component bearing both sets of diagnostic artifacts is always located above the latest pure Besant component and underneath the earliest exclusively Avonlea component.

I also noted that large basin shaped hearths are typically associated with Avonlea components while bone uprights are often associated with Besant components. This posses a problem in that the radiocarbon date recovered from one of the bone uprights at EdNh-35 is more consistent with the range of dates attributed to the Avonlea complex. Either the radiocarbon date is misleading or Avonlea groups produced some of the bone uprights encountered at this site.

One criticism of this project could be that I have mostly used data from published site monographs to arrive at my conclusions. Given that most of the
archaeological fieldwork done each year is conducted by consulting firms, the bulk of contemporary archaeological data is contained within unpublished permit reports that exist in various company and government offices across the northern plains. When compared to this “grey literature”, the data set I used is undoubtably small. There are likely many more radiocarbon dates and many more Besant and Avonlea multicomponent sites out there than are mentioned in this thesis. Should a site exist that demonstrates a different stratigraphic relationship between Besant and Avonlea components or one that offers up evidence that these two complexes interacted, then my conclusions would have to be revised accordingly.

8.2 Suggestions for Future Research

It would be of enormous benefit to go back and revisit some of the previously excavated Besant and Avonlea sites for the sole purpose of obtaining additional radiocarbon dates. In cases where this has been done in the past, the newer suite of radiocarbon dates has often demonstrated that the original age assignment for a site was in error. This is particularly true for sites that were originally excavated more than 30 years ago. Thus the potential exists to re-write the accepted age ranges for both the Besant and Avonlea complexes. I would imagine that in many cases a revisitation would be impossible as the original site has either been destroyed, heavily disturbed, or excavated completely.

It would also be useful to simply re-evaluate the radiocarbon dates that are already in existence. The first step in this procedure would be to compile a comprehensive list of all radiocarbon dates that have been assigned to either the Besant or Avonlea complexes. Once the list was compiled, the dates would have to be evaluated on a case by case basis in regards to the strength of association between the material being dated and the diagnostic artifact, the material being dated, field handling procedures, and laboratory techniques.
employed. This would be similar to what Morlan (1993) did in his evaluation of Saskatchewan radiocarbon dates, but the scope would be focussed solely on Besant and Avonlea dates and would encompass the entire northern plains.

Once the radiocarbon dates had been evaluated and all those with of questionable association or suspected contamination were disregarded, we should be left with a much more accurate expression of the time interval during which each of the complexes inhabited the northern plains. I suspect that there would still be a number of radiocarbon dates that are anomalous, but where it could not be objectively demonstrated that the sample was contaminated. Regardless, it would be important to see if the age ranges for the Besant and Avonlea complexes still overlapped within the same geographic area, as they do now.
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Appendix A

Radiocarbon Dates for the Besant and Avonlea Complexes
## Table A1: Normalized radiocarbon dates for the Besant Complex on the northern plains (Morlan 2003)

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<th>Province or State</th>
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<th>Site Name</th>
<th>Lab Number</th>
<th>Corrected Date</th>
<th>Standard Deviation</th>
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<td>Aldon Plant</td>
<td>AECV-1569 C</td>
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<td>80</td>
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Table A1: Normalized radiocarbon dates for the Besant Complex on the northern plains (Morlan 2003)

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Table A1: Normalized radiocarbon dates for the Besant Complex on the northern plains (Morlan 2003)

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Table A2: Normalized radiocarbon dates for the Avonlea Complex on the Northern Plains (Morlan 2003)

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### Table A2: Normalized radiocarbon dates for the Avonlea Complex on the Northern Plains (Morlan 2003)

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Table A2: Normalized radiocarbon dates for the Avonlea Complex on the Northern Plains (Morlan 2003)

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Table A2: Normalized radiocarbon dates for the Avonlea Complex on the Northern Plains (Morlan 2003)

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