Buried soils in river valleys indicate increased landscape stability by 8,500 BP. Some data suggest cooler, moister conditions at this time with worldwide glacial expansion, while others predict increasing aridity (Beaudoin and Oetelaar 2003:199–200). The difference is likely a discrepancy between local and broad-scale records, as most authorities infer a trend toward increased aridity beginning around 10,000 BP with a peak about 9,000 to 8,000 BP. The eruption of Mount Mazama in Oregon (now Crater Lake) occurred at roughly 6,730 +/- 40 BP, which produced a significant ash fall event in southern Alberta and much of North America (Zdanowicz et al. 1999). The ash is a very fine-grained, silty material like flour; it darkened the skies of Alberta for up to two days (Beaudoin and Oetelaar 2006). The weak archaeological record for immediately after the ash fall suggests conditions were not particularly good for some time. By 6,000 BP, conditions were still warmer and drier than today, with elevated treelines in the mountains and lower lakes on the plains (Vance et al. 1995). Reeves (1973) suggested that the low frequency of Early Middle Prehistoric period sites, in general, was a product of sampling and not a response to the increased aridity. Recent studies suggest that Hurt’s (1966) refugee model best explains the absence of sites (Sheehan 1995). Under this model, Early Middle Prehistoric period sites are predicted to concentrate around reliable water sources such as major river
basins. Vance (1991) suggested that by 4,000 BP a regime of climate that was cooler and moister than the preceding millennium may have aided people in establishing themselves in southern Alberta. By 3,000 BP, the Plains had receded southward to its modern distribution relative to the boreal forest. Between ca. 2,000 and 1,000 BP was an interval of infrequent drought, which likely produced abundant and dependable animal resources (Vance 1991:155).

COUNTRY HILLS COMPLEX (CA. 7,500 TO 7,300 BP)

In 1982, an excavation in two small in-filled basins overlooking a glacial outwash channel in northwest Calgary produced a stratified sequence of material that defied classification by the archaeological knowledge of the day (Wright 1983). Material from the Wimpey site (EgPn 146) was recovered both above and below a 15-cm-thick layer of Mazama Ash, ensuring that the recovered items were of some antiquity. The earliest level with cultural material in Area A contained a large triangular barbed point described by the researcher as “Pelican Lake-like” (Wright 1983:125). A second point in this level was originally interpreted as a Mummy Cave point (Wright 1983:125) but its form most resembles the resharpened Pelican Lake-like specimen with which it was associated. The poorly defined occupations lead to the conclusion that no clearly defined sequence of projectile points had been recovered and that early and late Mummy Cave occupations (respectively above and below the ash) may be represented based on the existing understanding of that time period (Wright 1983:155). Beyond this, the points were never named and the cultural components were not further defined.

In 1984, Ronaghan (1992:121–133) revisited the Jensen Spring site (DjPn 90) on a high outwash terrace above the Crowsnest River valley. During testing of the site, he recovered a large Pelican Lake style point below Mazama Ash (Ronaghan 1992:130). Similarities to specimens from Indian Creek, Montana, were noted, as were similarities to the specimens from the Wimpey site. Ronaghan (1992:131) reiterated that firm typological systematics for Early Middle Prehistoric points had not been established. He argued that the deeply corner-notched style of projectile point, bearing some resemblance to Pelican Lake points, may be diagnostic within recognizable Early Middle Prehistoric period components in the foothills area of Alberta (Ronaghan 1992:131).
Large, barbed projectile points were again uncovered in west Calgary in Component 1 of EgPn 230 (Vivian et al. 1998). Vivian, Bosch, and Reeves (1998:15) noted the similarity of some of the specimens from EgPn 230 to Ronaghan’s Jensen Spring specimen. They did not commit, however, to any specific relationships between the points and any of the other point assemblages from the numerous sites in the transitional Early Middle Prehistoric period. Nor did they lump the material within the Mummy Cave complex. Rather, they noted that the transitional Early Middle Prehistoric period appeared to exhibit remarkable and rapid technological and/or cultural changes (Vivian et al. 1998:16–17).

The Sites
Although few in number, there are now enough assemblages with diagnostic projectile points and contemporary radiocarbon dates to support Ronaghan’s (1992:131) suggestion that they are part of an Early Middle Prehistoric period cultural phenomenon. The broad, bladed points with very pronounced tangs, deep corner-notches, and a stemmed-like appearance have been radiocarbon or relatively dated to about 7,500 BP in a number of sites (see Plate 10 and Figure 11). Brian Ronaghan (personal communication 2006) offered the term Burmis barbed point for the diagnostic projectile point, based on the name of a nearby town to the Jensen Spring site. Collectively, the sites yielding Burmis barbed points have been labelled the Country Hills complex, owing to the recovery of the first known in situ Burmis barbed point at the Wimpey site, which is adjacent to Country Hills Boulevard in Calgary. These sites tend to fall within the foothills of the Rocky Mountains, making “Country Hills” a somewhat appropriate moniker. This synthesis of the Early Middle period follows Peck (2005).

Everblue Springs (EgPn 700), Component 1. The Everblue Springs site is a multicomponent bison kill site located in a wide shallow basin in Twelve Mile Coulee, southeast of its junction with Crowchild Trail, in northwest Calgary (Vivian 2007a). The site was named for the Everblue Tree Nursery once located at the spot. There were two components identified at the site. Above Mazama Ash, there was diffuse scatter of material culture. Below Mazama Ash was a large bone bed. In 2006, 104 m² were excavated at the site (Vivian 2007a). The site was being mitigated for a housing subdivision.
PLATE 10
Burmis barbed points. Illustrated are points from EgPn 625 (a–j); EgPn 633 (k–m); Wimpey (EgPn146) (n and o); the Everblue Springs site (EgPn 700) (p–t); the Jensen Spring site (DjPn 90), Component 1 (u); the Scapa site (ElPa 1) (v); and EgPn 230 (w–cc). Photo credit: Alberta Culture and Community Spirit (a–m, p–v); ARESCO (n and o); Lifeways of Canada Limited (w–cc).
Figure 11
Country Hills sites within Alberta
Nine projectile points were recovered from the site: six barbed and corner-notched points, two lanceolate point blades (not unlike Lusk point blades), and a point tip. The lithic tool assemblage also included a biface, a retouched flake, and choppers \((n = 6)\). The lithic assemblage \((n = 126)\) contained dolomite \((n = 25)\), quartzite \((n = 21)\), Top-of-the-World chert \((n = 20)\), black siltstone \((n = 10)\), chert \((n = 10)\), and basalt \((n = 1)\). Thus, raw material sources are restricted to local or nearby mountain sources (Vivian 2007a:14).

The faunal assemblage \((n = 78,356)\) was in variable states of preservation, suggesting multiple use events (Vivian 2007a:17). The assemblage was largely bison \((99.6\%)\). Analysis suggested that the materials represented a robust form of *Bison bison*, a late form of *B. antiquus*, or a transitional form. Deer and antelope \((n = 112)\) were also recovered with an *MNI* of four adult antelope being positively identified in the assemblage. The lack of deer and antelope bone in the centre of the site suggested that the material may mark a separate event, or that all the material may be a single event in which the smaller deer and antelope carcasses were transported to the edge of the site for processing (Vivian 2007a:21). Canid \((n = 3)\) bones likely represent a large dog or wolf (Vivian 2007a:21). Cottontail and hare \((n = 41)\), beaver \((n = 1)\), prairie chicken/grouse-sized bird \((n = 6)\), and various intrusive rodents were also recovered. The recovery of mollusc shells in the water-saturated bone bed indicated the wet/dry environment had been present at the site for quite a while (Vivian 2007a:22). An analysis of the bison bone suggested a minimum of forty mature animals. Metric analysis of navicular cuboids \((n = 29\) rights) produced nineteen female and ten male animals; a similar conclusion was reached with metapodials (Vivian 2007a:25). Fetal bone \((n = 8)\) was recovered at the site, suggesting a late fall to late winter occupation (Vivian 2007a:26–27). In terms of butchering, few cut marks were observed. Hump meat, ribs, upper forelimb muscle, and upper hind limb muscle were selectively removed with little processing of the remaining bone (Vivian 2007a:42).

Two radiocarbon dates of about 7,800 and 7,400 BP were obtained (see Table 9). These dates, while both considered valid, were statistically unlikely to be dating the same event (Vivian 2007a:6). The earliest component of the site likely represents a main kill and several other closely spaced kills between 7,800 and 7,400 BP (Vivian 2007a:43). A mixed herd of at least forty mature bison and two calves, likely *B. antiquus*, were ambushed at a spring-fed watering hole in late fall or early winter (Vivian 2007a:43). The consistency within the lithic raw material and
Projectile point assemblages supports the argument that the pre-Mazama Ash bone bed is a single cultural/depositional event (Vivian 2007a:6). Vivian (2007a:47–58) argued that the Everblue Springs site illustrates a movement toward a broader, more thorough utilization of the bison than is typical of earlier Palaeoindian kill sites such as Fletcher, Heron-Edon, Horner, Casper and Olsen-Chubbuck.

**Table 9**

<table>
<thead>
<tr>
<th>Site</th>
<th>Conventional ¹⁴C Age</th>
<th>¹³C / ¹²C Ratio</th>
<th>Material</th>
<th>Calibration</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>EgPn 700</td>
<td>7820 +/- 50</td>
<td>-19.3‰</td>
<td>collagen</td>
<td>6760–6570 B.C. (p = 0.954)</td>
<td>Vivian 2007a:161–162</td>
</tr>
<tr>
<td>EgPn 700</td>
<td>7430 +/- 70</td>
<td>-18.8‰</td>
<td>collagen</td>
<td>6440–6200 B.C. (p = 0.896)</td>
<td>Vivian 2007a:159–160</td>
</tr>
<tr>
<td>DjPo 47</td>
<td>7280 +/- 230</td>
<td>-20.0‰</td>
<td>collagen</td>
<td>6600–5700 B.C. (p = 0.954)</td>
<td>Landals 198670; Morlan n.d.</td>
</tr>
<tr>
<td>EgPn 230</td>
<td>7030 +/- 70</td>
<td>?</td>
<td>collagen</td>
<td>6350–6310 B.C. (p = 0.025)</td>
<td>Vivian et al. 1998:16</td>
</tr>
</tbody>
</table>

Maple Leaf (DjPo 47), Component 2. The Maple Leaf site is a multicomponent site on a terrace immediately above the Crowsnest River south of the town of Bellevue and the Hillcrest Mines in the Crowsnest Pass (Landals 1986:37; Driver 1982). The site is described above in the section on the Plains/Mountain complex. In Component 2, lying just below Mazama Ash, an Elko Eared point was recovered. Evidence for the occupation just below Mazama Ash was found in both Areas One and Two of the site. Reeves and Driver (1978:12) initially reported the recovery of an Elko Eared point made of Knife River flint associated with Area B (i.e., Area Two), as well as a widely scattered bone bed on pond sediments underlaying Mazama Ash in Area B (i.e., Area Two) and between Mazama Ash and marl in Area A (i.e., Area One). Reeves and Driver (1978:12) referred to the specimen as an Elko Eared point because of its similarity in form to specimens near the northern part of the Great Basin. While not identical, the specimen does exhibit strong morphological similarity to large, barbed corner-notched specimens proposed to exist locally in the foothills and mountains of Alberta. It seems most appropriate to classify this specimen...
with local specimens of similar age and morphology: a Burmis barbed point. In view of the faunal assemblage, they interpreted the widely scattered butchered bone as signs of butchering and processing (Reeves and Driver 1978:12). Other species recovered included deer, represented by a single shed antler, two paired, and butchered mandibles of wolf, and a butchered badger mandible (Reeves and Driver 1978:13).

Landals (1986:70–81) provided a comprehensive analysis of Component 2 material from Area One. She noted that no diagnostic lithic artifacts were found, but three lithic artifacts were recovered, including a small flake end scraper, a chert flake fragment, and a rounded and pitted pebble hammerstone (Landals 1986:71). A spherical stone that may be cultural was also recovered. The faunal assemblage was small (n = 1,150) and consisted of distinct clusters of articulating elements. The limbs of a single young adult male bison are represented in the assemblage. No sign of carnivore activity was apparent (Landals 1986:72). The two paired mandibles were considered to be “extra large” dogs, not wolves, but no signs of butchering were observed on them (Landals 1986:80). The deer antler was stratigraphically located between Component 1 and 2 and considered non-cultural (Landals 1986:80). The unusual faunal assemblage might not be cultural; however, attributing the finds to natural causes was also problematic. A single radiocarbon date of about 7,300 BP was obtained for the component (Table 9).

EgPn 230, Component 1. EgPn 230 is located on the south side of the Bow River, but north of Highway 1, in the south end of a deep gully on the west side of Calgary (Vivian et al. 1998:2). Three components were observed at the site. The lowest component, in a palaeosol, contained Country Hills material below a layer of Mazama Ash. In 1997, 84 m² were excavated at the site as part of mitigative action prior to development of a golf course (Vivian 1998:2).

Eight projectile points were recovered, including five large corner-notched Burmis barbed points, a blade fragment of a possible Lusk point, and two blade tips (Vivian et al. 1998:6–9, 194). Other tools recovered include end scrapers (n = 2), retouched flakes (n = 3), cores (n = 5), and a wide side-struck flake exhibiting retouch and polish. Debitage (n = 377) was scattered randomly across the site and largely reflected tool finishing and maintenance. Three of the projectile points were observed to be burinated, apparently for reuse as another tool form. Raw materials emphasized local sources, dominated by quartzite and siltstone (Vivian et al. 1998:10–11, 102).
The faunal assemblage (n = 1,275) consisted of small fragments of bone representing at least two bison with a single possible deer element (Vivian et al. 1998:12). The researcher suggested that identifiable elements are larger than modern bison. Marrow extraction was suggested as an explanation for some of the bone fracturing. Burned bone was uncommon and FRB (n = 48) was almost absent from the component. A single radiocarbon date was obtained for the component (Table 9). Importantly, Vivian, Bosch, and Reeves (1998:15) noted the comparability of projectile points styles recovered at EgPn 230 and the specimen from the Jensen Spring site (Ronaghan 1992).

**Jensen Spring (DjPn 90), Component 1.** The Jensen Spring site is a multicomponent site located in a swale on a high bedrock ridge about 60 m above the outwash terraces of the Crowsnest River valley (Ronaghan 1992:121). The site was presumably named for the landowners at the time of the survey and the spring at the site’s location. In 1984, four backhoe test pits and eight 1 x 1-m test pits were excavated, exposing places across the site’s five natural sedimentary units (Ronaghan 1992:124). One of the natural layers was believed to be a Mazama Ash, which dates to ca. 6,800 BP. However, a radiocarbon date of about 6,000 BP (Table 9) from beneath the ash is problematic. Still, the error range for the radiocarbon date allows for overlap between the age of the apparent Mazama Ash and the radiocarbon date (Ronaghan 1992:128).

A single projectile point was recovered at 20 cm beneath the tephra near the springhead. It has a broad blade, very pronounced barbs, deep corner-notches, and a stemmed-like based. Stylistically the point fits well with other large, corner-notched Early Middle Prehistoric points. The point appears to have been recovered in situ beneath Mazama Ash. No other lithic artifacts were recovered at this depth. Faunal material was recovered at 10 cm beneath the tephra in this unit and two others. The faunal assemblage (n = 117) from beneath the ash layer was very sparse and only ten pieces could be identified as medium to large mammal, and three as bison or large ungulate (Ronaghan 1992:131). Like most other sites in this period, features are lacking, bone is highly fragmented and scarce, and it is hard to characterize the site.

**Wimpey (EgPn 146), Level 7.** The Wimpey site is a multicomponent campsite on a bench overlooking a glacial outwash channel in northwest Calgary. The site is named for the company for whom the mitigative
excavation was being conducted. This mitigative action was taken prior to the development of a subdivision (Wright 1983:1). In 1982, two basins were excavated that produced material above and below Mazama Ash. The more productive of the two basins, Area 5, was investigated using thirteen 2 × 2 m units to depths between 40 and 90 cm bs (Wright 1983:8). Level 7 exhibited Burmis barbed points. Level 6 produced Blackwater side-notched material. Level 5 produced a base that fits relatively well with the Bitterroot material, but is too fragmentary to be certain. Level 4 contained Mazama Ash. Level 3 produced a large point that defies classification. Level 2 produced a single point that fits well with the Maple Leaf material. Level 1 did not produce a diagnostic projectile point (Wright 1983).

Regarding Level 7, the larger point is very similar to those at EgPn 700, while the small specimen is clearly resharpened but exhibits a similar base to those at EgPn 700 and EgPn 230. Other tools recovered in this excavation level included a bipolar wedge, utilized flakes (n = 2) and a biface (Wright 1983:54). The points were made of quartzite and siltstone, the wedge was made of mudstone, the utilized flakes of siltstone, and the biface was made of chalcedony. The level also contained sixty-three pieces of debitage, reflecting early stages of reduction (Wright 1983:133). The assemblage was heavily dominated by local materials, especially quartzite and siltstone (Wright 1983:134).

The faunal remains (n = 285) were highly fragmented and unidentifiable (Wright 1983:149). Most of the fragments are believed to be bison bone. FBR was not present (Wright 1983:145). The basin likely represents a refuse dump for bone, debitage, and broken tools, as it is too small to have held a dwelling of any size. Dates were not available for this material and the levels were differentiated arbitrarily, not by sedimentation. Still, the materials clearly predate the Mazama Ash fall (Level 4) by some time.

**Scapa (ElPa 1), Basin 4.** The Scapa site is described in the section on the Lusk complex. A possible Burmis barbed point was recovered in Component 2. Originally classified as an Alberta point (Hanna and Neal 1992:102), the specimen in Component 2 is more likely a Burmis barbed point. The point has slightly barbed shoulders and a slightly flared base. Other tools recovered included a biface and biface fragment, a scraper, a uniface, cores and core fragments (n = 24), bipolar cores (n = 4), and marginally retouched tools (n = 17). Seven tools were tested for blood residue. The point tested positive for antelope. The biface and a core with edge crushing...
were positive for bison. The biface fragment, the scraper, and two marginally retouched tools had no blood residue. The vast majority of the assemblage was quartzite and petrified wood with very small amounts of exotic material such as Knife River flint and porcellanite. The faunal assemblage included one unidentifiable bone fragment and an unspecified fossil fragment (Hanna and Neal 1992:106). Four FBR pieces were found along with sixty unmodified cobbles. Some of the cobbles may have been arranged into a linear feature; the feature entered the southern wall, making the nature of the feature indeterminate (Hanna and Neal 1992:106).

A date was not obtained for the occupation, but it overlies what appears to be a Lusk occupation and underlies Mazama Ash, making a Country Hills affiliation reasonable. The researchers suggested the occupation reflected a living floor where lithic tool manufacturing, food acquisition, and food processing took place in the Early Middle Prehistoric period (Hanna and Neal 1992:106).

Other sites. The Gooseberry kill site (EgPn 625) and the Snack site (EgPn 633) are recently discovered Country Hills sites on Paskapoo Slopes; they produced Burmis barbed points within bison bone beds (Vivian et al. 2009; Vivian and Blakey 2009). As a caveat, a large barbed point was recovered at EdPp 21 in a multicomponent site exhibiting compressed stratigraphy, west of Turner Valley (McCullough and Fedirchuk 1983, plate 9c). The recovery of large, barbed points in contexts that can be dated is crucial to their identification. Without the dated context these points are often mistaken for Pelican Lake points. The aforementioned specimen was classified as a Pelican Lake point despite its barbed-like shoulders, large size, and stemmed appearance.

Country Hills: Barbed Darts in the Front Range and Foothills
Country Hills assemblages appear to have gone unrecognized in Alberta and abroad. The Burmis barbed point is relatively distinct, yet only a few appear to have been encountered in situ within the archaeological record of Alberta. This may be due, in part, to the association of the complex with the foothills of Alberta. This area has not been thoroughly surveyed. Thus, three of the four sites attributed to the complex are located within the City of Calgary. The Calgary area is one of the few areas of the foothills that has been extensively surveyed for archaeological sites. The Crowsnest Pass has similarly been examined more than most foothills areas. A second factor
affecting the visibility of these sites is that they tend to be buried fairly deeply. The Country Hills component at the Scapa site was buried under four other components. Still, while these sites are relatively deeply buried, they are not buried at prohibitive depths. As alluded to, it would seem that a superficial resemblance to Pelican Lake points may play a substantial role in misidentifying some specimens. Yet, the recovery of these points in situ at the aforementioned sites and the appreciation of their significance by the researchers has provided firm steps toward recognizing more of these Early Middle period sites.

The Burmis barbed point is diagnostic of the Country Hills complex. It is a fairly large point with deep corner-notches producing a strongly barbed appearance to the overall point. The blade tends to be fairly triangular in shape, often with slightly convex margins. The deep notching at the base can produce a stemmed-like appearance. Often the tip has a needle sharp point. Resharpening of this basic form appears to straighten the margins of the blade from its original slightly excursive form. With time, these traits appear to become less well formed (e.g., EgPn 230). As well, Lusk points appear to have been recovered in both EgPn 230 and 700. At the Scapa site, however, the Country Hills complex apparently overlies Lusk material. It is unclear what the relationship is between these cultural entities.

In addition to the points, few other tools have been recovered in Country Hills assemblages. In terms of the raw materials, quartzite and siltstone are common at EgPn 230 and the Wimpey site while quartzite and petrified wood were common at the Scapa site. Projectile points made of Knife River flint were recovered at both the Maple Leaf site and the Scapa site; this suggests ties to the Plains to the south and east.

The fauna recovered from the Country Hills assemblages suggest a Plains adaptation. The Everblue Springs site is a large bison kill site at the edge of the foothills, indicating that these people were accomplished bison hunters. A fair amount of antelope bone was also recovered at this site. The Maple Leaf site in the Crowsnest Pass also indicates bison were procured, possibly along with some large dogs. EgPn 230 at the foothills in Calgary produced both bison and deer bone. Similarly, Jensen Springs in the Crowsnest Pass had a small assemblage that suggested both bison and small ungulate were procured. The Wimpey site in the foothills produced small amounts of bone thought to be bison while the Scapa site in the parkland periphery produced no identifiable bone, although blood residue on a projectile point was identified as antelope. Although limited, these faunal assemblages attest
to a bison-oriented adaptation with supplementary subsistence from other animals resources. None of these sites are located on the Plains proper, but in the foothills and parkland on the Plains periphery.

Also in Alberta, a bison kill dated to 7,600 BP was identified below Mazama Ash at Locality C of the Mona Lisa site. No diagnostic material was recovered but it was suggested that a coulee was used to funnel animals to a pond “trap” (Wilson 1980). The date of this site and the method of entrapment are similar to the Country Hills complex such as the Everblue Springs site’s entrapment of bison at a natural wetland/spring (Brian Vivian, personal communication 2007). The people living during the Country Hills complex apparently exploited unaltered landscapes as natural traps to capture numerous bison.

Other Country Hills sites exist outside of Alberta. The sharply barbed specimens do not appear to have been recovered in Saskatchewan or Manitoba. Still, more lanceolate barbed points from surface finds near Quill Lakes in Saskatchewan show some affinity to the Burmis barbed points and may be culturally and/or temporally related (Novecosky 2002a).

In Montana, the Mammoth Meadow site at the Mammoth Meadow locality produced large, triangular, barbed points. These were referred to as Elko and Pelican Lake points despite being immediately overlying and/or in possible association with Scottsbluff material (Bonnichsen et al. 1992:309–310). The morphology and possible temporal position of these specimens suggest they are candidates for Burmis barbed points in Montana. The Cremer site (24sw264) is a multicomponent site in south central Montana (Nowatzyk 1983). Five cultural components were recognized. The second deepest layer, Layer iv, produce large barbed points in apparent association with side-notched points and fishtail points. The material in this layer could be interpreted as representing a palimpsest of Burmis barbed points (Nowatzyk 1983:76, fig. 13m and n), Mummy Cave points (Nowatzyk 1983:76, fig. 13d–h), and Maple Leaf fishtail points (Nowatzyk 1983, fig. 13a–c, i–l).

A more comparable site is the Mummy Cave site in northwestern Wyoming. The Mummy Cave site is a large rockshelter on the left bank of the North Fork of the Shoshone River about 55 km west of Cody, Wyoming (Husted and Edgar 2002:1). Thirty-eight cultural occupations were recognized. In Layer 16, an “expanding stem sharp shouldered” point and “expanding stem sharp shouldered indented base” point were recovered in association with a number of Blackwater side-notched points (Husted
and Edgar 2002:45–46, plate 13g, h). The former points exhibit a striking resemblance to the more barbed specimens in Alberta. A radiocarbon date of 7,630 +/- 170 BP (1-1588) was obtained for the level (Husted and Edgar 2002:26). Given the contemporary dates, remarkable similarity between point morphology, and similar foothills environment, a direct relationship between the makers of the points in Alberta and northwestern Wyoming seems evident.

**Mummy Cave Complex (7,300 to 6,700 BP)**

The Mummy Cave complex was named after the Mummy Cave site in Wyoming after numerous points in the stratified sequence were observed to be similar to those found in surface collections in Alberta (Reeves 1969:30). Reeves (1969:30) characterized the complex as exhibiting side-notched atlatl points. At the time he defined the complex, he noted that no components of such sites had been excavated on the plains of Alberta, but excavations at the Gap site in the front range of the Rocky Mountains and a few sites in Waterton Lakes National Park in the Rocky Mountains had produced these points (Reeves 1969:31). The complex was considered intrusive into the plains with its ultimate origins in the East, but possibly with origins in the mountainous west (Reeves 1969:31). Reeves (1969:30) estimated the timing of this complex to have been roughly between 7,500 to 5,500 BP.

The material recovered in the salvage excavations at the Gap site (Reeves and Dormaar 1972:333) and in Waterton Lakes National Park (Reeves 1972:442) included side-notched points that had well-defined basal edges, relatively “square” notches, and sharp shoulders. Reeves and Dormaar (1972:333) labelled them Bitterroot points based on similarities they saw to a type originally defined in the Idaho area (Swanson et al. 1964). Soon after, in 1971, Gryba (1976) discovered side-notched points in a deeply buried layer at the Stampede site in the Cypress Hills. Gryba (1976:95–96) considered the six point fragments and single unfinished point to be Bitterroot points of the Mummy Cave complex, comparable to the material from the Gap site. In the early 1980s, Walker (1992:133) considered the points from the Stampede site to be more appropriately classified as Blackwater side-notched points because of the striking similarity of their “rocker-shaped” basal edges to specimens from Layer 16 of the Mummy Cave site (Husted and Edgar 2002:98–99).

Walker’s (1992) statistical study of projectile point variability in the Early Middle Prehistoric period on the Northern Plains allowed him to
argue that Blackwater side-notched points were the earliest point form, followed by Bitterroot side-notched (a.k.a. Northern, Pahaska, or Mummy Cave), then Hawken side-notched, Gowen side-notched, and most recently Mount Albion corner-notched points (Walker 1992:132–142). He considered Blackwater side-notched points to be found at a few sites such as the Stampede site in Alberta and the Mummy Cave site (i.e., Layer 16) in Wyoming (Walker 1992:137). Bitterroot side-notched points were considered widespread, occurring at sites such as the Gap in southwestern Alberta, and Mummy Cave (i.e., Layers 17 and 18) and Lookingbill in northwestern Wyoming (Walker 1992:137). Gowen side-notched points were noted at the Gowen 1 and 2 sites in south-central Saskatchewan, the Welsch site in southwestern Alberta, and the Sorenson site in Wyoming (Walker 1992:141). Hawken side-notched points, recovered in Wyoming, and Mount Albion corner-notched points, found in sites along the Colorado Front Range, have not been discovered in well-stratified contexts in Alberta.

More recently, Dyck (1983:92) reconsidered the use of the term Mummy Cave complex for all cultural materials across the Northern Plains that date from the Bitterroot side-notched sequence to the beginning of Oxbow side-notched points. He indicated that there was a strong possibility more than one complex may be represented in this lengthy time range. He preferred to substitute the term Mummy Cave series. His warning was well founded as the term Mummy Cave/Bitterroot has been used to label most cultural manifestations that occur between 7,500 and 4,500 BP on the Northern Plains. The standard criteria for the Bitterroot side-notched point (i.e., defined basal edges, relatively “square” notches, and sharp shoulders) have been very loosely applied to assemblages from this period. Subsequently, so-called Bitterroot side-notched points have been recovered from numerous sites, including Head-Smashed-In Buffalo Jump, Vermilion Lakes (Locality A), Hawkwood, Maple Leaf, EgPn 87, Sara, Michalsky, DjPo 9, Anderson and Boy Chief amongst others, while Mummy Cave points were reported at EgPn 480.

When Reeves and Dormaar’s (1972:333) Bitterroot projectile point criteria are strictly applied to projectile point assemblages, only a handful of sites in the province can be considered Mummy Cave sites. Possibly related to Bitterroot side-notched points and slightly predating these assemblages are those with Blackwater side-notched points (Walker 1992:132–142). Blackwater side-notched points have relatively “square” notches, sharp shoulders, and their basal edges are well defined but often “rocker-shaped.”
Assemblages with Blackwater side-notched points often exhibit straight-based, Bitterroot-like points as well. Blackwater side-notched assemblages at both the Stampede site (Gryba 1976:105, fig. 51a) and the Mummy Cave site (Husted and Edgar 2002:183, plate 13f) produced points that would be considered Bitterroot had they been found in the subsequent level.

The Sites
In order to assess the Mummy Cave complex as presented above, assemblages exhibiting projectile points with sharp shoulders, square notches, and well-defined basal edges and with reliable radiocarbon dates are outlined below. These sites are used in a critical evaluation of the current view of the Mummy Cave complex (see Plate 11 and Figure 12).
FIGURE 12
Mummy Cave sites within Alberta
Chapter Four: Middle Prehistoric Period

Stampede Site (DjOn 26). The Stampede site is a multicomponent campsite near Elkwater in the Cypress Hills. The site exhibits at least an 8,000-year record of occupation as witnessed in a minimum of fourteen culture-bearing layers. Many discrete palaeosols mark former land surfaces used by people in the past. Palaeosol 12A contains the Mummy Cave material. The site was excavated in 1971–1972. Approximately 7 m² of cultural layer 12A were excavated. Oetelaar (2004a) revisited the site in the late 1990s. The Archaeological Survey contracted additional research in 2007–2008.

From the initial excavations, a total of six points and point fragments was recovered in association with a basin-shaped hearth, a diversity of stone and bone tools, a large quantity of lithic debitage, and faunal remains (Gryba 1975:133). Gryba (1975:135) classified the points as similar to Bitterroot points, comparable to those at the Gap site, discussed below. In a synthetic review of points characteristic of this period, Walker (1992:137) suggested the Cultural Layer 12A points were most similar to Blackwater side-notched points found at Mummy Cave, Wyoming (Husted and Edgar 2002:98–99, 183). Other tools that were recovered included asymmetrical ovate bifaces (n = 2), a drill tip, retouched flakes (n = 9), bipolar cores (n = 11), and other cores (n = 2). A bone tool consisting of two refitting fragments of a bone needle was also recovered (Gryba 1975:143).

The faunal assemblage consisted of 965 bone fragments, of which twenty-five were identifiable. Bone from at least one bison, one elk, and one gopher were recovered. The remaining fauna were too fragmented to be identified. Seasonal information was not determined. The fauna tended to be associated with the hearth. Within and immediately around the hearth was charred bone. The hearth was a circular, basin-shaped, unlined, 0.60 m-wide, and 0.08 m-deep pit (Gryba 1975:145). No other features were observed.

In the original excavations, a single radiocarbon date was obtained for this material: 7,245 ± 255 BP (NMC-571). Gryba (1975:145–146) interpreted the site as an Early Side-notched campsite where tools were fabricated and meals were consumed presumably in a warm season, owing to the lack of evidence for a shelter. More recently, Oetelaar (2004a) obtained a date of 7,115 ± 50 BP (OxA-11614) for this level, complimenting the previous date.

Vermilion Lakes, Locality A (EhPv 8, 153R), Occupation 4. The Vermilion Lakes site, Locality A, is a multicomponent site in a debris-flow fan on the north side of the Bow River Valley, west of Banff. It contains ten cultural occupation layers dating from 10,500 BP to about historic times.
Occupation 4 contains Bitterroot side-notched points in a mixed layer containing Mazama Ash (Fedje 1986:29). In 1983 and 1984, excavations took place at the site in response to construction on the Trans-Canada Highway. The highway was redesigned to avoid impacting this important site (Fedje 1986:25). Nine points and point fragments were recovered from a layer containing Mazama Ash. Fedje (1986:29) classified the points as Bitterroot given the association of the side-notched points and the Mazama Ash.

**Tuscany (EgPn 377).** The Tuscany site is described in the section on the Lusk complex. In a palaeosol beneath a Mazama Ash layer a single fragmented dart point was recovered in association with a few pieces of debitage (Oetelaar 1998). Although fragmented, the point exhibited shoulder and base structure similar to Bitterroot points. A concentration of bison bones and some antelope constituted the faunal remains recovered. A number of the bones exhibited cut marks but were otherwise relatively complete. The large size of the bison led the research to suggest they may represent *Bison occidentalis*. The occupation was interpreted as a kill event consisting of several animals dating to ca. 6,900 BP (Table 10; Oetelaar 1998).

<table>
<thead>
<tr>
<th>Site [LaB no.]</th>
<th>Conventional 14C Age</th>
<th>12C/12C Ratio</th>
<th>Material</th>
<th>Calibration</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>DJOn 26 [NMC-571]</td>
<td>7245 +/- 255</td>
<td>-25.0‰</td>
<td>charred bone</td>
<td>6600–5600 B.C. (p = 0.954)</td>
<td>Gryba 1975:133</td>
</tr>
<tr>
<td>DJOn 26 [OXA-11614]</td>
<td>7115 +/- 50</td>
<td>?</td>
<td>collagen</td>
<td>6070–5890 B.C. (p = 0.954)</td>
<td>Oetelaar 2004a; Freeman 2006:465</td>
</tr>
<tr>
<td>EgPn 377 [TO-9261]</td>
<td>6940 +/- 70</td>
<td>?</td>
<td>?</td>
<td>5990–5700 B.C. (p = 0.954)</td>
<td>Oetelaar 2004b:735</td>
</tr>
<tr>
<td>DIPo 20 [GSC-1298]</td>
<td>6720 +/- 170</td>
<td>-25.0‰</td>
<td>charcoal</td>
<td>6000–5300 B.C. (p = 0.954)</td>
<td>Reeves and Dormaar 1972; Morfan n.d.</td>
</tr>
</tbody>
</table>

**Gap (DIPo 20), Occupation 2.** The Gap site is described in the section on the Agate Basin/Hell Gap complex. Of interest is the second occupation, which lies directly beneath a layer of Mazama Ash. A single point base exhibiting a square base and deep notches was recovered. Reeves and Dormaar (1972:333) classified the specimen as Bitterroot. The point is made on fine-grained black chert. There are no other lithic materials described for this site. The faunal assemblage consists of a bison metatarsal,
two tarsals, and a radius (Reeves and Dormaar 1972:332). A single radiocarbon date of about 6,700 BP is available for this assemblage (Table 10). This date is slightly late but fits with the known age for the Mazama Ash event (ca. 6,800 BP).

**Hawkwood (EgPm 179).** The Hawkwood site is described under the Lusk complex. Component 4 produced two side-notched projectile points. The researchers interpreted these as Bitterroot side-notched points (Van Dyke and Stewart 1985:69–71). Other tools recovered include asymmetrical bifaces (n = 2), a scraper, wedges (n = 3), retouched/utilized spall tools (n = 7), and retouched flakes (n = 7). Local materials make up most of the raw materials utilized, especially quartzite, siltstone, and pebble cherts. The debitage suggests that the full range of tool manufacturing was undertaken, from blank manufacture to retouching used tools.

The faunal assemblage represented a minimum of two bison and an elk. There were numerous bison bones whereas the elk was represented by a single phalanx (Van Dyke and Stewart 1985:80). The sample was so fragmented that it was not possible to determine seasonality or sexing. Very few burned or calcine specimens were recovered (Van Dyke and Stewart 1985:84). Cobbles scattered randomly across the living floor were noted but no mention of fire was made (Van Dyke and Stewart 1985:82). No features or clear concentrations of material were noted. The occupation was immediately above a layer of Mazama Ash (ca. 6,800 BP). The researchers noted that the lithic assemblage was similar to Component 3, immediately above the ash layer, possibly indicating cultural continuity (Van Dyke and Stewart 1985:76, 83).

**Other sites.** EhPd 55, Component 1, is potentially a Mummy Cave occupation within a palaeosol in the Wintering Hills (Loveseth 1984). A single Bitterroot point and five point fragments were recovered beneath a McKean occupation. Radiocarbon dates were not obtained (Loveseth 1984:167, plate 17-1).

**Mummy Cave: The Earliest Side-notched Point Assemblages**

The Mummy Cave complex in Alberta was defined by Reeves (1969) based on sites in the foothills-mountain area (i.e., the Gap site and sites in Waterton Lakes National Park) knowing that surface collections on the Plains proper contained similar specimens. Despite the small samples sizes, a number of
parallels exist between Alberta assemblages and comparably dated assemblages in Wyoming. For example, Layer 16 at the Mummy Cave site contained similar material and was dated to 7,630 +/- 170 BP (1-1588) (Husted and Edgar 2002:26). While this layer produced Burmis barbed points (discussed above), it also produced four Blackwater side-notched points. These points exhibit deep, broad notches often with a rocker-shaped base. Walker (1992:132–142) has effectively argued that assemblages exhibiting Blackwater side-notched points predate those exhibiting Bitterroot points. In fact, in the stratified Wyoming sequence, a single specimen was classified as a Pahaska (i.e., Bitterroot) side-notched point amongst the Blackwater side-notched points in Layer 16, while the two subsequent layers produced nineteen points, all Pahaska (i.e., Bitterroot) side-notched points (Husted and Edgar 2002, plates 13f, 14a–f, and 15a–m).

In the Alberta material, this sequence is reproduced through radiocarbon-dated assemblages rather than stratigraphic sequences. The Stampede site is the only site in the province that clearly exhibits Blackwater side-notched points (Gryba 1976). The Blackwater side-notched specimens predate all other side-notched point assemblages in the province. The components that exhibit Bitterroot side-notched points at the Gap, Vermilion Lakes, and Hawkwood sites are all occupations that occurred close in time to the Mazama Ash fall, ca. 6,800 BP. In fact, the Hawkwood site may provide evidence that people producing the Bitterroot side-notched point survived the Mazama eruption, with the previous occupation at the site hinting at continuation in land tenure (Van Dyke and Stewart 1985:76, 83). Bitterroot side-notched points continue to be characterized by well-defined basal edges that tend to be straight, relatively square notches and sharp shoulders that can be somewhat barbed (see also Reeves 1972; Reeves and Dormaar 1972:333).

Importantly, subtle morphological variation is apparent between the Alberta Bitterroot side-notched points, the Pahaska points from Mummy Cave (Husted and Edgar 2002:99) and Lookingbill (Frison 1983:10, fig. 7a–k) in Wyoming, and the original Bitterroot type specimens in Idaho (Swanson et al. 1964:67). Comparisons of well-dated point assemblages from these areas will likely illustrate that there is a range of regional micromorphological variation in the large side-notched points at this time. Blackwater side-notched points exhibit similar attributes to Bitterroot side-notched points; they have relatively square notches, but their sharp shoulders have few barbs and their well-defined basal edges tend to be
rocker-shaped not straight. The small sample size that this point type has been based on, however, indicates that further research is required to solidify the nature of projectile point systematics for this poorly understood period.

In Saskatchewan, Bitterroot and Blackwater side-notched points do not appear to be present, at least not in an excavated context (e.g. Dyck 1983). Even within surface collections, these points or similar styles are not common. Likewise, Manitoba has not produced assemblages from dated contexts that are comparable to the Alberta material.

Just south of Manitoba, the Rustad site (32R1775) in southeastern North Dakota has produced numerous “Early Archaic projectile points” dating to about 7,400 bp. Michlovic and Sather (2005:143) equated the material with Logan Creek/Mummy Cave points. Using the strict definition for Alberta’s Bitterroot points (i.e., well-defined basal edges, relatively square notches, and sharp shoulders) presented above, it is fair to differentiate Alberta’s Mummy Cave material from the Rustad site material. The latter exhibits well-defined basal edges but lacks relatively square notches and sharp shoulders. However, Michlovic and Sather’s (2005:143) comparison of the Rustad material to Gowen material deserves further attention. Also of interest is the focus of relatively local lithic raw materials at the Rustad site during the Early Archaic period (Michlovic and Sather 2005).

In Montana, the Barton Gulch site along the Madison River in the southeast is described as containing Bitterroot side-notched points post-dating the Mazama Ash fall (Aaberg et al. 1996:86). Illustrations of the point specimens, however, were not available for comparison. Similarly, the Mammoth Meadow site in southwestern Montana produced a sequence of early points, some of which were called Bitterroot points (Bonnichsen et al. 1992:310). Published images of the Bitterroot specimens (Bonnichsen et al. 1992:310), with their curved bases and deep notching, suggest stronger similarities to Pahaska points rather than Alberta’s Bitterroot points. Smith (1981, fig. 7a–c) illustrated a number of points from west-central Montana, considered to be Middle Prehistoric period in age. Although recovered during a surface reconnaissance, these specimens exhibit square bases and subtle barbs, making them quite similar to the Bitterroot and Blackwater side-notched points described above for Alberta. Interestingly, they were recovered in the same geographic area from which Mammoth Meadows produced Pahaska-like points.

In Wyoming, the Eagle Shelter site (48BH657) produced a number of
points in Levels 6–8 that are similar to Alberta’s Mummy Cave points (Chomko 1990). The points have relatively rectangular bases with slightly concave basal edges. Level 8 has an associated date of 6,790 +/- 110 BP (Chomko 1990:56). In essence, they are most similar to the Pahaska points at Mummy Cave and elsewhere. Thus, besides the Blackwater side-notched material from the Mummy Cave site, little else exhibits a strong resemblance to the material from Alberta’s Early Middle Prehistoric period. Materials to the south are properly labelled Pahaska points, such as those in Levels 17 and 18 of Mummy Cave (ca. 7,150–6,750 BP) and the Lookingbill site (ca. 7,000 BP) (Frison 1983:9–10, fig. 7a–k). The Pahaska points are a cohesive group of material; both formally and temporally, they are different from the Bitterroot points in Alberta.

MAPLE LEAF COMPLEX (CA. 6,300 TO 5,200 BP)

Traditionally, archaeologists have designated cultural materials that immediately postdate the Mazama Ash fall event either Mummy Cave complex or Mummy Cave series (e.g., Dyck 1983:92–95; Reeves 1969:30–31, 1990:177–180; Vickers 1986:58–63). Projectile points recovered in such components are typically labelled “Bitterroot side-notched” despite obvious deviation from the established criteria (see previous section).

In 1978, Wilson (1980:17) recovered three relatively complete points from two discrete bone beds above Mazama Ash at Locality C of the Mona Lisa site in Calgary. These bone beds were dated to roughly 5,500 BP. He likened the points to specimens from the Hawken site but classified them using the convention of the day: Bitterroot side-notched points of the Mummy Cave complex (Wilson 1980:17). The specimens lacked the defining criteria of Bitterroot side-notched points (Wilson 1980:54, plate 1).

Excavations in the mid-1970s at the Maple Leaf site in the Crowsnest Pass produced projectile points from above Mazama Ash that potentially dated to about 6,300 BP (Reeves and Driver 1978; Landals 1986). The points were initially classified as Bitterroot side-notched points of the Mummy Cave complex (Reeves and Driver 1978). Landals (1986) subsequently suggested the points be classified as Salmon River/Bitterroot side-notched attributable to the Early Middle Prehistoric period. The term Salmon River side-notched was meant to reflect similarities to specimens in Idaho (Swanson and Sneed 1966:24–26, fig. 18h–j). Swanson and Sneed’s (1966:26) Salmon River points have shallow side notches close enough to the base to remove a small portion of the corner of the point. They also have flat bases. This
The points from these sites exhibit obtuse shoulders, deep but open notches and slightly concave bases. None of these sites that postdate Mazama Ash produced points exhibiting the attributes of Bitterroot side-notched points. Bitterroot side-notched points were defined as exhibiting well-defined basal edges, relatively square notches, and sharp shoulders (Reeves 1972:442; Reeves and Dormaar 1972:333).

The Sites
The following presents well-dated sites with diagnostic materials that postdate the Mazama Ash fall event. There are no dated sites in Alberta with diagnostic materials that immediately postdate Mazama Ash (see Plate 12 and Figure 13).

Maple Leaf (DjPo 47). The Maple Leaf site is discussed in the section on the Plains/Mountain complex. The third component, of concern here, represents a bison kill site in a natural trap, representing at least two and possibly several small-scale events (Landals 1986). The thickness of the component varied between 5 and 50 cm and overlaid Mazama Ash. The site was examined in 1975, 1977, and 1978.

Ten projectile points were associated with a wetland feature, a hearth...
PLATE 12
Maple Leaf points.
Illustrated are points from the Maple Leaf site (DjPo 47) (a–d); the Wimpey site (EgPn 46) (e); the Mona Lisa site (EgPm 3), Component 4 (f); and (EgPm 3), Component 3 (g and h); EgPn 87 (i and j); the Stampede site (DjOn26), Palaeosol 10 (k) and Palaeosol 8 (t–w); the Scapa site (ElPa 1) (l); the Anderson site (FdOt 1) (m–p); DjPn 16 (q–s).
Photo credit: Alison Landals (a–d); Aresco (e); Michael Wilson (f–h); Bison Historical Services Limited (i and j); Gerald Oetelaar (k, t–w); Alberta Culture and Community Spirit (l–s).
Figure 13
Maple Leaf sites within Alberta
feature, and two possible post-mould features. Landals (1986:99–109) identified two Oxbow points, seven Bitterroot/Salmon River side-notched points and one unclassifiable specimen. The remaining lithic tools support an interpretation of specific tasks relating to killing, butchering, tool sharpening/maintenance, and limited hide processing (Landals 1986:97). The assemblage indicated the use of local raw materials (Landals 1986:104). The faunal assemblage contained at least seventeen bison, four canids (two possible dogs), a badger, and a goose (Landals 1986:124–128). Three fetal bison bones were recovered, suggesting late winter to early spring use (Landals 1986:136). A single bone tool of unknown function was manufactured on a radius.

<table>
<thead>
<tr>
<th>Site</th>
<th>Conventional 14C Age</th>
<th>13C/12C Ratio</th>
<th>Material</th>
<th>Calibration</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>DjPo 47</td>
<td>6420 +/- 160</td>
<td>-20.0‰</td>
<td>bone</td>
<td>5650–5000 B.C. (p = 0.954)</td>
<td>Landals 1986; Morlan n.d.</td>
</tr>
<tr>
<td>DjOn 26</td>
<td>6195 +/- 45</td>
<td>?</td>
<td>?</td>
<td>5300–5020 B.C. (p = 0.954)</td>
<td>Oetelaar 2004a</td>
</tr>
<tr>
<td>DlPo 20</td>
<td>6060 +/- 140</td>
<td>-23.6‰</td>
<td>charcoal</td>
<td>5350–4600 B.C. (p = 0.954)</td>
<td>Reeves and Dormaar 1972:333; Morlan n.d.</td>
</tr>
<tr>
<td>EgPn 87</td>
<td>5800 +/- 80</td>
<td>-19.6‰</td>
<td>collagen</td>
<td>4840–4460 B.C. (p = 0.954)</td>
<td>Hanna and Head 2000:94, 108</td>
</tr>
<tr>
<td>EgPm 3</td>
<td>5715 +/- 150</td>
<td>-10.0‰</td>
<td>apatite</td>
<td>4950–4250 B.C. (p = 0.954)</td>
<td>Wilson 1980:46; Morlan n.d.</td>
</tr>
<tr>
<td>EgPm 3</td>
<td>5390 +/- 170</td>
<td>-10.0‰</td>
<td>apatite</td>
<td>4600–3750 B.C. (p = 0.954)</td>
<td>Wilson 1980:46; Morlan n.d.</td>
</tr>
<tr>
<td>DjPn 16</td>
<td>4730 +/- 110</td>
<td>-20.0‰</td>
<td>collagen</td>
<td>3800–3100 B.C. (p = 0.954)</td>
<td>Ronaghan 1992:53; Beaudoin 1987; Morlan n.d.</td>
</tr>
<tr>
<td>DjPn 16</td>
<td>5280 +/- 160</td>
<td>-20.0‰</td>
<td>collagen</td>
<td>4450–3700 B.C. (p = 0.954)</td>
<td>Ronaghan 1992:53; Beaudoin 1987; Morlan n.d.</td>
</tr>
<tr>
<td>DjPn 16</td>
<td>4040 +/- 140</td>
<td>-20.0‰</td>
<td>collagen</td>
<td>rejected</td>
<td>Ronaghan 1992:53; Morlan n.d.</td>
</tr>
<tr>
<td>FdOt 1</td>
<td>4805 +/- 150</td>
<td>-20.0‰</td>
<td>collagen</td>
<td>4000–3100 B.C. (p = 0.954)</td>
<td>Quigg 1984:155-156; Morlan n.d.</td>
</tr>
<tr>
<td>FdOt 1</td>
<td>5540 +/- 160</td>
<td>-20.0‰</td>
<td>collagen</td>
<td>4750–3950 B.C. (p = 0.954)</td>
<td>Quigg 1984:155-156; Morlan n.d.</td>
</tr>
</tbody>
</table>

Three dates were obtained from the component: 6,400, 4,400 and 4,200 BP (see Table 11). Landals (1986:171) noted it was unlikely that a single event was evinced in the third component. The radiocarbon dates and the projectile points suggest that at least two time periods were represented in
the formation of the assemblage. The earlier date reflected Bitterroot/Salmon River occupation(s) and is supported by the materials' stratigraphic position immediately above Mazama Ash. The latter dates reflected Oxbow occupation(s). Based on this and a thorough analysis of the faunal remains, Landals (1986) rejected an interpretation of a large-scale communal kill event in favour of a series of small-scale kills, likely occurring in late winter/early spring.

_EgPn 87, Lower component._ EgPn 87 is a multicomponent campsite in a large, flat-bottomed depression at the prairie level above the Bow River, just west of Calgary (Hanna and Head 2000:63). Three components were observed. The uppermost and middle components did not produce diagnostic materials but the lowermost component produced diagnostic cultural material. These lowest sediments exhibited a discontinuous layer of what is believed to be Mazama Ash overlying a thin but well-defined brown-red palaeosol; cultural materials were predominantly recovered from the palaeosol (Hanna and Head 2000:93).

Two points and a point tip were recovered from the site. The smaller specimen was classified as a Bitterroot point despite its rounded base, while the larger point was classified as Gowen in spite of its large size (Hanna and Head 2000:98–99). Other lithic tools include biface fragments (n = 3), end scrapers (n = 5), side scrapers (n = 4), a wedge, a retouched flake, utilized split pebbles (n = 2), a utilized flake, core fragments (n = 4), an anvil, and hammerstones (n = 2). Miscellaneous cherts predominated as the raw materials used in tool manufacture, but quartzite was also common. The reverse was true of the lithic debitage; the majority of the debitage is quartzite but miscellaneous cherts, siltstones, and basalts were relatively common.

The faunal assemblage (n = 1,579) was limited and fragmentary, of which only fifty-four fragments were identifiable to species. Only mature animal bone was recovered so neither seasonality nor herd composition could be reliably determined from the sample. No discrete features were observed at the site but the distribution of materials in the east block did suggest a circular pattern (Hanna and Head 2000:93). No FBR was recovered, an omission likely reflecting cultural practices not the scale of the work, given the area sampled (Hanna and Head 2000:94).

A single radiocarbon date, 5,800 BP, was obtained for the site (Table 11) (Hanna and Head 2000:94). The age estimate is too recent for a pre-Mazama Ash fall event. It is possible that the ash was redeposited at EgPn 87,
but this was considered unlikely. Mixing of assemblages was also considered unlikely given the sparse nature of the materials. Stylistically, the points fit well with the radiocarbon date. Alternatively, some soil processes can superficially mimic ash layers, making the identification of ash incorrect.

Mona Lisa (EgPm 3), Component 3 and 4. The Mona Lisa site is a multicomponent kill site beneath the urban core of Calgary. The materials discussed here are from Locality C. The site is on a prominent terrace about 8 m above the Bow River, although the archaeological materials were recovered from an infill coulee in this terrace. Two cultural components were noted above and two cultural components were noted below Mazama Ash. The pre-Mazama Ash components (1 and 2) consisted of “two closely spaced sets of organic horizons, containing charcoal along with butchered and burnt bone.” However, only a single flake was recovered from what appeared to be redeposited materials washed into the coulee from the slope and rim (Wilson 1980:11). The post-Mazama bone beds (Components 3 and 4) were devoid of charcoal but produced bone and stone tools in components 10 cm apart. Remnants of the site likely exist in areas where urban basements have not disturbed the ground (Wilson 1980:46, 1986:63).

Component 3 produced two projectile points and a point fragment (Wilson 1980:17). The researcher likened the points to specimens from the Hawken site but classified them as Bitterroot side-notched points and placed the site in the Mummy Cave complex (Wilson 1980:17). The points were made of basalt, quartzite, and lamprophyre while the unidentified tool was made on schist. The remaining lithics were all quartzite. The faunal assemblage had a minimum of seven bison, representing two fetal animals, two subadults, and three adult females. The faunal specimens were generally clustered; this was interpreted as a product of activity around specific animals (Wilson 1980:36). Variable butchering, from animal to animal, made generalizations unwarranted. The longitudinal splitting of bone using wedges, however, was noted as an unusual activity (Wilson 1980:43). A late winter/early spring use of the kill site, based on the recovery of fetal bone, was suggested (Wilson 1980:43). A single radiocarbon date of about 5700 BP was obtained from this component (Wilson 1980; Brumley and Rushworth 1983:155).

Component 4 produced a single projectile point. It, too, was likened to Hawken points but classified as Bitterroot and considered part of the
Mummy Cave complex (Wilson 1980:17). Other tools include three cores/choppers, one flake, and a hammerstone. The point was made on basalt, one chopper was made of limestone, the flake was chert, and the remaining choppers and the hammerstone were quartzite. The faunal assemblage had a minimum of two bison, representing an adult male and an adult female. The bone was relatively scattered in this component. No material was recovered to suggest seasonality. A single radiocarbon date of about 5,400 BP was obtained (Wilson 1980; Brumley and Rushworth 1983:155).

Sara (DjPn 16), Component 3. The Sara site is multicomponent campsite on a low terrace on the south side of the Crowsnest River. The site was named for Dr. Sara, the landowner at the time of its discovery (Ronaghan 1992:36). Five post-Mazama Ash components were differentiated: Component 1 was culturally unidentified, Component 2 was tenuously linked to Mt. Albion, Component 3 contained Bitterroot material, Component 4 was a mix of Oxbow and McKean material, and Component 5 was agriculturally mixed with Component 4 and represented material over the last 4,500 years (Ronaghan 1992:63). The site was initially discovered and tested by the University of Calgary. Ronaghan (1992:39) re-evaluated the site with seventeen dispersed 1-x-1-m units.

Five projectile points were recovered from Component 3. Four of the points have rounded bases and open notches, with the remaining point simply a tip. The researcher considered these to be Bitterroot points (Ronaghan 1992:52), but the points lack rectangular bases and clear side-notches. Other tools recovered include a biface preform, side scrapers (n = 2), a perforator, retouched flakes (n = 10), utilized flakes (n = 8), and two split pebble cores. The lithic assemblage was largely local materials (72.6%), with exotic materials emphasizing sources in British Columbia (6.5%).

The faunal assemblage (n = 2,722) was highly pulverized (Ronaghan 1992:53); the majority of the bone (n = 2,378) could only be classified as mammal bone fragments. Recognized species include mule deer, moose, and bison. Only three green-bone fractures and one instance of butchering marks were observed. No clear features were recorded although FBR (n = 114) was recovered, some apparently arranged in a linear or clustered distribution (Ronaghan 1992:54). Three radiocarbon dates are available to assess this component: 3,960, 4,650, and 5,200 BP (Table 11). Although the researcher accepted the range of dates, the first date is late and well within the succeeding Oxbow time period, but the latter two dates overlap.
Anderson (Fdo 1). The Anderson site is a campsite near the Battle River on high ground overlooking Hardisty Lake (Quigg 1984). In 1978, a series of tests were conducted at the site. Test excavation Unit B, 2 × 4 m, encountered a cluster of artifacts at 48–63 cm bs and contained atlatl points, among other things. The excavation was part of a research program on archaeological sites in the parkland.

Seven side-notched points were recovered from the well-defined occupation layer. Quigg (1984:153) classified these as Bitterroot points after Reeves’ (1969) definition. However, two basic forms are present: a large Oxbow-like point with a slightly concave base and wide, v-shaped notches (Quigg 1984:155, figs. 3, 5–7) and a smaller point with a rounded base with minimal basal convexity and wide, open notches (Quigg 1984:155, fig. 3, nos. 1–4). Other tools recovered include bifaces (n = 3), end scrapers (n = 8), unifaces (n = 3), retouched tools (n = 15), an anvil, and a hammerstone. There was little primary reduction detritus but secondary and sharpening/resharpening flakes were relatively common (Quigg 1984:153). Quartz and quartzite accounted for 80 percent of the raw material use, while pebble cherts and silicified wood account for most of the remaining lithic material (Quigg 1984:153). The faunal assemblage consisted of over one thousand bone fragments, of which fewer than one hundred were identifiable. All identifiable bone was bison. Every element was represented except those in the front quarter (i.e., humerus, radius, and ulna). A minimum of eight animals were present. No seasonal information was derived. Some burned bone (500 g) was also recovered. No features were observed and only eleven pieces of fbr were noted.

Two disparate radiocarbon dates were obtained for this occupation (Table 11). Given the vertical distribution of the material in the site (15 cm), the presence of two distinct projectile points, and two distinct dates, the site likely represents a palimpsest. The smaller, rounded-base points are most likely associated with the Maple Leaf phase and the earlier date while the larger more Oxbow-like points likely associate with the pre-Oxbow Estevan phase and the later date.

Other sites. A few other Alberta assemblages exhibit traits that might be considered representative of the Maple Leaf complex. At Head-Smashed-In Buffalo Jump, Reeves (1978) recovered Bitterroot, Salmon River, and Pelican Lake-like points in layers dated between 5,600 and 5,000 BP. Specimens that morphologically appear to correlate to the current use of Salmon River
fishtail points occur in the Head-Smashed-In material (Reeves 1978:171, fig. 17.21, nos. 9, 10, and 13). The current model would suggest these points could occur in the earlier levels of what Reeves (1978) lumped together as the Mummy Cave complex. The Wimpey site (EgPn 146) in northwest Calgary is discussed in previous sections. This stratified sequence produced a Salmon River fishtail point about 10 cm above the Mazama Ash layer. It exhibits striking resemblance to the points from the Mona Lisa site. The lack of radiocarbon dates is not too significant given the strong sequence of material that can be typologically dated. Similarly, a single specimen from Scapa, Basin 4, Component 4, is very similar to the Wimpey and Mona Lisa points. The specimen is heavily resharpened and, although not radiometrically dated, it is stratigraphically located between Mazama Ash and a component of Calderwood material (Hanna and Neal 1992:112–118).

The Stampede (DjOn 26) site in the Cypress Hills of southeastern Alberta also produced projectile points that exhibit some traits similar to Salmon River fishtail projectile points, in Palaeosols 8 and 10, dating to ca. 6,100 BP (Oetelaar 2004a).

Lastly, the third occupation at the Gap site (DlOp 20) overlies Mazama Ash and produced a point blade associated with some bison rib fragments, two navicular cuboids, one proximal metacarpal, four partially burned carpals, miscellaneous burned bone fragments, and an ash-fill pit (Reeves and Dormaar 1972:332). A date of about 6,000 BP was obtained (Table 11). This material fits temporally with the material discussed here.

Maple Leaf: Subsisting in the Foothills and Front Range

Driver (1978) used the term Maple Leaf subphase to label culture-historical events in the Early Middle Prehistoric period in the Crowsnest Pass dating between 7,500 to 3,000 BP. As well, the Maple Leaf site provided significant materials that date to this period. For these reasons, the term Maple Leaf is retained from its earlier use in this model of culture history and applied here as the Maple Leaf complex. The Maple Leaf complex is defined by the large and small varieties of Salmon River projectile points; this material dates between ca. 6,300 and 5,200 BP. The terminological alteration is meant to acknowledge the previous research, at the same time reflecting the refined temporal distribution of the material and the enlarged geographic spread of the similar assemblages well into the foothills and perhaps the Plains proper.
The Salmon River side-notched projectile point derives its origin from the misclassification of Alberta materials using the typology Swanson and Sneed (1966) developed for materials in Idaho. The Salmon River point as originally defined does not occur in Alberta, as they are strictly defined as a regional variant of Bitterroot side-notched points found only at the Shoup rockshelters site in Idaho and not common abroad (Swanson and Sneed 1966:24). The point was originally described as a flat-based, shallow, side-notched point with notching close enough to the base to remove a small portion of the corner of the point. Morphologically the point is not particularly similar to the material described for Alberta (see Swanson and Sneed 1966:36, fig. 18h–j). The Alberta material tends to be larger overall, with much more of the base being removed in notching, making a narrower base (i.e., fishtail appearance) that is straight to concave. Still, the term is somewhat ingrained, so for Alberta modifications of the original term are suggested here, in order to address these specimens. Thus, in Alberta, for the larger dart points that exhibit the narrow, concave base the term Salmon River fishtail point is suggested. For the smaller points that exhibit a narrow, flat to convex base, the term Salmon River oval-base is suggested. Compared to other periods and typological classifications, this material is more varied. At some point in the future it would not be surprising to find a number of cultural complexes/phases and projectile point types represented in what is defined here as the Maple Leaf complex.

The only reasonably sized assemblages recovered of Maple Leaf material came from EgPn 87 and at the Sara site. It is difficult to generalize about such limited samples. Still, raw material occurred in large enough numbers at EgPn 87 and the Sara site to be quantified. Quartzite, basalt, siltstone, and miscellaneous cherts predominate the two assemblages. Some Knife River flint, Avon chert, Montana chert, Etherington chert, obsidian, and Top-of-the-World chert also occur in small amounts in these assemblages.

The fauna from the sites is largely restricted to bison. EgPn 87, Mona Lisa, and Anderson produced bison bone. The Sara site produced bison bone along with evidence of moose and mule deer. The Maple Leaf site also contained bison, along with dog, badger and goose. The associations between the projectile points and the faunal assemblages was questionable at the Sara and Maple Leaf sites. Certainly, bison were a major subsistence focus at this time. The animals were being taken in small ambushes at natural traps such as the wetland at the Maple Leaf site or the coulees at the Mona Lisa site.
Features are not common in these sites. The absence of fbr was noted at EgPn 87. fbr was not reported at the Maple Leaf site, the Mona Lisa site or the Gap site. Eleven pieces were reported at the Anderson site. At the Sara site no clear features were recorded but clusters of fbr, totalling one hundred fourteen pieces, were present. The low occurrence of fbr in these assemblages suggests it was being produced by spalling around a campfire, rather than as a product of intensive stone boiling. The fbr patterning at the Sara site is difficult to interpret but it might reflect the use of cooking platforms.

The majority of the known sites in Alberta are located in the foothills (e.g., DjPo 47, EgPn 87, EgPn 3, DjPn 16, DlPo 16, and EgPn 146). Sites on the periphery of the Plains are known but are much less common (e.g., FdOt 1 and ELpa 1), while no sites are known from the Plains proper, with the exception of prairie “oases” such as the Cypress Hills (e.g., DjOn 26).

Looking further abroad, dated components of Maple Leaf material or sites dated to this period are not known from Saskatchewan. In Manitoba, the Atkinson (DiMe 27) site on the north bank of the Souris River dates to ca. 5,400 BP (Nicholson and Playford 2009). Beneath a McKean occupation, seven projectile points were recovered and classified as Gowen points (Nicholson and Playford 2009:31–33). The form of the Atkinson site Gowen points are not similar to Maple Leaf specimens, nor are they similar to Alberta’s Gowen.

In Montana, there may be point styles similar to the Maple Leaf complex. The Cremer site (24 SW 264) is a multicomponent site in south-central Montana, exhibiting five cultural components (Nowatzyk 1983). The second deepest layer, iv, was interpreted as an Early Middle Prehistoric period occupation that produced large barbed points in apparent association with side-notched points and fishtail points (Nowatzyk 1983:88). The layer could be interpreted as representing a palimpsest of Burmis barbed points (Nowatzyk 1983:76, fig. 13m, n), Mummy Cave points (Nowatzyk 1983:76, fig. 13d–h), and Salmon River fishtail points (Nowatzyk 1983, fig. 13a–c, i–l). To the south, in North Dakota and Wyoming, there does not appear to be cultural material equivalent to the Maple Leaf complex. More data will assist in addressing this assessment. The Maple Leaf complex appears to be a geographically restricted cultural phenomenon exhibiting distinctive projectile points over a relatively brief period of time. Perhaps with a larger and better-dated sample this apparent “complex” of material may be recognized as something more culturally discrete.
CALDERWOOD COMPLEX (CA. 5,200 TO 4,700 BP)
In the late 1960s and early 1970s, Reeves (1978) recovered what he termed Mummy Cave materials in the deepest culture-bearing levels at Head-Smashed-In Buffalo Jump. In both the north and south excavation areas, materials were recovered that dated between 5,700 and 5,100 BP. The projectile points exhibited a wide range of variability, being classified as Bitterroot, Salmon River, and Pelican Lake-like (Reeves 1978:164, 171). A similar range of projectile point variability was recovered from EFPs 3 in the Kananaskis area (Reeves 1974). At EFPs 3, sixteen points were recovered from a context geologically dated to ca. 7,000 to 5,000 BP. Like the Head-Smashed-In Buffalo Jump material, the points were classified as Bitterroot, Salmon River, and Pelican Lake-like points. Again in the mid-1970s, Reeves (1976) excavated DjPo 9 near Bellevue in the Crowsnest Pass. A single point was recovered in the earliest occupation; it was classified as Bitterroot, despite its rounded base and fairly broad notches.

Other materials that date to this time period have been similarly classified as Bitterroot, Salmon River, or Pelican Lake-like. At the Michalsky site, Ronaghan (1992:117) recovered a single point from a dated context of ca. 5,000 BP. He classified it as a Bitterroot point despite its rounded ears and concave base. In Component 2 at the Vermilion Lakes site, Fedje (1986:38) recovered numerous points considered to “compare favourably to the Pelican Lake type.” The component was not radiocarbon dated and the assemblage exhibited the range of morphological variability similar to the aforementioned assemblages (see Fedje 1986:39, fig. 11b–f).

The Sites
The following presents well-dated sites with diagnostic materials that postdate the Mazama Ash fall event but predate the highly recognizable Oxbow phase. As alluded to above, the assemblages from this period, ca. 5,000 BP, do not exhibit the classic Bitterroot criteria of well-defined basal edges, relatively square notches, and sharp shoulders, but rather a wide range of morphological variability (see Plate 13 and Figure 14).

Head-Smashed-In Buffalo Jump (DkPj 1). Head-Smashed-In Buffalo Jump consists of a kill site and an associated processing site located at the southeastern edge of the Porcupine Hills in southwestern Alberta. This kill site complex consists of a gathering basin and drive lanes located to the west of the Porcupine Hills, which lead to the jump at their eastern edge.
Calderwood points. Illustrated are projectile points from Head-Smashed-In Buffalo Jump (DkPj 1) (a–f); the Stampede site (DjOn 26), Palaeosol 7b (g–j); Palaeosol 7 (j–o) and Palaeosol 6 (aa and bb); DjPo 9 (p); the Majorville Medicine Wheel (EdPc 3) (q–u); EfPs 3 (v); the Scapa site (ElPa 1) (w–y); and the Michalsky site (DjPn 66) (z).

Photo credit: Royal Alberta Museum (a–f); Gerald Oetelaar (g–o, aa and bb); Alberta Culture and Community Spirit (p–z).
Figure 14
Calderwood sites within Alberta
The jump consists of a sandstone outcrop running a lateral distance of 350 m with drops of approximately eleven to thirteen metres. At the base of the jump is a bison bone midden. The associated processing site is located below the jump, to the east, on flatter ground. In the late 1960s and early 1970s, Reeves (1978) excavated in the north and south areas of the kill site deposits.

Reeves (1978) defined the oldest culture-bearing levels as the Mummy Cave complex. The South Area produced three Mummy Cave levels while the North Area produced four levels; these levels dated to between ca. 5,700 and 5,100 BP. Fourteen points were recovered from the Mummy Cave levels. The points were classified as Bitterroot, Salmon River, and Pelican Lake-like (Reeves 1978:164, 171). Despite the lack of strict provenience, it was argued above that the Maple Leaf complex is represented by the Salmon River points (i.e., Reeves 1978:171, fig. 17.21, nos. 9, 10, 11, and 13); these were likely recovered from the earliest of Reeves’ Mummy Cave levels. The remaining points, although morphologically varied, may fall into what is labelled here as the Calderwood complex.

Four dates were obtained from the Mummy Cave levels at Head-Smashed-In Buffalo Jump (see Table 12). The date from the Gakushuin lab (gak) is known to be unacceptable (Blakeslee 1994). The remaining dates suggested an age for the material likely postdating ca. 5,500 BP.

Majorville Medicine Wheel (EdPc 1). The Majorville Medicine Wheel is a cairn made of cobbles approximately 9 m in diameter, from which twenty-six to twenty-eight spokes radiate out to a larger ring of stones that encircles the cairn. The stone circle has a radius of approximately 14 m. The site is located on the highest hilltop in the vicinity of Bassano (Calder 1977:4–5). Calder (1977) excavated the south half of the cairn and inferred it was likely created by the slow accumulation of successive layers of stone. The traditional interpretation is that a sequence of projectile points from the Oxbow phase through to the Old Women’s phase was represented in the accretional layers, suggesting that there is chronological significance in the cairn’s construction (Calder 1977:8–41). In this traditional assessment, Calderwood points were grouped with Oxbow (i.e., Calder 1977, fig. 33, nos. 24–28). The projectile points suggest the initiation of the cairn predates the Oxbow phase by a few hundred years with the actual commencement of use during the Calderwood phase.
Michalsky (DjPn 66), Component 1. The Michalsky site is a multi-component campsite at the head of a spring that originates high above the valley of the Crowsnest River in the lower slopes of the Livingstone Range (Ronaghan 1992:110). The site was named for the landowner. The University of Calgary originally discovered the site in 1973. It was identified as a series of isolated finds and an historic homestead. In 1985, Ronaghan (1992:110) excavated a dispersed series of 1-×-1-m (5.575 m²) units at the site (Ronaghan 1992:110). Two components were differentiated: a lower Bitterroot component and a culturally unidentified component. The site was estimated to be 15,000 m².

A single point was recovered from the lower component. The researcher classified it as a Bitterroot point (Ronaghan 1992:117), but its rounded ears and concave base suggest this is not appropriate. A small assemblage
of material was found associated with the point, including a perforator and some debitage ($n=16$). The raw materials are all local, including siltstones, miscellaneous cherts, and basalts. The faunal assemblage ($n=94$) was small, fragmented, and of little interpretive value (Ronaghan 1992:117).

Four radiocarbon dates are available for this component (Table 12). The youngest date can be rejected owing to its conflict with its stratigraphic position; the other dates are highly consistent (Ronaghan 1992:117). The site locale provides a good spot for short-term camping and game observation but the limited excavations conducted in the meadow were not enough to infer onsite activities, duration and season of occupation, or other subsistence settlement characteristics.

**DjPo 9, Test 10, Occupation 1.** DjPo 9 is a stratified campsite in a sheltered swale on an outwash terrace in the Bellevue/Maple Leaf area of the Crowsnest Pass (Reeves 1976:29). The 1975 investigations exhibited four occupation levels. The lowest level, Component 1, was considered late Mummy Cave. A single point was recovered. The researchers classified it as a Bitterroot side-notched point but the rounded ears and broad notches suggest this designation may not be appropriate. Other tools recovered included an end scraper, retouched flakes ($n=2$), and large stone flake tools ($n=2$). Twenty-two pieces of lithic debitage were also associated with this occupation. The small lithic assemblage was dominated by quartzite and local cherts. The faunal assemblage produced evidence of a single adult bison. The bone was highly fragmented and only a few skull and tooth fragments were recovered (Reeves 1976:49). For this occupation there was no mention of features, and a single date of about 4,800 BP was obtained (Table 12).

**Vermilion Lakes, Locality B (EhPv 8, 502R).** The Vermilion Lakes site is described in a previous section. Locality B, Occupation 2, contained side- and corner-notched points considered similar to Pelican Lake points (Fedje 1986:39, fig. 11b–f). A corner-notched specimen does exist, as does round based specimens with large notches. In addition to the points, a large lithic assemblage ($n=5,300$) was recovered from a fairly small area. The bulk of the material was recovered from a 10-m$^2$ area (Fedje 1986:38). Morphologically this assemblage appears to exhibit much of the variability found within assemblages dating to ca. 5,000 BP. Radiocarbon dates, however, were not available for this level.
**EFPs 3.** EFPs 3 is a single-component campsite located in the Kananaskis Valley, southwest of Barrier Lake (Reeves 1974). The site is situated on a 7-m-high gravel terrace produced by glacial outwash, above the Kananaskis River (Reeves 1974). In 1973, a total of 104 m$^2$ was excavated at the site. The site area was estimated to be 1,510 m$^2$. It was excavated as a mitigation project prior to a highway alignment (Reeves 1974:1). The majority of the site was destroyed by the highway construction.

Sixteen projectile points were recovered from the site. The researcher suggested these included Bitterroot ($n = 4$), Salmon River ($n = 3$), Pelican Lake ($n = 2$), Lusk ($n = 1$), ground argillite ($n = 1$), and unclassifiable ($n = 5$) points. There is a wide range of variability within these points. This variability includes corner-notched points; round-based, broad-notched points; and side-notched points. Other tools recovered from the site included bifaces ($n = 16$), end scrapers ($n = 22$), retouched flakes ($n = 71$), perforators ($n = 3$), gravers/cutters ($n = 210$), a wedge, cores ($n = 88$), choppers ($n = 8$), hammerstones ($n = 8$), anvils ($n = 3$), a grinding slab, rubbing stones ($n = 14$), and ochre fragments ($n = 8$). Banff chert dominated the lithic assemblage, with smaller amounts of miscellaneous cherts, quartzite, and chalcedony (Reeves 1974:61).

The faunal assemblage was very sparse, likely having been reduced by the acidic podzol soil (Reeves 1974:49). Only twelve calcine long-bone fragments and five pieces of tooth enamel were recovered. The tooth fragments were identified as bison (Reeves 1974:50). FBR was also very rare at the site. A total of sixty-eight small fragments was recovered, all of local quartzite, sandstone, and conglomerate cobbles (Reeves 1974:49). No clear activity areas were delineated (Reeves 1974:49).

The site was not radiocarbon dated, but typological cross dating suggested an age between 7,500 and 5,000 BP. This date was arrived at by acknowledging that Oxbow and McKean points, which were known at the time to postdate 5,000 BP, did not occur in the assemblage (Reeves 1974:8). Geological dating also suggested an age estimate between 7,500 and 5,000 BP (Reeves 1974:9). The range of variability within the assemblage typologically compares to assemblages estimated to date about 5,000 BP.

**Scapa Ribstone (ElPa 1).** The Scapa Ribstone site is described above. Three projectile points were recovered in Components 5 and 6 that exhibit striking similarity to those describe as dating to ca. 5,000 BP. This includes two round-based, broad-notched points and a corner-notched specimen. The corner-notched specimen from Component 5 and the side-notched
points from Component 6 were all classified as likely Besant (Hanna and Neal 1992:120, 129). This assignment is refuted by the stratigraphy, as Besant invariably overlies Pelican Lake (Component 4), not the reverse. Component 5 had a burned bone concentration and a random scatter of FBR. Component 6 exhibited a debitage concentration, a bone concentration and random scatter of FBR, and a possible stone circle with a central hearth. Although a radiometric date is not available for the components, their stratigraphic position relative to other point styles supports an age estimate of approximately 5,000 BP.

**Stampede (DjOn 26).** The Stampede site also contained components that produced projectile point assemblages exhibiting tremendous variability. Palaeosols 8, 7B, 7A, and 6 have morphologically diverse projectile point samples that date to ca. 6,000–5,000 BP (Oetelaar 2004a). Palaeosol 8 was dated to ca. 6,100 BP. Palaeosol 7A produced two dates: ca. 4,700 BP and 5,200 BP (Table 12). An initial evaluation of the sediments suggested the assemblage was not the result of deflation or mixing (Brian Vivian, personal communication 2007).

**Other sites.** In the Wintering Hills, EhPd 88 is a stratified site with five complete and four fragmentary points in a context immediately above Mazama Ash (Loveseth 1984:102). The point styles were interpreted as Late Plains, but under the current classification system they are considered Calderwood points (Loveseth 1984: plate 17, nos. 2, 3, 4, 10, 11, 17, and 19). No dates were obtained for the material. Another possible Calderwood site is EiPl 12, west of Beiseker. It consisted of a small campsite exhibiting “Salmon River” points (Loveseth 1981). The six relatively complete points (Loveseth 1981: plate 4, nos. 1–6) appear similar in their range of variation to the Calderwood projectile points.

**Calderwood: Social and Material Culture Diversity Five Thousand Years Ago**

The lack of a single iconic projectile point within the assemblages from this period in time provides problems for classification. Additionally, the assemblages that exhibit a diverse range of projectile point morphology were recovered from across southern Alberta, including the Crowsnest Pass area in the southwest (i.e., Michalsky, DjPo 9), the Kananaskis area in the west-central (i.e., EfPs 3), the Cypress Hills in the southeast (i.e., Stampede), and
the parkland periphery in the south-central (i.e., Majorville, Scapa) parts of the province. None of the projectile points exhibit the morphological features of Bitterroot side-notched points. Yet, some commonalities occur across the assemblages. Whether this material is culturally cohesive remains to be demonstrated, but it is presented here as such. Collectively this material has been labelled Calderwood complex owing to the first excavated assemblage occurring at Head-Smashed-In Buffalo Jump on the Calderwood family's land (Reeves 1978). These assemblages date between 5,200 and 4,700 BP.

Perhaps four projectile point forms can be subjectively differentiated within the larger range of variation of Calderwood material. One form has an elongate outline with broad-round notches and a straight base. One complete specimen was recovered at DjPo 9, and another from Palaeosol 7A at the Stampede site, and a base was recovered from Palaeosol 7B at the Stampede site. Another form is stout with very sharp shoulders, almost barbed-like in appearance, small round notches, and a slightly concave base. Fairly complete specimens of this form were recovered at Michalsky, Palaeosol 7A at Stampede, Majorville, and Component 6 at Scapa. Yet another form is Oxbow-like in general outline, but with smaller ears, round open notches, and a concave base. This form was recovered at Majorville, in Palaeosols 7B and 7A at Stampede, and in Component 6 at Scapa. Lastly, a type of almost-corner-notched specimen with an irregular to straight base and very wide-open notches was recovered from Majorville, Component 5 at Scapa, and Palaeosol 7A at Stampede. To reiterate, the projectile point samples presented here are small and the range of diversity is quite wide. Further research may find that the point assemblages are palimpsests, truly associated, or culturally intertwined.

There is nothing exceptional about the non-projectile point tools associated with the Calderwood complex. Typical items such as bifaces, end scrapers, retouched flakes, choppers, and hammerstones have been recovered. The Calderwood lithic assemblage is based on local raw materials. Few if any exotics were recovered from these sites. Quartzite, siltstone, and Banff chert are amongst the more common toolstones. Bison are the primary animal identified in the faunal assemblages. The quantity of bone recovered is usually small and other species (e.g., fox and moose) were also recovered. Although there is some evidence for large bison kills at Head-Smashed-In Buffalo Jump, these major events appear to be rare. Most sites appear to be small habitation sites with minimal features and processing.
The likelihood of cairn building commencing at the Majorville Medicine Wheel adds a new level to social complexity that might be mirroring requirements for communal bison killing.

**GOWEN COMPLEX (CA. 5,900 TO 5,200 BP)**

In 1977, a site was uncovered by earth-moving equipment in terrace deposits along the South Saskatchewan River within the City of Saskatoon, Saskatchewan (Schroedl and Walker 1978; Walker 1992:1). The site was named Gowen 1 (FaNq 25) after its discoverer Charlie Gowen. Three years later, a second cultural deposit, Gowen 2 (FaNq 32), was discovered 70 m to the west (Walker 1992:1). Five radiocarbon dates were obtained for Gowen 1 and four dates for Gowen 2 (Walker 1992:24). An average date of about 5,900 BP was produced for the assemblages. The projectile point assemblages from the two sites were considered similar (Walker 1992:72). Lateral margins of the point blades were usually convex or straight, asymmetry was not uncommon, the maximum width of the blade was usually at the shoulders except in reworked points, most points were side-notched with shallow and wide notches low on the lateral margins, and the basal margin was usually straight to slightly concave (Walker 1992:44, 72). Walker (1992) called these “Gowen side-notched points.” Other recovered lithic tools included hafted bifaces (possible spear tips), bifacial knives, end scrapers, side scrapers, unifaces, gouges, gravers, drills, spokeshaves, retouched lithics, anvils, and hammerstones (Walker 1992:45–66, 77–94). Bone tools included a possible bone tube, awls, and other miscellaneous altered bone fragments (Walker 1992:66–70, 94–95). Lithics used at the Gowen sites focused on locally available quartzite and chert, with chalcedonies and petrified wood used to a lesser extent (Walker 1992:65).

The Gowen sites’ faunal assemblages are highly fragmented. The Gowen 1 site produced two wolf-sized canids, one antelope, and seven bison. The bison bone suggested transport of select body portions to the site for processing. The presence of two young animals indicated that the site was occupied in the summer (Walker 1992:101). A smudge pit produced Chenopodiaceae, likely utilized as a smudge material or possibly embedded in utilized dung (Walker 1992:103). A number of shallow basin pits and surface hearths were also recovered. The Gowen 2 site produced one muskrat, a variety of canid bone (possibly coyote, wolf, and/or dog), and fourteen bison (Walker 1992:103–107). Similar bone reduction patterns were observed. Hearths in this site seemed to have been excavated to be...
more basin-like (Walker 1992:115–119). Lastly, small quantities of bulky pieces of FBR were recovered from both sites (Walker 1992:94).

In 1988, during the excavation of the basement beneath his home in Saskatoon, Les Norby encountered archaeological remains. The Norby site (FbNp 56) is a Mummy Cave bison kill that produced two complete Gowen side-notched points and a stemmed point (Zurburg 1991). The lithic assemblage consisted of local materials (Zurburg 1991:65–66). Three radiocarbon dates were obtained for the site, suggesting an age of about 5,700 BP (Zurburg 1991:175). Interestingly, the kill was interpreted as a male bison herd of twenty-six individuals; not surprisingly, young animals were absent (Zurburg 1991:182).

The Below Forks (FhNg 25) also produced Early Side-notched projectile points reminiscent of Gowen side-notched forms (Kasstan 2004:159). The lower component produced four points: two side-notched Gowen-like points, a small stemmed point, and a non-diagnostic blade (Kasstan 2004:98–99). As with the Gowen sites and the Norby site, the lithic assemblage consisted of mainly local raw materials (Kasstan 2004:51). Three radiocarbon dates suggest an age about 5,900 BP (Kasstan 2004:44).

Gowen side-notched points have been demonstrated to exhibit a fairly consistent form, with some variability, during a relatively limited period of time in central Saskatchewan (Kasstan 2004; Walker 1992; Zurburg 1991). As Walker (1992:72) outlined, these points have convex to straight blades, often exhibit asymmetry, distal blade width is maximum, wide and shallow notches are low on the lateral margins, and the basal margin is usually straight. The Gowen 1, Gowen 2, Norby, and Below Forks sites have all been radiocarbon dated to about 5,900 to 5,700 BP. Still, researchers have not delimited an archaeological culture that would distinguish the Gowen sites from the Early Side-notched/Mummy Cave series.

The Sites

In Alberta, there are two sites that may exhibit diagnostic materials similar to the Gowen side-notched assemblages in Saskatchewan. These sites are the Snyder Farm Locality at DjPm 36 and the Spring Kill site (EgPs 51). These two sites have been distinguished from other sites of a similar age by the presence of projectile points exhibiting straight to convex blades, asymmetry, maximum width at the distal blade and shallow, wide notches low on the lateral margins. In short, they seem to exhibit projectile points reminiscent of the Gowen forms in Saskatchewan (see Plate 14 and Figure 15).
DjPm 36, Snyder Farm Locality, Component 1. DjPm 36, Snyder Farm locality, named after the tenant of the land, is located at the confluence of the North Fork of the Oldman River and the Crowsnest River (Van Dyke 1994:116). This part of the DjPm 36 site was excavated between 1988 and 1990. Evidence of Component 1 (the component exhibiting the Gowen side-notched material) was found in three excavation blocks. However, a large area was only opened up in one block. A total of 51 m² was excavated (Van Dyke 1994:122). The site was part of the mitigation program in response to the construction of the Oldman River Dam.

Twelve points or point fragments were recovered in association with a possible hearth and lithic and bone concentrations. Van Dyke (1994:128) acknowledged that the majority of the points are very comparable to the Gowen side-notched type. Other tools recovered included bifaces (n = 2), cores (n = 33), end scrapers (n = 12), retouched flakes (n = 12), a unifacial knife, a scraper/plane, a hammerstone, and an anvil (Van Dyke 1994:123). The lithic assemblage emphasized local quartzite and siltstones but also exhibited more exotic materials such as Knife River flint, Montana chert, and obsidian (Van Dyke 1994:246). The vast majority of the debitage is tertiary detritus. There are two concentrations of debitage within the excavation block: a retooling location by a possible hearth and a second location away
FIGURE 15
Gowen sites within Alberta
from the hearth. Two pieces of worked bone were also recovered. The faunal assemblage \(n=4,608\) had a minimum of four bison (two fetal), a deer, a bird, a large canid, and a medium to small canid (Van Dyke 1994:126). The differential development of the fetal bison bone suggested both early and late winter events, which might indicate prolonged use of the site. The bone, like the tools and the debitage, was distributed in two major clusters of material culture on the living floor. A few burned and calcine pieces of bone were recovered. Fuel was rare (Van Dyke 1994:121).

A single radiocarbon date of about 5,900 BP was obtained for the site (Van Dyke 1994:126). The researchers interpreted the site as a possible household structure in which people who manufactured Gowen side-notched points produced two clusters of activities, including lithic workshop debitage and domestic detritus around a possible hearth (surface burns) during winter (Van Dyke 1994).

Spring Kill (EgPs 51). The Spring Kill site is located along the Bow River near Exshaw in the front range of the Rocky Mountains (Kooyman 2000a:1). The site derived its name from a nearby spring that had waterlogged the site sediments, thus eroding bison bone. Six general stratigraphic layers were identified with major bone deposits in Layers 3 and 4. Each general stratigraphic layer was further subdivided into more discrete depositional events. Only Layer 3 produced diagnostic material; two Gowen side-notched points were recovered (Kooyman 2000a:10–14). A total of 10 m\(^2\) was excavated as part of a research program (Kooyman 2000a:3).

Two points and an apparent point tip were recovered in possible association with the bone beds (Kooyman 2000a:55–56). Kooyman (2000a:55–56) considered the points to be most similar to Gowen side-notched points. No other tools were recovered in Layer 3 but a few pieces of debitage \((n=12)\) were noted. Banff chert was the most exotic raw material used while quartzite and chert dominated the small assemblage (Kooyman 2000a:95–96). The faunal assemblage was largely bison but a single large canid bone was also recovered. The bison were larger than modern bison. The absence of the humerus and femur indicated the highest-utility bones were removed from the site (Kooyman 2000a:52). Marrow removal was not conducted, at least not on the entire skeleton. The butchering pattern and sediment deposition suggested that several episodes likely occurred at the site with individual animals being dispatched (Kooyman 2000a:50–51). No features were observed.
A total of five radiocarbon dates was obtained for Layer 3 (see Table 13). Layer 4, immediately beneath this layer, provided a date of 5,400 BP. However, Newton’s (1991:121) initial discovery of the site provided a radiocarbon date for Layer 3 of approximately 6,000 BP. Kooyman (2000a:18) could not provide a reasonable explanation for the asynchronous dates.

<table>
<thead>
<tr>
<th>Site [LAB NO.]</th>
<th>Conventional (^{14})C Age</th>
<th>(^{13})C/(^{12})C Ratio</th>
<th>Material</th>
<th>Calibration</th>
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<td>5920 +/- 170</td>
<td>-18.5‰</td>
<td>collagen</td>
<td>5250–4580 B.C. (p = 0.954)</td>
<td>Van Dyke 1994:126</td>
</tr>
<tr>
<td>EgPs 51 [AEVC-2004C]</td>
<td>5190 +/- 70</td>
<td>n/a</td>
<td>charcoal</td>
<td>4240–4190 B.C. (p = 0.063)</td>
<td>Kooyman 2000a:126</td>
</tr>
<tr>
<td>EgPs 51 [AEVC-1910C]</td>
<td>5330 +/- 90</td>
<td>n/a</td>
<td>charcoal</td>
<td>4340–3880 B.C. (p = 0.954)</td>
<td>Kooyman 2000a:126</td>
</tr>
<tr>
<td>EgPs 51 [AEVC-2006C]</td>
<td>5370 +/- 90</td>
<td>n/a</td>
<td>charcoal</td>
<td>4360–3980 B.C. (p = 0.954)</td>
<td>Kooyman 2000a:126</td>
</tr>
<tr>
<td>EgPs 51 [AEVC-2005C]</td>
<td>5010 +/- 90</td>
<td>n/a</td>
<td>charcoal</td>
<td>3970–3640 B.C. (p = 0.954)</td>
<td>Kooyman 2000a:126</td>
</tr>
<tr>
<td>EgPs 51 [AEVC-2003C]</td>
<td>5000 +/- 80</td>
<td>?</td>
<td>collagen</td>
<td>3960–3650 B.C. (p = 0.954)</td>
<td>Kooyman 2000a:126</td>
</tr>
</tbody>
</table>

**Gowen: A Distinct Cultural Entity?**

The Snyder Farm Locality and EgPs 51 appear to yield Gowen side-notched points along with lithic assemblages that focus on local raw materials but exhibit some exotic material, small campsites, and small kill sites that date between 5,900 and 5,200 BP. For historical reasons, the Gowen side-notched points have consistently been interpreted as part of the Early Side-notched/Mummy Cave series of projectile points, and these points and their associated assemblages have been placed within the Early Middle Prehistoric period or Mummy Cave complex. In this review, the term Mummy Cave complex has been restricted to sites exhibiting Bitterroot side-notched points, an approach that applies a strict definition for Bitterroot points. Similarly, it is argued that the Gowen side-notched points and their associated assemblages are distinct and should be recognized as such. As defined, assemblages with apparent Gowen side-notched points appear to be rare in Alberta, if they exist at all. Notwithstanding, the original Gowen material in Saskatchewan exhibits a wide range of variability, so considerable research
is still required to better understand the true nature of this phenomenon.

For purposes of this book, the Gowen side-notched point is considered to be diagnostic of the Gowen complex. As originally described by Walker (1992:44, 72) these points exhibit convex or straight blade margins, frequent asymmetry, maximum blade width at the shoulders, wide and shallow side-notches low on the lateral margins, and straight to slightly convex basal margins. Walker (1992:133) indicated that Gowen side-notched points may be synonymous with the Salmon River side-notched type (Swanson and Sneed 1966). Reeves (1973:1244) included both Swanson’s (1962) Bitterroot and Salmon River side-notched points as diagnostics of the Mummy Cave complex. Although a statistical comparison of Walker’s (1992) Gowen side-notched points and Swanson’s (1962) Salmon River side-notched points has never been conducted, a visual examination suggests they are not particularly comparable. Partly for these reasons, the Salmon River side-notched point terminology has been retained in this book to describe projectile points associated with the Maple Leaf complex.

Given that only two sites in Alberta may contain Gowen material, little can be generalized about Gowen assemblages in the Province. There does not appear to be any unique tools associated with the Gowen complex, save the projectile points. The lithic raw material utilization appears to be focused on local raw materials such as quartzite and siltstone. In terms of subsistence, EgPs 51 appears to be a small ambush site, while the Snyder Farm Locality appears to be more domestic with a larger range of fauna reflected in the assemblage, including deer, a bird, and large and small-medium canids. A single feature was recorded at the Snyder Farm Locality; it was a small surface hearth with associated lithic and bone concentrations, suggesting domestic activities of a small group of people. Importantly, very little fiber was recovered, suggesting extensive processing had not been undertaken. Dates for the Gowen complex in Saskatchewan fall between 5,900 and 5,700 BP. For Alberta, the date for Snyder Farm Locality falls nicely within this range of dates but EgPs 51 is an outlier, dating to about 5,200 BP. The small number of possible sites and the range of dates mean there is work to be done, to increase our understanding of the Gowen complex.

**Estevan Phase (ca. 4,900 to 4,500 BP)**

Reeves (1969:32) suggested that the co-occurrence of side-notched points with Oxbow points and McKean points provided evidence for a relationship between the Mummy Cave, the Oxbow, and the McKean complexes.
Reeves (1969:32) postulated that the Oxbow complex derived from the Mummy Cave complex and that the occasional McKean point in some assemblages was a product of cultural contact between two culturally distinct populations. A few years later, Reeves (1973) divided the Oxbow complex into Early and Late segments. He defined the Early Oxbow complex, ca. 5,000–4,500 BP, by the co-occurrence of Bitterroot and Oxbow points and the Late Oxbow complex, ca. 4,500–4,000 BP, by assemblages containing only Oxbow points. Reeves (1973:1240–1242) cited Long Creek Levels 8 and 9, Oxbow Dam, and Sorenson V as Early Oxbow sites.

Similarly, Dyck (1983:92–96) noted that both the Oxbow Dam site and Level 9 of the Long Creek site dated to the threshold of the Oxbow complex. Unlike Reeves (1973), who considered the material to be Early Oxbow with historical ties to the Mummy Cave complex, Dyck (1983) classified the material as Late Mummy Cave series assemblages. Materials from Levels 7 and 8 of the Long Creek site, on the other hand, he classified as Oxbow assemblages (Dyck 1983:96–100). This debate went beyond the Oxbow Dam and Long Creek sites. Large side-notched points recovered from the Anderson site in eastern central Alberta were compared to the point assemblage recovered from Level 8 at Long Creek, amongst other sites (Quigg 1984). Despite calling the Anderson points Bitterroot side-notched points, the researcher considered the specimens to be comparable to the Oxbow specimens from Level 8 at Long Creek. Walker (1992:144) considered some similarities between Gowen side-notched points and the earliest Oxbow specimens from the Oxbow Dam and Long Creek sites. He noted that the comparisons were subjective and would require statistical confirmation. If correct, however, the Oxbow complex would be an in situ development from the preceding Gowen/Mummy Cave complex and not a cultural migration (Walker 1992:144). In his model there was no recognizable or discrete intermediate culture or diagnostic material culture, only similarity in point forms during a transition from Gowen to Oxbow.

The original Oxbow Dam site material was excavated in 1956. Green (2005) reviewed the interpretations surrounding the Oxbow Dam in a historical context. As well, he conducted additional excavations (18 m²) at the site. His synthesis of this material is most illuminating. Oxbow Dam is a multicomponent site, of which one level contained Oxbow material. The site was initially considered to be the type site for the Oxbow complex, but as more Oxbow sites were excavated it was gradually reinterpreted as an early transitional or proto-Oxbow site because of a radiocarbon date of ca.
5,200 BP (Green 2005:107). Green (2005:108) persuasively argued that material was mixed from both earlier and later levels, because of deformation of stratigraphic layers, into the level containing the Oxbow type assemblage. As well, the radiocarbon date was likely conducted on intrusive material from a lower level (Green 2005:4). Further complicating the picture was the inclusion of material from Levels 7 and 8 of the Long Creek site in the original assemblages used to define the Oxbow complex (Green 2005:3). Green’s (2005:104–105) excavation at the Oxbow Dam site recovered a Late Oxbow assemblage dating to ca. 4,300 BP rather than the original 5,200 BP. Importantly, only “classic” Oxbow points (n = 5) were recovered, with no Mummy Cave material. This left Long Creek Level 8 appearing unusual, with its Oxbow-like points being associated with corner-notched specimens and a radiocarbon date of ca. 4,700 BP (earlier than “classic” Oxbow material). Regardless, Green (2005) considered Oxbow to derive from Gowen. The commonalities he saw between Gowen and Oxbow included small groups inhabiting sites for short periods of time, stalking lone animals or conducting small bison kills, with lithic technology such as split pebble technology, and tool assemblages including large hafted bifaces, ovoid bifaces, and flake perforators (Green 2005:102–103).

Bryant (2002, 2007) conducted an important reanalysis of the Long Creek site. Based on the original field notes for Level 8, she noted that as many as three occupations may be represented. A reconstruction of the provenience of specific artifacts, however, was not possible. Bryant (2002:185) classified all the points as Early Side-notched and/or Mummy Cave series points. A radiocarbon date of ca. 4,650 BP was originally obtained. Bryant (2002:204) got another radiocarbon date of ca. 4,960 BP, which supports the initial date. She interpreted these dates as placing the assemblage within the late Mummy Cave complex and early Oxbow complex, possibly representing a series of transitional levels (Bryant 2002:206). She emphasized that the points should not be confused with Bitterroot points but suggested there may be similarities to Gowen materials (Bryant 2002:223–224).

The Sites

A number of sites with radiocarbon dates in the period immediately predating the “classic” Oxbow material have been found in Alberta. These sites are presented in order to assess the various lines of thinking regarding archaeological assemblages immediately predating the Oxbow phase (see Plate 15 and Figure 16).
Anderson (FdOt 1). The Anderson site is a campsite near the Battle River on high ground overlooking Hardisty Lake (Quigg 1984). The site is discussed under the Maple Leaf complex. Testing encountered a concentration of artifacts at 48–63 cm bs containing, amongst other things, atlatl points exhibiting two distinct forms: a large block-eared, Oxbow-like point and a smaller round-based point. Similarly, two radiocarbon dates were obtained for this occupation: ca. 4,800 BP and 5,500 BP. Given the vertical distribution of the material in the site (15 cm), the presence of two distinct projectile points, and two distinct dates, it was previously suggested that the site is a palimpsest. The smaller, round-based points are most likely associated with the Maple Leaf complex and the earlier date. The larger, block-eared, more Oxbow-like points are likely associated with the pre-Oxbow date.

EgPn 480, Component 3. EgPn 480 is a multicomponent site in a prominent basin southeast of the Elbow River, west of Calgary (de Mille and Head 2001:54). The site is outlined in the section on the Scottsbluff-Eden phase. The second component exhibits both a corner-notched and side-notched projectile point. The two points were recovered in association with an FBR feature and a diffuse scatter of lithics and bone. The researchers indicated that the recovered points were most similar to Mummy Cave material. One specimen exhibited block ears similar to an Oxbow point while the second point was corner-notched, resembling a Pelican Lake point. Other tools recovered included bifaces (n = 2), end scrapers (n = 4), retouched tools (n = 2), side scrapers (n = 2), a utilized flake, choppers (n = 2), hammerstones (n = 2), a maul fragment, unidirectional cores (n = 4), multidirectional cores (n = 19), and miscellaneous cobbles (n = 31). The lithic assemblage was dominated by quartzite, siltstone, and sandstone (de Mille and Head 2001:97). In terms of the quartzite debitage, a high cortex to non-cortex ratio, heavy representation of larger-sized detritus, and large number of single-faceted.
Figure 16: Estevan sites within Alberta
and cortex-covered platforms were interpreted as indicating early stages of core preparation and bifacial reduction. Few quartzite tools were recovered, suggesting their use elsewhere (de Mille and Head 2001:99). The siltstone debitage indicates a similar pattern.

The faunal assemblage ($n = 222$) consisted of bison, based on only thirty-eight identifiable fragments. A minimum of a single bison was observed in the sample. The highly fragmented material was interpreted as campsite consumption, marrow removal, and processing activities (de Mille and Head 2001:96). Only two burned and four calcine bones were reported, possibly indicating rodent transportation from lower levels where burning was more common (de Mille and Head 2001:96). A linear FBR feature consisting of a concentration of a single layer of five large and five small FBR were recorded but not interpreted. Across the site, researchers recorded 22,487.1 grams of water-fractured FBR within a total of 29,961.6 grams of general FBR (de Mille and Head 2001:94). No other artifacts were recovered in the area of FBR concentration.

A single radiocarbon data of ca. 4,700 BP was obtained for this occupation. The authors noted that the materials in this component were widely distributed and lacked concentrations in contrast to the underlying occupations and suggested the possibility of extensive bioturbation (de Mille and Head 2001:102).

**Boy Chief (EcOV 68).** The Boy Chief site is also known as Saahkö-maapiina in honour of Boy Chief, a Siksika who travelled through the area as young man (Head et al. 2003:i). The site is a multicomponent site near the town of Princess and is located above an intermediate terrace on Little Sandhill Creek, a tributary of the Red Deer River. Block 3 exhibited six components with the earliest component underlying three Oxbow components, followed by a Hanna component and a Pelican Lake/Besant component. The site was excavated in 1990 and 1994, with a total of 97 m$^2$ excavated during the earlier excavation phase and an additional 166 m$^2$ excavated during the later phase (Head et al. 2003:v).

Occupation 1 produced one point in association with six hearths (Head et al. 2003:32–51). The researchers classify this point as a Bitterroot point (Head et al. 2002:51). Walker (1992), however, strongly suggested that points of this morphology and time period should be classified as Gowen points. Moreover, he argued that Gowen points are morphologically distinct from Bitterroot points, which occur much earlier in time (Walker 1992).
Although one ear is damaged, it has the overall look of a block-cored Oxbow point with a very shallowly indented base. Other tools included side scrapers (n = 2), retouched flakes (n = 5), and cores/choppers (n = 13). Most of these were recovered in the southwest corner of the excavation block (Head et al. 2003:47). The assemblage was dominated by quartzite, miscellaneous cherts, and massive quartz (Head et al. 2003:44).

The faunal assemblage includes at least three bison, a bird, and a canid (Head et al. 2002:37). Only 183 of the 2,085 bone fragments were identifiable. Faunal analysis suggested the presence of a juvenile animal while sexing indicated a female and two males were present (Head et al. 2003:38–39). An analysis of the assemblage suggested that a secondary processing locale was used to “pare down limbs removed from the main kill areas into more manageable portions” for subsequent processing (Head et al. 2003:43). 

Angular specimens were recovered, which suggests immersion in water for stone boiling (Head et al. 2003:44). All the features were small surface hearths. One hearth exhibited a bison mandible placed upright into the sand with unmodified rocks holding its anterior end (Head et al. 2003:50); the purpose of this feature could not be determined.

Five radiocarbon dates were obtained for this occupation (see Table 14). The average age for the occupation was 4,439 ± 36 BP (Head et al. 2003:50). The researchers noted that this was late for a Mummy Cave/Bitterroot occupation (Head et al. 2003:50).

<table>
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<tr>
<th>Site [Lab No.]</th>
<th>Conventional ¹⁴C Age</th>
<th>¹³C/¹²C Ratio</th>
<th>Material</th>
<th>Calibration</th>
<th>Reference</th>
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<tr>
<td>FdOt 1 [Gx-6129-G]</td>
<td>4805 ± 150</td>
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<td>collagen</td>
<td>4000–3100 B.C. (p = 0.954)</td>
<td>Quigg 1984:155-156; Morlan n.d.</td>
</tr>
<tr>
<td>EgPn 480 [BETA-127234]</td>
<td>4690 ± 70</td>
<td>-19.8‰</td>
<td>collagen</td>
<td>3640–3350 B.C. (p = 0.954)</td>
<td>de Mille and Head 2001:101, Morlan n.d.</td>
</tr>
<tr>
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<td>-22.5‰</td>
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<td>3340–2870 B.C. (p = 0.954)</td>
<td>Head et al. 2002:50</td>
</tr>
<tr>
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<td>Head et al. 2002:50</td>
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<td>3350–2700 B.C. (p = 0.954)</td>
<td>Head et al. 2002:50</td>
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</table>

TABLE 14
Radiocarbon dates for Estevan sites (calibrated by OxCal 3.10 [Ramsey 2005])
Other sites. Other sites in Alberta exhibit block-eared Oxbow points but have not been radiocarbon dated. EhPn 44 is a small campsite in the gently rolling knob-and-kettle topography northwest of Calgary (Vivian and Dow 2006). A single point base was recovered from the site, exhibiting a striking similarity to the corner-notched specimen from Component 3 of EgPn 480 (de Mille and Head 2001). The specimen is quite fragmentary so this identification is tenuous. Two bifaces, two retouched flakes and forty-five pieces of debitage rounded out the rest of the lithic assemblage (Vivian and Dow 2006:5). Similarly, the S.S. Burmis site (DjPn 62), adjacent to the Crowsnest River near the town of Burmis, produced a point reminiscent of a block-eared Oxbow point (Quigg 1975b:17, plate 1, no. 28). Unfortunately, the specimen was considered to be out of context, as it appeared to be associated with two Hanna points (Quigg 1975b:5).

Estevan: Oxbow Beginnings on the Alberta Plains
A review of sites that immediately precede “classic” Oxbow material but do not exhibit Oxbow points illustrates a strong trend toward block-eared, Oxbow-like points associated with corner-notched points that date between 5,000 and 4,500 BP. The similarity of the block-eared Oxbow-like points to “classic” Oxbow points is striking, although no comparable material to the corner-notched points in the later assemblages is apparent. Reeves (1973:1240–1242) originally called this material Early Oxbow complex, dating to ca. 5,000–4,500 BP. He defined it based on the perceived co-occurrence of Bitterroot and Oxbow points and cited Long Creek Levels 8 and 9, Oxbow Dam, and Sorenson V as examples of this site type. Green (2005) has shown that the Oxbow Dam site is a mixed assemblage and is more accurately a “classic” Oxbow site. Originally, Reeves (1973) saw similarities and continuity between the Early Oxbow points and Bitterroot specimens. It is now known that Bitterroot points were produced about 7,000 BP (see the Mummy Cave complex). This means that two thousand years separate the two forms. While there may be some stylistic similarities between Bitterroot and the Early Oxbow points, there is likely little cultural continuity between these forms. Thus, it is suggested that the term Long Creek points be used to label these distinct block-eared specimens that immediately precede the “classic” Oxbow material. This terminology follows Taylor (2006:312–313), who recognized the distinctive nature of the points. Likewise, rather than Early Oxbow complex for the cultural entity, a more traditional name seems appropriate. “The
Estevan phase of the Oxbow tradition” better reflects the formative and emergent nature of the “Oxbow” phenomenon. Estevan has been used as the phase name, to commemorate the Oxbow Dam site's proximity to the local town of that name.

At least two diagnostic point forms are associated with the Estevan phase: Long Creek and Souris points. The Long Creek point tends to be short and broad with fairly shallow side notches and a slightly concave base. The Souris point exhibits shallow corner notches and a relatively straight base. The points are named after drainages near the Long Creek site.

In terms of the tool assemblage, the usual range of tools is present with side scrapers being more common than in later times. Also of interest is a maul fragment in EgPn 480. This is amongst the earliest evidence of mauls recovered in a well-preserved context. Three mauls were recovered at the Gray site (EcNx 1) in Saskatchewan, but they were not in direct association with the Oxbow burials (Millar 1978:305–309). Mauls are interpreted as indicators of increased processing. The lithic raw materials from Boy Chief and EgPn 480 are largely quartzite, quartz, siltstone, petrified wood, and miscellaneous cherts. Although some chalcedony was recovered, almost no exotic material was found in the assemblages from these sites. The faunal assemblages indicate that the subsistence of these people included bison, the most common species recovered at Boy Chief and EgPn 430, with bird and canid being additionally recovered at the Boy Chief site. The bison remains at the Boy Chief site suggested that individual or small kills occurred at remote locations, and that selective processing resulted in selected carcass segments being transported back to the campsite.

A possible technological innovation may make its first appearance at this time. Importantly, both the Boy Chief site and EgPn 480 provide evidence of angular, water-fractured fbr. Associated pit features, however, were not observed. The implication is that stone boiling may be appearing in the archaeological record at this early period, with the purpose of extracting grease from boiled bone. The presence of the maul may be related to this phenomenon, as it could be used for fragmenting bone in order to increase the surface area for grease extraction. At EgPn 480, the fbr was considered to be water fractured and was observed scattered across the site but not associated with any features (de Mille and Head 2001:94). At the Boy Chief site, fbr was largely recovered in the southeast corner of the excavation block around three surface hearths. The researcher noted that the angular specimens suggested water fracturing likely from stone boiling.
This is the earliest that substantial quantities of FBR occur in Alberta’s archaeological record.

Other sites that should be considered part of the Estevan phase of the Oxbow complex that are located outside of Alberta include the Long Creek and the Gray sites in Saskatchewan, and the Sorenson and Sun River sites in Montana. The Long Creek site is located on Long Creek just above its confluence with the Souris River in southeastern Saskatchewan (Bryant 2002, 2007; Wettlaufer and Mayer-Oakes 1960). In 1957, 193.5 m² were excavated in Level 8 of the site (Bryant 2002:185). Bryant (2002) has illustrated that as many as three occupations are present in Level 8. Although originally called Oxbow points (Wettlaufer and Mayer-Oakes 1960) and later called Early Side-notched points (Bryant 2002:185–188), the current research considers a total of ten Long Creek and two Souris points to have been recovered. These points were largely manufactured on fused shale and Knife River flint. Other recovered tools include preforms, numerous end scrapers, a few side scrapers, biface, a hammerstone, and retouched flakes. Bone tools include awl tips, a bone scraper, and some polished bone. Most of the fauna was bison (n = 4) but canid and squirrel were also recovered. A number of hearths were uncovered in association with lithic and bone scatters. Two radiocarbon dates were obtained for this level: 4,620 +/- 80 BP (S-52) and 4,650 +/- 150 BP (S-53) (Morlan n.d.). Bryant (2002:203–206) obtained a third date of 4,960 +/- 70 BP (Beta-168214).

The Gray site is located in southwestern Saskatchewan. It has been interpreted as a burial ground attributed largely to peoples of the Oxbow (Millar 1978). Projectile points recovered within the excavated burials tend to be “classic” Oxbow points; however, some un-notched Oxbow points or possibly McKean points were also recovered. Two large points, possibly spear tips, are Oxbow-like in form but more similar to the Long Creek points in outline morphology (see Millar 1978:263, fig. 117a, b). One of the specimens was recovered in two pieces from a grave dated to ca. 5,000 BP (Millar 1978:260–263, fig. 117a). As well, a few block- eared, Oxbow-like points were recovered at the site. One specimen was recovered within an undated burial (Millar 1978:267, fig. 118g), a second was recovered on an extinct soil surface (Millar 1978:267, fig. 118i), while a third was recovered in a burial dated to ca. 5,000 BP (Millar 1978:267, fig. 118b). All of these potential Long Creek points exhibit the block ears and very slight basal concavities. One point (Millar 1978:267, fig. 118a) has block ears but a deep basal concavity, differentiating it from Long Creek points. The point,
however, was recovered from a burial dated to ca. 5,100 BP, suggesting it should be included within the Estevan phase. A large standard deviation for this date (Millar 1978:387) might place it with more morphologically similar “classic” Oxbow points. Also important, although circumstantial, is that dates for the site range between ca. 5,000 BP and 3,000 BP. This is roughly coincidental with the beginning of the Estevan phase and lends support to the idea that the two phases are sequential in time and possibly culturally related. The cultural relationship goes beyond being sequential in time to include exhibiting similar point morphology, the solitary stocking of game, coincidental use of burial/ceremonial sites, and the utilization of new technologies such as stone boiling. The continuity or overlap between Estevan block-earred Oxbow-like material (ca. 5,000–4,500) and “classic” Oxbow material (ca. 4,500–4,000; see next section) is the reason for placing the Estevan phase and the Oxbow phase within the Oxbow tradition.

Based on surface finds, Taylor (2006:313–315) suggested that Long Creek points might also be found in eastern Montana and western North Dakota. At the Sorenson site in south-central Montana, a single point resembling the Long Creek type was recovered in Occupation V (Husted and Edgar 2002, plate 11, no. 1). The occupation was radiometrically dated to ca. 5,000 BP. At the Sun River site, Oxbow material dating before and after 4,500 BP was recovered (Greiser et al. 1985). These early dates suggest a closer examination of these materials might shed light on developments that led to the Oxbow phase. Perhaps an origin to the southwest has merit. To the south in Nebraska is a burial site (25SF17) on a hilltop on the south side of the North Platte River (Carlson et al. 1999:113–115). The burial was disturbed by land levelling. No information was obtained on burial type, sex, age, or number of individuals (Carlson et al. 1999:114). Associated with the burial were five large side-notched knives, four points, an unperforated bead possibly of amber, and possible fragmentary bird bone. The five side-notched knives (Carlson et al. 1999:115, fig. 7A–E) are strikingly similar in size and form to the large side-notched spear point recovered in the 5,000 BP burial at the Gray site (Millar 1978:263). Three of the four points were classified as Oxbow (Carlson 1999:114, 115, fig. 7F–H), but the suite of points is most similar to the Long Creek points defined above. They tend to exhibit block ears with fairly shallow basal concavities. An examination of Oxbow materials in the Nebraska area might prove fruitful in understanding the Oxbow tradition on the Northern Plains. Perhaps Wettlaufer and Mayer-Oakes (1960:116–118) and Wormington and Forbis
light from ancient campfires • trevor r. peck

(1965:190) were close when they suggested long ago that the Oxbow complex was derived from an Archaic culture on the prairie-woodland border zone to the east of the Great Plains.

OXBOW PHASE (CA. 4,500 TO 4,100 BP)

In 1956, a cut in the Souris River bank, produced by spring flooding, exposed a site just below the dam near the town of Oxbow, Saskatchewan (Nero and McCorquodale 1958:116). Noted that the upstream dam provided the site with an appropriate name: the Oxbow Dam site. Five points, four scrapers, two blade fragments, a flake knife, and part of a shell gorget were recovered (Nero and McCorquodale 1958:85–87). Comparisons of the Oxbow Dam site material to material from the lower levels of the Long Creek site were made (Nero and McCorquodale 1958:88). Building on this newly recovered material, Wettlaufer assigned Level 7 and 8 of the Long Creek site to the Oxbow culture (Wettlaufer and Mayer-Oakes 1960:52–67). In this same report, Mayer-Oakes suggested Wettlaufer consider the term Long Creek Side-notched instead of Oxbow for the recovered projectile points, given that the material was known best from the Long Creek site (Wettlaufer and Mayer-Oakes 1960:116). He did admit, however, the Long Creek material was strikingly similar to the Oxbow Dam site material (Wettlaufer and Mayer-Oakes 1960:116).

Such was the preamble that led up to the series of discussions concerning the nature and relationship of the Oxbow Dam site material and material from the Long Creek site Levels 7 and 8. Many of the developments are outlined in the preceding section on the Estevan phase. In summary, there have been numerous views concerning Oxbow and Oxbow-like projectile points and their associated assemblages (e.g., Dyck 1983; Quigg 1984; Reeves 1969, 1973; Walker 1992). Green’s (2005) review of interpretations surrounding the Oxbow Dam site and Long Creek site placed the previous excavations into historical context. His additional excavations at the original location of the Oxbow Dam site indicated the earlier excavations had examined mixed assemblages (Green 2005:108). As well, the radiocarbon date had likely been derived from intrusive material from a lower level (Green 2005:4). Green’s (2005:104–105) excavation at the Oxbow Dam site produced a “classic” Oxbow assemblage dating ca. 4,300 BP exhibiting no Mummy Cave material. While Green (2005) saw Oxbow materials as derived from the Gowen complex, the preceding section provides a reasonable argument that the Estevan phase, in essence, is a proto-Oxbow entity.
exhibiting all the hallmark features of the Oxbow phase. Thus, the Estevan phase is an ancestor to the Oxbow phase within the Oxbow tradition.

The Sites

Green’s (2005) review of the literature exposed the Oxbow Dam site as an example of an Oxbow campsite that had originally been interpreted from mixed deposits. This data fits Reeves’ (1973) criteria for “classic” Oxbow assemblage with no Mummy Cave material intermixed. Oxbow points exhibit shallow side-notches located relatively high on the lateral edges and a deep concave base, which combine to give the point a characteristic eared or lugged appearance (Green 2005:53). As well, the points tend to exhibit basal thinning flake scars projecting upward from the concave portion of the base (Green 2005:53). Using these criteria, the following reviews the Alberta archaeological record for well-dated sites with appropriate material (see Plate 16 and Figure 17)

Southridge (EaOq 17). The Southridge site is a processing site in Medicine Hat. The site was named for the subdivision in which it was found (Brumley 1981). The site is located at the prairie level just southeast of Seven Persons Creek valley (Brumley 1981:1). It was excavated in fall 1979 and fall 1980. Three sub-areas were defined with Sub-area B producing the Oxbow material; a total of 152 m² was excavated (Brumley 1981:40).

Seventeen Oxbow points and three preforms were associated with two hearths and two boiling pits (Brumley 1981:40–91). Other tools recovered included marginally retouched flakes (n = 69), utilized flakes (n = 4), end scrapers (n = 3), bifaces (n = 20), anvils/hammerstones (n = 3), a spokeshave, and a graver. All these items would be used in the processing of carcasses. Most of the raw materials were local with fine tools manufactured on the better toolstone (Brumley 1981:68). The bison faunal assemblage (n = 3,207) consisted almost entirely of fractured limb elements (Brumley 1981: 52–54). The assemblage was highly fractured. Brumley (1981:47) argued that each hearth was associated with a different boiling pit, suggesting two activity areas were present; the distribution of FBR and bone delimiting an area around these features supported his interpretation (Brumley 1981:47–48).

Three radiocarbon dates were obtained for this area of the site (see Table 15). The two earlier dates were from fill within a feature and were considered acceptable. The more recent date was derived from bone within several shallowly buried units and was possibly contaminated (Brumley 1981:89–90).
PLATE 16
Oxbow points. Illustrated are projectile points from the Ross Glen site (DIOp 2) (a and b); the Southridge site (EAOq 27) (c–e); the Boy Chief site (EEOv 68) (f–i); the Castor Creek site (FBOW 1) (j–o); the Stampede site (DjOn 26), Palaeosol 5b (p and q), and Palaeosol 5c (r); and EhPm 72 (s–u).
Photo credit: Alberta Culture and Community Spirit.
Figure 17
Oxbow sites within Alberta
## Table 15
Radiocarbon dates for Oxbow sites (calibrated by OxCal 3.10 [Ramsey 2005])

<table>
<thead>
<tr>
<th>Site</th>
<th>Conventional ¹⁴C Age</th>
<th>¹³C/¹²C Ratio</th>
<th>Material</th>
<th>Calibration</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>EdPc 1</td>
<td>2170 +/- 210</td>
<td>-20.0‰</td>
<td>collagen</td>
<td>800 B.C.–A.D. 300</td>
<td>Morlan n.d.</td>
</tr>
<tr>
<td>(S-854)</td>
<td></td>
<td></td>
<td></td>
<td>(p = 0.954)</td>
<td></td>
</tr>
<tr>
<td>(S-856)</td>
<td></td>
<td></td>
<td></td>
<td>(p = 0.954)</td>
<td></td>
</tr>
<tr>
<td>FbOw 1</td>
<td>4475 +/- 1000</td>
<td>?</td>
<td>charcoal</td>
<td>5500–600 B.C.</td>
<td>Forbis 1970:17; Brumley and Rushworth 1983:155</td>
</tr>
<tr>
<td>[N/A-47]</td>
<td></td>
<td></td>
<td></td>
<td>(p = 0.954)</td>
<td></td>
</tr>
<tr>
<td>DjPo 47</td>
<td>6420 +/- 160</td>
<td>-20.0‰</td>
<td>collagen</td>
<td>not associated</td>
<td>Landals 1986:94; Morlan n.d.</td>
</tr>
<tr>
<td>[RL-508]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[RL-877]</td>
<td></td>
<td></td>
<td></td>
<td>(p = 0.954)</td>
<td></td>
</tr>
<tr>
<td>[GX-6184 A]</td>
<td></td>
<td></td>
<td></td>
<td>(p = 0.954)</td>
<td></td>
</tr>
<tr>
<td>EaOq 17</td>
<td>4340 +/- 140</td>
<td>-20.0‰</td>
<td>collagen</td>
<td>3400–2550 B.C.</td>
<td>Brumley 1981:89; Morlan n.d.</td>
</tr>
<tr>
<td>[RL-15135]</td>
<td></td>
<td></td>
<td></td>
<td>(p = 0.954)</td>
<td></td>
</tr>
<tr>
<td>EaOq 17</td>
<td>4240 +/- 150</td>
<td>-20.0‰</td>
<td>collagen</td>
<td>3350–2450 B.C.</td>
<td>Brumley 1981:89; Morlan n.d.</td>
</tr>
<tr>
<td>[RL-1514]</td>
<td></td>
<td></td>
<td></td>
<td>(p = 0.954)</td>
<td></td>
</tr>
<tr>
<td>EaOq 17</td>
<td>3750 ± 130</td>
<td>-20.0‰</td>
<td>collagen</td>
<td>2600–1750 B.C.</td>
<td>Brumley 1981:89; Morlan n.d.</td>
</tr>
<tr>
<td>[RL-1516]</td>
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<td></td>
<td></td>
<td>(p = 0.954)</td>
<td></td>
</tr>
<tr>
<td>[RL-1583]</td>
<td></td>
<td></td>
<td></td>
<td>(p = 0.954)</td>
<td></td>
</tr>
<tr>
<td>[BETA-43910]</td>
<td></td>
<td></td>
<td></td>
<td>(p = 0.954)</td>
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<tr>
<td>EeOv 68</td>
<td>4350 +/- 90</td>
<td>-23.8‰</td>
<td>collagen</td>
<td>3350–2700 B.C.</td>
<td>Head et al. 2003:21; Morlan n.d.</td>
</tr>
<tr>
<td>[AECV-2026C]</td>
<td></td>
<td></td>
<td></td>
<td>(p = 0.954)</td>
<td></td>
</tr>
<tr>
<td>EeOv 68</td>
<td>4400 +/- 55</td>
<td>-20.0‰</td>
<td>collagen</td>
<td>3330–3210 B.C.</td>
<td>Head et al. 2003:21; Morlan n.d.</td>
</tr>
<tr>
<td>[BETA-38789]</td>
<td></td>
<td></td>
<td></td>
<td>(p = 0.17); 3190–3150 B.C. (p = 0.03); 3130–2900 B.C. (p = 0.754)</td>
<td></td>
</tr>
<tr>
<td>[AECV-2010C]</td>
<td></td>
<td></td>
<td></td>
<td>(p = 0.954)</td>
<td></td>
</tr>
<tr>
<td>EeOv 68</td>
<td>3220 +/- 150</td>
<td>-19.9‰</td>
<td>collagen</td>
<td>1900–1050 B.C.</td>
<td>Head et al. 2003:21; Morlan n.d.</td>
</tr>
<tr>
<td>[BETA-43911]</td>
<td></td>
<td></td>
<td></td>
<td>(p = 0.954)</td>
<td></td>
</tr>
<tr>
<td>EhPm 72</td>
<td>4160 +/- 40</td>
<td>-20.1‰</td>
<td>collagen</td>
<td>2890–2629 B.C.</td>
<td>Vivian 2007b:3</td>
</tr>
<tr>
<td>[BETA-223884]</td>
<td></td>
<td></td>
<td></td>
<td>(p = 0.954)</td>
<td></td>
</tr>
</tbody>
</table>

**Majorville Medicine Wheel (EdPc 1).** The Majorville Medicine Wheel is described in the Calderwood section. As noted above, Oxbow is traditionally considered to represent the earliest use of the cairn (Calder 1977:30–48), however, Calderwood points in the cairn’s assemblage provide an earlier commencement date. Firm stratigraphic associations could
not be determined between items within the cairn because of its accretional formation. Still, Oxbow points (n = 26) were mainly recovered in Layers 14–16 at the center of the cairn (Calder 1977:36). Calder (1977:202) suggested that cairn making was introduced during the Oxbow phase, but he remained non-committal with respect to the origins of the practice or the people that carried it out. This excavation approach only attributes the cairn to the Oxbow phase, not the spokes or the large circle. Like the cairn itself, these may have been added with time. The ceremonial function of the medicine wheel seemed self-evident. Calder suggested that the presence of projectile points, utilitarian tools and the site’s vantage point likely related to bison hunting ceremonialism.

Three radiocarbon dates were obtained from the medicine wheel; two of the dates were from Oxbow layers near the center of the cairn (Calder 1977:41–42). Bone recovered from near the center produced a date of ca. 2,000 BP; it was rejected because the date did not reflect the assumed age of the associated projectile points. The second date on bone produced a date of ca. 3,850 BP, supporting an Oxbow phase age (Table 15).

**British Block Cairn (EdOp 1).** The British Block Cairn is located on a high hill with a view of the South Saskatchewan River valley and the Cypress Hills (about 50 miles, or 80.5 km, away) to the southeast (Wormington and Forbis 1965:122). The site is within the Canadian Forces Base Suffield near Medicine Hat; this part of the base is known as the British Block for which the site was named. The site consists of a cairn approximately 2 m high and 9 m in diameter and a human (Napi) effigy, which are encircled by a ring about 2.4 m in diameter. Forbis excavated the British Block Cairn in the early 1960s. Like the Majorville Cairn, it produced a wide range of artifacts, including Oxbow points as the earliest diagnostic (Wormington and Forbis 1965:124). The cairn was not excavated accretionally (by peeling off layers like an onion) so the arbitrary layers crosscut the depositional layers. Thus, the stratigraphic relationships between the points and other artifacts were not evident in the recorded data (Wormington and Forbis 1965:124). No dates are available from the cairn.

**See-Everywhere (EcOr 34).** The See-Everywhere site is a cairn located on a prominent knoll at the highest point in the area, with a commanding view of the surrounding landscape for kilometres in all directions, on the Canadian Forces Base Suffield (Brumley 1972:27). The site consists of
the hilltop cairn, about 2 m north–south, 1.5 east–west, and 0.5 m high, within an encompassing scatter of debitage over an area of 30 m in diameter. Also nearby are five stone circles (Brumley 1972:27). A 2 × 2-m unit was excavated into the cairn and five test units of varying sizes were conducted atop the prominent knoll. The mitigative excavations were undertaken to mitigate potential impacts by military activity (Brumley 1972:21).

Excavations revealed that the cairn extended 25 cm bs and contained large amounts of lithic debitage and tools, small amounts of prehistoric pottery, and some historic items. Rodents appeared to have disrupted any stratigraphic elements of the cairn. Items recovered within the cairn included Oxbow (n = 4), McKean (n = 1), Avonlea (n = 2), Cayley Series (Late Side-notched) points (n = 6), and unclassified (n = 1) points (Brumley 1972:28–29). Given the sequence of points at Majorville Cairn and apparently at British Block Cairn, it is tempting to suggest a similar sequence at the See-Everywhere site, starting with Oxbow. While it is possible the points reflect offerings left by passers-by, the items may be curated items or curiosities from other times and locations (Brumley 1972:95). A single radiocarbon date on a bison horn core from the base of See-Everywhere cairn produced an age of ca. 160 ± 60 BP (S-1014), which does not reflect events as old as the Oxbow phase.

**Boy Chief, Block 3 (EcOv-68), Occupation 2, 3, and 4.** The Boy Chief site is discussed in the section on the Estevan phase. The earliest Oxbow component, Occupation 2, produced one reworked and three complete Oxbow points in association with four hearths. The other lithic tools included bifaces (n = 2), retouched flakes (n = 6), cores (n = 9), an end scraper, a side scraper, a wedge, a chopper, and a hammerstone. The lithic assemblage emphasized local raw materials, especially Swan River chert, quartzite, and petrified wood. The faunal assemblage suggested secondary processing took place at the site. A minimum of eleven bison, one canid, and one porcupine were represented in the sample. Four juvenile, one fetal and at least one neonatal (n = 24 fragments) bison were represented (Head et al. 2003:58–59). The presence of young animals and sexing analysis suggested that cow/calf herds were taken in late winter or early spring (Head et al. 2003:63). A structured pattern of discard was suggested by the distribution of the faunal assemblage: limbs and body portions were removed at the kill and secondary removal of extreme upper and lower limbs was conducted at the site (Head et al. 2003:62).

The four hearths were each associated with some bone and fbr.
A lithic reduction area appeared to be associated with one of the hearths. The concentration of lithics, 8 m wide, around one of the hearths suggested a possible structure, with the detritus possibly outlining the inside of a circular dwelling (Head et al. 2003:70). Substantial amounts of FBR were recovered, which exhibited angular fractures associated with stone boiling, but stone-boiling pits were not observed (Head et al. 2003:66). Three radiocarbon dates were obtained for this component (Table 15). A late date does not correlate with previous Oxbow dates and is inconsistent with dates from other levels of the site (Head et al. 2003:70–71). On these grounds it was rejected while the other two dates were accepted (Head et al. 2003:70). In summary, Occupation 2 at the Boy Chief site is an Oxbow campsite/processing site with an average date of 4,300 BP (Head et al. 2003:70–71).

The next component, Occupation 3, also produced Oxbow material. Three Oxbow points were recovered in association with two hearths in the southwest part of the excavation. Other tools recovered included bifaces \( (n = 2) \), end scrapers \( (n = 10) \), side scrapers \( (n = 2) \), wedges \( (n = 6) \), retouched tools \( (n = 1) \), bipolar cores \( (n = 15) \), multidirectional cores \( (n = 7) \), and unidirectional cores \( (n = 2) \) (Head et al. 2003:80–83). Most of the tools and debitage were associated with the hearths. A minimum of three adult bison and one canid was recovered in the faunal assemblage; four juvenile and one fetal bison were also represented (Head et al. 2003:72–75). Sexing of the sample could only differentiate one female. This assessment, along with the juvenile and fetal bison, suggested procurement from cow/calf herds in late winter/early spring. The faunal material was concentrated in association with a hearth. As in the earlier level, axial elements were rare and a secondary processing area was represented (Head et al. 2003:76–77). FBR was recovered in substantial amounts and was concentrated in the southwest part of the excavation with the hearths. The sample largely exhibited angular fractures associated with stones immersed in water for stone boiling, but no pits were recovered (Head et al. 2003:77). A single radiocarbon date of ca. 4,350 BP was obtained for this occupation (Head et al. 2003:84).

The next component at the site, Occupation 4, produced two basal fragments of Oxbow points in association with three hearths (Head et al. 2003:91). Other tools recovered included bifaces \( (n = 10) \), end scrapers \( (n = 12) \), side scrapers \( (n = 8) \), wedges \( (n = 2) \), retouched lithics \( (n = 15) \), bipolar cores \( (n = 33) \), multidirectional cores \( (n = 8) \), and unidirectional cores \( (n = 3) \) (Head et al. 2003:88–93). The lithic assemblage was dominated by
quartzite, miscellaneous cherts, and petrified wood. The lithics did not exhibit any patterned distribution. The reduction strategy appeared to focus on bifacial reduction with a “strong pebble chert industry” (Head et al. 2003:91). The faunal assemblage consisted of at least one bison and one canid. The sample was small but upper forelimbs and hindlimbs were emphasized, suggesting tertiary butchering with meat stripping, marrow extraction, and possibly grease extraction (Head et al. 2003:88). Substantial FBR was recovered; it was spread throughout the excavation and not clustered around any of the three hearths (Head et al. 2003:88). The nature of the FBR suggested stone boiling although pits were not observed (Head et al. 2003:92). The hearths were shallow surface hearths generally exhibiting flecks of charcoal and maybe charred bone. No radiocarbon dates were obtained for this occupation. Its stratigraphic position above two dated Oxbow occupations suggested an age around 4,350 BP (Head et al. 2003:92). Based on evidence of tertiary butchering, the site was interpreted as a camp involved with the final stripping of meat (Head et al. 2003:92).

Castor Creek (FbOw 1). The Castor Creek site is located in a hanging valley about 11 m above Castor Creek near Castor, southeastern Alberta. In 1961, Forbis investigated the site after a copper crescent reminiscent of the Old Copper culture of the Great Lakes area was recovered downstream (Wormington and Forbis 1965:115). No materials attributable to the Old Copper culture were recovered from the excavations. However, six Oxbow points and a McKean point were recovered from a deeply buried palaeosol. To explain the co-occurrence of Oxbow and McKean, Forbis (1992:49) considered the assemblage might indicate contemporaneity or the “McKean” point may simply be an Oxbow preform. All other material recovered from the site appears to have been lithic (Wormington and Forbis 1965:116). A single radiocarbon date of ca. 4,500 BP was obtained (Table 15).

Maple Leaf (DjPo 47), Component 3. The Maple Leaf site is described above in the section on the Plains/Mountain complex. Ten projectile points were associated with a wetland, a hearth, and two possible post-mould features. Landals (1986:99–109) identified two Oxbow points, seven Salmon River fishtail points, and one unclassifiable specimen. The remaining lithic tools support an interpretation of specific tasks relating to killing, butchering, sharpening/maintenance, and limited hide processing (Landals 1986:97). The composition of the assemblage indicated the use of
local raw materials; however, the Oxbow points were made on non-local chalcedonies (Landals 1986:104).

The faunal assemblage suggested at least seventeen bison, four canids (two possible dogs), a badger, and a goose were present (Landals 1986:124–128). Three fetal bison bones were recovered at widely separated locations, suggesting late winter to early spring use (Landals 1986:136). The majority of the bone was associated with the wetland feature (Landals 1986:150). A single bone tool of unknown function was manufactured on a radius. Three dates were obtained from the third component, ca. 6,400 BP, 4,200 BP, and 4,400 BP (Table 15). As stated above, the radiocarbon dates and the projectile points suggest at least two periods are represented in the formation of the assemblage: the earlier date reflecting the Maple Leaf occupation (6,400 BP) and the later dates reflecting an Oxbow occupation (4,200 BP and 4,400 BP).

EhPm 72. EhPm 72 is a buried processing site at the base of a sandstone sill on the western side of Nose Creek and Symons Valley (Vivian 2007b:3–15). The site consists of continuous cultural deposits with two levels exhibiting distinct concentrations of material: Levels 6–7 and Levels 11–12 (Vivian 2007a:5). These concentrations were interpreted as two cultural occupations although each produced the same cultural diagnostics. In 2006, a total of 26 m² was excavated at the site (Vivian 2007b:3–4). The site was excavated as mitigation prior to subdivision development.

Three Oxbow base fragments were recovered from the site: two in the upper occupation and one in the lower occupation (Vivian 2007b:5–6). Other lithic tools recovered included a biface fragment, a wedge, a teardrop-shaped scraper, cores (n = 4), a hammerstone, and retouched flakes (n = 2). The lithic raw materials were largely local quartzites and siltstones with only a few exotic cherts and chalcedonies (Vivian 2007b:10). The assemblage had a surprisingly high tool-to-debitage ratio.

The faunal assemblage (n = 2,936) was small and fragmented with only a few items identifiable to element (n = 80). All the identifiable bone was bison. The material from both occupations was mainly axial elements of little economic value that had been discarded at a processing site (Vivian 2007b:14). A single burned bone was recovered, and no associated processing features were recognized. (Vivian 2007b:14). Reworking of the site was ruled out because of the recovery of an intact vertebral articulation and the observation of a core in association with some of its own debitage.
A radiocarbon date of ca. 4,160 BP (Table 15) was obtained from bone recovered in the lower component, an appropriate age for the Oxbow phase.

Other sites. A number of other sites contain Oxbow material but have not been fully reported in the literature. The Bill White site (DjPo 25), named after the landowner, is a multicomponent campsite located just north of the town of Bellevue in the Crowsnest Pass (Reeves and Kennedy 1980). In 1975, two intersecting backhoe trenches and nine 2-x-2-m units were excavated adjacent to the main trench, and revealed a complex geological history. At least ten buried soil horizons were observed with three possibly producing Oxbow material. The Stampede (DjOn 26) site is a well-stratified campsite in the Cypress Hills. At least a couple of levels have been attributed to the Oxbow phase (Gryba 1976, Oetelaar 2004a). Oetelaar (2004a) obtained a very late date of 3,000 +/- 70 BP (TO-10926) for the uppermost Oxbow level (5B) (Freeman 2006:454). The Tuscany (EgPn-377) site is a multicomponent site that produced an Oxbow component. A date of 3,680 +/- 40 BP (Beta-222821) was obtained for bone associated with several large unmodified cobbles that appear to outline a rough circle, possibly representing a stone circle (Oetelaar 1998). Again, this is a late date for an Oxbow site.

Another possible Oxbow-age stone circle was suggested at EfOp 53, a large stone circle site on a series of terraces along Alkali Creek (Adams 1978:51). In 1976, two stone circles were excavated, yielding 160 m². The excavations uncovered a buried ring with the second level producing a possible Oxbow point (Adams 1978:59-60, plate 14b). Adams (1978:60) acknowledged that the recovered point was a poor specimen and that stratigraphy within stone circles lent themselves to mixing. It is unlikely this stone circle dates to the Oxbow phase.

Ross Glen (DIOp 2) is a stone circle site on the prairie level above Bullhead Creek in Medicine Hat (Quigg 1986). The main occupation was by Besant people but evidence of Oxbow and Hanna peoples was also recovered. Two Oxbow points were recovered at the site. In Stone Circle 13, an unusual Oxbow-like point was recovered that exhibited a shallow basal concavity and slightly upturned ears. This point was initially classified as Bitterroot (Quigg 1986:60), but would now be consider to be a Long Creek point. A point tip and a Hanna-like point base were also recovered under the stone circle. Importantly, no Besant points were recovered in this part of an otherwise Besant-dominated site. A “classic” Oxbow point was
found less than 20 m to the north of Stone Circle 13 near two ancillary features. Lastly, an ancillary feature consisting of a basin-shaped pit full of burned faunal material about 15 m northeast of Stone Circle 13 produced a radiocarbon date of 4,260 +/-140 BP (RL-1585), a date that fits well with known Oxbow dates. While there appears to be an Oxbow occupation at the site, there is little evidence for an Oxbow association with any of the stone circles. The Oxbow phase at the site most likely relates to a scatter of material in the area underlying the more recent stone circle.

Oxbow points have been recovered north of the Plains in Alberta as well. For example, Gruhn (1981:88) noted the similarity of a number of specimens recovered at sites GhPh 102, 103, and 106 to Oxbow points. While superficially similar to “classic” Oxbow points, the Calling Lake specimens are slightly aberrant; these specimens may represent something quite different. Without secure dating and more thorough comparisons any conclusions are very tenuous.

Oxbow: Cemeteries, Boiling Pits, and More
The Oxbow phase designation has had a long and tumultuous history (Green 2005). In Alberta, numerous sites speak to a discrete material culture that exists during a delimited period of time. The Oxbow phase thrived on the Alberta plains between 4,500 and 4,100 BP. Oxbow’s ties to Estevan make it part of a tradition rather than part of a complex. Most of the radiocarbon dates for the phase fall within this period with a few dates as late as 3,500–3,000 BP (e.g., Stampede, Tuscany). It is currently unclear whether these late dates exhibit aberrant dates or represent a late expression of the Oxbow phase (see below). The diagnostic artifact of the Oxbow phase is the Oxbow point, described above. The points are almost invariably bifacial, never flake points.

A number of cultural innovations occurred during the Oxbow phase. The process of stone boiling to extract bone grease may have been introduced as early as the Estevan phase. The presence of boiling pits, however, during the Oxbow phase confirms this innovation. The Southridge site provides evidence of Oxbow people using stone-boiling pits. The extraction of grease from bone is important in preserving meat from kills where surplus has been created. Thus, stores of food can be created, allowing for a whole new range of mobility and behaviours not possible for people tethered to procuring fresh meat.

The toolkit of the Oxbow phase was largely produced on local materials.
Few exotic materials are found in the assemblages. Oxbow assemblages near the mountains utilized materials from the mountains such as Etherington chert. Quartzite and miscellaneous cherts account for most lithic raw materials during the phase. As for the tools themselves, end scrapers are slightly more common than side scrapers. Bifaces occur in ovate and triangular form but other configurations occur. Hammerstones are relatively more common in Oxbow assemblages, likely owing to the need to crush bones for the grease extraction process. Cores of all sorts are recovered including multidirectional and bipolar cores. Retouched flakes are quite common in Oxbow sites.

The fauna reflect a strategy of bison procurement via stalking. Bison kills tend to be small with only a few animals being taken at any time. Repeatedly using the same strategy at one location can produce misleading faunal assemblages (e.g., DjPo 47) in which large assemblages are really products of repeated smaller kills. Often, only some elements of the bison make it back to the campsites (e.g., EeOv 68) with much being left at the kill site (e.g., EhPm 72, DjPo 47). The people of the Oxbow phase apparently did not conduct large-scale kills. Despite a focus on bison, other animals were taken, including canid (possibly dog), badger, porcupine, and goose as part of a subsistence strategy.

The Oxbow phase exhibits an increase in features within sites compared to previous periods. Surface and basin hearths occur in a number of sites. FBR and charred-bone concentrations also increase in number. Most of the Oxbow sites produced FBR in contrast to previous archaeological cultures, which produced very little, if any. Boiling pits, as already mentioned, provide archaeological evidence for stone boiling and grease extraction not previously represented in the archaeological record.

It now seems apparent that the people of the Oxbow phase were not the first to establish cairns, which later became “medicine wheels,” on high points of land. This honour falls to the Calderwood complex. Still, items that likely represent offerings, such as projectile points, geodes, and bone fragments, were placed inside cairns in prominent locations at this time. The spectacular viewscapes almost certainly played a role in the location and function of these features. It is not known when the radiating spokes and larger circles were associated with the cairns; it is possible that initially only a small cairn marked the top of prominent hills and subsequent visitors elaborated on the design for millennia.

Importantly, the Oxbow phase is found well beyond Alberta’s borders.
Saskatchewan has produced a number of well-dated Oxbow sites. The Oxbow Dam site is discussed. It produced Oxbow points with an associated radiocarbon date of ca. 4,300 BP (Green 2005). Also, the Long Creek site, Level 7, produced a diffuse campsite that contained two Oxbow points and two preforms (Wettlaufer and Mayer-Oakes 1960:53–55). A radiocarbon date of ca. 4,600 was obtained for the level (Wettlaufer and Mayer-Oakes 1960:136; Morlan n.d.).

The Gray site (EcNx 1) is located northwest of Swift Current, Saskatchewan. The site was named after the family who owned the land in 1963, when human skeletal material first came to light (Millar 1978:65). The site consists of multiple interments on a south-facing hillside covered in windblown sands (Millar 1978). From the initial discovery of the site until 1973, approximately ninety-eight burials were examined in whole or in part, not including non-professional investigations (Millar 1978:70). An estimated 40 percent of the northern part of the site (EcNx 1a) remained unexcavated after the work in 1973, while work at the southern area (EcNx 1b) was restricted to very limited testing (Millar 1978:72). Almost all the points from the burials are Long Creek or Oxbow points. A couple, recovered from a single grave, were basally indented, lanceolate-shaped specimens that superficially appear to be McKean points but were interpreted as preforms owing to the coincidental recovery of an Oxbow point and a basally indented leaf-shaped form in a common burial unit (Millar 1978:275). Nine radiocarbon dates from nine burials were obtained from the site (Millar 1978:386–389). Millar suggested the dates may represent random points on a continuum, or five groups with four hiatuses (ca. 5,500–4,800 BP; 4,600–4,100 BP; 3,930–3,600 BP; 3,850–3,300 BP; and 3,000–2,850 BP). As noted above, Estevan material may represent the initiation of this site. Oxbow material occurs in many of the burials, and most of the dates fall within the accepted Oxbow period. A few dates are particularly late to be Oxbow phase; Burial B70 is dated to 3,015 +/- 85 BP (S-1449). It is important too, that four of the five most recent dates were derived from insoluble collagen extraction, which can produce aberrantly young dates (Morlan 1994:19). As discussed below, it is also possible that the Oxbow phase lingered in southern Alberta and north-central Montana Plains as late as ca. 3,500 BP.

The Greenwater Lake site (FcMv 1) is an incomplete, single, primary extended interment that eroded from a steep backslope of a municipal road (Walker 1981). Red ochre or powdered hematite was observed on
the surface of the bone and in nodular form (Walker 1981:8). A single Oxbow point manufactured on Swan River chert was recovered from the thoracic region of the burial (Walker 1981:8). The skeleton represents an adult male in his early twenties (Walker 1981:11). A radiocarbon date of 4,490 +/- 105 BP was obtained for the site (Morlan et al. 2002; Walker 1981:8). Similarly, the St. Brieux site (FdNf 2) is a burial radiocarbon dated at 5,085 +/- 80 BP (S-520) (Morlan et al. 2002:51; Walker 1981:11). An adult male was identified lying face down in a sandy kame on a lacustrine plain near St. Brieux, north of Lenore Lake (Morlan et al. 2002:51). The burial was associated with ochre but no diagnostic artifacts (Morlan et al. 2002:51). It would appear to be an Oxbow interment.

As an aside to the preceding discussion on burials, of considerable interest is the possible association of Oxbow materials with native copper. The Castor Creek site provided evidence that suggested an association between Oxbow and a copper crescent, but an actual association could not be demonstrated. Green (2005:98) provided similar examples of Oxbow materials and native copper items found together in unconvincing contexts in Saskatchewan. Importantly, native copper has been recovered archaeologically from three interments at the Gray site, suggesting contact with the east (Green 2005:99). Recoveries such as these strengthen suggestions that the people of the Oxbow phase had relationships to people in the east, and especially to the Old Copper culture (see Green 2005:98–100).

The Harder site (FbNs 1) is a campsite in the Dunfermline Sand Hills in the parkland west of Saskatoon (Dyck 1977). Dyck (1977) recovered many Oxbow points and preforms in 129.5 m² of excavation. Bison were the primary species represented. A reanalysis of the bison remains at the site suggested that they represent an attritional assemblage, indicating numerous solitary kills and possibly some communal events (Morlan 1994:770). Features recovered included general disposal areas, hearths, and bone spill piles. Dyck (1977:184) argued the bone fragments were evidence of bone breaking for marrow and pulverizing for grease. Despite unearthing four pits with amounts of coarse stone toward the edge, boiling for grease was not clearly demonstrated. Six to eight roughly circular detritus areas were interpreted as large features reflecting social activity, specifically dwelling floors (Dyck 1977). Originally dated to ca. 3,400 BP (Dyck 1977), more recent efforts suggest an age between ca. 4,400 and 4,100 BP is more appropriate (Morlan 1994:760–761). Morlan (1994:760) had noted during his compilation of radiocarbon dates that all the youngest Oxbow dates in Saskatchewan were
obtained prior to instilling the protocol of extraction of soluble collagen to reduce contaminants. Redating of the site produced a more acceptable age.

The Moon Lake site (FaNq 5) is a small, temporary occupation overlooking a former channel of the South Saskatchewan River, southwest of Saskatoon (Dyck 1970). A number of Oxbow points and unnotched points were found within a palaeosol (Dyck 1970; Morlan et al. 2002:40). A number of activities took place at the site, including bison procurement and processing, flintknapping, and possibly the hunting of birds (Dyck 1970:16–17). An interesting feature at the site consisted of a series of post-moulds in a southwest–northeast line extending for 6 ft (~2 m) and ending in a hearth. A radiocarbon date of 4,180 +/- 90 BP (S-403) was obtained.

Carruthers (FbNs 3) is a single-component Oxbow site in the Dunfermline Sand Hills west of Saskatoon (Morlan et al. 2002:50). Two complete and one broken Oxbow point were recovered along with a few faunal remains. A single radiocarbon date of 3,130 +/- 80 BP (S-742) was obtained by combining charred and comminuted bone from nine of the profiles to form a composite sample based on insoluble extraction (Morlan et al. 2002:50). As noted above for the Harder site, the Carruthers sample falls within these early radiocarbon dates that are not reliable.

East Pasture (EcNx 4) is a multicomponent campsite. The third level contains Oxbow material, including a point missing an ear and an ear of a (different) point (Millar et al. 1971:27–29). A radiocarbon date of 4,315 +/- 60 BP (S-637) from Level 3 was recovered from a test pit several metres from the test unit where the more complete Oxbow point was recovered (Morlan et al. 2002:29).

The Amisk site (FbNp 17) is a multicomponent site with Oxbow campsite material in Levels 4 and 5 (Amundson 1986). In Level 4, seven Oxbow points were recovered. Most of the lithics were local, with the exception of chalcedony and welded volcanic tuff. The vast majority of the faunal remains were bison (mni = 4), with smaller amounts of clam and beaver (Amundson 1986:134). A hearth and small amounts of fbr were also recorded. A date of 4,015 +/- 195 BP (S-2336) was obtained. In Level 5, a single Oxbow point fragment was recovered. Lithic use mirrored Level 4 with the addition of obsidian to the exotics. Bison dominated the faunal assemblage (mni = 6), with a wolf-sized animal and clam. A hearth, fbr, and a bone-filled pit were also uncovered at the site, but no reddening was observed in the pit (Amundson 1986:155). The level was dated to 4,120 +/- 190 BP (S-2535) (Amundson 1986:193). The underlying level, Level 6,
may be Oxbow but no diagnostics were recovered and an aberrant radiocarbon was obtained.

Manitoba has also produced a number of Oxbow sites. The Cherry Point site is on the north shore of Oak Lake in southwestern Manitoba. Sym's (1974) survey of a campground formally recorded the site, in which numerous archaeological cultures from Paleoindian to Late Woodland time periods were represented. Subsequent excavation at the site produced, among other things, Oxbow points, which were also known from local collections obtained from the site (Haug 1975).

Buchner (1979) excavated Oxbow material near Caribou Lake in east-central Manitoba. The site consisted of eight Oxbow points in association with broken bifaces (n = 3), scrapers (n = 2), unifacial knives (n = 2), a graver/burin, and charred bone (n = 89) (Buchner 1979:31–32). Nearby is the Whitemouth Falls site (EaLa 1) along the Winnipeg River in southeastern Manitoba. It produced Oxbow material from buried context and a radiocarbon date of 4,625 +/- 150 BP (GX-4416) (Buchner 1979:80–81). This component overlaid a primary flexed interment associated with a bison skull and a shell paint dish (Buchner 1979:80). The Gakushuin lab dates obtained for the interment were rejected (Blakeslee 1994), but it seems reasonable to suggest a possible link between burial and the overlying Oxbow occupation.

The Hacault site (DkLm 1) is an Oxbow occupation site located southeast of Brandon in southwestern Manitoba (Nero 1997). Surface reconnaissance and excavation produced sixty projectile points with as many as twenty-two classifiable as Oxbow. Triangular points and/or preforms were also numerous. A large side-notched point was recovered in several pieces that emulate the smaller Oxbow points (Nero 1997, fig. 3v). Similar specimens have been recovered from the Harder site and Connell Creek site. Two radiocarbon dates of 3,150 +/- 550 BP (BGS-1717) and 2,915 +/- 125 BP (BGS-1953) were obtained for the site (Nero 1997; Morlan n.d.).

Montana has produced a number of dated Oxbow components. The Sun River site (24CA74) is a stratified site with three Oxbow components (Greiser et al. 1985). The site is located on a floodplain of the Sun River just above its confluence with the Missouri River. Cultural Level IV was an Oxbow living floor that produced a date of 3,450 +/- 350 BP (Greiser et al. 1985:855–856). A sand-filled, basin-shaped hearth was associated with the living floor. Lithics were all derived from local sources. Fauna included bison (MNI = 3), rodent, rabbit, fish, and amphibian. Cultural Level V
was an Oxbow occupation dated by three radiocarbon dates to about 4,500 BP (Greiser et al. 1985:860). Most, if not all, of the lithics were obtained from local sources. Fauna included bison (MN1 = 6), pronghorn, wapiti, deer, and bird. Cultural Level V I was an occupation dated by three radiocarbon dates to about 5,200 BP. Seven Oxbow points are associated with a bone-processing area and an excavated hearth. The lithics were all derived from local sources. The fauna included pronghorn (MN1 = 4), bird, deer, rodent, bison, jackrabbit, and wolf. Cultural Level VI was amongst the earliest dated Oxbow levels on the plains. Frison (1991a:88) illustrated some of the Oxbow points from the Sun River site. Although they are not labelled by stratigraphic level, some specimens exhibit the block-eared form but lack the shallow indented base (Frison 1991a:88, fig. 2.48d and e) of the Long Creek points of the Estevan phase, which date to ca. 5,000+ BP. Examining the Sun River site point assemblage in light of its stratigraphy and age might be instructive on Oxbow continuity and change.

The King site (24PH3886) is a multicomponent site on the Fort Belknap Indian Reservation on the eastern margin of the Little Rocky Mountains in north-central Montana (Brumley and Rennie 1999). The site is located in the Bear Gulch drainage. In xu-6 (excavation unit 6) a single occupation consisted of a concentration of bone and lithic debitage in association with three Oxbow points and a preform (Brumley and Rennie 1999:60–61). The fauna produced a minimum of a single bison. A radiocarbon date of 3,590 +/- 80 BP (Beta-60244) was obtained. Brumley and Rennie (2005:16) noted that Oxbow points, although only recovered from a few dated contexts in northern Montana, are “a common occurrence in surface collections…from throughout northern Montana.”

Cree Crossing (24PH3396) is an Oxbow winter campsite adjacent to a ford of the Milk River in north-central Montana (Aaberg et al. 2003). Six Oxbow points and four point fragments were recovered along with five preforms. Other tools recovered included bifaces, end scrapers, side scrapers, flake tools, cores, and hammerstones (Aaberg et al. 2003:66). The faunal assemblage reflects large artiodactyls. An immunological analysis of the tools did confirm sheep and deer residues but also indicated the butchering of rabbit and dog (Aaberg et al. 2003:46–54). Three features were recorded at the site. Two deep features produced the majority of the burned bone along with slight concentrations of FBR. Still, FBR was scattered across the site (Aaberg et al. 2003:43–44). A third shallow feature produced only an organic stain and charcoal flecks. The former produced dates of ca. 3,570
light from ancient campfires • trevor r. peck

BP and 3,410 BP while the latter produced a surprisingly recent date of ca. 2,100 BP (Aaberg et al. 2003:42).

Site 24B1176 is located in the Bears Paw Mountains in north-central Montana (Brumley and Rennie 2005:15). The site is a small campsite with an Oxbow component that was dated to 3,910 +/- 80 BP (Beta-32009) (Brumley and Rennie 2005:15).

In North Dakota, very few Oxbow sites have been reported. Gregg (1986:105–108) noted two surface finds of Oxbow points: the Moe site and the Cinnamon Creek Ridge site. Similarly, South Dakota has produced a few Oxbow points, but not from excavated contexts. Mc Nerney (1970) recovered numerous projectile points during a surface survey along Blue Dog Lake in northeast South Dakota. Of these he identified two Oxbow points from a 35-m stretch of beach labelled site 39DA201 (McNerney 1970:292).

In Nebraska, the Sidney Burial has been proposed as an Oxbow site (Carlson et al. 1999). The burial was located on a low hill along Lodgepole Creek. Two individuals (a young man in a flexed position and very fragmentary remains of an infant) were recovered from what appears to be a burial pit (Carlson et al. 1999:107). A notched biface, five small worked amazonite pendants, a fragmented turtle carapace, several bird bones, other vertebrate remains, and some freshwater shell fragments were also recovered (Carlson et al. 1999:108). The point/notched biface is not Oxbow in form. A radiocarbon date of 3,910 +/- 60 BP (Beta-66571/CAMS-9886) was obtained. The Sidney burial, however, exhibits many common traits to Oxbow burial phenomena, including the locale, the nature of the surroundings, red ochre, points and/or knives, pendants, shell, bird bone, rock clusters marking the burial, and exotic materials (Carlson et al. 1999:116). Still, no diagnostic artifacts were recovered and Oxbow material has rarely, if ever, been found south of the northern part of South Dakota. Even there, Oxbow is only known in surface finds. A stronger explanation of their similarity is that they share a recent common origin. The Oxbow phase derives from the Estevan phase, which may have had its origins in the periphery of the Eastern Woods, perhaps even in Nebraska (see Estevan phase above).

In northwestern Wyoming, the Mummy Cave deposits dating to the Oxbow phase exhibit Oxbow-like points. In Level 28, very square-eared, Oxbow-like points were recovered with corner-notched material dating to ca. 4,600 BP (Husted and Edgar 2002). It is overlaid by Level 30, which contained Oxbow-like points that have their ears “pointing down-shaft” and very elongate McKean points dating to ca. 4,100 BP (Husted and
Edgar 2002). The similarity in form between these materials and the Oxbow materials is no doubt a product of common historical past but their temporal congruity suggests it is not a product of intense cultural contact or the similarity would likely be stronger. Thus, northern Montana would appear to be the southern boundary of the Oxbow phase.

In terms of the fate of the Oxbow phase, Reeves (1969:34) postulated that the Oxbow phase might be ancestral to Besant in the Napikwan tradition. Syms (1970:125–127) placed the Oxbow and McKean phases as mostly contemporaneous on much of the Plains. A number of archaeologists have noted that there are Oxbow and Oxbow-like points in sites within the boreal forest. Moreover, these sites often date relatively late compared to the majority of Oxbow sites. To account for the presence of Oxbow in the boreal forest, Buchner (1981b) proposed the “Anomalous Winter Hypothesis.” Buchner noted the reliance on bison, which is evident in the faunal assemblages of Oxbow sites, and reckoned that the Oxbow people must have had a close relationship with the seasonal movements of this animal. He suggested that as the Hypsithermal period ended, changes in winter weather severity altered the ability of bison to arrive at their wintering grounds. The Oxbow people, already at the bison’s wintering grounds in the parkland, gradually became increasingly more dependent on forest resources (Buchner 1981b:142). Other archaeologists have also noted the presence of Oxbow and/or Oxbow-like points in the parkland and boreal forest (Gibson 1981; Pollock 1981; Spurling and Ball 1981). Some have suggested a movement of people from the plains into the boreal forest (Gibson 1981; Spurling and Ball 1981) while others have suggested that the apparent spread of Oxbow may relate to a technological tradition rather than an archaeological culture or cultures (Pollock 1981). This text suggests the Oxbow phase was displaced off the Northern Plains at ca. 4,100 BP by the McKean complex. A pocket of Oxbow people persisted on the Plains in north-central Montana. This is witnessed in the late-dated sites in southern Alberta and northern Montana such as Tuscany, Stampede, Sun River, King, Cree Crossing, and 24Bl.1176. Perhaps other people of the Oxbow phase were displaced into the northern and eastern parkland periphery as a result of the McKean influx.

**MCKEAN COMPLEX (CA. 4,200 TO 3,500 BP)**

The McKean Lanceolate projectile point was first described by Wheeler (1952) after its recovery in the lower of two levels at the McKean site in northeastern Wyoming. Mulloy (1954) described the assemblage associated
with the McKean Lanceolate points and elaborated on its possible relationship to similar assemblages on the plains. Mulloy (1954:445) recognized that the term McKean Lanceolate addressed only a small part of the projectile point assemblage recovered from the McKean level at the site. Subsequently, Wheeler (1954) elaborated upon his typology, confirming that McKean Lanceolate referred to basally notched lanceolate points. He added the term Duncan to refer to stemmed McKean points that had, thus far, been labelled McKean Stemmed, to avoid confusion with McKean Lanceolate. The Duncan point is characterized by a straight converging or bilaterally convex blade, insloping and non-barbed shoulders, straight parallel-sided stem, and a notched base (Wheeler 1954:7–8). As well, he used the term Hanna, instead of the previous suggestion of Perry, for points with straight converging and incurring blades, straight or sloping and slightly barbed shoulders, an expanding stem, and a shallow notch on the base (Wheeler 1954:8–9). Similar points and assemblages were noted at Pictograph Cave, Signal Butte, Ash Hollow, Dead Man Cave, Promontory Caves, Black Rock Cave, Billings Bison Trap, and Birdshead Cave (Mulloy 1954:453–454).

On the Northern Plains, McKean sites are not particularly common, leading to relatively little literature on the subject (Webster 2004). Initially, Wormington and Forbis (1965:191) dated the McKean occupation in Alberta to between ca. 4,500 and 3,300 BP based on work at the type site, among others. They contended that a subsistence based on bison was present, rather than foraging, despite acknowledging that the McKean material may represent a migration of people (Wormington and Forbis 1965:190–192). Reeves (1969:33) suggested a similar date for the McKean phase (4,500–3,500 BP) signified by McKean points, and acknowledged a Hanna phase (3,500–3,000 BP) signified by Hanna points. Like Wormington and Forbis (1965:190–192), he noted that these point styles quite often co-occurred in sites. Syms (1970:125), working in Manitoba, noted an increasing degree of “stemness” through time from McKean, with no stem, to Duncan and Hanna, with substantial stemness. He argued the typological boundary between McKean and Duncan, as well as Duncan and Hanna, was arbitrary based on the measure of stemness (Syms 1970:125). Most recently, Webster (2004:106–122) examined stratified and radiocarbon dated McKean/Duncan/Hanna sites to suggest McKean sites predate Duncan/Hanna material. His review produced evidence that McKean sites date mainly from 4,400 to 3,900 BP on the Canadian Plains, while Duncan and Hanna sites largely postdate this time period. Co-occurrence of
the points could not be entirely ruled out, however, and he suggested that the three points be conceived as a “series” (Webster 2004:121).

Perhaps the most influential McKean site in the development of an understanding of the McKean complex on the Northern Plains has been the Cactus Flower site (EbOp 16). Brumley (1975) excavated this well-stratified site, which is located on the Canadian Forces Base Suffield, north of Medicine Hat. Ten occupation floors were recognized. The oldest occupation, x, did not contain diagnostic material. A single McKean point was recovered in the overlying occupation, ix. The next occupation, viii, produced two McKean points, five Duncan points, and two Hanna points. Occupation floors vii to iii each produced at least one Duncan or one Hanna point, and a single McKean point was recovered in occupation vi. Two flake points occurred in Occupation ii while two Pelican Lake points were recovered in Occupation i (Brumley 1975). Features at the site included hearths, ash concentrations, and earth pits (Brumley 1975:19). Cobble-lined hearths are common in McKean sites to the south but were not observed at the Cactus Flower site. Similarly, grinding slabs often recovered at McKean sites in southern Montana and Wyoming were not recovered. The Cactus Flower site was interpreted as a campsite positioned for ambushing prey at a river crossing used by bison (Brumley 1975, 1978).

Numerous perspectives have been expressed regarding the origin of McKean material. Mulloy’s (1954:440) impression of the materials from the McKean site lead him to make comparisons with historically known people in the Great Basin living in small groups and subsisting on wild vegetable products and small game. In the 1950s and 60s, years of cave site excavations on the Plains periphery had produced long cultural sequences while open sites dating to the Middle Prehistoric period on the Plains proper were rare. This fuelled the debate concerning the abandonment of the Plains during the Middle Prehistoric period Hypsithermal interval, supporting proposals of a McKean migration in response to climate amelioration (see Reeves 1973:1221–1222 for a summary; Webster 2004:82). Importantly, a Great Basin origin has been soundly rejected, based on technological comparisons and increasing similarities to materials in the foothills and mountains of the northwestern United States (Green 1975, cited in Webster 2004:83). Husted (1969) rejected a Great Basin origin for McKean, suggesting a mountain origin within the Western macrotradition in Idaho, Oregon, and Wyoming with continuity back to the Agate Basin complex. Black (1991) argued that there is little evidence to
relate mountain-adapted people back to the Agate Basin complex, given the widespread Mountain tradition.

In Canada, Syms (1970:131) followed prominent American researchers (e.g., Husted) in suggesting that the McKean complex represented people that moved down from the foothills of the Rockies as the Hypsithermal developed. He used radiocarbon dates to illustrate that the earliest McKean sites were generally located around the Big Horn Basin of northwestern Wyoming (Syms 1970:131). Reeves (1969) initially presented three possible scenarios for McKean origins: (1) McKean might have had antecedents in the Oxbow phase, (2) McKean might represent an intrusive population from the mountains, or (3) McKean might be an indigenous culture that became highly enculturated by its neighbours. Subsequently, Reeves (1973) suggested that an Oxbow/McKean complex exhibited both point types, followed by a McKean complex featuring only McKean points; the origin of McKean, however, is not overtly stated. Reeves later classified the cultural historical sequence as Oxbow/Late Mummy Cave followed by McKean as the two distinctive cultural traditions in the Early Middle Prehistoric (i.e., 2,800–1,000 B.C.) (Reeves 1990:180).

Keyser and Davis (1984) suggested that McKean materials might represent the diffusion of a techno-complex through existing populations. Similarly, Tratebas (1998) also argued for diffusion based on analyses indicating long-term cultural continuity in the Black Hills. Ramsay (1993:337–348) updated Syms’ site chrono-distribution data, which increased the age of some of the outlying areas but maintained the earliest dates in the Bighorn Basin and surrounding areas.

Despite the various lines of argument, migration models appear to be a prominent theoretical position among many Canadian researchers (Brumley 1975; Pettipas 1996a; Ramsay 1993; Reeves 1983a; Syms 1970). Webster (2004:89–105) recently summarized archaeological knowledge concerning McKean migration. Importantly, he states confidently that Canadian McKean material is the same, more or less, as American McKean material (Webster 2004:91). He did point out, however, that Canadian McKean points tend to be shorter and wider than their American counterparts (Webster 2004:91). Webster (2004:91–92) suggested that the best evidence for cultural continuity between northern and southern McKean can be found in human interments including the McKean site (Haspel and Wedel 1985; Mulloy 1954), the Dead Indian Creek site (Gill 1984), the Crown site (Walker 1986), the Graham site (Walker 1984a), and possibly...
two interments from the Gray site (Millar 1978). With the exception of the Graham cremation and the two possible McKean interments at the Gray site, all the burials were shallow pits in primary living floors that generally lacked grave goods, and were not associated with red ochre (Webster 2004:93). This practice is in stark contrast to the Oxbow phase, in which there are isolated interments away from campsites (or interments in the Gray site), consistent use of red ochre, and a tendency towards primary extended burials (Webster 2004:94). Webster (2004:95–99) used a revised version of Sym’s chronodistribution of McKean data to, once again, determine that the oldest sites occur in the headwaters of the Yellowstone River and the mountains of the Bighorn Basin. He suggested an origin of ca. 4,900 BP with expansion to the Black Hills by 4,700–4,500 BP (Webster 2004:96). By ca. 4,400 BP, McKean was in southern Saskatchewan and by ca. 4,200 BP in southern Alberta. The impetus for a migration is likely multicausal and will be difficult to determine. It is possible McKean developed at the end of the Hypsithermal in the Bighorn Basin area and expanded when conditions were favourable (Webster 2004:100). Linked to this may be population increases and the need to exploit new land.

The Sites

The following presents well-dated sites with diagnostic materials that can be considered part of the McKean complex (i.e., McKean/Duncan/Hanna). As Webster (2004) suggested, McKean Lanceolate points are the earliest McKean point, followed by Duncan and Hanna points. It has not been unequivocally determined if McKean precedes both Duncan and Hanna or whether the McKean-Duncan-Hanna series of points co-occur in McKean sites. Webster (2004) suggested leaving the projectile points as a series of temporally overlapping styles until more data is accumulated (see Plate 17 and Figure 18).

Cactus Flower (EbOp 16). The Cactus Flower site is a multicomponent campsite located above the South Saskatchewan River within the boundaries of the Canadian Forces Base Suffield. The site was named for the cactuses that were flowering when the site was excavated (John Brumley, personal communication 2007). Ten occupations were defined. The site was found in 1969 by Archie Stalker of the Geological Survey of Canada, but excavation did not take place until 1974. Brumley (1975, 1978) excavated six areas at the site, totalling 364 m² as part of a program to minimize the impact of the military presence on the base.
As noted, Occupation x, the earliest occupation, did not produce a diagnostically diagnostic point. It did contain one retouched flake, one core, a hammerstone, and three heavy chipped tools. Faunal remains indicated a single bison was present. A hearth and a possible earth pit were also recorded. The occupation was radiocarbon dated to ca. 3,700 BP (see Table 16), a date out of sequence with dates in the other occupations, so was rejected.

Occupation ix produced a McKean Lanceolate point, bifaces (n = 14), retouched flakes (n = 32), end scrapers (n = 5), a graver, pebble cores (n = 8), heavy chipped tools (n = 4), hammerstones (n = 5), a shell bead, and shell fragments. The fauna included a minimum of six bison, an antelope, a cottontail rabbit, and a freshwater clam. Two basin hearths were also recorded. A radiocarbon date of ca. 2,100 BP was considered to be in error (Brumley 1975).

Occupation viii produced two McKean Lanceolate, five Duncan, two Hanna and four fragmentary points. Other lithics recovered include bifaces (n = 34), marginally retouched tools (n = 54), end scrapers (n = 9), spokeshaves (n = 2), a tit graver, pebble cores (n = 35), heavy chipped tools (n = 14), hammerstones (n = 2), and anvil stones (n = 2). Part of a ground-stone pipe and
Figure 18
McKean sites within Alberta
an ammonite septum were also recovered. Bone tools include three awls, two beads, and other polished fragments. Fauna recovered from the site include a minimum of twenty bison, an antelope, three dogs, a kit fox, a cottontail rabbit, a jackrabbit, a bird, and a fish. A total of four basin hearths, an earthen pit, and a circular distribution of material interpreted as a former structure were also recorded. Two radiocarbon dates were obtained: ca. 4130 BP and 4220 BP (Table 16).

<table>
<thead>
<tr>
<th>Site [LAB no.]</th>
<th>Conventional ¹⁴C Age</th>
<th>¹³C/¹²C Ratio</th>
<th>Material</th>
<th>Calibration</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>EbOp 16, LIII [S-1210]</td>
<td>4220 +/- 130</td>
<td>-25.0%o</td>
<td>charcoal</td>
<td>3350–2450 B.C. (p = 0.954)</td>
<td>Brumley 1975; Morlan n.d.</td>
</tr>
<tr>
<td>EbOp 16, LIII [S-782]</td>
<td>4130 +/- 85</td>
<td>-25.0%o</td>
<td>charcoal</td>
<td>2900–2480 B.C. (p = 0.954)</td>
<td>Brumley 1975; Morlan n.d.</td>
</tr>
<tr>
<td>DiPl 1 [GX-1460]</td>
<td>3890 +/- 215</td>
<td>-10.0%o</td>
<td>apatite</td>
<td>3000–1700 B.C. (p = 0.954)</td>
<td>Brumley 1975; Morlan n.d.</td>
</tr>
<tr>
<td>EaPk 201 [S-3984]</td>
<td>3720 +/- 260</td>
<td>?</td>
<td>collagen</td>
<td>2900–1500 B.C. (p = 0.954)</td>
<td>Brumley 1975; Morlan n.d.</td>
</tr>
<tr>
<td>EbOp 16, L X [S-821]</td>
<td>3725 +/- 95</td>
<td>-25.0%o</td>
<td>charcoal</td>
<td>rejected</td>
<td>Brumley 1975; Morlan n.d.</td>
</tr>
<tr>
<td>EbOp 16, L VI [S-823]</td>
<td>3615 +/- 95</td>
<td>-25.0%o</td>
<td>charcoal</td>
<td>2300–1650 B.C. (p = 0.954)</td>
<td>Brumley 1975; Morlan n.d.</td>
</tr>
<tr>
<td>EbOp 16, L IV [S-784]</td>
<td>3705 +/- 80</td>
<td>-20.0%o</td>
<td>collagen</td>
<td>2400–1850 B.C. (p = 0.954)</td>
<td>Brumley 1975; Morlan n.d.</td>
</tr>
<tr>
<td>EbOp 16, L IV [S-822]</td>
<td>3620 +/- 95</td>
<td>-25.0%o</td>
<td>charcoal</td>
<td>2300–1650 B.C. (p = 0.954)</td>
<td>Brumley 1975; Morlan n.d.</td>
</tr>
<tr>
<td>EbOp 16, L III [S-1013]</td>
<td>3930 +/- 110</td>
<td>-25.0%o</td>
<td>charcoal</td>
<td>2900–2050 B.C. (p = 0.954)</td>
<td>Brumley 1975; Morlan n.d.</td>
</tr>
<tr>
<td>DjPm 36 [AECV-1995C]</td>
<td>3670 +/- 130</td>
<td>-18.3%o</td>
<td>collagen</td>
<td>2500–1700 B.C. (p = 0.954)</td>
<td>Van Dyke 1994:128</td>
</tr>
<tr>
<td>EgPn 430, Area 2 [BETA-126647]</td>
<td>3580 +/- 70</td>
<td>-20.0%o</td>
<td>collagen</td>
<td>2140–1740 B.C. (p = 0.954)</td>
<td>Vivian et al. 2005, Vol. 1:6</td>
</tr>
<tr>
<td>EhPv 58 [S-2778]</td>
<td>3560 +/- 135</td>
<td>?</td>
<td>charcoal</td>
<td>2300–1500 B.C. (p = 0.954)</td>
<td>Fedje 1986:52</td>
</tr>
<tr>
<td>EhPv 58 [S-2754]</td>
<td>2540 +/- 120</td>
<td>?</td>
<td>bone</td>
<td>rejected</td>
<td>Fedje 1986:52, 54</td>
</tr>
<tr>
<td>EhPo 55 [AECV-13554C]</td>
<td>3540 +/- 60</td>
<td>-18.9%o</td>
<td>collagen</td>
<td>2040–1730 B.C. (p = 0.941); 1720–1690 B.C. (p = 0.013)</td>
<td>Van Dyke 1993</td>
</tr>
</tbody>
</table>
Occupation VII produced two Duncan points, bifaces \((n = 12)\), marginally retouched flakes \((n = 18)\), end scrapers \((n = 4)\), a graver, pebble cores \((n = 6)\), and heavy chipped tools \((n = 8)\). Bone tools include a blunt end tool. The fauna included a minimum of three bison, a cottontail rabbit, two birds, and a freshwater clam. Features were numerous, including four basin hearths, three surface hearths, and five ash concentrations, and an earth pit. Occupation VII was not dated.

Occupation VI contained one Duncan, three Hanna, and three fragmentary points. Other lithics include bifaces \((n = 6)\), marginally retouched tools \((n = 25)\), end scrapers \((n = 5)\), pebble cores \((n = 4)\), heavy chipped tools \((n = 23)\), and an anvil. A ground-stone disk was also recovered. Bone tools include four awls, two blunt end tools, and antler tine fragments. A shell disk was also recovered. Fauna included a minimum of four bison, three antelope, a mule deer, a dog, and a freshwater clam. Features recorded included two basin hearths and two surface hearths. Two radiocarbon dates were obtained for this level: ca. 3,600 BP and 3,900 BP.

Occupation V contained a Duncan point along with a biface, marginally retouched tools \((n = 6)\), end scrapers \((n = 4)\), and heavy chipped tools \((n = 2)\). A circular, polished stone and a bone awl were also recovered. A minimum of one bison and one bird were represented in the faunal assemblage. A single surface hearth was recorded in this occupation. No radiocarbon dates were obtained for this level.

Occupation IV produced one McKean Lanceolate, one Duncan, two Hanna, and two fragmentary points. Other lithics include bifaces \((n = 6)\), marginally retouched flakes \((n = 37)\), end scrapers \((n = 7)\), spokeshaves \((n = 2)\),...
pebble cores (n = 5), and heavy chipped tools (n = 12). Bone tools include four awls and a bone bead. A shell bead was also recovered. The faunal assemblage suggests a minimum of two bison, an antelope, a dog, and a freshwater clam at the site. Two radiocarbon dates were obtained for this occupation, both of which date to approximately ca. 3,600 BP.

Occupation 111 contained one Duncan point, two Hanna points, and one fragmentary point. The lithic assemblage also included a marginally retouched flake and four heavy chipped tools. A minimum of one bison was recovered. The features recorded included a basin hearth, eight earth pits, and five surface hearths. A radiocarbon date of ca. 3,900 BP was obtained for the occupation. This date is out of sequence with the other occupations so was rejected.

Brumley (1975, 1978) considered the Cactus Flower site to be a campsite that was repeatedly used over time by a series of single families or a small number of family groups. Brumley argued that the site is well-situated for ambushing animals that water themselves along the South Saskatchewan River. The area is ideal for ambushes owing to the steep banks, which offer few access points. Brumley (1975, 1978) argued the stratified deposits represent a sequence documenting the cultural changes from the McKean complex to the Pelican Lake phase (part of Reeves’ Tunaxa tradition), with the abandonment of the site during the later Pelican Lake phase, illustrating the move to communal kills and away from ambush kills (Brumley 1978).

Pass Creek Cabin (DgPl 1). The Pass Creek Cabin site is a kill site and campsite located on the south side of the Pass Creek Valley entrance north of the Waterton town site in Waterton Lakes National Park (Reeves 1972:41). The site consists of “a series of closely, vertically superimposed living floors which vary horizontally” (Reeves 1972:55). The lowest occupation, 1A, produced a Lusk point, 1B produced Bitterroot and Salmon River points, 1C produced McKean Lanceolate points, and the level above 1C, which was considered disturbed, produced Late Side-notched material. The site was excavated in 1968 and 1969 as part of a systematic study and inventory of archaeological materials for the National Parks Service.

Four McKean Lanceolate points were recovered from Level 1C in association with a surface hearth, a stone platform hearth, and a possible cairn (Reeves 1972:56–57). Side-notched points were recovered within this level but were considered intrusive from overlying levels because of rodent disturbance (Reeves 1972:55). Few pieces of FBR were recorded in the closely
spaced McKean complex floors. A radiocarbon date of ca. 3,890 BP was obtained for the material (Reeves 1972:56).

**EaPk 201.** EaPk 201 is a multicomponent site on a large flood plain terrace on the east bank of Willow Creek a few kilometres upstream from its confluence with Pine Creek (Hjermstad 1998:76). The site consisted of three components that were investigated mainly using three excavation blocks: west, central, and east. A total of 122 m² was excavated at the site to mitigate the construction of a dam.

The west block (25 m²) produced a possible Hanna point in the second-lowest cultural unit (cu-2) and a classic Hanna point in the underlying level, cu-3 (Hjermstad 1998:88). cu-2 also contained two features: a basin hearth and a cobbled platform associated with one t-butt drill and two end scrapers. A total of 173 pieces of debitage was recovered with most being secondary flakes. Quartz (40%), chert (27%), and quartzite (15%) dominated the assemblage (Hjermstad 1998:104). Four pieces of obsidian were recovered from the level and were sourced to the Bear Gulch quarry in the Centennial Mountains of eastern Idaho. FBR (n = 171) was small in size. The faunal assemblage (n = 2,300+) was relatively large. A minimum of nine bison was inferred from this sample. As well, six canid bones and the bones of a large bird were recovered. A radiometric date of ca. 3,700 BP was obtained for the occupation (Hjermstad 1998:99). The level was interpreted as a secondary butchering locale.

In cu-3, in addition to the classic Hanna point recovered, lithic tools included two end scrapers and a utilized flake. Thirty-five lithics were recovered, most of which were quartzite (51%). Quartz (13%), siltstone (8%), petrified wood (8%), shale (3%), chert (10%), obsidian (5%), and chalcedony (3%) were also present. The faunal assemblage (n = 445) produced a minimum of six bison (Hjermstad 1998:118). Deer, dog, and wolf were also present. FBR (n = 47) were small in size (Hjermstad 1998:118). A radiometric date of 3,860 BP was obtained for the occupation (Hjermstad 1998:116). The occupation was interpreted as an early-winter campsites and bison processing area. The other block excavations failed to produce diagnostics or even large assemblages.

**DjPm 36, Snyder Farm Locality, Component 2.** DjPm 36, Snyder Farm Locality, is discussed in the section on the Gowen complex. The lowest level at the site provided evidence of Gowen side-notched material that
was overlain by a sparse Hanna occupation. This occupation, in turn, was overlain by a Pelican Lake occupation. Most of the Hanna material was recovered within a single block between 100 and 120 cm bs.

A single Hanna projectile point was recovered. Other lithic tools included cores (n = 2), a biface, an elongate pebble, and retouched flakes (n = 3) (Van Dyke 1994:128), as well as pieces of debitage (n = 10) and FBR (n = 93). The faunal assemblage (n = 45) was fragmentary. No features were recorded. A radiometric date of ca. 3,670 BP was obtained for the overlying level in a nearby block providing a terminus ante quem (Van Dyke 1994:128).

EgPn 430, Area Two. EgPn 430 is large multicomponent bison kill/processing campsite on the northwest slope of the West Paskapoo Escarpment in west Calgary (Vivian et al. 2005, vol. 1:1). Six areas were defined for this site. The main occupation was associated with the McKean complex (Vivian et al. 2005, vol. 1:4). Some mixing of subsequent occupations occurred, with items being sorted by mass and weight (Vivian et al. 2005, vol.1:5–6). In Area 2, a total of 27 m² in a block excavation and thirteen 1-x-1-m scatter units were excavated prior to the development of a subdivision at the site (Vivian et al. 2005, vol. 1:2).

Twelve McKean Lanceolate and two Hanna points or point fragments were recovered along with two Late Side-notched points, three Pelican Lake points, and four non-diagnostic points associated with the processing area (Vivian et al. 2005, vol. 1:6–15). Numerous other tools were recovered in the processing area, including bifaces, end scrapers, wedges, retouched flakes, utilized flakes, cores, a drill, a graver, and a chopper (Vivian et al. 2005:15–24). Bone tools recovered included a bone hammer and three bone awls (Vivian et al. 2005, vol. 1:24–25). Four fossilized shell fragments were also recovered (Vivian et al. 2005, vol. 1:25). Lastly, a kaolin pipe stem fragment from the Proto-historic period was also recovered (Vivian 2005:25). The lithic suite was considered comparable to the Austech site (see below) but possible mixing makes this comparison problematic (Vivian et al. 2005, vol. 1:26).

The faunal assemblage included mainly bison (MN1 = 14), with wolf, fox, wapiti, rabbit, and bivalves (Vivian et al. 2005, vol. 1:30). Two fetal bones likely representing one fetal animal and a mandible of a two- to three-month-old calf were recovered, suggesting a spring kill (Vivian et al. 2005, vol. 1:33–34). No discrete features were observed, and FBR was scattered across the site (Vivian et al. 2005:45). A radiocarbon date of ca. 3,580 BP
supports a McKean affiliation for at least some of the bone in the site. The researchers argued that the site is a McKean processing area with other materials incidentally mixed into it. They suggested the site shows many similarities to the Austech site (see below). Both are considered to be processing sites without features, both sites produced primarily McKean points, and their dates are McKean complex in age (Vivian et al. 2005, vol. 1:46–47).

Second Lake (EhPv 58, 162R). The Second Lake site is a multicomponent campsite within Banff National Park. It consists of nine separate occupations on an alluvial fan on the northwestern edge of Second Lake (Fedje 1986:48). In 1985, a total of 19 m² was excavated at the site (Fedje 1986:48). An overlying roadway protects the deposits. In Occupation 6, two Hanna-like points were recovered along with 650 pieces of lithic debitage and a faunal assemblage including bison, deer, and beaver (Fedje 1986:54). Two dates were obtained for this level: ca. 3,560 BP and 2,450 BP. The later date was rejected as intrusive (Fedje 1986:54).

Austech (EhPo 55). The Austech site is a butchering area at the base of the fourth and highest terrace along the Bow River, near its confluence with Jumpingpound Creek (Van Dyke 1993). The site was discovered in 1982 although mitigative excavations did not take place until 1993. A North block (10 m²) and a South block (32 m²) were excavated (Van Dyke 1993:38–40). In both blocks, cultural material occurred in the plough zone, at 30–60 cm bs and at 100 cm bs. The layer of interest occurred between 30 and 60 cm bs.

The south block contained one McKean and one Hanna point in association with a discrete horizon of bone (Van Dyke 1993). The lithic assemblage also included a marginally retouched flake and four heavy chipped tools. Debitage (n = 189) most commonly recovered was siltstone, miscellaneous chert, and quartzite.

The faunal assemblage had an MN1 of twelve bison, as well as a neonatal bone and a fetal bone (Van Dyke 1993:52–53). A few fragments were burned or calcine and many exhibited impact marks (n = 26) and cut marks (n = 3). The low incidence of axial elements, other than ribs, suggested the main focus of activity was butchering and processing of animals killed nearby (Van Dyke 1993:61). No features were observed although FRB, both spalled and water-fractured, were generally clustered in the east-central area of the excavation (Van Dyke 1993:53).
The North block produced five tools and twenty-two pieces of debitage. The tools included an unclassifiable point base, a core, a chopper, a retouched tool and a retouched flake (Van Dyke 1993:46). The faunal assemblage produced an MNI of three bison. FBR, spalled and water fractured, was common in the southeast part of the block (Van Dyke 1993:47). Two radiocarbon dates were obtained from the South block: ca. 3,540 BP and 3,400 BP (Table 16). These dates, taken with the context of the excavated material, were interpreted as a single event: a McKean butchering site where bison were dispatched in late winter/early spring about 3,500 years ago (Van Dyke 1993:62).

EgPn 467. EgPn 467 is a multicomponent campsite located in hummocky terrain above the Bow River southwest of the Bearspaw Reservoir, just west of Calgary (Hanna and Head 2000). The site consisted of an upper and lower component, both of which were attributed to the McKean complex based on the presence of Hanna points. A total of 50 m² was excavated as part of a mitigative program for a subdivision.

The Lower Component produced a single Hanna base (Hanna and Head 2000:181). Other lithic materials recovered include a biface, a side scraper, four retouched flakes, a utilized flake, a core, and two hammerstones. Debitage consisted of flakes (n = 37), flake fragments (n = 18), and shatter (n = 21) (Hanna and Head 2000:181). Most of the raw materials were quartzite (56.7%) or chert (23.3%), but obsidian (3.3%), chalcedony (6.6%), and quartz (11.1%) were also found. The faunal assemblage (n = 683) was highly fragmented with only seventy-three pieces assigned as bison. Neither seasonality nor herd composition could be determined. FBR (n = 857) was considered relatively rare at the site; it was largely crenulated not spalled. A radiometric date was not available for this component. The site was interpreted as a late-winter base camp that had been repeatedly occupied (Hanna and Head 2000:199).

The Upper Component produced seven Hanna points, a Duncan point, a possible McKean Lanceolate point, an Oxbow point and a point tip (Hanna and Head 2000:154). Other lithics included bifaces, scrapers (n = 4), flake tools (n = 19), cores (n = 4), and hammer stones (n = 3). Debitage (n = 239) was also common. Raw materials were dominated by chert (44.9%), quartzite (32.6%), chalcedony (9.1%), and siltstone (7.6%), with some obsidian (2.9%), basalt (2.5%), and petrified wood (0.4%) (Hanna and Head 2000:155). The faunal assemblage (n = 1,499) was highly fragmented. Only 235 bison bones.
were identifiable to species. This included two neonatal pelvis fragments, suggesting a late winter/early spring occupation. FBR \( n = 3,437 \) was relatively common. Small crenulated specimens were dominant, with few spalled pieces suggesting repeated use in stone boiling. A radiometric date of ca. 3,330 BP was obtained (Table 16). Like the Lower Component, this occupation was interpreted as a late-winter base camp. The site is considered to represent serial occupations over relatively long periods of time by what appears to be a single cultural group (Hanna and Head 2000:155).

**Hitching Post Ranch (EiPo 51).** The Hitching Post Ranch site is a bison assemblage near Bottrel in the foothills northwest of Calgary (Wilson 1983:110). In 1980, the site was discovered on the Hitching Post Ranch (the site’s namesake) during backhoe excavations at a spring (Wilson 1983:100).

The faunal assemblage was very diverse. Bones from eleven species were present, including a goose-sized bird, a medium-sized duck, a large sandpiper, snowshoe hare, a mouse-sized rodent, ground squirrel, wolf or wolf-like dog, white-tailed deer, wapiti, moose, and a large number of bison. An estimated 130 bison were recovered. The large number of young and adult male animals in the age distribution suggested a catastrophic die-off rather than selective hunting and processing. This interpretation was supported by the lack of mid-shaft breakages and cut marks, and high frequencies of tooth scoring from scavengers (Wilson 1983).

Cultural material was also recovered. One complete and two fragmentary Hanna points were recovered in apparent association with the bone bed (Wilson 1983:127). Also recovered were five flakes, an antler hammer, an antler punch, an antler wedge, and a *Dentalium* bead. The flakes did not exhibit retouch or use wear. Except for the points, this is not an assemblage useful for bison procurement or processing (Wilson 1983:128). Wilson (1983:128) speculated that the association of the tools with the catastrophic die-off may have resulted from scavenging of animal carcasses after a prairie fire. A single radiocarbon date of ca. 3,680 BP was obtained (Table 16) (Wilson 1983:104).

**Boy Chief (EcOV 68), Block 4, Occupation 3.** The Boy Chief site is described in the section on the Estevan phase. Block 4, Occupation 3 is the dated McKean component. It produced two Hanna points and an unidentifiable point associated with a small surface hearth (Head et al. 2003:135–142). Other tools in the assemblage include two edge modified
flakes, an end scraper, and a bipolar core (Head et al. 2003:138–140). The lithic assemblage is dominated by quartzite and miscellaneous chert (Head et al. 2003:139).

The faunal assemblage was suggestive of a small secondary processing camp focusing on the forelimbs (Head et al. 2003:137). A total of 525 bone fragments was recovered. A minimum number of two bison is represented in the sample. Neither fetal bones nor elements for differentiating sex were recovered (Head et al. 2003:137). There was a concentration of unidentifiable limb elements and bone fragments in the southeast corner of the excavation. Three bone fragments have ochre on them, while a few (n = 45) were charred. The FBR assemblage (n = 161) was widely scattered. Angular fractures suggested stone boiling (Head et al. 2003:138). FBR appeared to be clustered to the north and west of the hearth (Head et al. 2003:141). Artifacts were distributed in a semicircular fashion around the hearth potentially outline a structure (Head et al. 2003:141). Two radiocarbon dates were obtained: ca. 3,400 BP and 3,360 BP (Table 16). The dates yield an average age of 3,376 +/- 55 BP and support a Hanna-age cultural affiliation (Head et al. 2003:141).

EhPm 113. EhPm 113 is a multicomponent kill/processing site located on a small upper valley bench above Beddington Creek in north-central Calgary (Malasiuk 2007:6). A total of 4 m² was excavated in two blocks of 1 x 2 m units. Three cultural horizons were established based on the sediments and their cultural contents. The upper horizon, Horizon 1, did not produce diagnostic material. Horizon 2 produced the base of a Hanna point. The bottom horizon, Horizon 3, produced a complete Hanna point.

Horizon 2 correlates with the palaeosol that produced the base of an atypical Hanna point (Malasiuk 2007:53). The point has a relatively straight stem, pointed basal corners, and less defined shoulders than other Hanna points. A radiocarbon date of 2,880 BP was obtained (Table 16). Horizon 3 produced another complete Hanna point, exhibiting the slightly unusual style mentioned above (Malasiuk 2007:55). The late date for a Hanna occupation, the unusual point morphology, the lack of clear stratigraphy, and an expressed concern for disturbance by rodents indicate that EhPm 113 needs to be studied further.

Other sites. Surface finds of projectile points from this time period are fairly common south of the North Saskatchewan River in Alberta (Wormington
and Forbis 1965:188). Two sites with points exhibiting deeply notched bases are FeOs 37 on the Canadian Forces Base Wainwright and EhPm 67 in Barn Coulee in north Calgary (Vivian and Reeves 2002:16–17, 84; McCullough and Landals 1995:133). The deep basal concavity may reflect an earlier form of McKean point than the less-indented form that is much more common. EfPm 266 is a buried partial stone circle associated with hearths and a basal portion of a stemmed point (Vivian 2006a). A date of ca. 3,600 BP was established for the occupation. This is amongst the oldest dated stone circles in Alberta.

Two sites that produced good McKean assemblages but lack radiometric dating and/or exhibit some mixing are DjPm 228 and EgPn 506. DjPm 228 is a multicomponent site on a relict landform near Horseshoe Canyon in the Oldman River Dam area (Van Dyke 1994:259–264). Four areas, based on the level of testing and excavation, were assigned to the site. In Block B, from 30 to 40 cm bs, a Hanna point, end scrapers (n = 2), a core, retouched flakes (n = 3), debitage (n = 40), and two bone fragments were recovered in 6 m² (Van Dyke 1994:262). Immediately overlying this occupation is a Bracken occupation with two radiocarbon dates of ca. 2,500 BP. EgPn 506 is a multicomponent processing site on a high bench on the Paskapoo Slopes, about 12 m below the escarpment in west Calgary (Vivian et al. 2003a). A McKean occupation represented by twenty-one complete or broken Hanna points, as well as Avonlea and Old Women’s occupations, was present at the site (Vivian et al. 2003a:89). The cultural complexes, however, were not stratigraphically discrete (Vivian et al. 2003a:89). There were many features at the site, especially along the terrace edge. The features may be grouped in associated clusters of stone-boiling pits, hearths, and dump piles; the lack of stratigraphic control makes temporal interpretations difficult. Overall, the site appears to be a series of mid-winter to early spring campsites that focused on domestic activity (Vivian et al. 2003a).

Another possible McKean site is located in west-central Alberta is FfQh 32 (Kulle and Neal 1998:36). The site is an artifact scatter on a mid-level terrace above the McLeod River. A total of 8 m² produced a McKean Lanceolate point, two bifaces, seven expedient tools, and 385 pieces of debitage. Most of the raw materials were silicified siltstone or quartzite (Kulle and Neal 1998:41–42). A scatter of FBR was also noted with some calcine bone. The site was interpreted as a small campsite centred on a hearth (Kulle and Neal 1998:50). The site was not radiometrically dated.
McKean: Migrants from the Big Horn Basin/Black Hills Area

The McKean complex in Alberta dates roughly between 4,200 and 3,500 BP. In general, McKean Lanceolate points occur during the earliest part of this period, followed by Duncan points occurring over the middle of the period, and Hanna points occurring over the last part of the period. Thus, it is possible to get sites with only a single McKean diagnostic or all three diagnostics. Importantly, McKean Lanceolate points and Duncan points generally conform to Wheeler’s (1954) defined types. The earliest McKean points may have deep basal concavities and be slightly more lanceolate compared to later specimens. Similarly, Hanna points tend to become atypical toward the end of the McKean complex. Specimens at the Hitching Post Ranch site and EhPm 113 exhibit fairly straight and parallel stems with very slightly indented basal edges. Also, the two specimens from the Boy Chief site Occupation 3, Level 4, are almost corner-notched, appearing to be transitional between Hanna and Pelican Lake forms.

In terms of stone tools, McKean tool kits emphasize end scrapers over the nearly absent side scrapers. Utilized flakes and retouched flakes are common. Lithic raw materials are mainly locally procured; very few exotics have been recovered in these sites. Bone and antler tools appear to be more common in the McKean complex than earlier archaeological cultures. Interestingly, shell beads occur frequently in McKean sites. As well, the oldest known stone pipe in Alberta dates to this time period. It is tubular in form and was recovered at the Cactus Flower site.

Subsistence during the McKean complex in Alberta is diverse but still focused on bison. The main strategy for procuring bison appears to be stalking of solitary animals or perhaps ambushing prey at watering holes. Thus, bison are the most common animal recovered in McKean sites. However, bison are only being taken in small numbers. Other animals recovered include antelope, wolf, dog, kit fox, cottontail rabbit, jack rabbit, birds, and fish.

Many features are known from this period. Hearths are common with both surface and basin hearths being present. Earth pits were reported but mostly only from the Cactus Flower site. Ash concentrations and plenty of FBR suggest stone boiling operations were conducted. The cobble platform at EaPk 1 is unique for the McKean complex; it is associated with a basin hearth and may represent a roasting platform. As well, at the Cactus Flower site a circular distribution of debris was noted around a small hearth. This was interpreted as reflecting material kept inside a shelter. Similar circular debris distributions have been noted during the Oxbow phase and these
seem likely to be indicative of shelters. Whether these interesting distributions of materials reflect locations of actual tipis or other kinds of shelters is difficult to assess, as tipi pegs or stones and the all-important central tie-down stake, a hallmark of a true tipi, have not been recovered. Still, EfPm 266 produced a partial stone circle potentially culturally associated with the twilight of the complex.

Having defined the McKean complex in Alberta, it is appropriate to look further abroad. In Saskatchewan, there are a number of McKean sites. EgNo 23 is a multicomponent site just north of the Douglas Park Sandhills (Webster 2004:6). Seven occupations were observed, of which three were McKean occupations (Occupations 2a, 2b, and 3) (Webster 2004:10). Level 2a centred on a spill pit for a nearby but unexcavated stone-boiling pit; the level produced a Hanna point, a Duncan point, and a date of 3,427 +/- 50 BP (BGS 2363). Level 2b was a temporary camp likely related to Level 2 materials; it did not produce diagnostics but dated to 3,520 +/- 40 BP (Beta-167310). Level 2, combining Levels 2a and 2b where stratigraphic separation was not evident, focused around a boiling pit and FRB, yielding a Hanna point, a Pelican Lake-like point, and a date of 3,537 +/- 55 BP (BGS 2364). Level 3, the lowest level, produced a single McKean Lanceolate point and a small side-notched point in a bison kill (mni = 3) or processing site that was dated to 4,240 +/- 60 (Beta-183521) (Webster 2004:10-18).

The Redtail (FbNp 10) site is located in Wanuskewin Park near Saskatoon. The site is a multicomponent site with about twenty-six cultural occupations, in a small basin above the South Saskatchewan River. Seven levels produced McKean material. Occupation 8 exhibited a possible pit house. Occupation 11 produced a Hanna point and a date of 3,580 +/- 80 BP (S-3372) (Ramsay 1993:88-91). Planview artifact distribution patterns show a circular patterning, which suggests a possible structure (Ramsay 1993:288). Occupations 12(1) and 12(2) produced six Hanna points and two radiocarbon dates: 3,570 +/- 80 BP (S-3373) and 3,740 +/- 75 BP (S-3008) (Ramsay 1993:88-91). An oval distribution of material around a hearth was suggestive of a structure (Ramsay 1993:289). Occupation 13(1) did not produce diagnostics or radiocarbon dates. Occupation 13(2) produced the base of a McKean Lanceolate point, the base of a Duncan point, and a possible grinding tool in association with materials that provided two radiocarbon dates: 3,965 +/- 70 BP (S-3374) and 3,980 +/- 70 BP (S-3375) (Ramsay 1993:88-91). Occupation 13(3) did not produce diagnostics or radiocarbon dates. The oldest McKean occupation that exhibited
diagnostics was Occupation 13(4). Two McKean Lanceolate points with deep basal notches were recovered. A date of 4,280 +/- 80 BP was obtained (Ramsay 1993:88–91).

The Thundercloud (FbNp 25) site is located on the floodplain of the Opimihaw Valley about 1 km from the South Saskatchewan River. About eleven cultural occupations were recorded. Level 4 had Pelican Lake material, Level 5 contained three McKean occupations, and Level 6 contained two Oxbow levels (Webster 2004:34). Level 5c produced three McKean points and a date of 4,145 +/- 90 BP (S-3645) (Webster 2004:35). The intermediate level between 5c and 5b produced two Duncan points. Level 5b produced a third Duncan point and two radiocarbon dates: 3,375 +/- 50 BP (BGS-2367) and 3,382 +/- 55 BP (NZA-15749) (Webster 2004:35–36). Level 5a produced two possible Hanna points and a radiocarbon date of 3,172 +/- 50 BP (BGS-2369) (Webster 2004:35–36). One of these points exhibited a broken stem while the second was a base fragment with broad notches and a straight base. Given the age of these specimens and their fragmented form, they could also fall within the range of barbed Pelican Lake points.

The Cut Arm site (FbNp 22) is located in Wanuskewin Park near Saskatoon. This multicomponent site is located in a basin above the confluence of the South Saskatchewan River and the Opimihaw Creek. Of the twelve occupations at the site, Level 8 produced at least one McKean component. The upper component in Level 8 contained a McKean Lanceolate point and produced a radiocarbon date of 3,441 +/- 50 BP (BGS-2383) (Webster 2004:41; Morlan n.d.). The lower component of Level 8 did not produce a diagnostic but was dated to 3,520 +/- 60 BP (BGS-2384).

The Crown site (FhNa 86) was found during a cultural resource management study conducted prior to the construction of the Nipawin Reservoir. The site is located at the southern edge of the boreal forest on a small terrace above an unnamed tributary of the Saskatchewan River. Three components were recognized, with the middle component containing Hanna material and the lower component containing McKean material. The Hanna level produced a burial.

The Sjovold site (EiNs 4) is a multicomponent site on the South Saskatchewan River near Outlook. Twenty-one occupations were observed, with Layer xx1 considered a Hanna occupation (Dyck and Morlan 1995). The site was interpreted as a camp periphery. A single Hanna point was recovered and the level produced a radiocarbon date of 3,610 +/- 115 BP (S-2062) (Dyck and Morlan 1995; Morlan n.d.).
The Billet site (EkNv 36) is located near the town of Harris. Many artifacts have been recovered from the surface of this cultivated sand dune. Limited testing, however, produced five points in the vicinity of two hearths. Four of the points were Hanna points. The hearths produced three dates: 1,560 +/- 160 BP (S-2053), 3,180 +/- 65 BP (S-2054), and 3,470 +/- 120 BP (S-2063) (Dyck 1983:90; Webster 2004:50–51, Morlan n.d.).

The Graham site (FaNq 30) is a cremation burial within a habitation floor located about 3.5 km south of Saskatoon (Walker 1984a). A single Duncan point, a large hafted biface, ten other bifaces, a core fragment, twenty-one pieces of debitage, a cut deer antler burr, an antler segment possibly representing a hammer, and a split rib awl were recovered from a rough circular stained area (Walker 1984a:140–142). A radiocarbon date of 3,350 +/- 55 BP (S-1574) was obtained from comminuted human bone (Walker 1984a:142).

The Mortlach site (EcNl 1) is located in the Besant Valley south of the town of Mortlach. It produced four Hanna/Duncan points in its earliest level (Zone 8). Originally, the material was labelled “Thunder Creek culture” and compared to Duncan and McKean points to the south (Wettlaufer 1955:71). Currently, the material is considered part of the McKean complex (Dyck 1980:101). A radiocarbon date of 3,480 +/- 200 BP (S-2) was obtained for the level (Wettlaufer 1955:81, Morlan n.d.).

The Long Creek site (DgMr 1) is a multicomponent site near Estevan. Nine occupation levels were recorded with Level 5 producing a Hanna point (Wettlaufer and Mayer-Oakes 1960:47–50, 109). The level produced a radiocarbon date of 3,370 +/- 145 BP (S-63a) (Wettlaufer and Mayer-Oakes 1960:109; Morlan n.d.). Bryant’s (2002:155, 2007) reanalysis of the site produced a radiocarbon date of 3,865 +/- 55 BP (bgs-2362).

Other Saskatchewan sites that are of interest but lack radiocarbon dates include: the Meewasin site (FbNp 9), which contained nine occupations with at least one McKean occupation; the Sullivan site (EjNr 1), which contained Duncan points in a palaeosol overlying Oxbow points; the Lubyk site (FhNh 138), which was a surface site that produced mainly Hanna points; and the Big Kill site (EbNj 2), which was a surface collection that contained seven McKean Lanceolate points (Webster 2004).

In Manitoba, McKean is concentrated in the southwestern part of the province (Syms 1970:127). The Pas Reserve site (FkMh 5) is located on the Saskatchewan River in west-central Manitoba (Webster 2004:62). Hanna and Duncan points were recovered from the lowest level of the four
occupations at the site. A radiocarbon date of 3,190 +/- 60 BP (A-1369) was obtained (Webster 2004:62). Other McKean sites in Manitoba include the Trailrace Bay site that produced some McKean points, as well as a possible Duncan point. Similarly, the Cemetery Point (EaKv 1) site produced McKean points and a reworked Duncan point. Both sites exhibit mixed assemblages (Syms 1970:129; Webster 2004:62–63). The Larter site produced McKean Lanceolate points and a possible Hanna point in disturbed context along the Red River (Syms 1970:129). Boyd (2000:35) has recently argued that the distribution of McKean sites in Manitoba is broadly associated with modern lowlands, rivers, wetlands, and lakes with less emphasis on high areas of the Manitoba Escarpment.

In North Dakota, a few McKean sites are known from the western half of the state. The Red Fox site (32b0213) is located on Spring Creek in the southwest corner of the state (Keyser 1982:32). Within the McKean component, which produced at least four occupations, there were at least nine Duncan points in association with a storage pit, sixteen hearths, and possible a pit house. Fire pits tend to be circular and shallow but a conical pit with a rock bottom was present. A radiocarbon date of 3,770 +/- 90 BP was obtained from Level 4 (Keyser 1982:32).

In northwestern South Dakota, the Lightning Spring site (39hn204) is a deeply buried multicomponent site in the North Cave Hills, less than 30 km from the Red Fox site in North Dakota (see above) (Keyser 1982:31). Eleven occupations were recorded with Levels 8–11 attributed to the McKean complex. Level 8 dated to 3,430 +/- 270 BP (TX-4084), Level 9 dated to 4,190 +/- 110 BP (TX-4083), and Level 10 produced two dates of 3,870 +/- 210 BP (TX-4082) and 3,850 +/- 150 BP (TX-4081) (Keyser 1982:32). Hearths at the site tend to be shallow and round, but conical rock-filled hearths occur (Keyser 1982:36).

In Montana, only a limited number of McKean sites with radiocarbon dates are known. All are within the southern portion of the state. At the Sorenson site (24cb202), a possible McKean Lanceolate point was recovered in Level vi (dating ca. 1,300 BP) in association with bowl-shaped pits (Husted 1969:21–22, 82, 116: plate 11k). There appears to be a dating problem here. The Pictograph Cave site in south-central Montana also appears to have McKean material in its lowest level, Level 1 (Mulloy 1958:31–32, fig. 6). The Dodge site (24rb1225) is a McKean cache in the Tongue River Valley in southeastern Montana (Davis 1976). Although the four recovered points were called McKean stemmed at the time (Davis 1976:39),
the specimens would be called Duncan today (i.e., Wheeler 1954). Also recovered were large, notched bifaces \( n = 5 \), symmetrical ovate bifaces \( n = 14 \), asymmetrical bifaces \( n = 2 \), a symmetrical uniface, ovoid unifaces \( n = 2 \), and flakes \( n = 2 \). The points are quite large and well formed compared to Alberta specimens. The Cremer site (24SW264) in south-central Montana produced an assemblage of Duncan material from a buried context. At least six Duncan points were recovered from Cultural Layer II, immediately overlying what was interpreted as Early Prehistoric period material (Nowatzky 1983:72, fig. 11j–o). No radiometric dates were acquired for the level.

In northern Wyoming, there are numerous sites that appear to contain McKean components. The Bottleneck Cave site (48BH206) contained McKean Lanceolate points and a Duncan point in Occupation IV and dated to ca. 3,800 BP; the material was recovered in association with both basin-shaped fire pits and deep rock-filled pits (Husted 1969:56–57, 82, plate 30a, c, and d). At the Wedding of the Waters Cave (48HO301) in north-central Wyoming, McKean and Hanna points were recovered in the lowest level (Frison 1962:248, fig. 1a–b). At Dead Indian Creek in northwestern Wyoming, so-called McKean projectile point variants were recovered and dated to ca. 4,400, 4,200, and 3,800 BP (Frison 1991a:99). The serrated artifacts, however, distantly resemble McKean material on the Northern Plains. The Scoggin site in south-central Wyoming has elongate McKean Lanceolate points with deep basal notches in association with large side-notched Mallory points (Lobdell 1974). Both the shape of the McKean points and the association with Mallory points are foreign to the Northern Plains assemblages. A single date on charcoal from a food processing area was obtained for the site: 4,540 +/- 110 BP (RL-174). Similarly, the Mummy Cave site produced a number of elongate McKean points in Layer 30, ca. 4,400–4,000 BP (Husted and Edgar 2002).

In summary, the distribution of lanceolate points that have been called McKean is quite wide-ranging, from the Great Basin to the forest edge of the Canadian Plains. The review above, however, illustrates that a variety of point morphologies and lifeways occurs within this vast geographic area. Brumley and Rennie (2005) have proposed that culturally meaningful divisions are observable within the broadly defined McKean complex. They suggest that the southern McKean assemblages — those in southern Montana, Wyoming, northeast Colorado, western South Dakota, and western Nebraska — are distinguishable owing to the use of grinding slabs,
cobble-lined hearths, and edge-ground cobbles in the foothills/mountain assemblages (Brumley and Rennie 2005). The sites exhibiting these features would include, but not be limited to, DesRosier (Brumley 1974), Dodge (Davis 1976), Myers-Hindman (Lahren 1976), Lightning Spring (Keyser 1982), Red Fox (Keyser 1982), Scoggin (Lobdell 1974), Dead Indian Creek (Frison 1991a), Mummy Cave (Husted and Edgar 2002), McKean (Mulloy 1954), Fourth of July Valley (Benedict and Olson 1973), and Signal Butte (Strong 1935). The limited presence of Mallory points in association with McKean points is also restricted to southern McKean sites (Brumley and Rennie 2005:23–24). Mallory points have been found in southeastern Montana, central Wyoming, northeastern Colorado, and western Nebraska (Brumley and Rennie 2005:23; Frison 1991a:91).

Brumley and Rennie (2005:24) indicated that this distinctive set of traits within the southern McKean complex does not occur in McKean sites north of Helena, Montana. The northern McKean sites are those in northeastern Montana, southern Alberta, southern Saskatchewan, and southern Manitoba. Sites appear earliest in southern Saskatchewan, ca. 4,400 BP, and then occurred in Alberta by about 4,200 BP, and later into Manitoba. Interestingly, at the earliest Saskatchewan sites, the diagnostic McKean Lanceolate points are similar to the southern McKean Lanceolate point style; they exhibit a relatively deeper basal indentation and are relatively long. As Webster (2004) observed, the northern specimens tend to be smaller than the southern specimens in overall size.

A number of lines of evidence link the northern and southern McKean complexes. There can be little doubt that the projectile points are very similar despite the variation in size. These artifacts are common throughout the McKean complex. At the Redtail site in Saskatchewan a possible grinding stone was recovered in Level 13(2). However, the item in question is quite unlike grinding stones to the south in terms of form, and its function was not unequivocally determined: the flat surface of the gneiss cobble in question had not been used extensively (Ramsay 1993:143–146). This artifact does not provide good evidence of grinding stones in the northern McKean sites. Similarly, in Level 8 of the Redtail site a possible pit house was revealed, but, no evidence of construction or a structure was presented.

The evidence for the origin of the McKean complex appears to lie in the south. A number of sites at the headwaters of the Yellowstone River and the Bighorn Basin are dated to about 4,900 BP. By 4,700 to 4,500 BP the McKean complex had expanded to the Black Hills (Webster 2004:96).
Likely following river systems, the McKean complex was in southern Saskatchewan and in southern Alberta by ca. 4,200 BP.

The split between northern and southern McKean might simply be a result of geography and/or resource base. In the northern McKean sites, there is ample evidence of bison procurement by solitary stalking or ambush of small herds. Bison occur in small numbers in most northern McKean sites. Larger kills by McKean complex were possible, of course. Webster (2004:144–158) argued that EgNo 23 represented a McKean bison kill site that dates to ca. 3,550 BP. No projectile points were recovered in firm association with the bone bed. The Austech site provides another possible bison kill site. The Scoggin site in the southern McKean complex exhibited a bison corral and processing area. Still, bison kill sites of this nature appear rarely in the southern McKean complex. In the southern McKean tradition a wide range of fauna was exploited, with a focus on bison. The common recovery of milling stone technology at southern sites suggests that plant materials were also important elements in people’s diets. Still, only a few sites have exhibited direct evidence of plant exploitation (e.g., Haberman 1986; Keyser 1986). The archaeologically visible diet breadth of the northern McKean complex was focused on hunting game, predominantly of bison, but also included antelope, wolf, dog, kit fox, cottontail rabbit, jackrabbit, birds, and fish.

In terms of lithic resource utilization, northern McKean materials are mainly locally derived. Similarly, at least at some of the southern McKean sites, lithic procurement is locally oriented. For example, the Lightning Spring site in North Dakota yielded a group of bifaces manufactured on Tongue River silicified sediment, which is locally available (Keyser and Fagan 1993). Similarly, the Dodge cache consisted of porcellanite and chert, both locally available in southern Montana (Davis 1976).

Features associated with food processing are frequent in the northern McKean complex. Surface and basin hearths are both common. EaPk 1 produced an unusual cobble platform possibly associated with roasting. Earth pits were repeatedly observed at the Cactus Flower site but not elsewhere. Evidence of stone boiling was indicated by the recovery of substantial amounts of fbr at most sites. Circular distributions of debris were noticed at the Cactus Flower site and the Redtail site; in both cases these were interpreted as delimiting the former locations of a structure. Centre stakes or tie-down pegs were not found with these debris distributions, making it difficult to determine whether they represented tipis.
or another form of circular structure. The possible identification of a pit house was also noted at the Redtail site. The available data did not substantiate this claim.

There will likely be much debate about whether the McKean complex's rapid appearance across the Northern Plains can be attributed to the spread of technology, people, or both. Certainly, it was replaced by the Pelican Lake complex, which exhibits a large corner-notched dart point. Some researchers perceive the change from the McKean complex's Hanna point to the Pelican Lake corner-notched point as a shift in a continuum of style and technology (Reeves 1983a; Webster 2004). The view taken in this text is that this dramatic shift likely represents a change in the people using the technology and not just the introduction of technology to an extant population.

**Pelican Lake Complex (ca. 3,600 to 2,800 BP)**

The “Pelican Lake culture” was first defined based on materials recovered in Occupations 5A, 5B, 6 and 7 of the Mortlach site, south-central Saskatchewan (Wettlaufer 1955:54–57). Wettlaufer (1955:55) described the points as corner-notched, with oval cross-sections, bevelled to the edges and toward the base, widest just above the notches, with the base narrower than the blade and tapered to a long symmetrical point. The Pelican Lake point and culture likely received its name from Pelican Lake, a body of water several kilometres north of Mortlach, Saskatchewan (Kehoe 1974:109).

Subsequently, Reeves (1983a) provided a more thorough description of Pelican Lake material culture as a ‘phase’ by focusing on its spatial and temporal distribution. Reeves (1983a:94) accepted the description of the Pelican Lake atlatl point provided by Wettlaufer (1955:55). In addition, he noted that flake points were infrequent but that Hanna points were present in some early components (Reeves 1983a:82–83). Ceramics were found in only one site, the Mule Creek Rock Shelter, making the Pelican Lake phase largely aceramic (Reeves 1983a:85). Reeves (1983a:76) subdivided the geographic distribution of the Pelican Lake phase into eight regional subphases based on varying degrees of distinctive environments and specific areas of archaeological activity. For this review there are four relevant subphases including Blue Slate Canyon in the Rocky Mountains of northern Montana and southern Alberta (Duke 1985), Keaster in the upper Missouri Basin, Mortlach across the Canadian Plains as far north
as the parkland, and Larter in southwestern Manitoba (Reeves 1983a:2–4, 78–79). Reeves (1983a:5, 80–81) considered the initial appearance of Pelican Lake on the Northern Plains to be about 3,400 BP, with it lasting until about 1,800 BP.

Focusing on the Northern Plains, Kehoe (1974:109–111) proposed a Pelican Lake point type with five varieties exhibiting temporal and/or morphological significance, based on materials recovered from the Walter Felt site. The varieties included both a large and a small Classic Pelican Lake barbed point that appear earliest. The Hudson Barbed, convex-based variety follows and is similar to the large Classic Pelican Lake barbed variety but with a convex base. The most recent varieties include the Danker shouldered, straight-base point and Bracken Shouldered, convex-based variety. The Sandy Creek material separated the Classic Pelican Lake point varieties from the later Danker Variety of Pelican Lake points at Walter Felt, the site upon which the typology was developed. More recently, Dyck (1983:105) proposed a similar but simpler classification, in which two varieties of Pelican Lake points existed. One variety had straight sides, a straight base, and corner notches that usually created sharp tangs on the shoulders; toward the end of Pelican Lake times, this variety developed a wider base to almost the full width of the shoulders, and the notches were narrow. Dyck credited Pendree (1981) with first recognizing this in materials from the Harris Sand Hills. The other variety appeared about midway through the sequence with straight sides and corner notches but a convex instead of a straight base. Brumley and Dau (1988:33–34) concurred with Dyck’s assessment of Pelican Lake on the Northern Plains. Regarding the distributional and lithic utilization patterns among Pelican Lake points, however, they suggested that straight-based Pelican Lake points are most common in southeastern and south-central Alberta and rare in central and northern Montana. The points were commonly manufactured on local lithics. When an exotic material was used, it was often Knife River flint. Convex-based Pelican Lake points were most common in southwestern Alberta and northern and central Montana (Brumley and Dau 1988:34). These were commonly made on Avon chert, Madison Formation chert, and porcellanite. Echoing Dyck’s (1983:107) remarks about frequent small Pelican Lake points, Brumley and Dau (1988:33) suggested their possible employment as arrow tips used with bows.

Currently, Wettlaufer’s (1955) original definition of Pelican Lake corner-notched point is utilized without any subdivisions or varieties being noted.
Similarly, the geographic distribution of the Pelican Lake sites does not retain its subphases with their geographic variability. None of Reeves’ (1983a) Pelican Lake subphases are systematically used. Dyck (1983:107) recognized that points with tangs and corner-notches are widespread throughout North America at this time, making questions about Pelican Lake origins, distribution, and fate difficult to address. Still, he did note that the three prairie provinces of Canada have produced similar Pelican Lake assemblages of comparable age (Dyck 1983:105). Vickers (1986:76) glosses over the issue of distribution by noting that Pelican Lake appears coevally from the Saskatchewan plains to the Wyoming Basin. Presumably, this statement refers to a formally similar point type and not a single archaeological culture. Temporally, Reeves (1983a:5, 80–81), Dyck (1983:105), and Vickers (1986:76) concur that the Pelican Lake phase begins about 3,300–3,500 BP roughly coeval with the end of the McKean complex. Similarly, Reeves (1983a:5, 80–81) and Dyck (1983:105) suggest a terminal age of 1,900–1,800 BP.

The origin of the Pelican Lake phase is not agreed upon. Reeves’ (1983a) model of culture history provides the most commonly cited framework. He included the Pelican Lake phase within his Tunaxa tradition, which includes McKean, Duncan, Hanna, Pelican Lake, and Avonlea (Reeves 1983a:7, 80). He cited basic technological continuity in tool types and technology between Hanna and Pelican Lake material as evidence of this cultural link (Reeves 1983a:7), and used the stratigraphic sequence at the Cactus Flower site to illustrate this argument. Still, he recommended more thorough analyses of these assemblages be undertaken to assess the model (Reeves 1983a:7). In contrast, Brumley (1975:73) noted that the small Pelican Lake assemblage from Cactus Flower was all chipped stone, while the McKean assemblages exhibited pecked, ground, and miscellaneous stone, as well as shell tools and antler. He suggested the difference between the layers may either be a result of sampling or actual cultural differences (Brumley 1975:73). Dyck (1983:105–107) proposed that, in view of the widespread nature of tanged and corner-notched points during this time period, a large study would be required establish the origins of Pelican Lake.

The demise of the Pelican Lake phase, like its origin, is unclear. Reeves’ (1983a:17) Tunaxa tradition linked Pelican Lake to Avonlea. He suggested that the mountain subphases of the Pelican Lake phase were forbearers to the Avonlea phase. He cited similarities of early corner-notched Avonlea
arrows to Pelican Lake points, and comparable lithic use patterns between
the two phases as evidence of this pedigree (Reeves 1983a:17). Vickers
(1986:80) aptly pointed out that Reeves’ own data suggested the Pelican
Lake phase shares more in common with the Besant phase than with the
Avonlea phase in terms of artifact types. As with the origins of Pelican
Lake, Dyck (1983:107) expected that the commonness of the point form
would require a broad investigation to address its fate.

The Sites
To assess the various lines of thinking presented above, Pelican Lake as­
semblages from Alberta with reliable radiocarbon dates are outlined be­
low. These sites will be used to critically evaluate the current view of the
Pelican Lake complex (see Plate 18 and Figure 19).

![Image of Pelican Lake points](Plate 18)

**Plate 18**
Pelican Lake points. Illustrated are projectile points from
DjPm 44 (a–c); the Boy Chief
site (EeOv 68) (d–g); the Scapa
site (ElPa 1) (h and i); and the
Second Lake site
(EhPy 58) (j–m).
Photo credit:
Alberta Culture
and Community
Spirit.
FIGURE 19
Pelican Lake sites within Alberta
Boy Chief (EcOV 68), Block 4, Occupations 4 and 5. The Boy Chief site is discussed in the above section on the Estevan phase. In Occupation 4, three barbed Pelican Lake points and a triangular unnotched point were found in association with two hearths and a scatter of ash (Head et al. 2003:142–148). Because of the early date for the occupation and the fragmentary points, the original researchers suggested this site might represent transitional material between Hanna and Pelican Lake materials (Head et al. 2003:148). While this is possible, the illustrated specimens exhibit the classic features of Pelican Lake points, including straight sides, narrow necks, and large corner-notches that create barbed shoulders. Other tools recovered in this occupation include three retouched flakes, two end scrapers, a biface, a side scraper, and a bipolar core (Head et al. 2003:146–147).

The lithic assemblage is dominated by quartzite, petrified wood, and massive quartz (Head et al. 2003:145). Concentrations of the various debitage types occur within the site, suggesting individual reduction sites or workshops (Head et al. 2003:146).

The faunal assemblage represented at least one bison. Its age and sex could not be determined. Only fourteen of the 415 bone fragments were identifiable, as the assemblage is very fragmented. Processing seemed to focus on removal and discard of elements at the tarsal-metatarsal joints (Head et al. 2003:144). FBR, consisting largely of quartzite, was widely scattered across the site. Much of the FBR exhibited crenulated fractures, suggesting stone boiling; these specimens are more associated with the hearth. The hearth is a circular surface hearth about 50 cm in diameter and 2 cm deep. Thirty-five pieces of FBR with bedding plane fractures are associated with the small hearth and ash scatter.

A single radiocarbon date of ca. 3,350 BP was obtained (see Table 17). This date is from a combined sample of bone from numerous units, but is consistent with dates from overlying occupations. The occupation is interpreted as a campsite living floor where minimal processing occurred.

Occupation 5 produced two barbed Pelican Lake points and two possible Pelican Lake points in association with a hearth and a lithic concentration. Other lithic tools recovered include bipolar cores (n = 65), multidirectional cores (n = 11), retouched flakes (n = 17), end scrapers (n = 4), side scrapers (n = 3), bifaces (n = 2), unifaces (n = 2), wedges (n = 2), choppers (n = 2), and a graver. Some of the tools appear to have a patterned distribution; for example, bipolar cores are largely found in the north and east while retouched flakes were found in two clusters in the northeast and southeast part of
the excavation block (Head et al. 2003:154). The lithic assemblage is dominated by quartzite, miscellaneous chert, and massive quartz (Head et al. 2003:151). The different percentages of cortex on various raw materials suggest different reduction strategies (Head et al. 2003:152). The spatial distribution of the various lithic raw materials also suggests patterned activity around the hearth.

<table>
<thead>
<tr>
<th>Site</th>
<th>Conventional 14C Age</th>
<th>( ^{13}C/^{12}C ) Ratio</th>
<th>Material</th>
<th>Calibration</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>EeOv 68 [AEVC-2051C]</td>
<td>3350 +/- 90</td>
<td>-19.4%</td>
<td>collagen</td>
<td>1880–1440 B.C. (p = 0.954)</td>
<td>Head et al. 2003:21</td>
</tr>
<tr>
<td>EeOv 68 [AEVC-2052C]</td>
<td>3270 +/- 90</td>
<td>-18.7%</td>
<td>collagen</td>
<td>1770–1370 B.C. (p = 0.954)</td>
<td>Head et al. 2003:21</td>
</tr>
<tr>
<td>DjPm 44 [AEVC-773C]</td>
<td>2770 +/- 120</td>
<td>-19.4%</td>
<td>collagen</td>
<td>1350–750 B.C. (p = 0.939) 700–550 B.C. (p = 0.015)</td>
<td>Van Dyke 1994:196</td>
</tr>
<tr>
<td>DjPm 44 [AEVC-759C]</td>
<td>2690 +/- 140</td>
<td>-26.6%</td>
<td>collagen</td>
<td>1250–400 B.C. (p = 0.954)</td>
<td>Van Dyke 1994:196</td>
</tr>
<tr>
<td>DjPm 44 [AEVC-740C]</td>
<td>3600 +/- 100</td>
<td>-19.0%</td>
<td>collagen</td>
<td>2300–1650 B.C. (p = 0.954)</td>
<td>Van Dyke 1994:196</td>
</tr>
<tr>
<td>DjPm 44 [AEVC-764C]</td>
<td>3520 +/- 210</td>
<td>-20.1%</td>
<td>collagen</td>
<td>2500–1400 B.C. (p = 0.954)</td>
<td>Van Dyke 1994:196</td>
</tr>
<tr>
<td>DjPm 44 [AEVC-1195C]</td>
<td>3110 +/- 90</td>
<td>-19.3%</td>
<td>bone</td>
<td>1610–1120 B.C. (p = 0.954)</td>
<td>Van Dyke 1994:196</td>
</tr>
<tr>
<td>DjPm 44 [AEVC-1196C]</td>
<td>3160 +/- 100</td>
<td>-18.5%</td>
<td>bone</td>
<td>1520–1370 B.C. (p = 0.923) 1340–1110 B.C. (p = 0.01)</td>
<td>Van Dyke 1994:196</td>
</tr>
<tr>
<td>EfPi 17 [BETA-157613]</td>
<td>3120 +/- 40</td>
<td>-18.1%</td>
<td>collagen</td>
<td>1500–1290 B.C. (p = 0.954)</td>
<td>Hanna 2002:76–77</td>
</tr>
<tr>
<td>EhPv 58 [S 2755]</td>
<td>3100 +/- 125</td>
<td>-20.2%</td>
<td>charcoal</td>
<td>1700–1000 B.C. (p = 0.954)</td>
<td>Fedje 1986:52</td>
</tr>
<tr>
<td>EhPp 74 [BETA-226858]</td>
<td>3020 +/- 40</td>
<td>-17.4%</td>
<td>collagen</td>
<td>1400–1120 B.C. (p = 0.954)</td>
<td>Goldsmith 2007a</td>
</tr>
<tr>
<td>EhPp 74 [BETA-226860]</td>
<td>2990 +/- 40</td>
<td>-18.2%</td>
<td>collagen</td>
<td>1390–1110 B.C. (p = 0.944) 1100–1080 B.C. (p = 0.03)</td>
<td>Goldsmith 2007a</td>
</tr>
<tr>
<td>EhPv 58 [S 2779]</td>
<td>2760 +/- 95</td>
<td>-10.0%</td>
<td>bone</td>
<td>1210–770 B.C. (p = 0.954)</td>
<td>Fedje 1986:52</td>
</tr>
<tr>
<td>EbOp 16 [S-1011]</td>
<td>2770 +/- 95</td>
<td>-20.0%</td>
<td>collagen</td>
<td>1300–810 B.C. (p = 0.954)</td>
<td>Morlan n.d.</td>
</tr>
</tbody>
</table>
The faunal assemblage included a minimum of two bison from a very fragmented assemblage of bone. Age and sex could not be determined. The identifiable elements are among the first to be discarded within a butchering sequence (Head et al. 2003:150). The FBR was widely scattered and dominated by quartzite. Angular fractures suggested fracturing during stone boiling; these pieces are generally west and north of the hearth (Head et al. 2003:151). Spalled FBR (n = 5) was associated with the hearth (Head et al. 2003:151). The hearth was roughly circular, about 55 cm in diameter and 2 cm thick (Head et al. 2003:156). A single radiocarbon date of ca. 3,270 BP was obtained (Table 17). The site was interpreted as a campsite with a very fragmentary faunal assemblage, FBR, and a substantial lithic assemblage associated with a hearth. The researchers suggest the range and frequency of tools represent an occupation during a cooler season when people were confined around the hearth within a structure (Head et al. 2003:157).

**EfPi 17, Upper Component.** The Upper Component of EfPi 17 is a diffuse and indistinct campsite (Hanna 2002:51–65). The site is discussed in the section on the Scottsbluff-Eden phase. Two barbed Pelican Lake points were recovered in the diffuse scatter of lithics, FBR, and bone. Unfortunately, the stratigraphy at the site produced indistinct separation from the lower Scottsbluff component. Raw materials and technology aided in differentiating these materials, but nothing could be established with certainty. Other tools recovered included a hammerstone, a biface, end scrapers (n = 2), retouched flakes (n = 13), and a utilized flake. The lithic assemblage was dominated by quartzite, miscellaneous cherts, and massive quartz (Hanna 2002:58). A single piece of obsidian was likely associated with the optically identical obsidian in the lower component, suggesting mixing (Hanna 2002:64).

The faunal assemblage consisted of very small weathered fragments (n = 159), with only a few identifiable as bison. Recovered FBR (n = 289) was mostly angular and highly fractured suggesting repeated use in stone boiling (Hanna 2002:62). A single radiocarbon date of 3,120 BP was obtained from bone thought to be contextually associated with the lower Scottsbluff component (Table 17). The researcher noted that the date reflected an age expected for the Upper Component, especially given the high potential for mixing (Hanna 2002:76–77). While problematic, this diffuse campsite exhibited many classic characteristics of a Pelican Lake site: narrow-necked,
barbed points, use of local lithics especially massive quartz, and a date around 3,100 BP.

**DjPm 44.** DjPm 44 is a multicomponent campsite with surface deposits dating to the Protohistoric Period and subsurface deposits dating to the Pelican Lake complex. The site is located on a 10-metre-high terrace along the Castle River at the south end of Horseshoe Canyon (Van Dyke 1994:191). A total of 196 m² was excavated at the site in six excavation blocks (i.e., A–F) in 1988 and 1990 (Van Dyke 1994:191). Subsequently, waters behind the Oldman River Dam have inundated the site.

Seven barbed Pelican Lake points, three unidentifiable points, a midsection, and two tips were recovered in association with unmodified cobbles that might represent stone circles in blocks E and F. Other tools recovered from the multiple occupations included a biface, end scrapers (n = 12), retouched flakes (n = 55), cobble cores (n = 11), and pebble cores (n = 3). The faunal assemblage included bison, canid, beaver, and a small ungulate (probably deer). A minimum of six bison was present. Six radiocarbon dates were obtained (Table 17). The researcher noted the dates form three clusters with averages of 2,730 BP, 3,135 BP, and 3,560 BP (Van Dyke 1994:201).

**EhPp 74.** EhPp 74 is a buried stone circle site on a terrace above Jumpingpound Creek near Cochrane (Goldsmith 2007a, 2007b). The site consisted of two buried stone circles in close proximity (ca. 5 m apart) and of similar river cobbles and sandstone slab construction (Goldsmith 2007a). A total of 82 m² exposed the two circles. A subdivision necessitated the mitigation.

Two small reworked Pelican Lake points, a base of a similar form, and a large Duncan-like point were associated with the stone circles. Non-projectile tools included a chopper, bifacially reworked tools (n = 2), and marginally retouched flakes (n = 6). The lithic debitage assemblage (n = 85) from the two circles was small and included flakes (n = 27), broken flakes (n = 22), and pieces of shattered (n = 36). Quartzite (n = 71) was dominant but massive quartz, siltstone, chert, sandstone, chalcedony, and obsidian were also recovered. Fauna included only bison, most of which was recovered from a bone-filled pit stratigraphically below the occupation floor and thus dated to an earlier period. Only eighty-seven bones were recovered in association with the two Pelican Lake stone circles. FBR (n = 985) appeared to be cracked by rapid water-cooling. FBR was mainly quartzite, but sandstone
and granite were also used. Distribution of FBR suggested little horizontal or vertical disturbance at the site (Goldsmith 2007a).

Two radiocarbon dates of ca. 2,900 BP for Stone Circles 1 and 2, respectively, and 4,650 +/- 50 BP for the bone pit beneath Stone Circle 2 were obtained (Goldsmith 2007a). The dates, their proximity to each other, and the artifacts suggest that the two stone circles were likely contemporaneous to Pelican Lake times. The pit is stratigraphically earlier than the stone circle, an inference supported by the radiocarbon dates, and possibly is associated with the Duncan-like point.

Second Lake (EhPv 58, 162R). The Second Lake site is described in the section on the McKean complex. In Occupation 5, two barbed Pelican Lake points and a point preform were associated with a hearth and a scatter of lithics and bone (Fedje 1986:53). The lithic assemblage contained 350 items. The faunal assemblage included bison, deer, dog/wolf, mallard, and trout. Two dates were obtained for the site: ca. 3,100 BP and 2,760 BP (Table 17). The researcher suggested that temporally distinct activities may be represented, but the dates are not significantly different; a mean date of 2,885 +/- 75 BP was determined (Fedje 1986:53–54).

Cactus Flower (EbOp 16). The Cactus Flower site has already discussed under the McKean complex. Occupation 1 capped seven McKean occupations and an anomalous occupation. It produced two barbed Pelican Lake points and four point fragments associated with a basin hearth. Approximately 182.77 m² of Occupation 1 was excavated (Brumley 1975:110). Other recovered tools included a crude biface, retouched flakes (n = 21), end scrapers (n = 4), spokeshaves (n = 2), bipolar cores (n = 3), and some miscellaneous heavy chipped stone tools (n = 4) (Brumley 1975:123–125). The faunal assemblage produced a minimum of one bison, based solely on skull fragments (Brumley 1975:129–130). A single radiocarbon date of ca. 2,770 BP was obtained (Table 17).

St. Pierre (DjPo 127). The St. Pierre site is a large campsite on the east side of the Livingstone Mountain Range north and west of Lundbreck. Cayley Series (i.e., Old Women's) (n = 25), Pelican Lake (n = 5), Oxbow (n = 1), and non-diagnostic (n = 3) points were recovered. The cultural material was concentrated in the second excavation level, although the researchers made a reasonable argument that Old Women's material was located in the
north and was largely horizontally separated from Pelican Lake material
in the south (Head and Kennedy 1994). Four radiocarbon dates supported
this argument. Three recent dates were associated with the Old Women’s
occupation and an earlier date of ca. 3000 BP (Table 17) was associated
with the Pelican Lake occupation (Head and Kennedy 1994:88). Still, the
potential for mixing of material into this assemblage makes it suspect for
archaeologically defining the Pelican Lake complex.

DjPl 13, Block D-1. DjPl 13 is a multicomponent site excavated during
the Oldman River Dam project. Four major and four minor block excavations
of various sizes, labelled A through H, were opened at the site. The earliest
occupation in Block D appeared to contain Pelican Lake and Hanna mate­
rial. Five points were recovered in association with a stone-ringed hearth
and a possible boiling pit (Van Dyke and Unfreed 1992:78). Three of the
points are fairly barbed, narrow-necked specimens not unlike the Pelican
Lake material. One point specimen is a base fragment that is suggestive of
Hanna; in fact, the researchers considered the component to be a mixed
occupation of Pelican Lake and Hanna (Van Dyke and Unfreed 1992:82).
The remaining point specimen was a non-diagnostic tip fragment. Further
analysis might clarify whether this site represents a palimpsest of material,
a transitional site, an aggregation locale, or something else.

Scapa Ribstone (ElPa 1). This site is described above under the Lusk
complex. Three Pelican Lake points were recovered in Components 6 and
7. While one is broken at the neck, the remaining two points exhibit large,
open corner notches, barbed shoulders, and narrow necks. Although a ra­
diometric date is not available for the components, their stratigraphic po­
sitions relative to other point styles support a Pelican Lake assignment.

Other sites. Numerous other Pelican Lake sites that lack radiocarbon
dates or good context exist in Alberta. In west Calgary, Component 2 of
EgPn 230 produced two barbed Pelican Lake points associated with three
other less-barbed specimens in a bison kill site. No date was available for
this component but it was stratigraphically above a Country Hills compo­
nent and beneath an Old Women’s component. The Calderwood Buffalo
Jump (DkPj 27) produced three barbed, narrow-necked Pelican Lake points
in Layer 6 (Brink et al. 1987:72, fig. 24, three points in bottom row, cen­
tre; Marshall 1988). Layer 5, the overlying level, was radiocarbon dated
to about 2,000 BP while the underlying Layer 8 was dated between 2,900 and 2,300 BP (Marshall 1988:60). DjPm 114, at the Oldman Reservoir, produced a barbed and narrow-necked specimen not unlike Pelican Lake points. It was apparently associated with a Bracken point and two other fragmentary point specimens and dated to about 2,000 BP. It is possible the barbed point was mixed into the assemblage although Landals (1993) suggested it most resembles interior British Columbia specimens such as Columbia Valley corner-notched. Lastly, of interest is EhPo 78 at the Cochrane Ranch in Cochrane. This site is located within a terrace above Big Hills Springs Creek. At a depth of 70 cm bs, three barbed Pelican Lake points were recovered in association with a maul (de Guzman 2008). Mauls have been found in good context as early as the Estevan phase (ca. 5,000 BP). Regardless, the recovery of a maul in situ is rare at any age.

Pelican Lake: The Twilight Days of Bison Stalking

Wettlaufer (1955:55) originally defined the Pelican Lake corner-notched point based on barbed, narrow-necked specimens from zone 5A at the Mortlach site. A review of Pelican Lake sites in Alberta illustrates an overwhelming trend toward barbed, narrow-necked points dating between 3,600 and 2,800 BP. More broadly corner-notched, wide-necked specimens postdate these barbed points. While these have commonly been included within the Pelican Lake complex, they are differentiated here owing to distinct chronostratigraphic placement and associated behavioural differences inferred from the assemblages exhibiting these points. For the purposes of this review, the latter have been labelled Bracken points (see the Bracken section below).

Two main competing models of Pelican Lake point forms have been mentioned. Dyck (1983) suggested that barbed points with straight, narrow bases occur earliest but gradually change to exhibit wider bases with narrow notches. Midway through this sequence a convex-based point emerges and co-occurs through the remainder of the Pelican Lake sequence. Kehoe’s (1974) typology, based on material from the Walter Felt site in south-central Saskatchewan, presented more of a temporal dichotomy. The early Pelican Lake points, called Small and Large Classic Pelican Lake, have straight sides, are barbed, and have narrow necks and bases. When these points have convex bases they are labelled “Hudson barbed (convex-based variety)” (Kehoe 1974:110). Stratigraphically, the more recent Pelican Lake point, the Danker Shouldered (straight-based variety), postdates 2,500 BP and exhibits
a broader neck and notching with a straight base. Similarly, the Bracken Shouldered, convex-based variety of the Pelican Lake point, not found in the Walter Felt sequence, is very similar to the Dankar variety, with a convex rather than straight base. Both point varieties are considered transitional from Pelican Lake to Besant. These two varieties would appear to be most similar to the second of Dyck’s forms. Kehoe’s (1974) point varieties have discrete distributions in time, rather than Dyck’s (1983) evolving forms, and mirror the situation in Alberta. Between 3,600 and 2,800 BP, the Pelican Lake complex exhibits a corner-notched, barbed, narrow-necked, straight-based, narrow-based, straight-sided projectile point. No obvious evolution into subsequent forms is apparent. As Kehoe (1974) described, at ca. 2,800 BP a corner-notched, shouldered, wide-necked, straight-to-slightly convex-based, wide-based, excursive-sided projectile point appears to quickly replace the barbed form in the archaeological record.

Thus, for the purposes of this text, Pelican Lake complex refers to the cultural materials recovered that date to between ca. 3,600 and 2,800 BP, and includes barbed, corner-notched points. In terms of the tool assemblage of the Pelican Lake complex, bifaces, end scrapers, and retouched flakes are common, while side scrapers and utilized flakes occur infrequently. Flake points have not been recovered. No bone tools have been noted. The lithic raw materials show a clear dependence on quartzite, miscellaneous cherts, chalcedony (much of which may be Knife River flint), and massive quartz. DjPm 44 shows clear attachments to the mountains (i.e., Etherington chert, Banff chert, Top-of-the-World chert) and Montana (i.e., Avon chert and obsidian) not reflected in the other sites. The different lithic procurement patterns might simply reflect geography. DjPm 44 is in the Oldman Dam area near the mountains. EeOv 68 and EfPi 17 (for example) are much further onto the plains and lack the same suite of mountain-oriented raw materials.

Recovered faunal assemblages suggest a subsistence relying on bison. The limited number of sites makes further inference difficult. The sites all appear to be campsites with little evidence of large scale bison procurement. The faunal assemblage from almost every site exhibits a few bison with only certain elements represented. This strongly suggests stalking of solitary animals away from the campsite; hunters would return with specific meat units after butchering carcasses for easy transport. A variety of other animals are also known, including deer, dog/wolf, beaver, mallard, and trout.

Only a handful of features were observed at these sites. Surface hearths were noted at a few. As well, a stone-ringed hearth and a possible boiling
pit were observed at DjPl 13. In fact, FBR was recovered in such quantities at most of the sites that it suggested that stone boiling for grease extraction from bone was being conducted. Perhaps most importantly is the secure dating of two buried stone circles. These almost certainly represent living structures. Evidence for a central tie-down stake was not recovered, but stone circles are commonly interpreted as representing tipis (see Kehoe 1960).

Pelican Lake materials are also known from Saskatchewan. The Walter Felt (EcNm 8) site is a multicomponent campsite near Mortlach (Kehoe 1974:103). From the perspective of this text, the sequence consists of Mortlach Group points (Layers 1–5), Early Cayley Series points (Layers 6 and 7), Avonlea and Sonota points (Layer 10), Besant points (Layer 13), Bracken points (Layer 15a), Sandy Creek points (Layer 15b), and Pelican Lake points (Layer 15d) from top to bottom in a stratified sequence (Kehoe 1974). The Pelican Lake point in Layer 15d exhibits the classic barbed shoulders and straight base that is absent in later points. A radiocarbon date from the overlying Sandy Creek layer (15b) produced an appropriate age of 2,430 +/− 90 BP (S-279) (Kehoe 1973:164; Morlan n.d.). The underlying Pelican Lake material is slightly older, of course. The Mortlach (EcNl 1) site is a multicomponent campsite in the Besant Valley near Mortlach (Wettlaufer 1955). Pelican Lake points (n = 6) were recovered in Zone 5A with point blades recovered from Zones 5B, 6, and 7 (Wettlaufer 1955:56–58). Zone 4E contained Sandy Creek material that immediately overlaid the Pelican Lake material. A radiocarbon date from organic sediment in Zone 4E produced a date of 2,400 +/− 173 BP (S-28) (Wettlaufer 1955:81; Morlan n.d.). Pelican Lake material is expected to be somewhat older.

The Long Creek (DgMr 1) site is a multicomponent campsite located on a terrace of Long Creek near Estevan (Wettlaufer and Mayer-Oakes 1960). The sequence of cultural occupations from top to bottom included Mortlach phase (Level 1), Avonlea phase (Level 2), Sonota phase (Level 3), Pelican Lake phase (Level 4), Hanna phase (Level 5A), Oxbow (Level 7), and Estevan phase (Level 8), with no diagnostics in Levels 6 or 9 (Wettlaufer and Mayer-Oakes 1960; see also Bryant 2002). The Pelican Lake points are typical barbed points. Bryant (2002:150) classified all the projectile points as Dyck’s first variety, the straight-based, earlier Pelican Lake form. The debitage emphasized Knife River flint and fused shale (Bryant 2002:147). Also found in this level was a feature consisting of a bison skull placed on its occipitals, horn tips down, with a rock under the foramen magnum (Bryant 2002:252). Two dates were available for this level. The upper part
of the level produced a date of 2,230 +/- 100 BP (S-49a) while the lower part of this level, possibly intrusive from the level below, produced a date of 3,710 +/- 70 BP (S-49b) (Bryant 2002:140–141; Morlan n.d.). Pelican Lake material is expected to date between these dates.

The Sjovold site (EiNs 4) is a highly stratified site at the confluence of the South Saskatchewan River and Sjovold Creek (Dyck and Morlan 1995). Layers xix and xx produced four barbed, narrow-necked points that fit well with the Pelican Lake form. Layer xix revealed two hearths surrounded by FBR, an abundance of bison bone, and other fauna, including dog or coyote, marten, rabbit, and a few bird bones. Other lithic tools included bifaces (n = 3), an end scraper, large scrapers (n = 2), and a retouched flake. The layer was interpreted as a Pelican Lake summer camp and produced a date of 3,355 +/- 160 BP (S-1769). The underlying layer, xx, was interpreted as sparse Pelican Lake occupation. It produced a date of 3,675 +/- 150 BP (S-2061).

EdNh 35 produced a Pelican Lake component on the second terrace of the Moose Jaw River just above its confluence with the Qu’Appelle River, in south-central Saskatchewan. The component underlay a co-occupation by people of the Sonota and Avonlea phases. The site produced two barbed, narrow-necked projectile points associated with the Pelican Lake complex (Cloutier 2004:117, fig. 6.9). A date of 3,678 +/- 80 BP was obtained from a composite bone sample from the component (Cloutier 2004:96).

The Crane site (DiMv 93) is a multicomponent site along the Souris River near the town of Estevan. The lowest cultural component contained Pelican Lake material, including three points (Gibson and McKeand 1992:80). One is very barbed with deep notching while another is mildly barbed with a narrow neck (Gibson and McKeand 1992:81–82). An early radiocarbon date on bone of 3,330 +/- 95 BP (S-2969) reinforced that they are Pelican Lake points (Morlan n.d.).

In Manitoba, the barbed Pelican Lake point has also been called the Larter tanged point. Reeves (1983a) considered the Manitoba assemblages to represent the Larter subphase of the Pelican Lake phase, based on recovered items from the Larter and Lockport sites. Subsequently, charcoal from the Lockport (EaLf 1) site provided an age estimate for the Larter assemblage of ca. 3,300 BP (Buchner 1988; Morlan n.d.). Other sites that fit in this phase include the Paddon (DLPg 1) site, which produced Larter points dating to 3,075 +/- 105 BP (Morlan n.d.), and the Bjorklund (EaLa 3) site, Component 3, which produced Larter points from context dated to ca. 3,000 BP (Morlan n.d.). Interestingly, immediately north of the Pelican Lake/Larter...
occupation in southwestern Manitoba, the Eriksdale (EfLl ? [sic]) site produced a burial containing a Larter point embedded in a femur shaft dated to 3,460 +/- 100 BP (Rutherford et al. 1981:95).

In Montana, Pelican Lake material appears to be rare. At the King site in the Little Rocky Mountains in north-central Montana a single barbed specimen was found in the same layer as a Sandy Creek point (Brumley and Rennie 1999:69, fig. 18, nos. 2 and 3). The Keaster site, a multicomponent kill site in north-central Montana, may contain some Bracken points but few if any Pelican Lake points (see Davis and Stallcop 1965). Although the site report is brief and the recovery techniques complicated, the site may have Pelican Lake points in its earliest level. Level 1v produced points that appear to have narrow necks and barbed shoulders (i.e., Davis and Stallcop 1965:11, plate 3, nos. 102 and 103; plate 5, no. 104). Better illustrations or firsthand comparisons would be necessary to confirm this suggestion. Surface finds of Pelican Lake points appear to have been recovered near Fort Benton (Shumate 1984:20, fig. 3i–r). The rarity of Pelican Lake material in Montana may be due to the presence of the Yonkee complex (ca. 2,900–2,100 BP), which has been found as far north as the Bears Paw Mountains.

Kooyman (2000b:122) suggested the Yonkee cultural manifestation was an in situ development from McKean in the Powder River Basin. As suggested previously, the relatively unique Yonkee point style possibly deriving from the late Oxbow phase that appears to linger in southern Alberta and central Montana until ca. 3,500 to 3,000 BP (see Oxbow, above).

In summary, the Pelican Lake complex has a strong presence on the plains of Alberta, Saskatchewan, and Manitoba. As early as 3,600 BP the complex is found across the plains of the Prairie Provinces and likely into northern Montana. Based on the stratigraphic sequence at the Cactus Flower site, Reeves (1983a:7) argued that there were basic technological continuities within tool types and technology between McKean and Pelican Lake material, suggesting a cultural link. In contrast, Brumley (1975:73) noted that the Pelican Lake assemblage at Cactus Flower was largely chipped stone tools while the McKean-Duncan-Hanna assemblages exhibited pecked, ground, miscellaneous stone, antler, and shell tools. Both Reeves and Brumley were cautious in their assessments. Reeves (1983a:7) recommended further assessment of the data before accepting the Hanna-Pelican Lake cultural link. Similarly, Brumley (1975:73) indicated that the perceived differences between Hanna and Pelican Lake at the Cactus Flower site might be a result of sampling rather than actual cultural differences.
The current evidence would suggest McKean and Pelican Lake are unrelated cultural phenomenon. The range of features found in McKean sites is not apparent in Pelican Lake sites. The presence of ground stone and bone technology in McKean sites is absent in Pelican Lake sites. Ambush bison hunting practices used by McKean people are not found for the Pelican Lake complex; the latter utilizes stalking as the predominate form of bison procurement. The Pelican Lake point is technologically divergent from the Hanna form. It appears to be functionally designed to penetrate animal hides and, once imbedded, the barbs are designed to keep it inside the target. Thus, the prey’s own movements agitate the imbedded point to continue to cut the animal apart, causing increased bleeding. This design would be implemented among hunters stalking solitary prey that was prone to flight once wounded. Such barbed points would not be required by people operating a pound, as these animals are contained and would not require tracking once injured. McKean-Duncan-Hanna points are all lanceolate points designed more for piercing. Such points are expected for hunters using blinds and ambushes where prey has less opportunity to escape at natural traps. The craftsmanship of the Pelican Lake point further suggests something different was happening: Pelican Lake points are relatively well crafted with good flaking, while the same cannot be said for most McKean points. Thus, technologically the barbed Pelican Lake points appear to reflect a different level of manufacture as well as hunting strategy.

The suite of lithic tools between McKean and Pelican Lake are relatively similar. Raw material use does tend to be more far-ranging for Pelican Lake complex compared to McKean-Duncan-Hanna complex. Pelican Lake assemblages exhibit Knife River flint and Rocky Mountain sources whereas the McKean-Duncan-Hanna does not. In addition, the Pelican Lake complex exhibits a stone circle camp while the McKean complex produced circular debris distributions, but nothing that was clearly indicative of a shelter. Of course, this difference might be attributed to season, a modest technological innovation, or archaeological sampling.

The craftsmanship and technological changes suggest the Pelican Lake complex is intrusive. As Dyck (1983:107) points out, however, the commonness of corner-notched points at this time makes pinpointing an origin for the Pelican Lake complex difficult. Still, the improved craftsmanship and the apparent trend toward solitary stalking of prey suggest an origin to the east where these practices were previously in place.
With regard to the fate of the people of the Pelican Lake complex, there are many lines of evidence to suggest they continued to culturally evolve, with innovations into the Bracken phase. Much of the tool kit remains the same, as do lithic raw material use patterns. Importantly, the corner-notched point loses its barbed shoulders in the Bracken phase. At the same time, jumping and impounding of bison begins to be significant. From this time forward, this technique is used continuously. Previous use of jumps occurred in earlier time periods but their use was episodic (i.e., Maple Leaf, Calderwood complex). The lack of barbed shoulders in the Bracken points likely reflects the increasing obsolescence of stalking of solitary prey. In contrast, bison that are impounded have limited chances of escape. Any dart piercing internal organs will eventually produce the animal’s demise within the pound. Barbed points that continue to cut at the animal, slowing it down and leaving a trail of blood to follow, would not be needed by a society that impounded bison such as that of the Bracken phase. Aside from the innovation of bison jumps and impounding, the Pelican Lake complex and the Bracken phase appear to be culturally similar.

-Outlook Complex (ca. 2,500 BP)

While working within the highly stratified deposits at Head-Smashed-In Buffalo Jump, Reeves (1978:164, 172, fig. 17.22; Reeves 1983:98) noted Besant points within the productive Pelican Lake (i.e., Bracken) bone layers. Based on other dated layers within the bone bed, he estimated the age of the layers with the Besant points to be ca. 2,500 BP (Reeves 1978:172, fig. 17.22). These points had notches low on the lateral margins and straight-to-slightly indented bases, all manufactured on Knife River flint. By designating these early points as Besant, he was clearly suggesting cultural continuity with the Besant phase that traditionally begins much later at ca. 2,000 BP. Reeves (1983:14) has, however, labelled the Sandy Creek complex as a likely progenitor of the Besant phase. It could not be discerned whether Reeves considered the Head-Smashed-In Buffalo Jump Besant points (ca. 2,500 BP) to be Sandy Creek points.

At the Sjovold site along the South Saskatchewan River in southern Saskatchewan, relatively lanceolate-shaped points with shallow side-notched and straight-to-slightly concave bases were recovered in Layer xiv. The materials from the layer produced a radiocarbon date of 2,580 +/- 85 BP (S-2060) (Dyck 1983:207–108; Dyck and Morlan 1995:446). Noting the similarity to Reeves’ (1978) Besant points at Head-Smashed-In Buffalo Jump, Dyck
labelled the group of materials the Un-named complex (Dyck 1983:107–108). He suggested the material might represent an expanding population of Early Woodland people from Minnesota, Illinois, and/or Ohio, whose population base increased in size at about 2,500 BP (Dyck 1983:108).

Subsequently, the Sjovold projectile points from Layer xiv have been labelled Outlook side-notched points after the nearby Saskatchewan town of the same name (Dyck and Morlan 1995:425). Dyck and Morlan (1995:425) maintained that the point style is an early manifestation of the Besant point, exhibiting a relatively straight base and side notches; they also consider Outlook side-notched points to be arrow tips, not dart tips. They argued that the Outlook material represents an influence from the eastern and central edges of the plains, despite its lack of ceramics (Dyck and Morlan 1995:446).

Elongate points made of Knife River flint have also been recovered at the Fincastle (DIOx 5) site in south-central Alberta (Bubel 2007; Varsakis and Peck 2005). These points were recovered in a bone bed and date to roughly 2,500 BP. Varsakis and Peck (2005) argued that the Fincastle assemblage strongly resembled assemblages from Sjovold (xiv), Head-Smashed-In Buffalo Jump, and the Happy Valley site. Subsequently, a comparison of the Fincastle site materials to a broader range of sites led Varsakis (2006) to note that, during this period, there were long points manufactured from Knife River flint (i.e., Fincastle, Muhlbach, Smith-Swainson), and shorter side-notched points often co-occurring with Pelican Lake points (i.e., EbPi 63, EgPn 111, Kenney). Following Joyes (1984) and Duke (1991), Varsakis (2006) proposed that the Besant phase be divided minimally into three subphases: Sonota subphase, Kenney subphase, and Fincastle subphase. Importantly, the Fincastle subphase may represent an early manifestation of the Sonota subphase. She argued that the Fincastle subphase came from the Dakotas on to the Northern Plains for trading purposes with the people of the Kenney subphase. Later, this trade continued but with the Sonota subphase. In Varsakis’ (2006) model the term Outlook was not used to represent any of this material.

The Sites
In order to assess the various lines of thinking presented above, Outlook assemblages from Alberta with solid radiocarbon dates are outlined below. These sites are used to critically evaluate the current view of the Outlook complex (see Plate 19 and Figure 20).
PLATE 19
Outlook points. Illustrated are projectile points from the Fincastle Kill site (DIOx 5) (a–o); Head-Smashed-In Buffalo Jump (DkPj 3) (p and q); and EgPn 290 (r–w). Photo credit: Alberta Culture and Community Spirit (a–o, r–w); Royal Alberta Museum (p and q).
Figure 2.0
Outlook sites within Alberta
Fincastle Kill site (DIOx 5). The Fincastle site is a single-component bison kill site in a stable dune complex a few kilometres north of Purple Springs and south of the Oldman River (Bubel 2007). The site was named for the nearby town of the same name. In 2004, 2006, and 2007 the University of Lethbridge conducted field schools at the site, while a total of 76 m² has been excavated. The field school project was initiated, in part, as a response to vandalism at the site.

Seventy-two complete and/or fragmentary points were recovered in association with five features in a bison bone bed (Varsakis 2006). Other lithics included several end scrapers and debitage. The vast majority of the lithic raw material was Knife River flint, although some Swan River chert was recovered (Varsakis 2006:99). The features included a small hearth and four bone uprights made of bison bone (Varsakis 2006:100–106). Scattered fa br was recovered throughout the bone bed (Varsakis 2006:100). The faunal assemblage consisted of large amounts of bison and some canid bone. Two radiometric dates of roughly 2,500 BP were obtained for the site (see Table 18).

<table>
<thead>
<tr>
<th>Site [LAB NO.]</th>
<th>Conventional ¹⁴C Age</th>
<th>¹³C/¹²C Ratio</th>
<th>Material</th>
<th>Calibration</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>EgPn 290 [RL-1657]</td>
<td>2440 +/- 120</td>
<td>-20.0‰</td>
<td>collagen</td>
<td>850–350 B.C. (p = 0.915) 300–200 B.C. (p = 0.039)</td>
<td>Shortt 1993:41–43; Morlan n.d.</td>
</tr>
<tr>
<td>EgPn 290 [BETA-51285]</td>
<td>2350 +/- 80</td>
<td>-20.0‰</td>
<td>collagen</td>
<td>800–200 B.C. (p = 0.954)</td>
<td>Shortt 1993:41–43; Morlan n.d.</td>
</tr>
<tr>
<td>EgPn 290 [RL-1658]</td>
<td>2450 +/- 120</td>
<td>-20.0‰</td>
<td>collagen</td>
<td>850–350 B.C. (p = 0.926) 300–200 B.C. (p = 0.020)</td>
<td>Shortt 1993:41–43; Morlan n.d.</td>
</tr>
</tbody>
</table>

Happy Valley (EgPn 290). The Happy Valley site is a single-component bison kill site on the south side of the Bow River below Canada Olympic Park (Shortt 1993). The site appears to be named for the Happy Valley Trailer Park, which formerly occupied the location. A total of 39.25 m² was excavated at the site (Shortt 1993:13–15), which was mitigated prior to the development of a golf/residential complex.
Thirteen projectile points and point fragments were recovered from the bone bed, including Besant side-notched \((n = 3)\), Pinched Creek corner-notched \((n = 2)\), Pelican Lake corner-notched \((n = 1)\), and unidentifiable fragments \((n = 7)\). These specimens fall within the range of variation described above for Outlook side-notched points and for those recovered at the Fincastle site. Other tools recovered included bifaces \((n = 3)\), retouched flakes \((n = 11)\), choppers \((n = 2)\), flake choppers \((n = 4)\), cobble spalls \((n = 5)\), and a hammerstone \((\text{Shortt } 1993:43–57)\). Quartzite \((46\%)\) was the most common raw material, followed by chert \((16\%)\), Knife River flint \((16\%)\), siltstone \((11\%)\), obsidian \((5\%)\), and others \((5\%)\) \((\text{Shortt } 1993:44)\). A number of bone tools for heavier carcass segmentation and processing were recovered. Distal humeri \((n = 4)\), posterior humeri \((n = 2)\), a distal radius, proximal radius \((n = 2)\), and distal tibia \((n = 2)\) had shafts shaped for cleaving meat, but little polish was discernable \((\text{Shortt } 1993:59–60)\).

The faunal assemblage \((n = 38,826)\) was mostly bison, but non-bison \((n = 43)\) elements, including small and large canid, that exhibited signs of butchering were identified \((\text{Shortt } 1993:63–64)\). An MN\(I\) of thirty-one bison was established based on the calcaneum. No fetal bone was recovered \((\text{Shortt } 1993:192)\). Three radiocarbon dates were obtained from the bone bed, suggesting an age of ca. 2,400 BP \((\text{Shortt } 1993:41–43)\). The site represents an Outlook bison kill and processing site.

**Head-Smashed-In Buffalo Jump (DkPj 1).** As mentioned above, Reeves \((1983a:98)\) noted Besant-like projectile points within Pelican Lake \((\text{i.e., Bracken})\) layers in his excavations at Head-Smashed-In Buffalo Jump. “The three Besant Side Notched points from the Pelican Lake phase components . . . have wider notches, longer stems and broader necks than is usual. They probably predate Besant occupation of southwestern Alberta by 500 years” \((\text{Reeves } 1983a:98)\). Although only three specimens were recovered, they exhibit a lanceolate form, slightly concave base, and wide-shallow side notch. It is also important to note that all three specimens were manufactured on Knife River flint \((\text{Reeves } 1978:172, \text{fig. } 17.22)\). These points are Outlook points in both age and morphology.

**Other sites.** Few other sites exhibit Outlook-like point specimens in Alberta. One possible exception is the Stampede \((\text{DjOn 26})\) site in the Cypress Hills. It produced a single brown chalcedony projectile point in Cultural Level 2. The specimen was classified as a large Samantha variety of Besant.
point but radiocarbon dates were not obtained (Gryba 1975:92–93). Little material was associated with this cultural level. The recovered point could be an Outlook point or a Sonota point (see Sonota phase below).

Outlook: The First Wave of Middle Missouri Invaders

Large dart points made on Knife River flint dating to approximately 2,500 BP have been repeatedly interpreted as antecedents to Besant (Dyck and Morlan 1995; Reeves 1983a; Shortt 1993; Varsakis 2006). Yet no known assemblage or assemblages bridge the temporal gap between the Knife River flint darts at 2,500 BP and the Besant phase at ca. 2,000 BP. It seems more reasonable for the material to stand on its own until more data can be brought to bear on the origin and demise of the Outlook complex. Dyck and Morlan (1995) provided the first name, other than Besant, for this material. The term Outlook is retained to refer to both the distinctive large Knife River flint dart points and to the related archaeological complex.

The Outlook point exhibits a range of variability but tends to be slightly elongate, wide-necked, straight- to concave-based points made on Knife River flint with side-notches low on the lateral margins (Reeves 1983a:31–33, fig. 17.22; Shortt 1993:48–49, fig. 13; Varsakis 2006). Few other tools have been recovered at sites of this type in Alberta. Varsakis (2006) noted some end scrapers while Reeves (1983a) only noted points. Shortt (1993), on the other hand, noted bifaces, retouched flakes, choppers, flake choppers, cobble spalls, a hammerstone, and some bone segmentation tools for chopping carcasses. The lithic raw material at these sites contains a large amount of Knife River flint. Although it is not always the dominant raw material, it occurs in unusual amounts relative to other periods in Alberta’s past.

In terms of features, a small hearth and four bone uprights were uncovered at the Fincastle site. No other features were noted at the other sites. Importantly, the Outlook components at the Fincastle site, the Happy Valley site, and Head-Smashed-In Buffalo Jump are all bison kill sites. The processing of the bison appears to have been geared toward drying meat and obtaining hides, since little FBK, few hearths, and no pits have been recovered at these sites. Still, given the small sample size of sites, this observation might simply mean that such an aspect of Outlook processing has not been exposed yet. The apparent emphasis on bison kill sites might also be a product of visibility and sampling.

As noted above, an Outlook site is also known from Saskatchewan. The Sjovold site (EiNs 4) is a highly stratified site on the South Saskatchewan
River near the town of Outlook. Layer xiv produced two hearths surrounded by bone and chipped stone. Nine projectile points were recovered. These points are elongate specimens with straight-to-slightly concave bases and notches low on the lateral margins. Dyck and Morlan (1995:436) presented metric measurements to suggest the points are arrows rather than darts. The neck widths range from 11 to 13 mm. Neck widths greater than 10 mm tend to be interpreted as dart points rather than arrow points; these points are interpreted here as falling within the range of atlatl and dart technology rather than bow and arrow technology. Dyck and Morlan (1995:437) argued that the prevalent use of Knife River flint in the projectile points and tools suggested a tie to the Besant phase. More appropriately, the abnormal occurrence of Knife River flint demarks ties to North Dakota and begs explanations of quarrying expeditions by Outlook peoples to North Dakota, exchange networks between Outlook peoples and those in North Dakota, or an origin of Outlook people in North Dakota.

In North Dakota, there are few known sites from this period. The Naze site (32sn246) is a multicomponent site with an Early Plains Woodland component underlying a Sonota Component (i.e., Middle Plains Woodland) and a Plains Village/Protohistoric Component (Gregg 1987). Five radiocarbon dates were obtained for the Early Plains Woodland level: 2,472 +/- 45 BP (SMU-1759); 2,448 +/- 44 BP (SMU-1760); 2,388 +/- 44 BP (SMU 1761); 2,440 +/- 70 BP (Beta-14746); and 2,780 +/- 80 BP (Beta-14745) (Gregg 1987:74). The Early Plains Woodland component produced forty-four tools of which five were projectile points. Four of the points were corner notched while the fifth had low side notches, a relatively wide neck, and a straight base (Gregg 1987:258, fig. 8.2a–e). The latter is not unlike the Outlook points found in the study area. The researcher considered the recovered points to be Besant and Pelican Lake points (Gregg 1987:442). Eighteen of the tools were manufactured on Knife River flint, with Swan River chert and basalt also common (Gregg 1987:255). A structure with footing trenches and central supports stood at the location. Four cord-roughened ceramic sherds exhibiting punctates were also recovered at the site (Gregg 1987:441). The fauna was dominated by bison, but elk, coyote or dog, beaver, and possibly wolf were present (Gregg 1987:443). The material was not assigned to any specifically named archaeological culture other than the Early Plains Woodland period (Gregg 1987:443). Importantly, Gregg (1987:443) considered the Sonota phase an in situ development out of this earlier yet-to-be named phenomenon.
The Outlook material in Alberta and Saskatchewan likely has links to this cultural phenomenon. They are coeval and some of the point forms are similar. The use of Knife River flint is prevalent in the archaeological assemblages from both areas. Within the Alberta and Saskatchewan sites, the predominance of bison kill sites and Knife River flint in the toolstone may suggest an intrusive group entering into the Northern Plains with a specific procurement pattern. For example, Early Plains Woodland people exhibiting a semi-sedentary lifestyle in North Dakota could have been frequenting the Northern Plains with the purpose of procuring bison for trade to neighbours further east. This would explain the large number of Outlook kill sites, a paucity of campsites, and the reliance on Knife River flint. Also important is that the Outlook material appears to have been deposited during the tenure of the Bracken phase. These Early Plains Woodland peoples may be invited guests or intruders on the Northern Plains.

The Outlook complex is dated to ca. 2,500 BP. It seems to be a very brief utilization of the Northern Plains. All the dates for the various sites in Alberta and Saskatchewan fall within a few decades of ca. 2,500 BP. By ca. 2,000 BP, the Sonota phase frequented the Northern Plains in a very similar fashion as the Outlook complex had 500 years earlier. The Sonota phase is characterized by large lanceolate points that are often found in bison kill sites. Currently, it is difficult to differentiate these specimens without an associated radiocarbon date. This difficulty is likely due to a common cultural background within North Dakota that bridges the 500 years over which the two cultures are absent from the Northern Plains.

The sudden appearance and then disappearance of the Outlook complex is difficult to explain. Development and growth of cultures in the east appears to have been constant. A decline in trade does not seem to be a reasonable answer. One possibility is the more firm protection of the Northern Plains by the occupying Bracken phase. At roughly this period, the Bracken phase commenced bison jumping and pounding, a hunting technique that had not been systematically applied until then. Associated with this subsistence shift is the first evidence of large social groups cohabitating. Until this time period, campsites had been small, suggesting no more than a few families together. The Bracken phase exhibits stone circle camps, suggesting tipi camps of as many as fifteen to eighteen families (or more than a hundred people). Such larger communities are in a better position to defend themselves from unwanted intruders.
The Sandy Creek culture was defined based on materials recovered at the Mortlach site (Wettlaufer 1955:50–53). The distinctive Sandy Creek projectile point is described as “having shallow side notches and an indented base forming ‘lugs’ or ‘ears’” (Wettlaufer 1955:49). Further, these specimens are “short, thick, rather misshapen points... characterised by shallow notches and slightly indented bases” (Wettlaufer 1955:52). Additional artifacts of the Sandy Creek culture include plano-convex scrapers and several bone tools (i.e., polished perforator/awl, bladed tanning tool) including evidence of bone tool manufacture by flaking bone (Wettlaufer 1955:50–51). The Sandy Creek culture at the Mortlach site stratigraphically underlies two Besant occupations (4A and 4B), and a Bracken occupation (4C), and overlies several Pelican Lake occupations (5B, 6, and 7) and a Hanna occupation (8). Level 4E, the level labelled by Wettlaufer as containing the Sandy Creek culture, produced a radiocarbon date of 2,400 +/- 173 BP (S-28) while the younger Sandy Creek level (4D) was not dated.

Dyck (1983:108–109) resurrected the Sandy Creek projectile point type to account for materials that resembled Oxbow projectile points that were recovered from sites dating hundreds of years too recent. In the Sandy Creek complex he included Levels 4D and E of the Mortlach site, Level 15b of the Walter Felt site dated to 2,430 +/- 90 BP (S-297), Level xii of the Sjovold site with a date of 2,435 +/- 105 BP (S-2059), the Heron site with dates of 2,280 +/- 65 BP and 2,330 +/- 70 BP, and Level 2 of the East Pasture site with no diagnostics but a date of 2,405 +/- 80 BP (S-639). For Manitoba, he included Component B of the Cherry Point site dated to 1,850 +/- 100 BP and 2,060 +/- 130 BP, and for British Columbia he suggested HaRk 1, a late Oxbow site dated to ca. 2,485 BP, was likely Sandy Creek (Dyck 1983:109).

Reeves (1983a:14) noted that Sandy Creek materials are interfingered between Pelican Lake materials at the Mortlach, Walter Felt, and Sjovold sites. He considered Sandy Creek projectile point technology to be transitional between late Oxbow and Besant side-notched owing to their squat form, low side notches, shallow offset v-shaped bases, and emphasis on local lithic raw materials (Reeves 1983a:14). Thus, the Sandy Creek complex emerged from the parkland, having developed out of the Oxbow phase, at the end of the Bracken phase, to become the Besant phase (Reeves 1983a:14).

More recently, Dyck has reversed his position on the Sandy Creek complex...
(Dyck and Morlan 1995:405). He indicated that "as the evidence from the Sjovold site unfolds we are beginning to question ever more strongly the idea that an archaeological complex, much less the looser series grouping, can be defined by a single point type" (Dyck and Morlan 1995:405). Thus, he no longer advocated classifying the projectile point from Level xii of the Sjovold site as Sandy Creek. Dyck and Morlan (1995:405) recommended classifying the point as Sandy Creek, a point type common within the Besant series or related materials through time.

Based on the recovery of in situ Sandy Creek material at the Aldon Plant site (EaOq 43) within Medicine Hat, Brumley (1995:17–18) argued for a slightly earlier appearance of the Sandy Creek complex. He obtained dates of 3,000 +/- 80 BP (AEcv 1569C) and 2,730 +/- 90 BP (AEcv 1570C) on material from the small bison jump or pound site (Brumley 1995:17). He suggested the Sandy Creek complex may begin as early as ca. 2,800 BP and terminate at ca. 1,950 BP (see also Dyck 1983:108–109). Another subtle observation was that Sandy Creek points are not so much Oxbow points “out-of-time” but are more similar to Besant in morphology. Brumley and Rennie (2005:18) included the Sandy Creek complex as intermediate between Oxbow and Besant within their Mondak tradition.

The Sites
In order to assess the various lines of thinking presented above, Sandy Creek assemblages from Alberta with reliable radiocarbon dates are outlined below. These sites are used to critically evaluate the current view of the Sandy Creek complex (see Plate 20 and Figure 21).

Aldon Plant Bison Kill (EaOq 43). The Aldon Plant site is a small bison kill located in a coulee bottom that joins to the South Saskatchewan, in the City of Medicine Hat. The site was test excavated in 1988. The site was determined to be 20–30 m wide and 100 m long. Modern cultivation
FIGURE 21
Sandy Creek sites within Alberta
had severely impacted the site. A series of Besant projectile points and a single Pelican Lake point were recovered from what appeared to be a single event kill. Brumley (1995:17) classified the Besant points as Sandy Creek points. Two radiocarbon dates of ca. 3,000 BP and 2,700 BP were obtained (Brumley 1995:17).

EgPn 666. EgPn 666 is a small temporary campsite on a terrace at the mouth of a main coulee that leads north to the Bow River (Vivian et al. 2003b:66). In 2002, 23 m² were excavated at the site, which was mitigated prior to a housing development.

Three projectile points were recovered from EgPn 666, including a Sandy Creek side-notched point and two unidentifiable point blades (Vivian et al. 2003b:68–69). Other tools recovered included a biface fragment, an end scraper, a wedge, a spoke shave, retouched flakes (n = 2), and a unidirectional core (Vivian et al. 2003b:69–71). The large number of tools and the late stage exhibited in the reduction of the debitage suggested winter retooling activity (Vivian et al. 2003b:72). An examination of the raw materials indicated that quartzite (44%) was most commonly used, followed by Knife River flint (14%), silicified siltstone (10%), white chalcedony (8%), Montana chert (8%), silicified sandstone (6%), Swan River chert (4%), Bowman chert (4%), and basalt (2%) (Vivian et al. 2003b:72, 115).

### Table 19: Radiocarbon dates for Sandy Creek sites (calibrated by OxCal 3.10 [Ramsey 2005])

<table>
<thead>
<tr>
<th>Site Lab No.</th>
<th>Conventional Age</th>
<th>$^{13}$C/$^{12}$C Ratio</th>
<th>Material</th>
<th>Calibration</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>EaOq 43</td>
<td>3000 +/- 80</td>
<td>-18.3‰</td>
<td>collagen</td>
<td>1430–1010 B.C. (p = 0.954)</td>
<td>Brumley 1995:17; Morlan n.d.</td>
</tr>
<tr>
<td>EaOq 43</td>
<td>2730 +/- 90</td>
<td>-17.9‰</td>
<td>collagen</td>
<td>1200–750 B.C. (p = 0.954)</td>
<td>Brumley 1995:17; Morlan n.d.</td>
</tr>
<tr>
<td>EgPn 666</td>
<td>2420 +/- 40</td>
<td>-19.0‰</td>
<td>collagen</td>
<td>760–680 B.C. (p = 0.178) 670–610 B.C. (p = 0.068) 600–390 B.C. (p = 0.708)</td>
<td>Vivian et al. 2003b</td>
</tr>
<tr>
<td>DjPl 1</td>
<td>2810 +/- 90</td>
<td>-18.6‰</td>
<td>collagen</td>
<td>1260–1230 B.C. (p = 0.011) 1220–800 B.C. (p = 0.943)</td>
<td>Ball 1987; Morlan n.d.</td>
</tr>
<tr>
<td>DjPl 1</td>
<td>3000 +/- 90</td>
<td>-18.2‰</td>
<td>collagen</td>
<td>1440–970 B.C. (p = 0.954)</td>
<td>Ball 1987; Morlan n.d.</td>
</tr>
</tbody>
</table>
The faunal assemblage (n=798) was very fragmentary and often burned. An MNI of two bison was established from a very small number of identifiable elements (Vivian et al. 2003b:72–73). The fauna exhibited a scatter of highly fragmented elements of low economic value. Two small oval open hearths and a boiling pit were also observed. The researchers suggested that the site represents a single household where bison were intensively butchered during a period of winter scarcity. A second household may also have been present, represented around the second hearth 12 m from the first hearth-pit processing area. A radiocarbon date of ca. 2,400 BP was obtained (see Table 19). This date falls within the range for the Sandy Creek complex. The morphology of the single complete projectile point from the site is not unlike points defined as Sandy Creek. The researchers classify it as such (Vivian et al. 2003b:68–69).

Other sites. Projectile points classifiable as Sandy Creek are very rare in Alberta. One site possibly exhibiting such a point is the Pincher Creek Buffalo Jump (DjPl 1) located north of Pincher Creek, just south of the Oldman River (Ball 1987:31). Excavations to determine the temporal extent of the site produced late side-notched points in the upper bone beds. Interestingly, a lower bone bed in Test Unit 1 produced two dates of 2,810 +/- 90 BP (AECV-0422c) and 3,000 +/- 90 BP (AECV-0418c). At the same time, test pits in stone circles adjacent to the jump produced a Sandy Creek-like point specimen (Ball 1987:22, fig. 22b). The large dart point exhibits the classic characteristics of Sandy Creek points, including a slightly concave base, ears, and shallow notches. It is also much larger than the other Late Prehistoric arrow points recovered at the site, as it has a neck width much greater than 10 mm.

Sandy Creek: Besant Beginnings?
The Sandy Creek complex is poorly known in Alberta and adjacent areas. The projectile points are relatively distinct, and are described as short, thick, and rather misshapen, with shallow side notches and indented bases forming lugs or ears. The consistency in point style and age is common enough to beg questions concerning the nature of this material. As noted above, Sandy Creek material has also been recovered outside of Alberta.

In Saskatchewan, the Mortlach site (EcNL 1) produced two levels with Sandy Creek points. Levels 4D and 4E both exhibit points with shallow side notches and indented bases forming lugs. These specimens are in stark
contrast to the overlying Besant material (4A–C) and the underlying Pelican Lake material (5A). Level 4E produced a date of ca. 2,400 BP while the overlying Sandy Creek level (4D) was not dated.

The Sjovold site (EiNs 4) produced a single Sandy Creek point and a tip fragment in Layer xii (Dyck and Morlan 1995:397, fig. 16.4e). The points were associated with hearths. Utilized lithic raw material showed a partiality for Knife River flint. While the point was acknowledged as Sandy Creek, the researchers explained they considered it just one in a range of point forms found in the Besant series, dating roughly from 2,500 to 1,500 BP. A radiocarbon date obtained from this level was 2,435 ± 105 BP (S-2059).

The Walter Felt site (EcMn 8) in south-central Saskatchewan produced two Sandy Creek points in Layer 15b (Kehoe 1974:107, fig. 4h, i). One specimen was missing an ear while the second specimen was simply a blade. Below this material were barbed Pelican Lake points in Layer 15d and above was Bracken material in Layer 15a. A radiocarbon date of 2,430 ± 90 BP (S-279) was obtained for Layer 15b (Kehoe 1974:111). Kehoe (1974:104) considered Sandy Creek to be a variety of the Pelican Lake point that immediately predates Besant. Dyck (1983; see also Morlan et al. 2002:29) also suggested the Heron site (EcNx 2) be considered a possible Sandy Creek site, owing to the presence of Oxbow-like points and radiocarbon dates of ca. 2,300 BP.

In Montana, at the King site in the Little Rocky Mountains in north-central Montana, a possible Sandy Creek point was found in the same level as Pelican Lake material (Brumley and Rennie 1999:69; fig. 18, no. 3.2). Brumley and Rennie (2005:18) stated that Sandy Creek points have not been found in excavated context in northern Montana, but are well represented in surface finds.

The Sandy Creek phenomenon is not well defined or understood. Initially defined as a discrete cultural phenomenon (Wettlaufer 1955), more recent investigators consider it the first point type in a series that make up the Besant series (Dyck and Morlan 1995). For the purpose of this review, the Sandy Creek point form and associated material seems too poorly understood to confidently associate it with another archaeological culture. Having stated that, the Sandy Creek material provides enough variability in form that it may fall within the dramatic range of variability exhibited by Bracken projectile points. Thus, there would be no justification for treating it as a separate unit. Clearly, further evidence needs to be brought to bear on the issue.
As noted earlier, the term Pelican Lake culture was applied by Wettlaufer (1955:54–57) to material at the Mortlach site. Level 5A produced corner-notched points with oval cross-sections and fine parallel or diagonal flaking that was widest just above the notches, with straight sides that taper to a point. Currently, the term Pelican Lake has become synonymous with corner-notched dart points (e.g., Gregg 1987:261). The important micro-stylistic variation captured in Wettlaufer’s (1955) description has been ignored. In this review, Wettlaufer’s original Pelican Lake material, dating to 3,500–2,800 BP and associated with points with barbed shoulders and narrow necks, is presented as culturally distinct from the corner-notched points and associated materials commonly referred to as Pelican Lake, which roughly date to between 2,800 and 2,000 BP. The former points exhibit less discrete shoulders and more convex bases than true Pelican Lake points. These subsequent less-descript corner-notched points are labelled Bracken points and are diagnostic of the Bracken phase.

Kehoe (1974) provided the term Bracken to be used with the Pelican Lake points in his system of large corner-notched points. He described the “Bracken shouldered, convex base variety” as having wide corner notches and straight shoulders, and a convex base that was ground like a Besant base (Kehoe 1974:111). Kehoe considered his Bracken Pelican Lake point to be a transitional form from Pelican Lake to Besant. He named it for the point style recovered from the Bracken Cairn site (see E. Walker 1982). The distinction between the Pelican Lake material and the Bracken material, however, goes beyond subtle projectile point morphological changes over time. There are major changes in cultural phenomenon that suggest that the two phases may be culturally unrelated.

Wettlaufer’s (1955) Pelican Lake culture at the Mortlach site was not radiometrically dated, but it stratigraphically underlay a Sandy Creek component dated to ca. 2,500 BP. Wettlaufer and Mayer-Oakes (1960) later applied the term to Level 4 of the Long Creek site, dated to ca. 2,300 BP. The main difference noted between the specimens from Mortlach and Long Creek was that the former had convex bases and the latter had straighter bases (Wettlaufer and Mayer-Oakes 1960:108). Despite the relatively late date for the Long Creek material, these two sites are examples of true Pelican Lake sites. Perhaps the apparently aberrant late date is part of the reason for the failure to recognize the distinction between barbed Pelican Lake points and later corner-notched points in the literature.
In 1965, Wormington and Forbis (1965:192) acknowledged the presence of Pelican Lake material on a large part of the Northern Plains. They realized that sites such as Keaster indicated large bison pounds were being used, although large Pelican Lake jumps were yet to be discovered. They attributed bison jumps to Besant (Wormington and Forbis 1965:192).

In 1969, Reeves (1969, 1983a) proposed the name Pelican Lake phase, based on Wettlaufer’s (1955) Pelican Lake culture at the Mortlach site. The diagnostic point type was named Pelican Lake corner-notched. He divided the area with known Pelican Lake corner-notched points into eight regional subphases (see Pelican Lake complex above). Unfortunately, the micro-stylistic variability within the projectile points that helped distinguish the subphases in Reeves’ (1969, 1983a) classification of Pelican Lake has rarely been applied in practice. Dyck (1983:105) recognized two basic varieties of Pelican Lake points but lumped them under the Pelican Lake complex, which he dated to ca. 3,300–1,850 BP. Following Reeves (1969, 1983a), Vickers (1986:76–81) considered Pelican Lake to appear on the plains about 3,300 BP and last until about 2,000 BP. As noted earlier, while Reeves (1983a) suggested Pelican Lake was the antecedent to Avonlea, Vickers (1986:80) used Reeves’ own data to suggest Pelican Lake lithic assemblages exhibit more in common with Besant lithic assemblages than they do with Avonlea lithic assemblages.

The Sites

In order to assess the various lines of thinking presented above, Pelican Lake assemblages from Alberta with reliable radiocarbon dates are outlined below. The barbed Pelican Lake material, dated to between ca. 3,600 and 2,800, will be left out of this discussion despite having been lumped together in most previous models of Pelican Lake materials. Only Pelican Lake sites exhibiting corner-notched points with obtuse shoulders and wide necks from contexts dated between ca. 2,800 and 2,100 BP are examined (see Plate 21 and Figure 22).

**Highwood River (EePk 272).** The Highwood River site is a secondary interment on the prairie level of the highest local crest overlooking the Highwood River valley (Brink and Baldwin 1988). The site is located southeast of Calgary about 4 km above the Highwood River’s confluence with the Bow River. Ploughing, erosion, and collecting had disturbed the site, but a tightly grouped surface exposure of human bone and associated
PLATE 21
Bracken points.
Illustrated are projectile points from the Smythe site (DjPm 116) (a–j); EgPn 362 (k–n); DjPf83 (o); (Old) Women’s Buffalo Jump (EcPl 1) (p–r); the Cattle Baron site (EcPn 2) (s and w); the Highwood site (EePc 272) (t); DjPm 114 (u and v); and EgPn 598 (x–z).
Photo credit: Alberta Culture and Community Spirit.
FIGURE 2.2
Bracken sites within Alberta
grave goods were observed (Brink and Baldwin 1988:112). The surface sand and artifacts were stained a deep red colour and this stain continued to a depth of 35 cm bs (Brink and Baldwin 1988:112). The original burial pit appeared to have been an oval, red ochre stained area about 1.5 m long east–west and 0.8 m north–south. The original depth of the burial or whether it was capped with rock could not be determined (Brink and Baldwin 1988:113). About 15 percent of the artifacts were recovered in situ.

The recovered skeletal material suggested that two individuals were present (Brink and Baldwin 1988:114). These appear to have been children, one perhaps ten years of age, whose bodies were defleshed in open air, perhaps on a scaffold. It is unclear if elements of one individual, represented by only a few bones, were inadvertently or intentionally included in the interment (Brink and Baldwin 1988:114–119). Items confidently recovered in association with the burial include three lithics (i.e., a Pelican Lake point, a retouched flake, and a chert core), one piece of native copper, perforated shell beads (n = 4), a gastropod shell bead, Dentalium shell beads (n = 2), pieces of unworked bivalve shell (n = 3), perforated grizzly bear claws (n = 11), and drilled bison incisors and canines (n = 66). A primary quartzite flake, a piece of shatter, and an fbr fragment were observed in close proximity to the burial but could not be confidently associated with the burial (Brink and Baldwin 1988:119). A single radiocarbon date of ca. 2,800 BP (see Table 20) was obtained for the interment (Brink and Baldwin 1988:125; Morlan n.d.).

Head-Smashed-In Buffalo Jump (DjPk 1). Head-Smashed-In Buffalo Jump is discussed in the previous section on the Calderwood complex. Bracken material was recovered by Reeves (1978) from numerous levels in both his north and south kill excavations (Reeves originally called all this material Pelican Lake). The Bracken points exhibit the slightly convex base, the obtuse to very mildly barbed shoulders, and the open corner notches (Reeves 1978:172, fig. 17.22, nos. 8–30). Two dates were obtained from the initial layers of the Pelican Lake (i.e., Bracken) layers: 3,100 BP and 2,770 BP (Table 20). The former date was analyzed from a laboratory that is not considered reliable (Blakeslee 1994). The remaining date suggests that Bracken phase bison jumping at Head-Smashed-In Buffalo Jump began about 2,800 BP. A terminal Bracken phase date of ca. 2000 BP was obtained near the top of the Pelican Lake (i.e., Bracken) deposits (Table 20).
<table>
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<tr>
<th>Site</th>
<th>Conventional $^{14}$C Age</th>
<th>$^{13}$C/$^{12}$C Ratio</th>
<th>Material</th>
<th>Calibration</th>
<th>Reference</th>
</tr>
</thead>
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<td>EePk 272</td>
<td>2825 +/- 95</td>
<td>-19.0‰</td>
<td>collagen</td>
<td>1260–800 B.C. (p = 0.954)</td>
<td>Brink and Baldwin 1988:125; Morlan n.d.</td>
</tr>
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<td>DkPj 1</td>
<td>2770 +/- 90</td>
<td>-20.0‰</td>
<td>collagen</td>
<td>1210–790 B.C. (p = 0.954)</td>
<td>Reeves 1990:162; Morlan n.d.</td>
</tr>
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<td>?</td>
<td>collagen</td>
<td>rejected</td>
<td>Reeves 1990:162; Morlan n.d.</td>
</tr>
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<td>2005 +/- 80</td>
<td>-20.0‰</td>
<td>collagen</td>
<td>250 B.C.–A.D. 250 (p = 0.954)</td>
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</tr>
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<td>2630 +/- 80</td>
<td>21.5‰</td>
<td>bone</td>
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<td>Brewer et al. 1995:171</td>
</tr>
<tr>
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<td>bone</td>
<td>810–480 B.C. (p = 0.888) 470–410 B.C. (p = 0.066)</td>
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</tr>
<tr>
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<td>charcoal</td>
<td>1200–100 B.C. (p = 0.954)</td>
<td>Fedje 1986:52</td>
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<td>2805 +/- 130</td>
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<td>EcPn 2</td>
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<td>900–350 B.C. (p = 0.954)</td>
<td>Morlan n.d.</td>
</tr>
<tr>
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<td>950–100 B.C. (p = 0.954)</td>
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</tr>
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<td>charcoal</td>
<td>950–350 B.C. (p = 0.954)</td>
<td>Van Dyke 1982:230; Morlan n.d.</td>
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<td>Ronaghan and Landals 1983:54</td>
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<td>800–350 B.C. (p = 0.911) 300–200 B.C. (p = 0.043)</td>
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<td>EgPn 598</td>
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<td>collagen</td>
<td>750–650 B.C. (p = 0.014) 550–150 B.C. (p = 0.94)</td>
<td>Vivian et al. 2003:233</td>
</tr>
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<td>400 B.C.–A.D. 1 (p = 0.954)</td>
<td>Marshall 1988:60; Morlan n.d.</td>
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<td>-24.3‰</td>
<td>collagen</td>
<td>160–130 B.C. (p = 0.01) 120 B.C.–A.D. 340 (p = 0.944)</td>
<td>Marshall 1988:6; Morlan n.d.</td>
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<td>Material</td>
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<td>Collagen Age ± Error</td>
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**Table 20 (continued)**
Smythe (DkJm 116). The Smythe site is multicomponent bison jump site in the Oldman River Dam area. Named after the landowners, the site was formerly on a low terrace on the south side of the Crowsnest River, just upstream from its confluence with the North Fork of the Oldman River (Landals 1993:69). A bone bed, processing area, and campsite were identified. Campsite remains were in the west on a mid-level terrace, while kill deposits and processing area were located in the east at the toe of the slope (Landals 1993:69). The site was excavated between 1988 and 1990. A total of 276 m³, in thirteen different blocks (labelled A through M), was excavated (Landals 1993:75). Discrete events were not discernable.

One hundred forty Bracken points were recovered in association with numerous kill, processing, and campsite deposits (Landals 1993:75). Although some of the points exhibited morphological affinities to Besant or Sandy Creek, Landals (1993:221) noted that they were recovered immediately adjacent to unmistakable corner-notched points. Other tools recovered included bifaces (n=29), end scrapers (n=35), marginally retouched tools (n=35), and cores (n=11). Lithic debitage (n=1,072) was also recovered. Many lithic raw materials came from the west, including Kootenay argillite, Top-of-the-World chert, and Etherington chert. The faunal assemblage consisted of numerous bones or bone fragments (n=227,157). The minimum number of bison killed at the jump was estimated at 1,200 to 1,600 animals (Landals 1993:219). An analysis of sex indicated comparable numbers of male and female bison. The researchers suggested that a late summer event during the rut was likely (Landals 1993:215).

Nineteen radiocarbon dates suggested the major period of use of the site was between 2,800 and 2,200 BP. The earliest date is ca. 3,000 BP (AECV-345C) and the most recent is ca. 2,000 BP (AECV-347C). One sample (AECV-342C) produced a date that was modern, while a second sample failed to produce a date; these samples were rejected.

Calderwood Buffalo Jump (DkJp 27). The Calderwood Buffalo Jump is a bison jump and kill site located on the southeastern edge of the Porcupine Hills about 20 km west of Fort Macleod (Marshall 1988). Head-Smashed-In Buffalo Jump is about 1 km south of the site, sharing the same sandstone outcrop of the Porcupine Hills (Brink et al. 1987:60; Marshall 1988). The Calderwood site was named after the landowners (Marshall 1988:42). Preliminary tests of two 1-m² units were conducted in 1985. In 1986, six 1-m² units were placed along a north–south baseline to determine
the placement of fifteen contiguous 1-m² units (Brink et al. 1987:63; Marshall 1988:43–48). Deposits at the base of the jump consisted of four bone layers; the lower three were heavily burned, and separated by layers of sandy silt (Brink et al. 1987:66). Examples of Bracken points were recovered in Levels vi (n = 3) and v (n = 7). Level vi was interpreted as a sterile level, but Level v was a bone bed with dates of ca. 1,900 BP and 2,200 BP (Table 20). Initial analysis suggested that the site was used at least four times as a bison jump (Brink et al. 1987:75). In contrast, soil chemical tests suggested that the site may reflect a more continuous rather than episodic use (Dormaar and Beaudoin 1991).

**Second Lake** (EhPv 58). The Second Lake site was briefly described above in the section on the McKean complex. Occupation 4 was a campsite assemblage. Four Bracken projectile points were associated with a hearth and a small cultural assemblage of about one hundred artifacts (Fedje 1986:51). The faunal assemblage included bison, goat, and sheep (Fedje 1986:51). A slab-lined hearth produced charcoal. Two dates of ca. 2,800 BP and 2,500 BP were obtained for the site (Table 20). The mean date was 2,735 +/- 110 BP (Fedje 1986:53). The disparate dates may be explained by independent occupations on a stable land surface.

**Cattle Baron** (EcPn 2). The Cattle Baron site is a campsite on a terrace above Pekisko Creek, located a few kilometres south of Longview (Wilson 1977:32). The site name is stated to reflect, “the pride of southern Albertans in their ranching heritage, and the rich history of large-scale ranching in the foothills west of High River” (Wilson 1977:32). A total of 21 m² was excavated in 1975. The site was excavated to mitigate road construction (Wilson 1977:1–3).

Eight Bracken points/point fragments were recovered. Importantly, a careful analysis led the excavator to horizontally differentiate a Pelican Lake (i.e., Bracken) component from an Old Women’s component (Wilson 1977:62–90). The Bracken points appeared to be associated with five FBR concentrations; three FBR concentrations are associated with shallow basins and two are associated with post-moulds (Wilson 1977:90–93). A single radiocarbon date of ca. 2,500 BP was obtained for bone associated with the Bracken material supporting the interpretation (Brumley and Rushworth 1983).
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Boyd (EdPn 8). The Boyd site is a stone circle site located on a very high terrace on the north edge of the Highwood River valley just south of Longview (Wilson 1977:250). The site was named for the landowners (Wilson 1977:250). In 1975, 30 m² of excavation were conducted (Wilson 1977:252). The site was mitigated for highway construction.

Stone Circle 1 contained a slightly off-center concentration of FBR and a subtle soil stain, suggesting a small hearth. A second FBR concentration along the southwest wall appears to have been a dump. A single point body fragment of Knife River flint was recovered from the FBR dump pile. A rib fragment was also recovered. Stone Circle 2 had a central FBR cluster with slight staining, suggesting a hearth. A second FBR cluster just outside the circle to the north suggested a second hearth while two remaining FBR clusters were associated with the stone circle walls. A single fragmentary Bracken point was recovered (Wilson 1977:269). Stone Circle 3 contained a scatter of FBR but no concentrations suggesting any features (Wilson 1977:270).

The researcher suggested the spacing of the stone circles, lack of “ring rock cannibalism,” and the light scattering of artifacts support a single occupation (Wilson 1977:275). A single radiocarbon date of ca. 2,400 BP (Table 20) supports a Bracken occupation (Brumley and Rushworth 1983).

EbPk 19. EbPk 19 is a stratified campsite next to a spring-fed stream in a tributary coulee on the west side of Pine Coulee (Brewer et al. 1995:142). A total of 21 m² of test excavation units were placed at the site. Ultimately, the site was not impacted by the Pine Coulee Reservoir and work beyond the testing phase was not conducted. In Test Unit 8, six cultural occupations were observed. Occupation 4 (120–150 cm bs) produced 980 artifacts within a 1-x-2 m area. A corner-notched point base was recovered along with two cores and twenty-three pieces of lithic debitage. As well, 954 bone fragments were recovered from this occupation. Most of the faunal assemblage was recovered from a small, irregularly shaped hearth feature. The hearth was about 25 cm north–south by 20 cm east–west. It contained FBR (n = 10), concentrations of burned and calcine bone, some lithic debitage, and the point base. The identifiable faunal material was bison, and an MNI of two was determined using metatarsals. Two radiocarbon dates were obtained from this site, ca. 2,600 BP and 2,500 BP (Table 20). The excavators concluded the corner-notched point was likely Pelican Lake (i.e., Bracken) based on the radiocarbon dates (Brewer et al. 1995:171).
Bow Bottom (EsPm 104). The Bow Bottom site is a stone circle campsite on a 7-metre-high terrace of the Bow River, in Calgary (Van Dyke 1982; Ronaghan and Landals 1983). In 1980, the site excavation included excavation of 200 m² at twelve of fourteen stone circles (Van Dyke 1982:ii). In 1981/82, an additional 113 m² were excavated at four stone circles and six external features (Ronaghan and Landals 1983). Between the two projects, sixteen stone circles were completely or partially excavated. All but one stone circle (Ring 10) had internal, ringed hearths and were associated with the same buried soil at a depth of about 40 cm bs. The earlier study found most of the rings aligned in a row with the north bank of the Bow River, while the subsequent study found additional rings following the same pattern immediately to the southeast. Following mitigation, the site was used for a transportation utility corridor and a subdivision.

During the initial mitigative excavations in 1980, thirty-nine points were recovered in association with twelve rings and two midden features. The researchers considered most of the points to be Pelican Lake (n = 16) but recognized a few Besant points (n = 4), some flake points (n = 6), a Samantha point, a preform, and a number of non-diagnostic points (n = 11). Other tools recovered included bifaces (n = 16), oval end scrapers (n = 25), a rectangular end scraper, side scrapers (n = 17), retouched flakes (n = 229), cores (n = 89), choppers (n = 13), and hammerstones (n = 2). The lithic assemblage was largely local with split pebble chert flakes representing 37.2 percent of the tool assemblage (Ronaghan and Landals 1983:iv). No fauna was reported within the rings. Fauna was only mentioned in passing concerning inter-ring midden Features 3 and 4. However, a winter occupation was inferred from the central hearths and the lack of fauna within the rings. Ring 1 had a ringed hearth that was slab-lined. Large amounts of fbr were recovered within the rings but it is not clear whether these are spalled hearth stones or rocks cracked from immersion in water. No boiling pits were observed. Two radiocarbon dates were obtained from these excavations ca. 2,500 BP and 2,300 BP. With the exception of overlain Ring 10, the researchers noted, “the evidence strongly suggests that the site represents a distinctive seasonal/functional variant of the Pelican Lake [Bracken] phase occupied sometime between 2,300 and 2,500 years ago” (Van Dyke 1982:x).

Mitigative excavations in 1981/82 produced similar material from four stone circles and six external features. Fourteen points were recovered, including Pelican Lake (n = 3), Kootenay side-notched (n = 3), triangular (n = 1),
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flake point \(n = 2\), small trianguloid \(n = 1\), preform \(n = 1\) and point fragments \(n = 4\). Other tools recovered include bifaces \(n = 7\), end scrapers \(n = 7\), side scrapers \(n = 2\), scraper fragments \(n = 3\), unifacial cutting tools \(n = 3\), wedges \(n = 6\), retouched/utilized flakes \(n = 94\), choppers \(n = 2\), large flake/cobble spall tools \(n = 16\), split pebble cores \(n = 17\), cores \(n = 50\), and enigmatic elongate pebbles \(n = 21\). The lithic assemblage was much like that recovered from the earlier excavations; it emphasised local materials and split pebble technology. The faunal assemblage was weathered although a bison and a deer were recovered. The researchers suggested that the lack of burned or calcine bone indicated that bone boiling and degreasing activities were not practiced (Ronaghan and Landals 1983:169–170). Regarding the stone circles, Ring 15 exhibited a bone upright consisting of a humerus, stood on end in an excavated pit and interpreted as an anvil. As well, a post-mould northeast of the hearth may represent a tie-down stake of the tipi (Ronaghan and Landals 1983:54, 206, fig. 30). Ring 17 exhibited a central hearth as well as an additional hearth along the northwest wall of the ring. This hearth was atypical in that it was dug down 29 cm into the floor and lined with large, flat, slab-like rocks. A piece of wood was recovered from this feature and dated (Ronaghan and Landals 1983:59). Six features were recorded external to the stone circles. These were concentrations of fire and charcoal interpreted as hearths (Ronaghan and Landals 1983:62). Three radiocarbon dates were obtained from these excavations: 2,600 BP from the hearth in Ring 15; 690 BP on unburned wood from a secondary hearth in Ring 17; and 2,300 BP on charcoal from external hearth Feature 9 (Ronaghan and Landals 1983). The recent date from Ring 17 was rejected because it did not reflect the associated material (Ronaghan and Landals 1983:59). Ronaghan and Landals (1983:87) concluded that the site is a winter occupation that “appears to represent a distinctive variant of Pelican Lake with influence from the mountains.” In a postscript, the authors considered that the assemblage might represent Sandy Creek material (transitional between Pelican Lake and Besant) (Ronaghan and Landals 1983:91–92). This text considers the Bow Bottom site to represent a Bracken campsite.

EgPn 362. EgPn 362 is a bison kill and processing site located on a north-facing, moderately sloping surface on the Paskapoo Slopes in Calgary (Vivian et al. 2003a). In 2000, a single cultural deposit (30–65 cm bs) was excavated (155 m²), concentrating in three areas: the main bone bed,
an unusual pit feature, and a processing area. The excavations mitigated a sewer right-of-way; portions of the site still remain intact.

Thirty-seven points or point fragments were recovered, including thirty Pelican Lake (i.e., Bracken) points and seven points too fragmentary to be classified. The researchers argued that there were two subgroups of points within the sample, based on raw material and manufacturing technique. They suggested that nine of the points made on siliceous siltstone were made using one manufacturing sequence, while six points made on heat-treated Swan River chert were manufactured using a different sequence. They also suggested that family and social ties explain both the similarities and differences between the points (Vivian et al. 2003a:50). Other lithic tools recovered at EgPn 362 included bifaces \((n = 2)\), end scrapers \((n = 7)\), side scrapers \((n = 2)\), and a retouched flake \((n = 1)\). The entire lithic assemblage consisted of only sixty-seven items with the majority made of siliceous siltstone \((n = 23)\) and quartzite \((n = 21)\) (Vivian et al. 2003a:48). The predominance of formed tools suggested little tool manufacturing or maintenance was conducted at the kill site (Vivian et al. 2003a:49). All but one end scraper was from the processing area. Chopping tools and bifacial knives were notably rare or absent, although large rocks in the kill area may have served as anvils (Vivian et al. 2003a:49, 60). A single bone tool may be represented by a split long bone with a well-rounded and polished tip, likely used in skinning or hide removal (Vivian et al. 2003a:48). In addition, a shell fragment of fossil freshwater clam was also recovered in the processing area adjacent to the primary kill; the researchers noted similar fossils used in beads found at sites in the area (Vivian et al. 2003a:48).

The faunal assemblage \((n = 72,884)\) consisted almost entirely of bison. A minimum of 1,45 bison was killed at the site. Other species recovered included wolf, mule deer, muskrat, rabbit and a few species of bird, possibly crane and grouse (Vivian et al. 2003a:53–54). An analysis of sex suggested females \((n = 50)\) were slightly more prevalent than males \((n = 39)\). Fetal remains were absent from the site, although these may have been selectively removed from the kill area or differentially preserved (Vivian et al. 2003a:58). Still, the co-occurrence of males and females and the absence of fetal bone suggested a late summer/early fall kill during the rut. The bone elements in the kill itself do not appear to have been sorted, suggesting “an aggressive selective strategy was pursued; one focused on procuring skulls, hides, and muscle mass — a selective gourmet strategy” (Vivian et al. 2003:74). A single radiocarbon date of roughly 2,400 BP
was obtained (Vivian et al. 2003a:30). This date supports a Bracken phase affiliation.

Two distinct activity areas were revealed in the excavations. The main excavation block exposed the bone bed of a primary kill event. Animals appeared to have been butchered around the perimeter of a pound enclosure with a refuse pile in the middle. Although no post-moulds were found, a pit feature at the base of a steep slope and just uphill from the bone bed was interpreted as a gate or trap entrance to a pound (Vivian et al. 2003a:75). The bone distribution suggested an oval area of 16 x 21 m for the pound, consistent with the size of known historical pound structures (Vivian et al. 2003a:76). Presumably brush interwoven into standing trees was used to create the pound structure. A second activity area contained highly fragmented bone and quantities of FBR. Spiral fractures on the bone were interpreted as evidence of marrow procurement. Also, large numbers of scrapers and the absence of points were interpreted as evidence for hide working. In sum, the site is a Bracken pound and kill site with a hide-working activity area on the site's eastern margin. Based on point similarity and age it may have cultural links to EgPn 598, just down slope (see below).

EgPn 598. EgPn 598 is a campsite/bison processing area on a wide bench about halfway down the Paskapoo Slopes in Calgary (Vivian et al. 2003a:232). A single cultural horizon was observed at the base of the Ah Horizon (Vivian et al. 2003a:233). In 2000, a 60-m² block was excavated to mitigate a sewer right-of-way. The site is large, ca. 40 x 40 m, with substantial portions remaining intact.

Eight points were recovered, including six Pelican Lake (i.e., Bracken) points and two indeterminate base fragments (Vivian et al. 2003a:234–237). The points were found in association with a hearth, an FBR concentration, and a scatter of bone. Other lithic tools recovered include bifaces (n = 4), end scrapers (n = 6), side scrapers (n = 15), drills (n = 2), spokeshaves (n = 4), wedges (n = 4), retouched flakes (n = 24), utilized flakes (n = 15), a unifacial tool (n = 1), a core (n = 1), an abrader (n = 1), hammerstones (n = 2), and an anvil (n = 1). A single bone bead made on fetal or neonatal bone was also recovered (Vivian et al. 2003a:258). The assemblage largely consisted of quartzite with a strong representation of basalt. As well, exotic materials appeared more common in this site than other sites in the area (Vivian et al. 2003a:259). Late-stage tool manufacturing and rejuvenation are mainly represented in the debitage.
The faunal assemblage ($n = 3,692$) consisted mainly of bison. A minimum of three bison was present, based on left distal humeri and left distal metacarpals. Numerous fetal bones (i.e., humeri, scapulae, and long bones) were recovered, suggesting a late winter/early spring event (Vivian et al. 2003a:262). Four canid bones were also recovered. Based on size, they likely represent mature wolf. The frequency of elements at the site suggested that it is a secondary processing locale to which specific items were brought from a nearby kill. Spiral fractures on bison long bones indicate marrow extraction (Vivian et al. 2003a:264). A concentration of FBR ($n = 44$) and a reddened soil were interpreted as a hearth; it was associated with burned fragments of bone ($n = 97$). A second concentration of FBR ($n = 134$) and bone ($n = 198$) did not exhibit any evidence of burning; the concentration was interpreted as a refuse pit (Vivian et al. 2003a:265).

A single radiocarbon date of ca. 2,300 BP was obtained for the site (Table 20). When the site was initially discovered, the amount of FBR and bone suggested that it was a processing camp. However, the range and diversity of tools suggest a camp used over a period of time. In summary, the researchers argued that this was a Pelican Lake (i.e., Bracken) campsite/processing site in which the spatial organization of activities was evident in the distribution of the stone tools. Projectile points, bifaces, scrapers, and drills were concentrated around a hearth and refuse pile for retooling. Scrapers, spokeshaves, and retouched and utilized flakes were common on the east side of the excavation and were strongly tied to secondary processing activities such as hide, wood, and bone working. In short, knapping activities were kept separate from intensive processing activities (Vivian et al. 2003a:266). As noted above, a Pelican Lake (i.e., Bracken) kill site of the same age, EgPn 362, was located just upslope from this site; the degree to which the sites are related cannot be determined, but they are roughly contemporary and complementary (Vivian et al. 2003a:266–267).

**DjPm 114.** DjPm 114 is a small multicomponent campsite on a 10-metre-high bench on the south side of the Crowsnest River, near its confluence with the North Fork of the Oldman River. Eastern (25 m$^2$) and western (23 m$^2$) excavation blocks were opened. In the western block, below a Late Prehistoric period component at 40–60 cm bs, was a Bracken component. The excavations were part of mitigative action associated with the Oldman Dam Reservoir project.
Four projectile points were recovered in association with a scatter of bone and FB, (Landals 1993:21). A barbed Pelican Lake point, a typical Bracken point, a blade fragment, and a tip were recovered. Other recovered tools include bifaces (n = 2), an end scraper, retouched tools (n = 3), and cores (n = 2). Etherington chert and quartzite dominated the small debitage assemblage while tools were largely manufactured on more fine-grained materials such as cherts. The faunal assemblage was mainly bison, with two fragments from small ungulates, a phalanx identifiable as small mammal, and a fox scapula (Landals 1993:139). A minimum of two bison was represented. Burned and calcine bone was rare; no hearth was recorded.

A single date was obtained of roughly 2,000 BP (Table 20). Landals (1993:137) suggested that the barbed point indicated links to the mountains and interior British Columbia, but considered the remaining points more typical of Pelican Lake (i.e., Bracken) points. The site was considered a Bracken campsite of limited size (Landals 1993:139). Alternatively, the barbed point conforms to the barbed Pelican Lake material, and site mixing or formation may have obscured its slightly older age.

DjPf 83. DjPf 83 is a buried campsite located on a terrace 60 m above the St. Mary River, north of Magrath (Ronaghan and Reeves 1980:10). The site is buried beneath about 1.5 m of sediment and is laterally continuous for 160 m. In 1980, 16 m² were excavated to mitigate placement of transmission line poles. A single Pelican Lake (i.e., Bracken) point was found in association with a hearth, differentially distributed artifacts, FB, and macerated bison bone, representing activity areas. Other lithic tools recovered included bifaces (n = 2), end scrapers (n = 3), pièces esquillées (n = 1), retouched flakes (n = 25), and cores/choppers (n = 5). The tools were made on fine materials such as Avon chert, Knife River flint, green argillite pebbles, and miscellaneous cherts while the debitage was largely reduced from local quartzite and argillite cobbles (Ronaghan and Reeves 1980:14–15).

The faunal assemblage was mainly identified as bison (MN1 = 3), with fetal long bones suggesting a late winter/early spring occupation (Ronaghan and Reeves 1980:11). Bison elements were heavily processed for marrow but lacked cut marks. Other fauna included a rib of an upland game bird, long bone fragments of a small unidentifiable ungulate (likely deer or antelope), and a mandible from a fish. The hearth was 100 cm in diameter and contained a surface cluster of FB, charcoal and burned bone. A single radiocarbon date of ca. 2,100 BP was obtained for the site (Table 20), which
Joffre (FbPj 8). The Joffre site is a stone circle campsite on an 8-metre-high terrace of the Red Deer River, about 12 km lower than the city of Red Deer (Smith and Reeves 1978). Based on a surface survey, sixteen 2-x-2-m test units were excavated across the terrace (Smith and Reeves 1978:9). A single cultural bearing Ah black soil was observed at 25–50 cm bs. The recovery of a Pelican Lake (i.e., Bracken) point led to four additional 2-x-2-m units. The productive nature of these tests led to an additional thirty-three 2-x-2-m test units, excavated in a block. The site was impacted by a water intake settling pond and related features (Smith and Reeves 1978).

Five corner-notched points/point fragments and an unidentifiable tip were recovered in association with a living floor, a stone circle and hearth, and a hearth/fbr concentration (Smith and Reeves 1978:14–16). A possible Sandy Creek point was also recovered with this material but was interpreted as a knife (Smith and Reeves 1978:23). Other tools included asymmetrical ovate bifaces (n=7), end scrapers (n=2), side scrapers (n=2), gravers (n=3), pièce esquillée (n=3), retouched flakes and/or utilized flakes (n=15), choppers (n=10), spalls (n=6), utilized cobbles (n=4), hammerstones (n=3), pecked or ground tools (n=8), and a sandstone abrading tool (Smith and Reeves 1978:23–32). The lithic assemblage consisted mainly of two local sources: quartzite and Paskapoo chert (siliﬁed limestone). Three bone tools were recovered: a pelvic gouging tool, a long bone compressor, and a rib shaft straightener (Smith and Reeves 1978:32–33).

The faunal assemblage was limited and poorly preserved. A minimum of four bison and two deer was represented. As expected from a faunal assemblage associated with a campsite, heavy, non-meaty bones are largely absent (Smith and Reeves 1978:20). A single weathered ungulate fetal bone suggested a winter occupation (Smith and Reeves 1978:17).

A single stone circle was uncovered. The stone circle consisted of sandstone slabs in a single row with rocks more tightly spaced in the south and west, presumably to protect from westerly winds (Smith and Reeves 1978:14). In the centre of the circle was an fbr scatter about 60 cm in diameter, presumably the remains of a hearth. A second hearth/fbr scatter was 7 m east of the circle. Neither hearth contained ash or charcoal (Smith and Reeves 1978:14). All the projectile points were recovered from the nine 2-x-2-m units around the stone circle (Smith and Reeves 1978:15). A single
radiocarbon date of ca. 1,200 BP (Table 20) was obtained from a composite bone sample (Smith and Reeves 1978:13). The researchers rejected this date as it contradicted the age suggested by the recovered diagnostic point (Smith and Reeves 1978:13). The site appears to be a large Bracken winter campsite along the Red Deer River.

EgPn 430, Area Three. EgPn 430 is a large multicomponent bison kill site, processing site, and campsite on the northwest slope of the Paskapoo Escarpment in west Calgary (Vivian et al. 2005, vol. i:i). Six areas were defined in this site with Area Three representing a Bracken kill site. Some mixing of subsequent occupations occurred, with items being sorted by mass and weight (Vivian et al. 2005, vol. i:5–6). A block excavation of 44 m² was conducted prior to subdivision development (Vivian et al. 2005, vol. i:49).

Fourteen “Pelican Lake” points were recovered in association with the bone bed, along with a McKean Lanceolate point, four Late Side-notched points, and five non-diagnostic point fragments (Vivian et al. 2005, vol. i:50–58). Other tools recovered included bifaces, a bifacial knife, an end scraper, a side scraper, a wedge, retouch flakes, a utilized spall, and two cores (Vivian et al. 2005, vol. i:58–63). Bone tools recovered included awls, a scraper, and a wedge (Vivian et al. 2005, vol. i:63–64). The lithic assemblage was mainly composed of local lithics, with some exotics. It was considered comparable to other Pelican Lake (i.e., Bracken) assemblages (Vivian et al. 2005, vol. i:64).

The faunal assemblage consisted mainly of bison (MNI = 45) but also included wolf, coyote, mule deer, rabbit, and grouse (Vivian et al. 2005, vol. i:68–69). A single immature bison was recovered although no evidence for fetal animals was observed (Vivian et al. 2005, vol. i:70). Primarily low-utility elements were recovered. The excavators suggested a summer or early fall kill based on the lack of young bison and a fairly even male/female herd composition (Vivian et al. 2005, vol. i:71). A radiocarbon date was obtained from the bone bed of ca. 2,600 BP (Table 20).

The excavators argued that EgPn 430, Area Three, represented a single-component kill site (Vivian et al. 2005, vol. i:89). The recovery of many Pelican Lake (i.e., Bracken) points and an appropriate radiocarbon date testified to the integrity of the deposits, while the recovery of a few other diagnostic points was considered to illustrate only minor mixing (Vivian et al. 2005, vol. i:93).
Other sites. There are other sites in Alberta that have produced Bracken material but lack dates or good context. For example, DjPo 46 is a multicomponent site within the town of Bellevue in the Crowsnest Valley (Reeves 1977a). Occupations 2 and 3 were interpreted as Pelican Lake (i.e., Bracken) occupations. These levels were overlaid by a Besant occupation and underlain by an occupation lacking diagnostic material. Both Occupations 2 and 3 produced Pelican Lake (i.e., Bracken) points, with Occupation 2 also producing a buried stone circle (Reeves 1977a:24). Unfortunately, stratigraphic separation of specific cultural entities did not appear to be discrete at this site.

Somewhat surprisingly, the Majorville Medicine Wheel may not exhibit any Bracken points (Calder 1977:249, fig. 32). The barbed Pelican Lake points are present in very low numbers (Calder 1977, fig. 32, nos. 7 and 8), and it is difficult to determine if any of the remaining points are Bracken points, especially without good context. It is possible that the people who produced the Bracken phase did not use the cairn (Calder 1977:202–203). Although a thorough analysis of British Block Cairn (EdOp 1) has never been conducted, Forbis (1970:30–31, Wormington and Forbis 1965:122) mention Oxbow, McKean, and Late points being recovered from the excavations, but not “Pelican Lake” points. It is possible that during the Bracken phase, a shift in spirituality, as witnessed in the apparent increase in subsurface interments, allowed the major cairns to fall into disuse for a period of time.

EdOq 17 is a large cairn on a prominent hilltop in the central part of the Canadian Forces Base Suffield (Brumley 1972:36), of which the west half was excavated, producing a number of tools and debitage as well as a Pelican Lake (i.e., Bracken) projectile point (Brumley 1972:36).

EgPn 343 is a small Pelican Lake winter campsite located adjacent to a large ravine on the Paskapoo Slopes in Calgary (Vivian et al. 2003a). A total of 14 m² was excavated at the site, resulting in the recovery of 286 stone artifacts, including two Pelican Lake (i.e., Bracken) dart points, a broken biface knife, scrapers, wedges, and a spokeshave. Interestingly, obsidian and other toolstones from the Montana Rockies were present. Highly fragmented bison bone (n = 1,075), including a fetal bison metapodial that suggests a winter occupation, was recovered (Vivian et al. 2003a). A hearth was identified with FB, and all of the formed tools were in close proximity to the hearth. The excavators interpreted the material as representing a single lodge.

Component 2 at EgPn 230 produced seven Pelican Lake (i.e., Bracken)
points (Vivian et al. 1998). Dyck and Morlan (1995:379) call this particular morphological expression Bratton, but the specimens fall within a continuum of degrading Pelican Lake forms that slowly deviate from the original corner-notched form. EgPn 230 appears to be a kill/processing site (Vivian et al. 1998:26).

DjPm 228 is an exposed site located on the high, relict landform of Horseshoe Canyon, now inundated behind the Oldman River Dam (Van Dyke 1994:259–268). A Pelican Lake (i.e., Bracken) occupation was uncovered yielding Pelican Lake (i.e., Bracken) projectile point specimens (n = 6), bifaces (n = 15), end scrapers (n = 11), unifaces (n = 7), a spokeshave, a drill, core tools (n = 36), a hammerstone, elongate pebbles (n = 2), and retouched flakes (n = 60). Substantial amounts of bone and fbr were also recovered. However, one Duncan, one Samantha, and four Late Side-notched points were also recovered in the same deposits. Two radiocarbon dates supported the Bracken phase assignment: 2,480 +/- 100 BP (aECV-772C) and 2,530 +/- 90 BP (aECV-768C) (Van Dyke 1994:267).

Lastly, DjPm 93 is a buried multicomponent campsite along the Crownest River at Warriner’s Coulee (Van Dyke et al. 1990:360–380). In Cultural Level 4, two Pelican Lake (i.e., Bracken) points were recovered in association with part of a stone circle and two radiocarbon dates: 2,510 +/- 90 BP (aECV-755C) and 2,520 +/- 110 BP (aECV-766C) (Van Dyke et al. 1990:379). A second Pelican Lake (i.e., Bracken) occupation overlies the aforementioned occupation.

Bracken: Industrializing Bison Procurement and Mobilizing a Workforce

The Bracken phase can be identified by its diagnostic point: the Bracken point. This phase is similar to Reeves’ (1983a) Mortlach subphase of the Pelican Lake phase, although he included barbed Pelican Lake material in his definition. The Bracken point, a merger of Kehoe’s (1974) Bracken and Dankar points, can be identified by a straight to usually convex basal edge, open notches that tend to be up-sloping such that there is little barbedness in the shoulders, and a broad body and neck. Based on the radiocarbon dates presented above, the Bracken phase begins as early as 2,800 BP and lasts until as late as 2,100 BP. Subjectively, the Bracken points, during their approximately 700-year existence, initially exhibit a very rough similarity to barbed Pelican Lake points but through time look increasingly like Besant points (see also Kehoe 1974:111).
In terms of the tool assemblage, bifaces, end scrapers, side scrapers, and retouched flakes are common, while utilized flakes occur infrequently. Pentagonal drills are noted. Flake points are rare. With regards to bone tools, a possible shaft wrench was recovered and a bone bead was noted. Likely owing to the commencement of mass bison kills, choppers and hammerstones occur more frequently in the lithic assemblages. The lithic raw materials show a clear dependence on quartzite, basalt, siltstone, pebble chert, and miscellaneous cherts. Exotic materials such as Knife River flint, Avon chert, Montana chert, and obsidian are not common, but definitely present. Material from the mountains was not as prevalent as one would expect. As well, very little petrified wood was used. Some makeshift bone tools, including round-ended ribs, have been recovered and were likely used for removing hides and similar processing activities.

The subsistence pattern continues to reflect a reliance on bison; however, the repeated use of major kill sites appears to begin in earnest during this phase. Head-Smashed-In Buffalo Jump, the (Old) Women’s Buffalo Jump, the Smythe site, and various sites on the Paskapoo Slopes exhibit repeated bison drives during this time. This bison utilization pattern is in stark contrast to the previous Pelican Lake complex. The Pelican Lake complex consisted of small campsites, with little evidence of large-scale bison procurement. Both Dyck (1983:107) and Wormington and Forbis (1965) partially grappled with Pelican Lake as potent communal hunters. This text strongly supports the notion that in Alberta, Bracken hunters provide the earliest evidence for the repeated use of key locations of mass bison pounds and jumps. In fact, the deterioration of Pelican Lake craftsmanship and form from the barbed Pelican Lake form through to the end of the Bracken phase (assuming continuity) might reflect the ease of mass kills versus the skill of stalking and killing individual prey. The former only required the hunter to pierce the hide and impact a key organ in the already impounded bison, while the latter required a deadly, accurate shot with a projectile that would pierce and bleed the prey, cutting apart the bison from the inside during the beast’s attempt at flight. Besides bison, deer were the next most frequently taken animal by Bracken hunters.

Numerous features were recovered from the Bracken sites. Surface hearths were common although a couple sites exhibited slab-lined hearths. FB1, suggesting processing of some kind, was recovered in quantities at most of the sites listed. The associated pits for stone boiling have not been excavated.
An apparent innovation of the Bracken phase is the development of the tipi. Previous cultural periods have yielded stone circles but the Bracken phase produced evidence for internal hearths associated with tie-down stakes. The tie-down stake is crucial as an anchor for providing stability to the tipi. The three or four main support poles for a tipi are knotted together and then staked securely to the ground within the tipi. In this manner it anchors the main structure of the tipi against the elements. Moreover, the Bracken phase also exhibits the earliest evidence of large campsites. Bow Bottom represents the encampment of a large number of people together over the winter months. Similarly, DjPf 83 and Joffre will likely provide evidence of similar encampments upon further excavation. The ability to keep a large number of people together for lengths of time on the Plains is important. Large encampments are required to conduct large bison kills, but they also provide time for development of social activities, societies, and courtship. As well, large social groups are in a better position to protect a population and its territory from neighbours in an ever increasingly populated Northern Plains (see also Walde 2006b).

The Bracken phase is not restricted to Alberta. It can be found in southern Saskatchewan (but not southern Manitoba) and northern Montana. In Saskatchewan, the Walter Felt (EcNm 8) site provided the current name for the phase and point form: Bracken (Kehoe 1974:111). As alluded to above, Kehoe’s (1974) Dankar Shouldered (straight-based) variety of Pelican Lake point only differs from the Bracken Shouldered (convex-base) variety by having a straight rather than a convex base. Kehoe’s (1974:111) Bracken points were not recovered at the Walter Felt site but Dankar points were, in Level 15a. In this text, Bracken and Dankar, despite their different basal edges, are considered Bracken points. Level 15a overlies Sandy Creek material dated to ca. 2,500 BP and underlies Sonota material dated to ca. 1,600 BP (see Kehoe 1974).

Newo Asinia (FbNp 16) is a multicomponent site in Wanuskewin Park, just north of Saskatoon. Level 4 produced a Bracken point, although the researcher labelled it a Besant series point. The layer was associated with a date of 3,025 +/- 250 BP (S-2764) (Kelly 1986:156–170). This date is early for Bracken material. Interestingly, a barbed Pelican Lake point was found in the overlying layer (Kelly 1986, fig. 21, upper right). It is seems possible that some disturbance may have occurred at the site.

The Sjovold site (EiNs 4) produced a few levels attributable to the Bracken phase. Layer X produced thirty-nine tools and twelve features (Dyck and
Morlan 1995:333–362). Dyck and Morlan (1995:351) suggested that the side-notched specimens were likely Besant while the corner-notched points were Pelican Lake, making the assemblage a mixture of archaeological cultures. For this text, the specimens are all considered to fall within the range of variation for Bracken points. Layer x also produced three radiocarbon dates: 2,170 +/- 165 BP (S-1767); 2,340 +/- 120 BP (S-3367); and 2,190 +/- 140 BP (S-3366). Layer x1 produced two points morphologically identical to side-notched specimens in Layer x (Dyck and Morlan 1995, fig. 15.6a and c compared to fig. 14.8a and e). The researchers called the points Bratton points, but for this review the material falls within the range of variation of the Bracken point type. (For a complete discussion of the Bratton point see Dyck and Morlan 1995:378–379.) The layer was radiocarbon dated to 2,585 +/- 90 BP (S-2058).

The Bracken Cairn (DhOb 3) derives its name from the nearby town of Bracken in southwestern Saskatchewan. The site is a burial in hill country overlooking the Frenchman River valley (E. Walker 1982:8). The burial consists of at least five individuals within a pit: three mature and two immature individuals. The pit was then covered with earth and the surface stained with red ochre. The entire burial was overlaid with boulders to form a rough 3-m diameter cairn (E. Walker 1982). The skeletons had red ochre on them. A radiocarbon date of 2,465 +/- 85 BP (S-912) was obtained. A single Bracken point was recovered along with a drill, end scrapers (n = 2), large ovate bifaces (n = 7), retouched flakes (n = 6), and a ground-stone pestle. As well, numerous mammalian bones were noted. Some of the bones were drilled for decorative purposes, and others were worked into pseudo-elk teeth (E. Walker 1982:25). A small rolled copper fragment was also recovered. The site was interpreted as the burial of a nuclear family or, more likely, individuals that were bundled and interred at the same time (E. Walker 1982:32). The Bradwell (EkNm 1) site near Bradwell is another possible Bracken burial in which a flexed skeleton, possibly associated with several eagle talons and a scraper, was recovered (Edmunds et al. 1938).

In Montana, Level 3 of the King site produced two Bracken points and the stem fragment of a possible third Bracken point (Brumley and Rennie 1999:48–49, fig. 9, nos. 6, 7, and 8). An associated radiocarbon date of 1,950 +/- 80 BP (Beta-60248) was obtained (Brumley and Rennie 1999:50).

The Keaster (24PH401) site is a multicomponent bison kill site located just south of Fort Belknap Indian Reservation in north-central Montana
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(Davis and Stallcop 1965). Four bone layers were observed but few projectile points were found in situ. Most of the points are relatively large, broad points, with straight bases, and relatively deep corner-notches that create rounded bars. This point style was the diagnostic point for Reeves’ (1983a) Keaster subphase of the Pelican Lake phase. Placed side-by-side with Bracken points, a striking difference is noticeable. The Keaster site points have straight basal edges, relatively deep corner notches, slightly barbed shoulders, and relatively broad blades. Level i produced a radiocarbon date of 2,270 +/- 95 BP (6X-1194); Level iii produced a radiocarbon date of 1,945 +/- 250 BP (W-1366) (Reeves 1983a:259; Morlan n.d.). Despite the chronometric reversal, these dates are roughly coeval at one sigma. To complicate the interpretation, the earliest bone layer, iv, may represent barbed Pelican Lake material, as the points from this level appear to have narrow necks and barbed shoulders (i.e., Davis and Stallcop 1965:11, 102–104, plates 3, 5). Firsthand comparisons would be necessary to confirm this interpretation.

A number of other sites in Montana have produced point assemblages like the Keaster site. Pictograph Cave, Levels 1 and 11, produced Projectile Point Type 5 (Mulloy 1958:33). Reeves (1983a:316) considered the Pictograph Cave material to fall within his Keaster subphase. The Ayers-Frazier (24PE30) bison trap is located in the Lower Yellowstone River drainage in southeastern Montana (Clarke and Wilson 1981). Seven points were recovered. They are similar to the Keaster style of point, exhibiting straight basal edges, relatively deep corner notches, slightly barbed shoulders, and relatively broad blades. The researchers noted the similarity of their material to the points of Wettlaufer’s (1955) Pelican Lake material. They also noted that this term has been applied to most corner-notched material in the general study area (Clarke and Wilson 1981:32; see also Gregg 1986:112). They placed the Ayers-Frazier assemblage in with Reeves’ (1983a) Upper Mile subphase, based on the high frequency of porcellanite in the tool assemblage (Clarke and Wilson 1981:34). Based on point morphology, the Keaster and Upper Mile subphases are indistinguishable and could be combined. The Ayers-Frazier site produced a date of 2,180 +/- 150 BP (TX-3170). Similarly, the Seline (24DW250) site, a bison kill located near Glendive, east-central Montana, produced Keaster style points (Roll et al. 1994); it was radiocarbon dated to 1,920 +/- 50 BP (Beta-24726) and 2,160 +/- 90 BP (Beta-24725) (Morlan n.d.).

In Wyoming, Pelican Lake-like material of Reeves’ (1983a) Spring Creek
A subphase occurs at Mummy Cave, Layer 30 (Husted and Edgar 2002:202, plate 32a–j), the Kobold site (Frison 1970:10, fig. 9a–e), Daugherty Cave Level 1 (Frison 1968:261, fig. 3a–o) and Wedding of the Waters Cave Level 2 (Frison 1962:248–254, fig. 1c–j). These sites have points with very deep and narrow corner notches, relatively straight basal edges, and straight to excursive lateral margins, and are somewhat diminutive compared to points of the Keaster subphase immediately to the north (see Reeves 1983a:81–82, fig. 12). In short, they are quite distinct from the Bracken and Keaster points.

The use of the term Pelican Lake needs to be reconsidered. Wettlaufer (1955) used it to describe a specific culture and projectile point recovered at the Mortlach site and then the Long Creek site. Reeves (1983a) used the term to define the Pelican Lake phase and Pelican Lake corner-notched point for which he defined several subphases. The corner-notched point was clearly used a horizon marker. Subsequently, few have recognized the micro-stylistic variation within the Pelican Lake corner-notched point horizon. Most researchers have opted to apply the term to any and all corner-notched dart points in the Northwestern Plains (e.g., Clarke and Wilson 1981:32; Gregg 1986:112). The various corner-notched dart forms from geographically distinct parts of the Northwestern Plains could likely trace their origin to a common source in their distant pasts; the notion does not necessarily link them as a single culture. Consequently, continuing to refer to all these archaeological materials under the rubric of “Pelican Lake” is problematic. It is suggested that Reeves’ Pelican Lake subphases should be retained as phase names to reflect the differences between the peoples of the corner-notched horizon. Thus, the Keaster subphase would be the Keaster phase, and so forth. The barbed Pelican Lake material, exhibiting possible ties to the Bracken phase, should remain the Pelican Lake phase until more firm relationships between the two archaeological cultures are determined. The term complex can be inserted for phase when relationships to other cultural materials cannot be determined.

In summary, the Bracken phase occurs between 2,800 and 2,100 BP in southern Alberta, southern Saskatchewan, and northern Montana. The key diagnostic of the phase is the Bracken point. Traditionally, this material, exhibiting corner-notched points, has been lumped in with Pelican Lake materials; however, there are a number of attributes that separate these cultural units. First, the Pelican Lake complex (3,600–2,800 BP) predates the Bracken phase (2,800–2,100 BP). Second, the diagnostic
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dart points are distinguishable from each other. The Pelican Lake point is barbed and narrow-necked while the Bracken point is broadly corner-notched, wide-necked, and has obtuse shoulders. Third, the people of the Pelican Lake complex stalked bison while Bracken people repeatedly jumped and impounded bison in large numbers. Fourth, Pelican Lake peoples appear to have used tipis, although evidence of tie-down stakes has not been found. Still, small camps of stone circles are known. The Bracken phase exhibits the earliest evidence of tie-down stakes within stone circles strongly suggesting the tipi was being utilized. Perhaps more importantly, tipi camps of fifteen to eighteen contemporaneous lodges are known to exist, indicating large populations were gathering and staying together for lengths of time. This is likely due to the ability to drive bison in large numbers and feed more people at one locale. The issue of cause and affect begs the question of which came first: the need for more people to be together or the need for more food to be produced. Fifth, a Pelican Lake burial system is not known. In contrast, the Bracken phase has produced a small sample of burials that tentatively suggest that (1) burials are often placed in high, prominent spots, usually with a commanding view, often overlooking water, or found on side slopes of small hills and knobs; (2) interment is in small and usually shallow subsurface pits; (3) rock cairns are sometimes placed over the in-filled pits; (4) burials are typically secondary bundle burials but may be primary and, if so, are flexed; (5) often more than one individual is present in a burial pit; (6) red ochre or similar pigment is present, usually both in the pit fill and on the human remains and grave goods; and (7) diverse grave goods are common and typically include a variety of lithic tools, including Pelican Lake (i.e., Bracken) type projectile points, biface, end and side scrapers, and retouched flakes, native copper, freshwater clam shell, shell beads and gorgets, perforated and imperforated bison and elk teeth, bear claws, eagle talons, exotic marine shells (especially *Olivella* and *Dentalium*), faunal remains from a variety of animals (especially large- and medium-sized mammals, frequently modified into beads), awls, and other bone tools and pieces of antler (Brink and Baldwin 1988:131).

The morphology of the Bracken point is not static throughout the Bracken phase. In the earliest part of the phase, it vaguely resembles the Pelican Lake point with mildly barbed shoulders. Towards the end of the Bracken phase, it becomes increasingly varied in appearance, exhibiting growing similarity to Besant points.
BESANT PHASE (Ca. 2,100 to 1,500 BP)

In Alberta, the Besant phase has been considered the last phase in the Middle Prehistoric period before the transition to the Late Prehistoric period (Reeves 1983a:36; Peck and Hudecek-Cuffe 2003:73; Vickers 1986). Dyck (1983) included the Besant complex in the Late Plains Indians period, based on the recovery of pottery and side-notched arrow points. The term Besant was first applied by Wettlaufer (1955:39–43) to a sequence of four levels, Occupations 4A through D, at the Mortlach site, south-central Saskatchewan. He described the Besant point as "short and broad with shallow side notches and a slightly concave base" (Wettlaufer 1955:44). The term Besant apparently derives from the Besant Valley in which the site is situated.

Subsequently, Reeves (1983a) provided a more thorough description of Besant material culture and its spatial and temporal distribution. Reeves (1983a:94) accepted the description of the Besant atlatl point provided by Wettlaufer (1955). He added a later derivative of the Besant atlatl point, the Samantha side-notched arrow point, to the phase (Kehoe and Kehoe 1968; see also Kehoe 1974). He considered the Besant phase to exhibit pottery with vertically or horizontally corded surface impressions and bosses or punctates on conoidal vessels. He did note, however, that the use of pottery during the Besant phase was largely restricted to the Middle Missouri area (Reeves 1983a:96). With regard to lithic utilization, Knife River flint and Avon chert were considered common, while the use of obsidian was rare (Reeves 1983a:96). An unusual feature of the Besant phase was the practice of secondary interments within log-covered pits sunken into the ground surface beneath mounds. These burials were often associated with grave goods, including, among other items, bison remains. Such interments were only known from the Middle Missouri area (Reeves 1983a:97). Reeves (1983a) considered the Besant phase to be relatively widespread across the Northwestern Plains, with assemblages recovered from eastern Wyoming, eastern Montana, North Dakota, northern South Dakota, southern Alberta, southern Saskatchewan, and southwestern Manitoba. For the Saskatchewan River Basin, he suggested the phase began approximately 1,800–1,700 BP and was replaced by the Old Women’s phase about 1,200 BP (Reeves 1983a:93–94).

Neuman (1975) and Syms (1977) suggested that much of the material in North Dakota, South Dakota, and southwestern Manitoba represented a separate phenomenon from the Besant phase: the Sonota complex. Neuman (1975) defined the Sonota complex based on the high frequency of Knife
River flint in tool manufacture, points resembling Besant and Samantha points, a distinctive conoidal pottery with vertical cord-roughened surface and punctates and bosses for decoration, low-domed burial mounds, bone uprights within campsites and kill sites, and an emphasis on bison for subsistence (Neuman 1975). Syms (1977:88–90) concurred with this assessment and added that Sonota sites have been found on the Alberta (i.e., Muhlbach) and Saskatchewan (i.e., Walter Felt) plains as well. Neuman (1975) dated the Sonota complex to between 1,950 and 1,350 BP while Syms (1977:90) suggested ca. 1,950 to 1,150 BP.

Most researchers have essentially sided with Reeves' (1983a) assessment of the Besant phase. Dyck (1983:113) acknowledged a distribution of Besant material across the Northwestern Plains between 2,000 and 1,150 BP. With the exception of the burial mounds and small differences in point styles, he found no justification for differentiating Besant and Sonota (Dyck 1983:114–115). Similarly, Vickers (1986:81–87, 1994:9–14) followed Reeves' distribution for Besant and suggested an age range of about 2,100 to 1,200 BP. Vickers (1986:85) did acknowledge the high frequencies of Knife River flint and the variation in point styles by considering the Sonota complex a regional subphase of the Besant phase. Walde et al. (1995) also mirrored Reeves' Besant phase distribution but indicated an age of 2,150 to 1,250 BP. Morlan (1988:305), using radiocarbon dates from sites assigned to the Besant phase, suggested an age range of between 2,350 to 2,150 BP and 1,250 BP.

The Besant side-notched atlatl point continues to be the diagnostic artifact of the phase. Wettlaufer's (1955) definition of a “short and broad” point continues to be adequate. Dyck (1983:115) noted that the notches are twice as high as they are deep while Reeves (1983a:55) noted that notches are often placed low on the point. Further, the point exhibits crude to well-controlled flaking, with the base often thinned or ground (Reeves 1983a:54–57). Kehoe (1974) provided a typology of large corner-notched points in which he outlined three varieties of Besant atlatl point and two varieties of Samantha arrow points. While the terms Besant and Samantha are commonly applied, Kehoe's varieties are rarely used (Vickers 1994:9). Importantly, Kehoe's (1974) typology was based on materials recovered at the Walter Felt site, a site Syms (1977) attributes to the Sonota complex. Samantha arrow points are morphologically similar to Besant atlatl points but smaller (Reeves 1983a:63). Reeves (1983a:63) further noted the similarity to early specimens of Late Side-notched points of the Old Women's
phase, a similarity noted by Kehoe (1974:109) in his typology for large corner-notched points, and also by Duke (1988:268) and others.

Another important diagnostic artifact of the Besant phase is pottery. Reeves (1983a:9, 96) contended that Besant sites exhibit "vertically or horizontally corded, bossed, or punctated conoidal pottery vessels," although most pottery-bearing sites are in the Middle Missouri area. Byrne (1973:446–447) conducted the most detailed analysis of pottery in the province and concluded that the Besant phase was aceramic. At the time, he noted that sites in Saskatchewan with apparent associations between Besant material and ceramics, such as the Walter Felt and Long Creek sites, exhibited numerous stratigraphic problems that could account for the recovery of the controversial items in Besant levels (Byrne 1973:447). More recently in Alberta, the Ross Glen site, EhPc 105 and the One-Eleven site are believed to be pottery-bearing Besant sites. The pottery at the Ross Glen site consists of thirty-seven small potsherds recovered from inside and outside Stone Circle 14 (Quigg 1986:119). Only body sherds were recovered. The interiors of the sherds were smooth while the exterior surface was fabric- or cord-pressed (Quigg 1986:121). A single Besant point was recovered within the stone circle. Sixteen stone circles at the site have been attributed to the Besant phase. This is an unusual situation made more confusing given the surface stripping and shallow deposition within the stone circles. EhPc 105 produced thirty-four small potsherds associated with a shallowly buried surface hearth; Besant points were recovered deeper in an adjoining test unit (Loveseth 1983). The pottery was classified as Saskatchewan Basin ceramics although its actual relationship to the Besant points was not well established. In Alberta, the best case for Besant pottery can be found at the One-Eleven site (EgPn 111). The One-Eleven site is described as a single-component Besant kill site that produced eighteen potsherds from two areas within a 176-m² excavation block (Head et al. 2002:164). The potsherds exhibited fabric-pressed surfaces considered similar to other Besant-Sonota pottery commonly found to the southeast (Head et al. 2002:164).

Regarding lithic raw materials, Besant sites emphasize either local sources or exotic porcelainite and Knife River flint sources in North Dakota. In Alberta, the S.S. Burmis site, the Dersch site, EfOw 26, and the Wells site are all Besant sites that utilized local lithic raw materials. In contrast, the One-Eleven site, the Muhlbach site, the Pigeon Mountain site, and the Fewkes and Smith-Swainson surface collections predominantly utilized Knife River flint. Some have argued that the high percentages of Knife
River flint might reflect groups that had recently travelled to North Dakota and actually represent the physical movement of people between the Alberta/Saskatchewan Plains and the North Dakota quarry sites (Vickers 1994:13; Walde et al. 1995:19).

The origin of the Besant phase has been the focus of considerable debate in the archaeological literature. Reeves’ (1983a) models of culture history are probably the most influential and commonly cited. Reeves (1983a) proposed two cultural traditions in southern Alberta for the last 4,000 years: the Tunaxa and Napikwan. In a more recent version of the model, the Tunaxa tradition culturally links the McKean, Pelican Lake, and Avonlea phases, while the Napikwan tradition links Besant and Old Women’s phases (Reeves 1983a). Reeves (1983a) suggested that the Besant phase was resident on the northeastern periphery of the Plains as early as 2,450 BP. An expansion of the Besant phase on to the Northwestern Plains displaced the resident Tunaxa population further west. To account for the Napikwan expansion, Reeves (1983a) suggested that Besant people were involved in the Hopewell Interaction Sphere, allowing them better and stronger lines of communication, and trade and transportation of goods. Reeves (1983a) speculated that the involvement of Besant in the Hopewellian system resulted from the desire of high-status groups further east to control access to resources. In the case of Besant people, access to Knife River flint, obsidian, grizzly bear teeth, bison hides, and dried meat as trade items is suggested. Meanwhile, the people of the Tunaxa tradition had not been entirely displaced off the plains and coexisted as the Avonlea phase for a time with the people of the Besant phase, until around 1,250 BP (Reeves 1983a).

Some have argued that the evidence does not support this model (Byrne 1973:466; Vickers 1986:86–87, 1994:14). Byrne (1973:465) failed to see Hopewelian influence in Early Variant of the Saskatchewan Basin Ceramics. Rather, he concurred with a notion that Reeves (1983a) had rejected, which was that the Besant phase had a northern origin, represented in the emergence of aceramic people out of the boreal forest, likely on to the prairie of Manitoba. The development of mounds and the restricted use of pottery would be a local development rather than Hopewelian stimulation of the Napikwan tradition into the west (Byrne 1973:466). Vickers (1986:86–87, 1994:14) noted that Knife River flint is rare in Hopewelian sites, while obsidian is rare in both Hopewelian and Besant sites. Further, the unranked group interments in the mounds do not reflect the high status/ranked burials that Reeves expected to be associated with.
the Hopewell Interaction Sphere (Vickers 1986:86; 1994:14). More recently, Reeves (1983a:13–14) has suggested that the ultimate origin of the Napikwan tradition lies deep in time. The Oxbow complex is considered culturally related to the Besant phase, with the Sandy Creek complex as temporally and technologically transitional between the two cultural entities (Reeves 1983a:13–14).

The fate of the Besant phase has been debated as much as its origins. Morlan (1988) has illustrated, using a comprehensive set of radiocarbon dates, that the Besant phase was present on the Northwestern Plains before the Avonlea phase, but that there is considerable overlap between the two. Walde et al. (1995:19) argue that the radiocarbon dataset incorporates a great deal of noise. Besant components always stratigraphically underlie Avonlea components, never the reverse, suggesting that the former preceded the latter; there is no strong reason to expect temporal overlap (see Cloutier 2004). Still, most archaeologists have noted that whatever the fate of the Besant phase, it was closely connected to developments within the Avonlea and Old Women’s phases (Peck and Hudecek-Cufte 2003:77).

The Sites

In order to assess the various lines of thinking presented above, Besant assemblages from Alberta with reliable radiocarbon dates are outlined below. These sites are used to critically evaluate the current view of the Besant phase (see Plate 22 and Figure 23).
PLATE 2.2
Besant points. Illustrated are projectile points from the Ross Glen site (DLOp 2) (a–c); (Old) Women's Buffalo Jump (EcPl 1)(d–g); DjPl 13(h–k); EgPn 220(l–o); EfOw 26(p–t); S.S. Burmis site (DjPn 62)(u–y); the Dersch site (DkPj 35), south knoll (z–bb) and Area 1 (cc); and EfOw 27 (dd). Photo credit: Alberta Culture and Community Spirit (a–t); Micheal Quigg (u–y); Fedirchuk-McCullough and Associates (z–bb); Alberta Culture and Community Spirit (cc and dd).
Figure 23
Besant sites within Alberta
(Old) Women’s Buffalo Jump (EcPl 1). The Women’s Buffalo Jump is located about 3 km northwest of Cayley on the south bank of Squaw Coulee (Forbis 1962:57). The site consists of low sandstone cliffs creating a six- to seven-metre drop to the slope deposits and bone bed that extend to the bottom of the valley (Forbis 1962:57). Forbis applied the adjective old in reference to the jump, as the site near Cayley was considered to be the oldest of the two possible locations for the Blackfoot’s Akee’-piskun, or Women’s Buffalo Jump. The name refers to a time when men and women lived separately and marks the location of the first marriages (Peck and Ives 2001:189). During the summer of 1957 through 1959, Forbis (1962) excavated an Upper and Lower pit at the site. The Upper Pit produced the best stratigraphy. Forbis (1962:74) divided the profile into an Upper Member consisting of Levels 1 to 14 and a Lower Member consisting of Levels 15 to 30. The Upper Member produced a long sequence of arrow points most recently called the Cayley Series (see Old Women’s section below). The Lower Member produced a series of layers exhibiting dart points, mainly Bracken and Besant.

Forbis (1962:107, figs. A–E) recovered classic examples of Besant points in Levels 15–21. Forbis (1962:170, fig. 14f, g) classified some material as Besant that might represent late Bracken material; these point styles were recovered in Levels 17–22. Regardless, Forbis’ (1962:107, figs. h, i) point type LM1 is a clear example of a Bracken point; it occurs in Levels 17–19. There appears to be stratigraphic co-occurrence of Besant and late Bracken at the Women’s Buffalo Jump. Forbis (1962:107, fig. 14j–k, l–m) classified a number of other Bracken points under terms such as LM2 and LM3. These were recovered from as deep as Level 28.

A single radiocarbon date is available for this important stratigraphic sequence. Level 25 was minimally dated to 2,000 BP (see Table 21). This makes a certain amount of sense stratigraphically, as Bracken overlaps with Besant in Level 17, while pristine Besant phase occurs in Levels 16 and 15. The transition from the Bracken phase to the Besant phase, whether it is outright replacement or gradual change, is expected to occur about 2,100 BP, based on other dated sites. Thus, Level 17 could date about 2,000 BP given that Level 25 is minimally dated to ca. 2000 BP as noted above.

DjPl 13, Component B-2. DjPl 13 is a multicomponent campsite-processing site on a 12-metre-high terrace on the north bank of the Oldman River, just above its confluence with the Castle River (Van Dyke 1994:38). During 1988–1990, after substantial testing, four major excavation blocks
were opened at the site: A (23 m²), B (50 m²), C (50 m²), and D (44 m²). Block B, Component 2, produced a stratigraphically isolated Besant assemblage.

Eight projectile points and point fragments were recovered in association with two FBR concentrations, two hearths, and an area of soil reddening (Van Dyke 1994:77). Three of the points were complete enough to classify as Besant with the remainder too fragmentary (Van Dyke 1994:78). Other tools recovered included bifaces (n = 6), cores (n = 2), end scrapers (n = 7), a side scraper, retouched flakes (n = 16), drills (n = 2), elongate pebbles (n = 2), and unifaces (n = 2). A bone spatulate tool was also recovered. The lithic assemblage exhibited a strong use of quartzite, black chert, Avon chert, miscellaneous chert, Etherington chert, and siltstone. The lithic debitage is primarily concentrated near the hearths in the eastern half of the excavation area.

The faunal assemblage (n = 1,225) was mainly bison (MNI = 1) but included four freshwater shell fragments. Only thirty-three bones exhibited evidence of burning, although most of the bone was associated with the hearths, soil reddening, and FBR concentrations in the eastern half of the excavation (Van Dyke 1994:79). FBR (n = 550) was lightly scattered across the western half of the excavation, with a concentration in the centre and around each feature. Two radiocarbon dates were obtained from this component of the site: ca. 2,150 BP and 2,060 BP (Table 21).

<table>
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<th>Site</th>
<th>Conventional ¹⁴C Age</th>
<th>¹³C/¹²C Ratio</th>
<th>Material</th>
<th>Calibration</th>
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<td>EcPl 1</td>
<td>1,920 +/- 75</td>
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<td>DjPl 13, C, B-2 [AECV-751C]</td>
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<td>-17.8‰</td>
<td>collagen</td>
<td>400 B.C.–A.D. 250 (p = 0.954)</td>
<td>Van Dyke 1994:79</td>
</tr>
<tr>
<td>EFOw 26, C5 [BETA-188555]</td>
<td>1890 +/- 40</td>
<td>-19.4‰</td>
<td>collagen</td>
<td>A.D. 20–230 (p = 0.954)</td>
<td>Goldsmith 2005:388</td>
</tr>
<tr>
<td>EFOw 26, C5 [BETA-190139]</td>
<td>1770 +/- 40</td>
<td>-18.6‰</td>
<td>collagen</td>
<td>A.D. 130–380 (p = 0.954)</td>
<td>Goldsmith 2005:385</td>
</tr>
<tr>
<td>EFOw 27, C6 [BETA-188557]</td>
<td>1800 +/- 60</td>
<td>-18.8‰</td>
<td>collagen</td>
<td>A.D. 80–390 (p = 0.954)</td>
<td>Goldsmith 2005:390</td>
</tr>
</tbody>
</table>
### Chapter Four: Middle Prehistoric Period

<table>
<thead>
<tr>
<th>Site</th>
<th>Sample</th>
<th>Date</th>
<th>Material</th>
<th>Age</th>
<th>Reference</th>
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<tbody>
<tr>
<td>DkPj 35, Area 1</td>
<td>[AECV-1763C]</td>
<td>1930 +/- 80</td>
<td>collagen</td>
<td>160–130 B.C. (p = 0.014); 120 B.C.–A.D. 260 (p = 0.94)</td>
<td>Damkjar 1995:135</td>
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<tr>
<td>DkPj 35, Area 1</td>
<td>[AECV-1764C]</td>
<td>1800 +/- 70</td>
<td>collagen</td>
<td>A.D. 70–400 (p = 0.954)</td>
<td>Damkjar 1995:135</td>
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<tr>
<td>EeOm 15</td>
<td>[SFU-NO#1]</td>
<td>1760 +/- 100</td>
<td>-20.0‰ collagen</td>
<td>A.D. 50–540 (p = 0.954)</td>
<td>Apland 1981:35; Morlan n.d.</td>
</tr>
<tr>
<td>EeOm 15</td>
<td>[SFU-NO8]</td>
<td>1700 +/- 80</td>
<td>-20.0‰ collagen</td>
<td>A.D. 130–540 (p = 0.954)</td>
<td>Apland 1981:35; Morlan n.d.</td>
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<tr>
<td>FePc 35</td>
<td>[BETA 225730]</td>
<td>1740 +/- 40</td>
<td>-20.0‰ collagen</td>
<td>A.D. 170–200 (p = 0.013); A.D. 210–410 (p = 0.94)</td>
<td>Spicer 2007a, 2007b</td>
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<tr>
<td>FePc 35</td>
<td>[BETA 225729]</td>
<td>1700 +/- 40</td>
<td>-19.7‰ collagen</td>
<td>A.D. 240–420 (p = 0.954)</td>
<td>Spicer 2007a, 2007b</td>
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<tr>
<td>DkPj 35, s. knoll</td>
<td>[AECV-1177C]</td>
<td>1550 +/- 90</td>
<td>-18.3‰ collagen</td>
<td>A.D. 260–280 (p = 0.013); A.D. 320–660 (p = 0.943)</td>
<td>Fedirchuk 1991; Morlan n.d.</td>
</tr>
<tr>
<td>DjPl 13, B-3</td>
<td>[AECV-1758C]</td>
<td>1610 +/- 90</td>
<td>-19.0‰ collagen</td>
<td>A.D. 240–630 (p = 0.954)</td>
<td>Van Dyke 1994:83</td>
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<td>DjPl 13, B-3</td>
<td>[AECV-1557C]</td>
<td>1010 +/- 90</td>
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<td>rejected</td>
<td>Van Dyke 1994:83</td>
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<tr>
<td>DjPl 13, C-4</td>
<td>[AECV-1361C]</td>
<td>1590 +/- 80</td>
<td>-18.3‰ collagen</td>
<td>A.D. 250–300 (p = 0.038); A.D. 320–640 (p = 0.916)</td>
<td>Van Dyke 1994:83</td>
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<tr>
<td>FdOt 9, Level 4</td>
<td>[BETA-23705]</td>
<td>1620 +/- 65</td>
<td>-20.0‰ collagen</td>
<td>A.D. 250–580 (p = 0.954)</td>
<td>Stuart 1988:88; Morlan n.d.</td>
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</table>

S.S. Burmis (DjPn 62). The S.S. Burmis site is a multicomponent campsite/processing site on the first terrace on the north side of the Crowsnest River, south of the town of Burmis (Quigg 1975b:77–78). Three components were observed at the site, with Oxbow and Hanna material in the lowest component, Besant material in the second component, and Old Women’s material in the most recent component (Quigg 1975b). In 1974,
twenty-six 2-x-2-m units (10.4 m²) were excavated at the site. The excavations were conducted as part of the University of Calgary archaeological field school (Quigg 1975b:77).

Fifteen projectile points were recovered from this level. Originally considered similar to Pelican Lake specimens and labelled as "unknown" (Quigg 1975b:82–83, 92), they exhibit similarities to Besant points. These points were associated with a hearth surrounded by vertically positioned bison bone elements, FBR piles, bone scrap pits, fire-redened stains, and a seed pit (Quigg 1975b:91). The use of local and non-local lithic raw materials was noted but not elaborated. Patterns in the lithic concentrations were noted with bifaces and end scrapers occurring in association with the main bone bed in the south area of the excavation and points, side scrapers, gravers, and retouched flakes associated with FBR in the north area of the excavation (Quigg 1975b:82).

The faunal assemblage was mainly bison but also included deer, beaver, elk, and coyote or dog (Quigg 1975b:82). Butchered bison remains and smashed bone in association with hearths and boiling pits indicated grease extraction from bones, presumably to produce pemmican (Quigg 1975b:82). For reasons not stated, the site was considered to be a winter/spring occupation (Quigg 1975b:91).

A single radiocarbon date of ca. 2,000 BP was obtained from Component 2 (Table 21). This date is among the earlier dates for Besant material. Some of the points have unusually sharp shoulders and Quigg (1975b) suggested that they might represent a transitional form of Pelican Lake (i.e., Bracken) points. In summary, the S.S. Burmis site is a rich Besant campsite/processing site with an array of unusual features.

Dersch, Area 1 (DkPj 35). The Dersch site is a southern extension of Head-Smashed-In Buffalo Jump, though distinctive from it both spatially and materially (Damkjar 1995:5). The site consists of three knolls and portions of the adjacent gullies. Area 1 is the northernmost of these knolls (Damkjar 1995:20). In 1991–1992, a block excavation of 2.4 m² was conducted with an additional two outlying 1-m² units at Area 1. A single occupation consisting of Besant material was revealed in the upper 20 cm of the excavation (Damkjar 1995:132). The mitigative excavations were conducted to assess the effects of planned road upgrading.

Twenty-one point fragments were recovered. The researcher classified twenty specimens as Besant, although five of these may be Samantha points,
based on neck width, with one point considered to be an Oxbow specimen (Damkjar 1995:134). These points were recovered in association with FBR, lithic debitage, two hearths, three pit features, and a set of bone uprights. Other recovered tools included bifaces (n = 6), cores (n = 2), end scrapers (n = 7), a side scraper, retouched flakes (n = 16), drills (n = 2), elongate pebbles (n = 2), and unifaces (n = 2). A bone spatulate tool was also recovered. The majority of the lithics were miscellaneous cherts (65%), with silicified siltstone (12%), quartzite (8%), Swan River chert (8%), and argillite (3%) also fairly common. Avon chert, a lithic raw material commonly used during the Besant phase according to Reeves (1983a:96), was observed in the lithic sample but was not quantified (Damkjar 1995:153).

The faunal assemblage (n = 234) was small and mainly associated with the features. The taxa present included three bison, two canids, a coyote, a fox, and twelve freshwater mussel shell fragments (Damkjar 1995:156). Fetal bison bone (mni = 3, n = 24) was common, suggesting a late winter/early spring occupation (Damkjar 1995:156). Large amounts of FBR (n = 4,476) were recovered at the site. An FBR concentration associated with a hearth was in the east half of the block, with smaller FBR concentrations in the southeast and east-central part of the excavation (Damkjar 1995:136). The larger surface hearth exhibited a lot of FBR, a Besant point, and three fired clay objects (two balls and a piece with three finger impressions on one face and cord markings on the other face) (Damkjar 1995:144). The clay “doodling” suggested ceramic production although no evidence of ceramic vessels was found. The second surface hearth was smaller but similar. Three small pits with limited amounts of bone and FBR were also excavated at the site. Multiple bone uprights, consisting of a femur shaft, two pieces of a radius shaft, a vertebral spine section, and two scapular fragments had been hammered into the ground (Damkjar 1995:149).

Three radiocarbon dates were obtained from this site: ca. 1,800 BP; 1,860 BP; and 1,930 BP (Table 21). These dates are internally consistent with the expected range for a Besant occupation. The focus of these Besant people appears to have been meat roasting for immediate consumption, since boiling pits were not found (Damkjar 1995:156).

EfOw 26, South Block, Component 5. EfOw 26 is a multicomponent campsite located on a coulee-bottom terrace along Deadfish Creek (now at the eastern toe of Deadfish Dam) north of Brooks (Goldsmith 2005:42). Five components were observed with Besant assemblages in the lowest two
components. These were overlain by an Old Women's component, which was overlain by two mixed components. A total of 43 m$^2$ was excavated at the site. Excavations focused on a north block (17 m$^2$) and a south block (15 m$^2$), while a series of other units were scattered across the terrace. Stratigraphic complexity across the site made strong correlations between the different excavation areas difficult (Goldsmith 2005:44–47). Excavations were undertaken as part of a mitigation program in response to the rehabilitation of the Deadfish Dam; unexcavated portions of the site lie outside the development footprint (Goldsmith 2005:1–6).

In Component 5, the lowest component, five points or point fragments were recovered in association with a possible buried stone circle and a hearth. Two of the points were Besant points, while two others are blade fragments that were similar in form but lacked bases. The fifth point was a McKean Lanceolate point. Other tools included biface fragments ($n = 2$), scrapers ($n = 5$), wedges ($n = 2$), a chopper, a bifacially retouched stone tool, unifacially retouched tools ($n = 5$), marginally modified flakes ($n = 11$), utilized flakes ($n = 4$), bipolar cores ($n = 3$), and multidirectional cores ($n = 7$). The lithic assemblage emphasized quartzite, massive quartz, and miscellaneous cherts (Goldsmith 2005:89). Lithic tools and debitage appeared to concentrate around a hearth feature.

The faunal assemblage ($n = 893$) was highly fragmented and consisted primarily of bison ($n = 150$) (Goldsmith 2005:126). A minimum of two bison were recovered. The materials contained little calcine or burned bone and few purposefully impacted pieces of bone. Still, the author argued the assemblage was consistent with campsite activities such as the processing of smaller meat portions and breaking of long bones for marrow (Goldsmith 2005:141). A basin hearth feature contained FBR, large amounts of bone, and some debitage. FBR ($n = 1,062$), while focused around the hearth, was common across the excavation area; it exhibited water fracture, was small (< 5 cm) and was made of quartzite. A second feature was an arc of unmodified cobbles interpreted as a stone circle.

Two radiocarbon dates were obtained for the component: ca. 1,900 BP and 1,800 BP (Table 21). The researcher suggested that the dates, along with four of the points, support a Besant-age occupation; the McKean point was considered intrusive. This interpretation fits with the stratigraphic position of the component beneath a second Besant component.

In Component 4, six projectile points or point fragments associated with four hearths and a micro-debitage cluster were recovered (Goldsmith
The faunal assemblage \( n = 1,392 \) consisted of bison \( (MNI = 3) \), based on numerous identified fragments \( (n = 343) \). Remaining fragments were unidentifiable beyond mammal or ungulate \( (Goldsmith 2005:126, 136-139) \). The fragmentary nature of the assemblage suggested campsite activities and marrow extraction, with the primary kill and/or processing activities occurring elsewhere. Five basin-shaped hearths were recorded in this component. A large amount of \( FBR \) \( (n = 2,228) \) was recovered, roughly correlating with the five hearth features. Most of the \( FBR \) was small quartzite cobbles \( (< 5 \text{ cm}) \) exhibiting a water-fractured pattern \( (Goldsmith 2005:150) \). There was also a concentration of Knife River flint micro-debitage in association with one of the hearths \( (Goldsmith 2005:198-199) \).

A single date of ca. 1,900 BP was obtained for the component \( (Table 21) \). This date corroborates the Besant affiliation of the majority of the projectile points, although an Avonlea point was also recovered. The researcher suggested that the close proximity of the numerous hearths indicate multiple occupations, rather than a single occupation; at least two palaeosols were incorporated in this component \( (Goldsmith 2005:200) \). These complexities suggest more refined excavations are required at the site before the relationships between these materials can be fully understood.

**EfOw 27, Component 6.** EfOw 27 is a multicomponent campsite in an alluvial terrace adjacent to Deadfish Creek at the toe of Deadfish Dam \( (Goldsmith 2005:208) \). Six components were observed, including, from bottom to top, Besant, non-diagnostic, Avonlea, non-diagnostic, non-diagnostic, and Old Women’s components. A total of 40 m² was excavated at the site, with a focus in a western block \( (2.4 \text{ m}^2) \). A smaller block was excavated in the east \( (2 \times 2 \text{ m}) \), as well as a scatter of individual units \( (12 \text{ m}^2) \). The researcher suspected that two separate depositional events might
have been present in Component 6 but the second layer could not be differentiated in the field or the subsequent analysis (Goldsmith 2005:308). The site was excavated as part of mitigative action in association with the rehabilitation of Deadfish Dam.

In Component 6, a Besant point and two point fragments were recovered in association with dense clusters of faunal material and a lithic scatter/activity area (Goldsmith 2005:231–232, 306–308). Other tools included a hammerstone and multidirectional cores (n = 2). Raw materials represented in the lithic assemblage were mainly quartzite (84%) and chert (8%) with the remainder being siltstone, granite, or sandstone. A concentration of twenty-four white or light brown quartzite flakes and shatter consisted of typical late-stage stone tool manufacturing debitage. The only bone tools included four bone beads manufactured on bird long bone shaft segments.

The faunal assemblage (n = 10,280) included bison (MNI = 14), dog or wolf (MNI = 1), bird, deer, fox, and four shell fragments (Goldsmith 2005:261–262). The west block contained the vast majority of the faunal deposits, with four clusters of material (Goldsmith 2005:306). The numerous skull fragments, taken with numerous axis and atlas fragments, suggested that primary skeletal segmentation occurred at a nearby kill site prior to being transported to this locale (Goldsmith 2005:265). Forelimbs and hind limbs were well represented in the assemblage. These carcass segments were brought to the site, stripped of meat, and further butchered for marrow. Sexing suggested both males (n = 5) and females (n = 8) were present, but seasonality was not assessed (Goldsmith 2005:269). FBR (n = 172) consisted of small water-fractured quartzite cobbles and was common across the west block, suggesting stone boiling activities (Goldsmith 2005:271).

A single radiocarbon date of ca. 1,800 BP was obtained for the Component 6 (Table 21). This date supports the Besant affiliation of the projectile point and point fragments. The site is a Besant secondary butchering and processing site near an as-yet unidentified kill site.

DjPn 132. DjPn 132 is a single-component campsite/processing site in a basin-like feature south of the Crowsnest River, east of Burmis (Van Dyke 1997:2–3). A total of 25 m² was excavated in a block. Generally, cultural materials were recovered between 5 and 35 cm bs (Van Dyke 1997:17). The excavations were conducted to mitigate impacts from a subdivision development.
Four Besant points were recovered in association with a scatter of lithics and bone. The researchers suggested that the points were Samantha points or Besant arrow points (Van Dyke 1997:23). The overall size of the points is small, with the neck widths on the points approaching 1.2 cm. Other tools recovered included biface fragments (n = 5), end scrapers (n = 2), and cores (n = 2). The lithic assemblage had a number of exotic lithics (i.e., Montana cherts, obsidian, and chalcedony) and a debitage-to-tool ratio that suggested high discard rates and low conservation (Van Dyke 1997:28).

The faunal assemblage (n = 699) consisted entirely of bison. An MNI of three adult bison was determined. A calf skull was also recovered. Seasonality was not determined, as fetal bone was not recovered and dentition was too fragmentary. Horizontal patterning in the sediments was absent, perhaps because of rodent activity. No features were observed and 8BR was scattered across the site fairly evenly (Van Dyke 1997:33).

A single radiocarbon date of ca. 1,800 BP was obtained for this site (Table 21). The date supports the interpretation that this is a small Besant/Samantha campsite/processing site where tool maintenance and small-scale hunting took place, perhaps repeatedly over time (Van Dyke 1997:39–40).

EeOm 15. EeOm 15 is a stone circle site consisting of fifteen stone circles on the east side of the South Saskatchewan River, just west of the Alberta-Saskatchewan border (Apland 1981:22). In 1980, subsequent to a testing program, two rings were entirely excavated.

Stone Circle 9 was 7 m in diameter and consisted of 161 cobbles (Apland 1981:24). A hearth was observed in the centre of the circle with artifacts (8BR, unburned and burned bone, and lithic debitage) clustering around the feature (Apland 1981:26). The feature was thin, consisting of a 0.5–1.0-cm thick reddish brown soil, suggesting a surface hearth.

Stone Circle 15 was 5 m in diameter and consisted of ninety-two cobbles (Apland 1981:28). Two hearths were observed, one towards the center and the second northeast of centre (Apland 1981:28). The central hearth consisted of a reddish stain 3–6 cm thick while the small hearth was thinner; both appear to be surface hearths. Lithic debitage was associated with the hearths and perhaps deposited next to the northeast wall (Apland 1981:28–30). Two point fragments were recovered from Stone Circle 15. The researcher ascribed the more complete point as Irvine (i.e., Cayley Series), but its large size challenges this identification. Although fragmentary, it most closely resembles Besant/Samantha point morphology. Other tools
recovered included scrapers (n = 5), retouched flakes (n = 10), bifaces (n = 2), spall tools (n = 7), a core tool, split pebble cores (n = 7), and cores (n = 15). Debitage (n = 1,915) was plentiful. Quartzite (58%), local chert (10.6%), and Avon chert (28.1%) were among the most common lithic raw materials while Knife River flint (9.7%), siltstone (11.1%), and petrified wood (0.2%) occurred in smaller amounts (Apland 1981:32).

A single radiocarbon date was obtained from material associated with each stone circle. Material from Stone Circle 9 produced a date of ca. 1,700 BP while material from Stone Circle 15 produced a date of ca. 1,760 BP (Table 21). The researcher struggled with these dates and the identification of the point as Irvine. Interpreting the point as Besant/Samantha accommodates the dates and the recovery of amounts of Avon chert (Reeves 1983a:96).

**Henry James (FePc 35).** The Henry James site is a two-component bison processing site and campsite in the Red Willow Creek valley east of Red Deer. The lower component is Besant and the upper component is Old Women’s. Three Besant points, an intrusive McKean point, and an unidentifiable body fragment were recovered in association with hearth features, scatters of FBR, and butchered bone. Two radiocarbon dates were obtained for the lower component: ca. 1,700 BP and 1,740 BP (Spicer 2007a, 2007b). Despite the intrusive McKean point, the lower component produced two Besant-age dates to accompany the Besant points, suggesting a fairly intensive Besant occupation.

**EgPn 220, Area One.** EgPn 220, Area One, is multi-use habitation site on a 10-metre-high terrace above the Bow River in west Calgary (Vivian 2002:1). In 1991, a 40-m² block excavation was conducted in this area. The site was mitigated relative to the construction of a golf course (Vivian 2002:1).

Eleven projectile points and point fragments were recovered from the site. These were classified as Besant (n = 2), Pelican Lake (n = 2), flake (n = 2), and non-diagnostic fragments (n = 5) (Vivian 2002:6–9). If reworking sequences and the exotic nature of the raw material are taken into account, these specimens are all strikingly similar to Besant points. Other tools recovered include biface fragments (n = 4), scrapers (n = 7), a drill, wedges (n = 5), gravers (n = 10), retouched and utilized flakes (n = 21), core tools (n = 6), and a hammerstone. A single bone tool (an awl shaft fragment) was recovered (Vivian 2002:115). Two bone beads were also recovered (Vivian 2002:119).
debitage (n = 361) consisted almost entirely of small retouching and resharpening flakes associated with retooling and curation (Vivian 2002:15–16). Quartzite (47%) was the most common raw material, with the remaining assemblage composed of local pebble cherts (9%), siltstones (7%), more exotic Montana cherts (22%), Bowman (i.e., Avon) chert (3%), chalcedony (7%), Knife River flint (2%), and obsidian (1%) (Vivian 2002:16).

The faunal assemblage (n = 10,281) was highly fragmented. Species present included bison (MNI = 2), at least one canid, a mountain sheep, a kit fox, and a deer (Vivian 2002:18). No fetal bone was recovered, although a juvenile bison mandible suggested a fall event (Vivian 2002:20). The excavator suggested a “gourmet” strategy was applied, as the highest utility elements were brought from the kill site/primary butchering location to be processed. Three features consisting of FBR concentrations with debitage and bone were observed. The northernmost pile was very large and interpreted as intentional disposal of exhausted FBR (Vivian 2002:27). The two other pits to the south were interpreted as boiling pits, although associated hearths were not observed (Vivian 2002:28). A single radiocarbon date of about 1,700 BP (Table 21) was obtained for the site.

**DjPl 13, Components B-3 & C-4.** DjPl 13 is a multicomponent campsite/processing site on the north side of the Oldman River (see above). Block B, Component 3 overlies Component 2, which also contains Besant material (discussed above). Based on stratigraphy, radiocarbon dates, and cultural similarities Block B, Component 3, is considered contemporaneous with Block C, Component 4 (Van Dyke 1994:81).

In Block B, Component 3, six projectile points were recovered. The researcher suggested that two Besant, two Samantha, one preform, and one unclassifiable fragment were present in association with a large FBR concentration, two smaller FBR concentrations, and four hearths (Van Dyke 1994:81). The lithic assemblage emphasized black chert, chalcedony, and quartzite, with substantial amounts of Avon and Etherington chert. The faunal assemblage (n = 878) consisted mainly of bison bone (MNI = 1) although a possible deer fragment and two pieces of freshwater shell were also recovered. The fauna was distributed fairly evenly throughout the block. Two radiocarbon dates are available for the component: ca. 1,600 BP and 1,000 BP (Table 21). The former date was accepted since it dates bone in the vicinity of a hearth (Van Dyke 1994:83). The latter date was rejected as too recent.
In Block C, Component 4, six projectile points or point fragments were recovered. Of these, two were classified as Besant while the remaining specimens classified as triangular preforms (one possibly an Avonlea preform) (Van Dyke 1994:84). The points were found in association with three hearths, a boiling pit, and an FRP concentration (Van Dyke 1994:83). The lithic assemblage emphasized chalcedony, Etherington chert, siltstone, and quartzite. The faunal assemblage (n=863) was mainly bison (MNI=1) but included four freshwater shell fragments and two fish bones. The fish are most easily caught during early fall spawning, but are available all year long (Van Dyke 1994:85). A single radiocarbon date of ca. 1,600 BP (Table 21) was obtained for the component.

Dersch, South Knoll (Dkpj 35). The Dersch site, as mentioned above, is a southern extension of Head-Smashed-In Buffalo Jump (Fedirchuk 1991; Damkjär 1995). This part of the site is located on a knoll overlooking a coulee that shelters a springhead (Fedirchuk 1991:1). In 1989, a block of 33 m² and eleven isolated 1-x-1-m units were excavated at the site. The site was mitigated relative to road construction (Fedirchuk 1991:1).

Eighteen projectile points and point fragments were recovered. Of these, twelve are classified as Besant, with the remaining points too fragmentary to classify (Fedirchuk 1991:19). Other tools recovered included bifaces (n=14), scrapers (n=15), lateral unifaces (n=13), retouched flakes (n=24), tool edge fragments (n=16), a chopper, a scraper plane, hammerstones (n=4), and cores (n=8). Two bone tools were recovered: a long bone shaft with a rounded spatulate end and a rib that was thinned and rounded at the distal end (Fedirchuk 1991:30). Debitage (n=4,030) was equally composed of flakes and flake fragments/shatter. The raw materials present in the assemblage were mainly cherts (55%), although chalcedony (16%) and quartzite (13.5%) were also common. Exotic raw materials also occur in small amounts, including Avon chert, Helena chert, Knife River flint, and Top-of-the-World chert (Fedirchuk 1991:34). Two small episodes of tool resharpening were noted: one represented by a concentration of Knife River flint flakes near Feature 1 and another represented by a separate concentration of chert flakes near Feature 3 (Fedirchuk 1991:97).

The faunal assemblage (n=13,341) was mainly bison (MNI=9), although canid and a possible bird bone fragment may also be represented. A piece of Dentalium shell and two other unidentifiable pieces of shell were also recovered (Fedirchuk 1991:37). A small amount of fetal bone was recovered.
and believed to be bison. \( FBR \ (n = 23,878) \) was plentiful and highly fragmented. Four features were identified. Feature 1 consisted of an \( FBR \) and bone cluster in an excavated pit (approximately \( 1 \times 0.75 \) m) covered with sandstone slabs in association with two hearths (Fedirchuk 1991:59). Feature 2 was a discard area for \( FBR \). Feature 3 was an \( FBR \) concentration with an associated hearth. Feature 4 was a pit (approximately \( 1 \times 0.35 \) m) with a sandstone slab base, filled with a bison cranium on its side and some long bone fragments. It was lined and/or covered by sandstone slabs (Fedirchuk 1991:85–89). At least one bone upright was also recorded. Besant points were associated with Features 1 and 4, and near Features 2 and 3.

Two radiocarbon dates were obtained for the site, both ca. 1,550 BP (Table 21). In summary, this site is a Besant bone-processing area most likely associated with a late winter/early spring bison kill at the southern end of Head-Smashed-In Buffalo Jump (Fedirchuk 1991:99).

Wells (FDoT 9), Component 1. The Wells site is a multicomponent campsite located southwest of Hardisty (Stuart 1988:1). In 1987, a total of 46 m\(^2\) was excavated in four small block excavations (Stuart 1988:15–16). Two components were identified: a Besant/Samantha component underly­ing an Avonlea component. The site was mitigated prior to the construction of a proposed pipeline.

Three points were recovered in the lower component. These were classified as Samantha points and were associated with a hearth, a concentration of \( FBR \) and articulated bone, and an \( FBR \) feature. Other tools recovered in this component included a biface, scrapers (\( n = 5 \)), retouched flakes (\( n = 7 \)), utilized flakes (\( n = 8 \)), cores (\( n = 3 \)), a hammerstone, and split pebbles (\( n = 4 \)). The lithic raw material assemblage was almost limited to quartzite (85.8\%) with some miscellaneous cherts (10.5\%) and trace amounts of exotics such as Knife River flint (1\%) (Stuart 1988:29). It was suggested that the raw material selection likely reflected availability rather than preference (Stuart 1988:86).

The faunal assemblage (\( n = 345 \)) was very fragmentary. One fragment was identified as bison while a second was identified as large ungulate (Stuart 1988:74–75). \( FBR \ (n = 652) \) was highly fragmented with most pieces smaller than 5 cm (Stuart 1988:69–70). Some \( FBR \) was associated with the hearth. Other pieces overlaid an articulated metacarpal–carpal bone feature. Still other pieces formed a separate \( FBR \) concentration presumably created from by-products of processing, and directly associated with a Samantha
point. The bone feature was radiocarbon dated to ca. 1,500 BP (Table 21). In summary, the site is a small Samantha-Besant campsite on the northern periphery of the Plains, where meat was roasted and some stone boiling may have occurred.

Ross Glen (DIOp 2). Ross Glen is a stone circle site on the prairie level above Bullshead Creek in Medicine Hat (Quigg 1986:2–7). The site was named for the subdivision being developed at the time. It consisted of eighteen largely buried stone circles, forty-two ancillary features, and a large artifact scatter, all covering 180 × 210 m. The main occupation was by Besant people (but see Oxbow phase above). In 1978 and 1981, a total of 754 m² was excavated: 301.9 m² inside the stone circles and 452.1 m² outside the stone circles (Quigg 1986:130). As alluded to above, impacts to the site were mitigated prior to a housing development.

Eleven projectile points from the primary occupation of the site were classified as Besant (Quigg 1986:124). They were found within six stone circles but were argued to be associated with seventeen stone circles and thirty-six ancillary features (Quigg 1986:124, 132). Four stone circles had post-moulds towards the center of the circle that were interpreted as tie-down stakes (Quigg 1986:132). A number of scrapers represented the domestic activities at the site; many of these items were made with Knife River flint and Montana cherts, suggesting trade and exchange. A small assemblage of potsherds (n = 24) was recovered in apparent association with the Besant material. The small size of the sherds limited description of them as “smooth with isolated occurrences of shallow striations” (Quigg 1986:121).

A patterned arrangement was seen in the distribution of the stone circles at the site. Quigg (1986:133) suggested that two groups or bands simultaneously met, with the ancillary features between the two groups providing common ground. Individual and/or family relationships would have determined the size of stone circles and their placement in relation to other circles within each group (Quigg 1986).

Three radiocarbon dates were obtained for the site although one clearly relates to earlier times (see Oxbow phase). The dates that reflect the Besant occupation are roughly 1,500 BP (GX-5892-A, on bone apatite) and 1,300 BP (GX-5892-G, on gelatin) (Table 21). Geochron Laboratory suggested the best date would be an average, ca. 1,458 +/− 156 BP (Quigg 1986:124). This is a late date for a Besant occupation, however, at two standard deviations, the site falls well within the usual parameters for Besant. Importantly,
Samantha points were not noted in this material, suggesting that the site may immediately predate the end of the Besant phase.

Other sites. There are numerous other Besant sites in Alberta that lack good context or radiocarbon dates or both. Others have not been fully reported upon. For example, the Coal Creek stone circle site (EhPp 1), west of Calgary, consisted of up to forty stone circles over three terraces (McIntyre 1978:19). Seven stone circles were fully or partially excavated. Four Besant points were recovered (McIntyre 1978:169, plate 17, nos. 1–4), all apparently associated with Level 2. Deposition in shallow sites, however, always leaves questions of stratigraphic integrity. The recovery of a stemmed atlatl point and a plains triangular preform in the same level supports the likelihood of mixed components (McIntyre 1978:56).

The Kenney site (DjPk 1) is a multicomponent campsite in southwestern Alberta (Reeves 1983b). The major occupational layers are a historic assemblage (Layers 1–3), Old Women’s material (Layer 4), and Besant material (Layers 6 and 8) (Reeves 1983b:23–26). Two Avonlea points occurred in Layer 6 while a Pelican Lake-like point occurred in Layer 8 (Reeves 1983b:59). A radiocarbon date was available for each layer (GAK-1354 was rejected, Blakeslee 1994). Charcoal from a hearth in Layer 6 produced a date of 700 ± 60 BP (S-271). But this date seems late for this material. Charcoal for another hearth in Layer 8 produced a more appropriate date of 1,600 ± 115 BP (S-272) (Reeves 1983b).

Lastly, EgPn 476 is a short-term campsite adjacent to the Elbow River valley, west of Calgary (de Mille and Head 2001:35–45). A Besant point was recovered in both the south and north parts of the site. Unfortunately, not enough bone was recovered to obtain a radiocarbon date (de Mille and Head 2001:45).

Besant: A Renewed Perspective

This review of Besant sites in Alberta illustrates an overwhelming trend toward short, broad points made of local lithic raw materials in assemblages that date between 2,100 and 1,500 BP. As well, the next section shows that lanceolate points or flake points of Knife River flint customarily included in the Besant phase invariably date to between 1,500 and 1,350 BP. The multi-faceted nature of Besant point morphology and lithology is temporarily separated in Alberta, providing strong evidence for inferring separate cultural units — a Besant phase and subsequent Sonota phase. Thus,
the notion of a Besant-Sonota complex is no longer tenable. The following outlines the Besant phase, based on the materials reviewed above.

The Besant side-notched point is the diagnostic point of the Besant phase. As originally defined by Wettlaufer (1955:39–43), it tends to be “short and broad with shallow side notches and a slightly concave base.” Dyck (1983:115) noted that the notches are twice as high as they are deep and Reeves (1983a:55) noted that notches are often placed low on the point. The flaking is crude compared to Sonota points. The Samantha arrow point appears late in the Besant phase. As Reeves (1983a:63) noted, the arrow points are morphologically similar to Besant atlatl points but are smaller. As well, there is a superficial similarity to early Cayley Series points of the Old Women’s phase (Reeves 1983a:63; Kehoe 1974:109; Duke 1988:268). Importantly, Kehoe’s (1974) Samantha points at the Walter Felt site were also classified as transitional between Avonlea and Besant (Kehoe 1973:164). It is argued in the next section, in fact, that Level 10 of the Walter Felt site represents Avonlea and Sonota materials co-existing at a site, rather than Samantha-Besant.

In terms of the tool assemblage, side scrapers are quite rare relative to end scrapers. Retouched and utilized flakes are common. Flake points appeared to be rare. One unusual type of artifact was recovered from a few sites in the Oldman River area: net sinkers. These would presumably be used for fishing, but only Level C-13 at DjPl 13 produced fish bone. Bone tools are rare in Besant sites. DkPj 35, South Knoll, produced two spatulate tools while DjPl 13, Level B-3, produced a single specimen. A Dentalium fragment was recovered at the South Knoll of DkPj 35 and freshwater mussel shell was recovered at EfOw 27, Area 1 of DkPj 35, and Levels B-2, B-3, and C-4 of DjPl 13. Presumably the recovered shell was used mainly for adornment.

The lithic raw materials used at various sites during the Besant phase show a heavy dependence on local sources. Based on the sites reviewed above, quartzite comprises about 22 percent of the lithic raw material in the sites discussed above, siltstones about 5.5 percent, Knife River flint about 5 percent, chalcedony about 7.6 percent, black chert about 5.6 percent, and miscellaneous cherts about 39.7 percent. Montana cherts account for 0.1 percent while porcellanite constitutes 0.4 percent of the raw materials. These numbers need to be taken with caution, however, owing to the disparate reports from which the data was gleaned.

Pottery appears to be almost entirely absent from the newly defined Besant phase in Alberta. Three sites have been considered Besant-Sonota
sites that exhibit pottery: Ross Glen, EhPc 105 and One-Eleven. The pottery at Ross Glen was recovered from within and outside a shallowly buried stone circle. Associations between artifacts within shallow sites such as stone circle sites are notoriously difficult to establish because of the ease with which subsequent materials can infiltrate the site. At EhPc 105, the pottery was associated with a hearth but the diagnostic points were recovered in an adjacent unit at greater depth. This association is not particularly sound. The One-Eleven site provides firm evidence of pottery within a Besant-Sonota kill site. The large number of lanceolate and flake points made on Knife River flint, however, indicate this site is a Sonota site, not a Besant site. Of course, Sonota burial mound sites in the Middle Missouri area fairly frequently exhibit pottery, so pottery at the One-Eleven site is not out of the ordinary. Somewhat perplexing is the pottery recovered at DkPj 35, Area 1. Damkjær (1995:144) recovered three fired clay objects (two balls and a piece with three finger impressions on one face and cord markings on the other face), but evidence of vessel production was not found. This part of the site was dated to early in the Besant phase. This recovery begs the question of its significance, given an apparent lack of ceramic vessels at Besant sites.

The subsistence as reflected in the fauna suggests a heavy reliance on bison. As with the previous Bracken phase, bison procurement through jumping bison and large encampments continue into the Besant phase. Wolf and/or dog was found in a number of the sites, as was coyote, while only one site appears to have produced fox. When one considers that a single deer and a single fish were the only other faunal remains recovered at the sites, making the heavy reliance on bison is even more evident. Of course, this is only a small sample of Besant sites and many more sites should be looked at before firm conclusions regarding Besant subsistence can be drawn. The features observed in the reviewed Besant sites include stone circles, surface hearths, basin hearths, FBR concentrations, earth pits, a possible boiling pit, and a set of bone uprights.

The description of the Besant phase presented above can be found in assemblages outside of Alberta. In Saskatchewan there are a number of Besant sites that roughly correlate in time and space with the aforementioned Alberta sites. The Mortlach (EcNL 1) site, in south-central Saskatchewan, produced Besant material in Occupations 4A and 4B (Wettlaufer 1955:96–97, plate 6, nos. 2–4; 98–99, plate 7, nos. 1–3). Short Besant points and an absence of pottery support the Besant phase association. Wettlaufer's
(1955) assignment of Occupations 4C and 4D to the Besant phase is not supported by the diagnostics within the recovered assemblages. A review of the point forms suggest that Occupations 4A and 4B exhibit short, broad points with shallow notches and slightly concave bases. A Pelican Lake point appears to have been mixed into the assemblage in Occupation 4A (Wettalufer 1955:44). Wettalufer (1955:80) noted that while chalcedony was recovered in fairly large amounts in Occupations 4A and 4B, petrified wood, quartzite, and crystalline cherts were recovered in very large amounts. This would be expected in Besant assemblages that invariably reflect local sources. Occupation 4B was radiocarbon dated to 1,660 +/- 159 BP (S-22).

The Elma Thompson (EIOj1) site is a buried stone circle site near Flaxcombe (Finnigan and Johnson 1984:27). Three Besant points were recovered in association with a hearth and rock-filled pit. Lithic materials included Swan River chert, chalcedony, and quartzite, among others, but no Knife River flint (Finnigan and Johnson 1984:30–32). The site is dated to 1,755 +/- 145 BP (S-2202) (Morlan et al. 2002:39).

The Newo Asiniak (FbNp16) site is a multicompontent site immediately north of Saskatoon (Kelly 1986). Level 3 produced seven Besant points and an anomalous Pelican Lake point (Kelly 1986:144). Most of the assemblage was quartzite although Knife River flint, jasper, and petrified wood were each used to make points (Kelly 1986:147). A date of 2,235 +/- 70 BP (S-2530) was obtained for the level (Kelly 1986:155).

In Montana, Herdegen’s Birdtail Butte (24BL1152) is a multicomponent bison kill site and campsite on the southeast margin of the Bear Paw Mountains (Brumley 1990). Sixteen layers were revealed with Avonlea present in all but one of the upper twelve layers (see Avonlea section). Layer 13 did not produce diagnostic material. Layer 14 to 15 produced Besant points while the base of the excavation was reached in Layer 16, a culturally sterile layer (Brumley 1990:36–46). The Besant points were all appropriately stout forms (Brumley 1990:44, fig. 17; 45, fig. 18). The lithic assemblages exhibit a fair amount of Knife River flint and porcellanite (Brumley 1990:85, tables 9 and 11), but this is not unexpected so close to the quarries. Pottery was not recovered. Unburned bone from Layer 13 produced a date of 1,690 +/- 80 BP (Beta-31793) and unburned bone from Layer 15 produced a date of 1,960 +/- 80 BP (Beta-31794) (Brumley 1990:41).

The Fresno (24HL103) site is a multicompontent site on the south shore of the Fresno Reservoir. The lower cultural level produced two Besant points, and two were found eroded onto the beach. A boiling pit, a prepared
basin-hearth, and two bone uprights were recovered within this level (Keyser 1979:64). A Gakushuin date (gak-6266) was rejected (see Blakeslee 1994).

The Donovan (24HL191) site is a multicomponent site along the south shore of the Fresno Reservoir at the mouth of a coulee in north-central Montana (Keyser 1979:48–55). The lower of two components are a Besant bison kill and processing occupations. A complete Besant point and a specimen lodged in an ischium were manufactured on brown chert and white agate, respectively (Keyser 1979:51). A biface of Knife River flint was recovered but only chert flakes were mentioned amongst the debitage. A Gakushuin date (gak-6272) was rejected (see Blakeslee 1994).

The Boarding School Bison Drive (24GL302) in north-central Montana produced a single, large corner-notched point in Level 31 below numerous levels containing Late Side-notched points (Kehoe 1967:46). Kehoe (1967:46) considered it similar to Middle Woodland forms but morphologically it seems most similar to points of the Besant phase (Kehoe 1967:135, plate 11). Another site that may have produced Besant points is Canyon Ferry Reservoir Localities vi (Greiser 1986, fig. 114m–s) and vii (Greiser 1986, fig. 125f–i). These points were surface collected over a period of nineteen years around the Canyon Ferry Reservoir (Greiser 1986). The lack of context for these points is unfortunate, as it precludes accurate dating and identification. Other possible Besant sites in Montana include 24PH601 (Hoy 1973:17) and the King site (24PH2886) (Brumley and Rennie 1999).

In summary, the Besant phase dates from ca. 2,100 to 1,500 BP. Besant material is found across southern Alberta, southwestern Saskatchewan, and north-central Montana. The Besant point is the diagnostic of the Besant phase. The Besant point is short and broad with shallow side-notches and a slightly concave base. Besant lithic assemblages almost invariably focus on local lithics. The use of jumps continued from the previous period and eventual excavation of Besant pounds may be expected. Stone circles exhibiting characteristics of tipis continue, as do large campsites that likely reflect winter encampments. The abrupt termination of the Besant phase occurs because of the spread of the Sonota phase from the Middle Missouri and southeastern Saskatchewan into southern Alberta at ca. 1,500 BP.