Early Prehistoric Period

CA. 11,050 BP TO 8,600 BP

Many researchers consider the coalescence of the Cordilleran and Laurentide ice sheets to have ceased around 12,000 BP (e.g., Osborn et al. 2000). Following this, the exposed land between the retreating ice sheets produced the so-called Ice-free Corridor. This new landscape was relatively unstable, exhibiting rapid change resulting from deglaciation. Meltwater created extensive proglacial lakes and erosional landforms. Revegetation likely occurred from plant communities to the south. Data gathered mainly from pollen records in the foothills suggests shrubby open vegetation in the mountains, open vegetation along a broad band at the foot of the mountain range, and spruce-dominated vegetation in the northeast (Beaudoin and Oetelaar 2003:196). By 11,000 BP, the ice had largely retreated from the province with the possible exception of the very northeast corner. Aeolian activity in dune fields, common in parts of Alberta, may have preserved or destroyed evidence of human activity at this time (Wolfe et al. 2006). Periglacial processes lessened as the glaciers retreated. By 10,000 BP, landforms were more stable and rivers began to incise into the terrain (Beaudoin and Oetelaar 2003:199). The dynamic environment that predominated during this time period likely played a large role in limiting the number of sites preserved and the archaeological visibility of sites from the Early Prehistoric period. The question remains whether the dynamic environment largely destroyed or deeply buried evidence of human activity.
Clovis Phase (ca. 11,050 to 10,800 BP)
The earliest widely accepted archaeological culture in the Americas is the Clovis phase of the Llano tradition. The most characteristic artifact of the phase is a large, fluted projectile point: the Clovis point. Flaked stone technology exhibiting bifacial and flake tool manufacturing is also common. Flake tools include knives, gravers, end scrapers (in some cases spurred), and large (macro-) blades (Haynes 1993). The fluted projectile points have sharp tips for initial penetration, sharp blade edges for cutting a hole to allow further penetration of the point, flutes for easy attachment to a notched foreshaft, and a narrower basal edge area than distal area for application of the binding so it does not inhibit penetration (Frison 1993b:241). As well, Clovis toolkits often contain what appear to be cylindrical, bevelled bone points, bone shaft wrenches, and rib segments with rounded and polished ends (Haynes 1993). Based on recoveries from the Anzick Burial site, ceremonial items apparently include exceptionally large and well-made Clovis points along with large bifaces, cylindrical bone rods and points, and red ochre (Haynes 1993:219). In terms of the range of sites encountered in the Clovis phase, most excavated sites have been interpreted as either kill sites or meat-processing sites, with the remainder being interpreted as burials and caches (Bradley 1993:253).

The subsistence strategy of the Clovis phase is most commonly thought of as big-game hunting. Evidence from fauna recovered at Clovis sites indicates a more complex subsistence than simply hunting of large mammals. Grayson and Meltzer (2002) reviewed the faunal assemblages from seventy-six sites and determined that only fourteen provided evidence of Clovis predation on megafauna, with twelve sites containing mammoth and two containing mastodon. Likewise, Clovis people were not preying on the full array of then-extant fauna that are now extinct, which suggests that Clovis people had little role in their extinction (Grayson and Meltzer 2002).

Delimiting the geographic extent of Clovis phase is complicated by the difficulty of differentiating Clovis points from other fluted points (Howard 1990). Clovis points are “comparatively large and heavy bifacially flaked fluted lanceolate points, lenticular to near oval in cross-section with parallel to moderately convex lateral edges” (Howard 1990:259), which are “normally fluted on both faces. Flutes are most often produced by multiple flake removals. Length and quality of flutes are greatly variable, with length usually 30 to 50 percent of overall point length” (Howard 1990:259). Importantly, the eastern fluted points do not match this description as they
tend to exhibit more advanced technological refinements such as large single channel flakes produced using the Folsom technique, deep basal concavities, constricted waists, extensive basal retouch, and comparatively fine, often sequentially positioned overall flaking (Howard 1990:259). A recent continent-wide study of Early Palaeoindian points supports this classification. Buchanan and Collard (2007) used cladistic analysis on morphological attributes of Palaeoindian projectile point assemblages. The analysis was conducted on the grounds that the migration route into the Americas by a group of people could be inferred by the relationships amongst the various populations left along the route; they argued that cladistics, because it takes into account projectile point morphology, could infer the historical relationships between the groups of people (Buchanan and Collard 2007). Their data indicate that the Clovis phase was a rapidly migrating population having its origin in the Ice-free Corridor, or possibly the Northwest Coast, but not the Isthmus of Panama or an ice bridge across the mid-Atlantic (Buchanan and Collard 2007; Hamilton and Buchanan 2007). Thus, the earliest Clovis points and Clovis variant points are found on the northern and western plains; the eastern fluted material is related to Clovis but is a later derivative, more properly “Folsom-like.”

The extreme rapidity with which the Clovis phase spread across the Americas from the northwest appears to be demonstrated in the aforementioned analyses by Buchanan and Collard (2007) and Hamilton and Buchanan (2007). Kelly and Todd (1988) suggested that Clovis hunters were not analogous to any modern hunter-gatherers. The apparent continual range shift would have brought these hunters into new and different environments but a primary dependence on large fauna would not have required a niche shift (Kelly and Todd 1988:234–235). As Clovis people were likely entering territory uninhabited by humans, they would have had few if any neighbouring groups to rely upon for assistance. They would have had no detailed knowledge of the terrain, thus, they would have used the landscape in a short-term and redundant fashion (Kelly and Todd 1988:235). Large Clovis bifaces of high-quality raw materials provided a transportable technology that was usable in unknown terrain for hunting-specific tasks (Kelly and Todd 1988:235). Long-term storage at successful kills would not be expected as stores reduced mobility; rather, renewed resource procurement was a less risky strategy under conditions of regionally abundant but locally unpredictable resources (Kelly and Todd 1988). An example supporting this model is Blackmar’s (2001) examination of the
distribution pattern of Clovis points in Kansas, Oklahoma, and Texas; it suggests that the distribution of Clovis materials represents a homogeneous occupation across the study area, possibly reflecting a subsistence strategy towards large mammals.

Traditionally the Clovis phase has been dated between ca. 11,500 BP and 10,900 BP (Frison 1991:25). More recently, Waters and Stafford (2007) have determined a more accurate time span for the Clovis phase by obtaining and analyzing high-precision accelerator mass spectrometry \(^{14}C\) ages from previously dated sites. Their research suggested that the Clovis phase existed between 11,050 BP and 10,800 BP. Thus, the Clovis phase would have been present over a roughly 250-year period, regardless of whether one examines radiocarbon or calendar years (Waters and Stafford 2007:1124).

In Alberta, there are no Clovis points from excavated contexts in demonstrable association with other Clovis material. The vast majority of the evidence for the Clovis occupation of Alberta has been recovered as isolated projectile points from cultivated fields and eroded areas. Comparison of the formal morphology of these projectile points to specimens of known age from adjacent regions of the United States has provided the evidence for their chronological placement. A brief historical outline of the recovery of Clovis points in Alberta follows, documenting the development of research in this area over the past few decades.

In the late 1930s, an eroded area north of Chinook produced a complete Clovis point and a point base along with other Palaeoindian artifacts. This site is called Johnston Locality 4 or EkOr 1 (Wormington and Forbis 1965:75–80, especially 77, fig. 20b; Gryba 1988:A3-33 to 35). In 1955, when William Mulloy of the Glenbow Foundation investigated the location, he noted that the area had likely been destroyed by erosion (Wormington and Forbis 1965:75). In the early 1950s, Armin Dyck found a Clovis point in the bottom of a trench while serving on a city road construction crew in Lethbridge (Wormington and Forbis 1965:135, fig. 55). Wormington and Forbis (1965:177, fig. 77a, b) mentioned three additional locations of lanceolate points that resemble possible Clovis sites. One locale produced two lanceolate points near Clear Hill, northwest of Peace River (Wormington and Forbis 1965:176; 177, fig. 77a). A second locale, located north of Peace River, produced a cache of up to 150 flakes along with two lanceolate points (Wormington and Forbis 1965:183). E. Mott Davis tested the location, labelling it HbQi 1, with a cross-shaped trench covering 400 square feet (~37 m\(^2\)), but he recovered only a few bone fragments (Wormington
The third locale was a cache located southeast of North Star. The cache consisted of bifaces as large as nine inches long (~23 cm), flakes, and "arrowheads" (Wormington and Forbis 1965:180). Similar caches of bifacially flaked specimens of black stone were reported for at least two other locations in the area (Wormington and Forbis 1965:180). The large bifacial tools and lanceolate points are hallmarks of Clovis cache strategy (e.g., Gillespie 2007).

Gryba (1988) conducted an inventory of fluted point occurrences in Alberta, with the objective of bringing together, in a single source, as many occurrences of fluted and Early Prehistoric period points as possible. He recorded 150 fluted point specimens during his fieldwork, including Clovis points (n = 46), multiple-fluted points (n = 13), fluted points (n = 21), Folsom points (n = 18), Midland points (n = 15), and basally thinned points (n = 37), as well as Palaeoindian points (n = 29) and one large biface fragment. (Gryba 1988). Gryba (1988:16) noted the heavy reliance on locally available lithic raw material in point manufacture, although some exotic materials were used. In terms of the geographic distribution of the Clovis points, Gryba (1988:17) described their almost exclusive presence in southern Alberta south of Cold Lake, as well as near Peace River, with a strong association to areas with agricultural and developed landscapes. Almost all subsequent research on fluted points has built on this significant collection of raw data.

Gillespie (2002; Gillespie et al. 2002) built upon Gryba’s (1988) database, from which he produced a typology. Attributes used in the typology were restricted to those related to basal morphology as these were seen as less controlled by function than the blade; a total of eight types were created (Gillespie 2002:65–80). In comparing the Alberta fluted-point database to an American fluted-point database (Tompkins 1993), Gillespie (2002:81–97) repeatedly found the strongest similarities between Alberta fluted material, Saskatchewan fluted material, and western U.S. fluted material, rather than to eastern U.S. or South American materials. The raw materials utilized in manufacturing the Alberta fluted points were dominated by locally available quartzite, siltstone, and mudstone (64%). In total, 71 percent of the raw materials were local, 16 percent were exotic, and 13 percent were undetermined (Gillespie 2002:108–109). This extensive use of local materials is in contrast to both modelled (Kelly and Todd 1988) and observed (Lahren and Bonnichsen 1974) Clovis lithic activity to the south in the United States.

Concerning the origin of the fluted material in Alberta, Gillespie (2002:130–135) argued that entry into Alberta could not have been from
the north through the Ice-free Corridor, as palaeoenvironmental and faunal evidence suggests that people could not have been supported within the corridor before 12,000 BP. Instead he proposed a northward migration into the province, based on the current lack of known human occupations in Alberta that predate fluted point sites in the United States (Gillespie 2002:138). Further, he compared the similarly undated Alaskan fluted points to the Alberta sample, as both exhibit triple fluting and heavy pressure flaking. Again he saw similarities that he interpreted as evidence of a northward migration.

The Sites
As stated above, surface finds of Clovis points are not common. It is difficult to assess the exact number of Clovis points that have been recovered from surface finds, owing to their lack of stratigraphic context, which causes them to lack key information about associated material culture. That is, there are many fluted points in Alberta that likely postdate the Clovis phase (see the Sibbald phase below) or are regional variants of the classic form (e.g., Gillespie 2002:80). Regardless, there are a number of Clovis points recovered from the surface and they are discussed below (see Plate 2 and Figure 3).

Gryba’s Inventory. Gryba (1988) provided the first exhaustive inventory of fluted points in Alberta. Many of the Clovis points known today are a product of his extensive and tireless research on Palaeoindian surface finds in the province. Table 1 summarizes keys aspects of his report for Clovis point recoveries.

EfPl 93. EfPl 93 is a buried campsite at the prairie level on the east side of the Bow River about 0.8 km south of its confluence with Fish Creek in south Calgary (McIntyre 1975). Ten 2×2-m units were excavated at the site. Two occupations were recorded. The lower occupation produced an ash-filled elliptical hearth associated with fire-broken rock (FBR) (McIntyre 1975:15–16). The upper occupation consisted of two rock-lined hearths, a surface hearth, and concentrations of FBR with bone and a few artifacts. A Besant point was collected from the surface while the base of a Clovis point was recovered from 20 cm below surface (cm bs) (McIntyre 1975:15–17; Gryba 1988). The Clovis specimen exhibited an arced base and straight lateral margins. The occupation was interpreted as a one-time, short-term campsite likely during the Besant phase. The Clovis point base was considered to be out of context and likely redeposited by later users of the area (McIntyre 1975).
PLATE 2
Clovis points. Illustrated are specimens from the Reed collection (a); Lougheed collection (b); Haug collection (c); DhPg 8 (d, i, n, and o); Bull collection (e); Cameron collection (g and l); Dyck collection (h); Johnston collection (j); Blumhagen collection (k); and Sawyer collection (m). Photo credit: Eugene Gryba (a–c, e, g–l, j–m); Shayne Tolman (d, f, i, n, and o).
Figure 3
Clovis and Goshen sites within Alberta
<table>
<thead>
<tr>
<th>Collection</th>
<th>Find Spot</th>
<th>Portion</th>
<th>Base Shape</th>
<th>Lateral Margins</th>
<th>Raw Material</th>
<th>Other</th>
</tr>
</thead>
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<td>Erik Andersen</td>
<td>Beaverlodge</td>
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<td>arced</td>
<td>excurrave</td>
<td>ironstone</td>
<td>reworked</td>
</tr>
<tr>
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<td>complete</td>
<td>arced</td>
<td>excurrave</td>
<td>quartzite</td>
<td>reworked</td>
</tr>
<tr>
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<td>Rocky Rapids</td>
<td>missing tip</td>
<td>arced</td>
<td>excurrave</td>
<td>quartzite</td>
<td>reworked</td>
</tr>
<tr>
<td>Eddy Cameron</td>
<td>Rocky Rapids</td>
<td>base, missing ear</td>
<td>V-shaped</td>
<td>straight</td>
<td>mudstone</td>
<td>reworked</td>
</tr>
<tr>
<td>Eddy Cameron</td>
<td>Rocky Rapids</td>
<td>complete</td>
<td>arced</td>
<td>straight</td>
<td>chert</td>
<td>reworked</td>
</tr>
<tr>
<td>Eddy Cameron</td>
<td>Rocky Rapids</td>
<td>complete</td>
<td>V-shaped</td>
<td>straight</td>
<td>mudstone</td>
<td>potlid fracture</td>
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<td>quartzite</td>
<td></td>
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<tr>
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<td>Red Deer</td>
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<td>V-shaped</td>
<td>straight</td>
<td>Swan River Chert</td>
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</tr>
<tr>
<td>Hugh Bower</td>
<td>Red Deer</td>
<td>missing tip</td>
<td>arced</td>
<td>straight</td>
<td>siltstone</td>
<td>reworked</td>
</tr>
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<td>arced</td>
<td>excurrave</td>
<td>northern quartzite</td>
<td></td>
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<td>excurrave</td>
<td>mudstone (?)</td>
<td></td>
</tr>
<tr>
<td>Philip Reed</td>
<td>Ponoka (?)</td>
<td>missing tip</td>
<td>arced</td>
<td>excurrave</td>
<td>mudstone</td>
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<tr>
<td>Jack McIntosh</td>
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<td>siltstone</td>
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<tr>
<td>Gordon Freeman</td>
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<td>V-shaped</td>
<td>excurrave</td>
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<td>straight</td>
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<td>heat treated</td>
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<td>EjOt 2</td>
<td>complete</td>
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<td>Bruderheim</td>
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<td>EhPu 1</td>
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<td>Penhold</td>
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<td>arced</td>
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</table>
Wally’s Beach (DhPg 8). The Wally’s Beach site is situated along the shoreline and in the lake bed of the St. Mary Reservoir, an impounded water body of the St. Mary River near Cardston in southwestern Alberta. The site consists of archaeological lithic and faunal surface scatters, along with palaeontological specimens and animal footprints from the end of the last glaciation, that were exposed by the erosion of 1.5 to 2 m of shoreline and lake bed during periods of high drawdown (Tolman 2001). The site was found by Shayne Tolman during a family outing in 1996 (Tolman 2001:2). A drawn-down area of the southeast shoreline has been repeatedly examined by various investigators. By 2001, approximately 5,400 culturally modified lithic specimens had been surface collected (Tolman 2001:85). Projectile points from the Early Prehistoric period to the Historic period have been found, including ten fluted points (Tolman 2001:86). Fauna recovered dated to about 11,100 BP, and included extinct horse, extinct bison, helmeted musk ox, and caribou.

The lack of context for the Early Prehistoric period points led to a protein residue analysis (i.e., crossover immunoelectrophoresis, or CiEP) to provide a link between the fluted specimens and palaeontological fauna recovered at the site (Kooyman et al. 2001). The points tested included three Clovis points, one Folsom point, and two Goshen points. The test produced positive results for protein residue on the three Clovis points: two for horse and one for bovid (i.e., bison, musk oxen, or cattle). Other Clovis sites in North America that are known to have horse are Bonfire Shelter, Colby, and Lubbock Lake.

Smuland Creek (GdQn 1). The Smuland Creek site is located in uplands southeast of Grand Prairie. Shovel testing at the site led to the recovery of a proximal portion of a quartzite fluted point, a black chert graver, and ten pieces of debitage (Bereziuk 2001). The site appears to occur along a strandline or beach ridge associated with the uppermost and earliest level of Glacial Lake Peace. All the artifacts were recovered in the top 15 cm of the sediments in an area of about 60 × 25 m. The compressed stratigraphy has foiled dating efforts at the site and it was not possible to determine associations between the artifacts (Bereziuk 2001). Still, the fluted point exhibits an arced basal edge and excruciate lateral margins, making it similar to Clovis material, while its small size likens it to the Northern Fluted points.
FgQm 59 (243R). FgQm 59 is a buried multicomponent campsite on a terrace on the north bank of the Snake Indian River in Jasper National Park (Hudecek-Cuffe 1998). The deposits consist of silts at 120–150 cm bs, overlying clay and glacial till. Seven components were excavated down to sterile glacial deposits during the 1997 University of Alberta field school. A single fluted point was recovered at 119.5 cm bs in a lens of dark reddish-brown silt. It is manufactured on a white, opaque quartzite with a single flute on one side. The basal edge is v-shaped. A number of small charcoal flecks were recovered between 120 and 125 cm bs but not in direct association with the point. Dates derived from the charcoal were 8,840 +/- 40 BP (CAMS 41241) and 8,410 +/- 80 BP (TO-6848). A few pieces of silicified siltstone debitage were recovered as well as a single mudstone flake from the fine screen, from 120–125 cm bs. The remaining sediments were sterile to a depth of 144 cm bs, where glacial till was encountered (Hudecek-Cuffe 1998:69). Assigning the specimen to the Sibbald phase was rejected owing to the widest part of the point apparently being located toward the tip rather than the base, and the fluting/thinning on the base is single rather than multiple (Hudecek-Cuffe 1998:371).

Clovis: An Unprecedented “Homecoming”? 
There can be little doubt that Clovis material has been recovered in Alberta. Studies thus far suggest Alberta’s Clovis material is largely manufactured on local material with few exotic lithics being utilized (Gryba 1988; Gillespie 2002). This is in contrast to Clovis material from the south in the United States. This difference is interesting for a number of reasons. First, entry into the Americas through Alberta would have presented Clovis people with few lithic choices. Despite Gillespie’s (2002) argument, Clovis knowledge of superior southern lithics would have predisposed these “stone snobs” to travel and outfit themselves at the better quarries to the south if a northern migration had occurred. It is reasonable to infer that they failed to use southern materials because they did not know about the resources. If they had, Alberta would exhibit evidence of the use of exotic lithics within Clovis’ transportable technology (Kelly and Todd 1988). The lack of a strong southern influence in the Alberta Clovis lithic material is reasonably explained by the idea that they had not reached the southern latitudes yet.

Another line of evidence supporting antiquity of Alberta’s Clovis material rests in point morphology. A thorough analysis of the technological reasons for the consistent difference in base form (i.e., arced versus v-shaped)
and lateral margin shape (i.e., straight versus excurvate) is overdue. For example, straight lateral margins, which appear to be rare to the south (e.g., Frison 1991a), might reflect an earlier Clovis technology replaced by excurvate forms that better allow haft penetration. Such technological analyses might help refine the typology, allowing Clovis material to be distinguished from other fluted material in Alberta.

Here, a discussion about the phenomenon of Northern Fluted points is appropriate. Numerous fluted points have been recovered from Alaska and the Yukon Territories. These often exhibit one, two, or, more commonly, three flutes (Clark 1984). These points are not the large Clovis points found on the plains of North America but are stouter specimens. Because of the surficial nature of most of the finds, it is unclear if the specimens are associated with the Denbigh Flint complex, the Northern Archaic tradition, the Palaeo-Arctic tradition, or the Palaeoindian tradition (Clark 1984). Loy and Dixon (1998) analyzed blood residue from thirty-four fluted points and two morphologically similar points from Eastern Beringia. Twenty-one specimens had microscopically visible residues (Loy and Dixon 1998:37). Five residues yielded mammoth crystals, two yielded modern bison, two produced sheep, one produced bear, eight yielded caribou, and one yielded musk ox (Loy and Dixon 1998:39–40). Although there are still questions to be asked of the technique, it suggests that Northern Fluted points are related to the Palaeoindian tradition that has been more fully documented to the south for the end of the Pleistocene (Loy and Dixon 1998). Some of the Alberta fluted points may be related to the Northern Fluted points, as suggested by the multiple flutes and stout size coupled with the location of the Ice-free Corridor that geographically linked the Alaska-Yukon area to Alberta.

In terms of the timing of entry into the Americas, the revised age range for Clovis sites easily allows for entry via the Ice-free Corridor, as there are hundreds of years between the separation of the glacial ice sheets and the earliest Clovis sites (Waters and Stafford 2007). The revised age range also makes sense in terms of the geographic extent of Clovis material. The work of Buchanan and Collard (2007), amongst others, has assisted in narrowing the geographic extent of the Clovis phase. Clovis material only covers the western Plains area of Canada and the United States. The fluted material to the east is distinctive in shape, and dates to slightly more recent times. Similarly, fluted fishtail material in South America is morphologically distinct and dates to slightly more recent times. Thus, the arrival of Clovis as a generalist hunter-gatherer covers a restricted time and space. Clovis
likely spread from the northwestern plains and adjacent areas to the southern plains between 11,050 and 10,800 BP. Related cultural phenomena such as the Folsom phase, eastern fluted points, and fishtail fluted points appear around the time that Clovis disappears.

Clovis material is known from the provinces and states adjacent to Alberta. A brief review of this data will help place Alberta’s material into perspective.

British Columbia has produced a Clovis point. The Pink Mountain site (HhRr 1) produced the base of a Clovis point (Wilson 1987:219, fig. 57). The site is 150 km northwest of Fort St. John. It is characterized by a scatter of material over a kilometre-long portion of a ridge overlooking the Sikanni Chief River (I. Wilson 1987:217). Also recovered at the site were macroblades and numerous other Palaeoindian points (Wilson 1987:217).

In Saskatchewan, a number of Clovis points are known. Kehoe (1966a:532, fig. 2) illustrated five classic specimens. He distinguished these fluted points from others based on their larger size and v-shaped bases. Kehoe’s (1966a:534–535) atypical fluted points tend to be more stout specimens with their greatest width near the base rather than midshaft. While still very similar to Clovis specimens, without secure contexts one is just as tempted to classify them as Northern Fluted points.

A bone rod was recovered in Saskatchewan (Wilmeth 1968). It was found near Grenfel at a depth of 2.5 m during excavation of a waterhole in the early 1900s; it was donated to the National Museum of Canada (Wilmeth 1968:100). Bone rods are known from a number of sites such as Blackwater Draw Locality No. 1 (Sellards 1952), the Sheaman site (Frison and Stanford 1982), and the Anzick site (Lahren and Bonnichsen 1974). These objects are commonly interpreted as part of a hafting system for the Clovis point itself (Lahren and Bonnichsen 1974; Stanford 1996) while some have argued that they represent levered hafting wedges for tightening sinew (Lyman et al. 1998). Two Clovis points have also been reported from near Invermay, 80 km north of Yorkton (Gryba and Gryba 1980). Fluted points are not common in this portion of the Saskatchewan plains. The specimens were made on quartzite and jasper, which is atypical of local stone (i.e., chalcedony and Swan River chert), suggesting that Clovis hunters brought the materials with them when they moved into the area (Gryba and Gryba 1980:172). A number of Clovis points have been reported from surface finds in west-central Saskatchewan. Carlson (1993) conducted a survey of Palaeoindian material in collections from the Battleford
and Lloydminster area. At least twenty-six fluted points were identified (Carlson 1993, see also Gryba 2001). Most were manufactured on local materials (e.g., Swan River chert, quartzite) but some exotic materials such as Knife River flint did occur \( n = 3 \). Few Clovis specimens appear to be in the collections, but numerous shorter specimens comparable to the Northern Fluted points are present.

A number of Clovis points are known from surface finds in Manitoba. Pettipas (1970:14, fig. 9a) recorded a specimen from Mentmore. A second Clovis point was recovered from the Brookdale-Mentmore area (Pettipas 1971:8). A Clovis point was recovered from the uppermost terrace of the Pembina River south of Manitou (Pettipas 1976). The latter specimen had been reworked and exhibited pot-lid fractures, an arced base, and straight margins. It was manufactured on thin-banded limestone (Pettipas 1976:4). A Clovis point was recovered near Erickson (Saylor 1978). A revisit to the findspot led to the recovery of two more artifacts. Three 2×2-m units were excavated at the site. Nine additional artifacts were recovered, thought possibly to be in association with the Clovis point.

Davis (1988:25) reported that few fluted points have been found in Montana, compared to Alberta, Saskatchewan, and Wyoming. He noted that recovered specimens tended to be manufactured on a wide range of lithics including basalt, obsidian, chert, quartzite, porcellanite, chalcedony, and Knife River flint, not all of which could be found in Montana (Davis 1988:26). The highest concentration of fluted material appears to be along the eastern foothills (Davis 1988:26, fig. 1). A working hypothesis proposed that fluted material was focused in areas of high relief and/or in the proximity of freshwater springs with better access to lithic-rich gravels (Davis and Aaberg 1988; Davis et al. 1989:6). The Otli Ridge site (24DW272), in the Blue Mountain area of Dawson County in east-central Montana, produced a Goshen point base made on patinated chalcedony, along with a number of other artifacts (Davis et al. 1989:5).

A few words need to be said about Goshen. Goshen points appear to be a technology related to the Clovis phase. The Goshen material was named for Goshen County, Wyoming, and was first recognized at the Hell Gap site in southeast Wyoming (Frison 1991a:44). It was tentatively labelled “Plainview,” reflecting similarity to points on the southern plains that occur post-Folsom; however, its pre-Folsom stratigraphic context suggested it was something else (Frison 1993a:7–8).

Goshen points are smaller than Clovis points and are manufactured
by pressure flaking rather than percussion (Frison 1993b:241). Frison (1993b:242) suggested that the change from percussion in Clovis point manufacture to pressure flaking in Goshen point manufacture is reflected in later Folsom points, which are also manufactured by pressure flaking. The Goshen toolkit, however, resembles a Clovis toolkit, including bifaces and blade tools (Frison 1991a:45). Goshen sites are geographically located on the northwestern plains with the classic example being the Mill Iron site, in southeastern Montana (Frison 1991b). Goshen has also been found stratigraphically below Folsom at the Hell Gap site, below Folsom at the Carter/Kerr-McGee site, surficially at the Powars 11 site near the Hell Gap site, and in Bentzen-Kaufmann Cave near Sheridan, Wyoming (Frison 1991a:45–46). A number of Goshen surface finds have been reported from adjacent South Dakota (Sellet and Fosha 2000; Fosha and Sellet 2000).

In Alberta, there is only one possible Goshen site recovered in situ: the base of a point was recovered in association with a well-defined hearth in Operation 17, Occupation 8, at Lake Minnewanka (EhPu 1) (Landals 2008:141). A total of eighty-four lithic artifacts were recovered, representing mainly local sources. Bone fragments (n = 39) produced two pieces identified as mountain sheep. The intentional incorporation of coal in the hearth by the past inhabitants produced two unacceptably old dates (Landals 2008:145–147). A date of ca. 10,250 BP from bone around the periphery of the hearth was accepted as a limiting date (Landals 2008:114). Because of the fragmentary nature of the point, the researcher suggested that affiliation to Clovis, Goshen, or Folsom was possible. In addition, a Goshen point was recovered as a surface find in close proximity to a Folsom point surface find at the Purple Springs site (DIOx 6) (Peck et al. 2006). Gryba (1988:A1–20) illustrated what he calls a Mill Iron-style point from a surface find west of Frank Lake. It exhibits morphology strikingly similar to Goshen material. Otherwise, there are very few of these points known in Alberta.

To summarize, perhaps the most striking aspect of the Clovis phase is its unique material culture and the implications of that uniqueness: the fluted points, large bifaces, macroblades, and use of high-quality stone from greatly distant sources all suggest a highly mobile people. Only the related Folsom phase exhibits such an interesting combination of material culture designed for high mobility and efficiency. A particularly strong reason for Clovis, and Folsom for that matter, to have left behind such material records
is that they were likely entering a world that was devoid or nearly devoid of people. This unusual circumstance allowed for an adaptation unlike any other time during the Holocene, as most other movements of people brought the immigrants in contact with new people. A key to deciphering this scenario may rest with Goshen materials, which appear to derive directly from the preceding Clovis phase and lead to the Folsom phase.

**Folsom Phase (ca. 10,900 to 10,200 BP)**

The Folsom phase of the Llano tradition is dated between ca. 10,900 and 10,200 BP (e.g., Frison 1991a:50, Haynes et al. 1992:96). Folsom material appears to derive from the preceding Clovis material, with the transition possibly occurring in less than a century (Haynes 1993). The Folsom point, with its long flute extending over two thirds of its length, is the diagnostic artifact of this phase. Ahler and Geib (2000) argued that the Folsom point provides an elegant technological solution to problems faced by mobile hunter-gatherers: “The symmetrical, bifluted form allowed a split, facial-contact haft to extend nearly to the tip, thereby controlling both location and extent of fracture and allowing many cycles of point reworking. Extreme thinness achieved by fluting facilitated leading edge sharpness for enhanced penetration. The near constant cross-section from tip to base meant no loss of leading edge acuteness upon resharpening and interchangeability of broken segments.” Such an efficient use of stone was critical for hunter-gatherer groups spending substantial time without access to raw materials (Ahler and Geib 2000).

Importantly, not all Folsom points are fluted. An unfluted point called Midland, similar to the Folsom point in every other way, occurs in some Folsom sites such as the Lindenmeier, Hanson, Agate Basin, and Shifting Sands sites (Frison 1991a:50; Hofman et al. 1990). The co-occurrence of these point styles suggests there may be no justification for two separate cultural entities (Agogino 1969, Ahler and Geib 2000:817; Bamforth 1991a:313, Frison 1991a:51, 1993b:242).

The Folsom point production appears to be the result of a specialized biface manufacturing process that is derived from Clovis biface reduction method (Bradley 1993:254). Bradley (1993:254–255) states that for Folsom lithic craftsmen, “biface manufacture functioned primarily as a flake production process (especially in the early stages) and shifted over to bifacial knife manufacture as the biface became too small and thin to produce usable flakes. It is also unlikely that the end product of this process
was the production of Folsom points.” Despite the functional arguments for the flute on Folsom points as a way to enhance the hafting process (e.g., Ahler and Geib 2000; Frison 1993b:243; F. Roberts 1935:21), other explanations for the large flute have been put forward. For example, Bradley (1993:256) suggested fluting was a risky ritualistic activity performed as a supernatural method of prognosticating success of an upcoming event such as a hunt. Frison (1991a:51) suggested that the exquisite craftsmanship found in Folsom points was more of an art form rather than for function. Regardless, Folsom point aesthetics were a pinnacle of lithic craftsmanship on the Northern Plains.

Bone tools were also exquisitely made objects. Delicately incised bone artifacts, apparently created as decorative pieces, are known from the Agate Basin and Lindenmeier sites (Frison 1991a:51). Eyed bone needles comparable in size to modern metal needles were recovered with Folsom material at the Agate Basin site (Frison 1991a:51). Bone and antler points and punches were recovered in the Folsom components of the Agate Basin site. A bison skull decorated with a red zigzag pigment, thought to be hematite, was recovered at the Cooper site in Oklahoma (Bement 1997). It was interpreted as a ritualistic object used in preparation for a bison kill (Bement 1997:92–93).

A variety of site types were produced by the people who left behind Folsom material. Many sites are campsites such as the MacHaffie site (Forbis and Sperry 1952) and the Hell Gap site (Irwin-Williams at al. 1973). Some sites are campsites/kill sites such as the Agate Basin site (Frison and Stanford 1982) and Fowler-Parrish site (Agogino and Parrish 1971). Short-term occupations have been excavated at the Rattlesnake Pass site (Smith and McNees 1990). The Adobe site has been interpreted as a hunting stand or lookout (Hofman and Ingbar 1988). Other sites have been interpreted as small field camps, such as the Mitchell Locality of Blackwater Draw (Boldurian 1990). Quarrying and manufacturing/repair stations are also known at sites such as the Lincoln Hills site (C. Howard 1988). There appears to be a much wider range of site types than was present for the Clovis phase. This wider range of site types is inferred to represent more specialized activities and more familiarity with the region.

Bison were most commonly the target of Folsom hunters — e.g., Cooper (Bement 1997), Stewart’s Cattle Guard (Jodry and Stanford 1992), Lake Theo (Buchanan 2002), Waugh (Hill and Hofman 1997), Fowler-Parrish (Agogino and Parrish 1971), and Shifting Sands (Hofman et al. 1990). The
lack of mammoth remains in Folsom sites suggests that they had disappeared by the time this culture developed (Frison 1991a:47). Elk bone was recovered as part of the tool assemblage in the Folsom levels of the Agate Basin site, but there was nothing to suggest that the animals were a large part of the Folsom food supply (Frison 1991a:57). At the MacHaffie site the faunal remains included bison, deer, wolf, and rabbit (Forbis and Sperry 1952:128). Similarly, bison, wolf, fox, and rabbit were reported for the faunal assemblage at the Lindenmeier site (Roberts 1935).

Much has been written on the topic of Folsom mobility and organization. There can be little doubt that the Folsom and Midland points, themselves, were functionally designed for expedient and efficient hafting and cutting edges (e.g., Ahler and Geib 2000). In terms of Folsom mobility and lithic utilization patterns, Blackmar (2001) argued they were linked to bison. Unlike the Clovis phase, the Folsom phase exhibits a predominance of bison kill sites. There is a strong correlation between the distribution of Folsom sites and the plains-prairie ecozone rather than the woodland ecozone in the Pleistocene for the Clovis phase. The Folsom lithic organization represents a solution to bison killing in a lithic-poor area (Blackmar 2001:78): practices of stone conservation (Amick 1996), such as the use of biface cores (Boldurian 1991), multifunction stone tools, and Folsom point preforms as tools (Boldurian and Hubinsky 1994), all represent elegant adaptive responses to a lifeway of hunting bison in stone-poor areas. Still, retooling at quarries would have been necessary (Buchanan 2002). The high mobility and scale of land use by people during the Folsom phase has been argued as distinctive from modern hunter-gatherers (Amick 1996). Additionally, Walker (1982:291–294) proposed that a recovered maxilla of a canid represents evidence of a domesticated dog in a Folsom component at the Agate Basin site. The possibility of a domesticated dog during Folsom times opens the door for other avenues of mobility, which will remain supposition until additional evidence is discovered.

The Midland complex at the Hell Gap site, Locality 11, produced evidence of two possible structures consisting of circular arrangements of postmoulds about 2 m in diameter or about 4 m in diameter. At the time, the authors suggested that the Midland complex exhibited a projectile point form distinct from the Folsom phase (Irwin-Williams et al. 1973:47). However, as noted above, it is generally believed these assemblages may represent a common cultural entity. Thus, the remains of early structures may be attributed to the Folsom phase.
The geographic distribution of Folsom sites is alluded to above with reference to the importance of a plains bison-oriented subsistence. Folsom points are known from as far north as northeastern British Columbia where a Midland base fragment was recovered (I. Wilson 1987). While the Midland identification may be contentious, firm identification of Folsom points from surface finds are known from as far north as the Grand Prairie area of Alberta, and from southern Alberta (e.g., Gryba 1988), southern Saskatchewan (e.g., Kehoe 1966a), and southwestern Manitoba (e.g., Boyd 2000). To the south, Folsom material has been recovered in Idaho (e.g., Campbell 1956), Montana (e.g., Forbis and Sperry 1952), North Dakota (Shifrin and William 1996; Root et al. 1996; Root et al. 1999), South Dakota (Sellet and Fosha 2000; Fosha and Sellet 2000), Wyoming (Frison and Stanford 1982; Irwin-Williams et al. 1973), Colorado (e.g., F. Roberts 1935; Agogino and Parrish 1971; Jodry et al. 1996), Oklahoma (e.g., Bement 1997; Hill and Hofman 1997), and Texas (Hester 1968; Hofman et al. 1990; Perttula 1993), as well as numerous sites observed within the plains-prairie ecozone in the states to the east (e.g., Billeck 1998; Delling 1966; Hofman 1994; Munson 1990). In essence, the distribution of Folsom sites is not unlike that of Clovis sites in terms of overall geography.

The Sites

Folsom points have not been found in situ in Alberta. Sixteen points are known from surface collections within the province (Gryba 1988; Trace 1991; Dawe 1997; Ronaghan 1993; Wormington and Forbis 1965:157). These specimens were largely recovered from the southern and southwest part of the province (see Plate 3 and Figure 4).

Gryba’s Inventory. Most of the Folsom sites that are known today are due to Gryba’s (1988) tireless research on Palaeoindian surface finds in the province. Keys aspects of his report are summarized in Table 2. In addition to the Folsom points, Gryba (1988) documented fifteen Midland points. Of these, worth mentioning are the Midland point at the Minnewanka site (EhPu 1) in Banff National Park and the Midland point base at the Sibbald Creek site (EgPr 2) recovered in the basal level of the site with two basally thinned triangular point specimens (Gryba 1983:66–68, 1988). 
PLATE 3
Folsom points. Illustrated are specimens from the Braseth collection (a); King collection (b and n); DhPg 8 (c); Gardner collection (d); Peterson collection (e, f, and i); Baines collection (g); Payne collection (h); Plant collection (j); Johnson collection (k); Visser collection (l); and Bondarenko collection (m).

Photo credit: Eugene Gryba (b, e–n); Royal Alberta Museum (a); Shayne Tolman (c); Alberta Culture and Community Spirit (d).
Figure 4
Folsom sites within Alberta
**TABLE 2** Folsom points listed in Eugene Gryba, *An Inventory of Fluted Point Occurrences in Alberta* (1988)

<table>
<thead>
<tr>
<th>Collection</th>
<th>Find Spot</th>
<th>Portion</th>
<th>Raw Material</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Don King</td>
<td>EdPk 3</td>
<td>base</td>
<td>chalcedony</td>
<td></td>
</tr>
<tr>
<td>Don King</td>
<td>Frank Lake</td>
<td>missing ear</td>
<td>chert</td>
<td></td>
</tr>
<tr>
<td>John Visser</td>
<td>Frank Lake</td>
<td>blade</td>
<td>jasper</td>
<td></td>
</tr>
<tr>
<td>Lloyd Peterson</td>
<td>Frank Lake</td>
<td>blade</td>
<td>siltstone</td>
<td></td>
</tr>
<tr>
<td>Lloyd Peterson</td>
<td>Frank Lake</td>
<td>lateral margin</td>
<td>chalcedony</td>
<td></td>
</tr>
<tr>
<td>Lloyd Peterson</td>
<td>Frank Lake</td>
<td>blade</td>
<td>chalcedony</td>
<td>failed in fluting</td>
</tr>
<tr>
<td>Lloyd Peterson</td>
<td>Frank Lake</td>
<td>complete</td>
<td>chert</td>
<td>reworked</td>
</tr>
<tr>
<td>Lloyd Peterson</td>
<td>Frank Lake</td>
<td>missing tip, ear</td>
<td>chert</td>
<td>impact damage</td>
</tr>
<tr>
<td>Brian Gablehouse</td>
<td>Champion</td>
<td>blade</td>
<td>chalcedony</td>
<td></td>
</tr>
<tr>
<td>Roger Baines</td>
<td>High River</td>
<td>blade</td>
<td>chert</td>
<td></td>
</tr>
<tr>
<td>J.A. Spence</td>
<td>DiPe 1</td>
<td>tip</td>
<td>chalcedony</td>
<td>failed in fluting</td>
</tr>
<tr>
<td>Eldon Plant</td>
<td>Medicine Hat</td>
<td>blade</td>
<td>chert</td>
<td></td>
</tr>
<tr>
<td>E.V. Johnson</td>
<td>Red Rock Coulee</td>
<td>blade</td>
<td>chert</td>
<td></td>
</tr>
<tr>
<td>A.G. Payne</td>
<td>Sand Hills</td>
<td>base, missing ears</td>
<td>quartzite</td>
<td></td>
</tr>
<tr>
<td>Konrad Bondarenko</td>
<td>Bruderheim</td>
<td>base</td>
<td>chalcedony</td>
<td></td>
</tr>
<tr>
<td>P. Rentiers</td>
<td>Vilna</td>
<td>complete</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>Guy Ireland</td>
<td>Peace River</td>
<td>base, missing ear</td>
<td>Peace River chert</td>
<td></td>
</tr>
</tbody>
</table>

**Purple Springs (DIOx 6).** The Purple Springs site was first recorded as a result of the recovery of a complete Folsom point from an erosional area in rolling sand dunes. The specimen is made on yellow chert and was recovered about 4 km north of the Purple Springs townsite, south-central Alberta (Peck et al. 2006). Excavation at the site determined that the Folsom point had likely been deflated onto glacial clay. The lowest palaeosol yielded Oxbow material, supporting the interpretation of erosion or little to no deposition since glacial times (Peck et al. 2006).

**Kelley (EkPu 15).** The Kelley site is located in James Pass Meadow just inside the Front Range of the Rocky Mountains about 100 km northwest of Calgary. A small, triangular concave-base Folsom point was surface collected by the Kelley family on the treed shores of Eagle Lake. In 1991, test excavations by the Archaeological Survey failed to recover diagnostic material. As well, stratified sediments were not observed (Ronaghan 1993:89–90).
Braseth (GfPs 1). A large Folsom blade tip made on lustrous black chert (cf. Peace River) was recovered from the surface of a farm near Grovedale in the Grande Prairie area. The specimen is in the Braseth Collection (Dawe 1997). Dawe (1997:13) provided a strong argument that the specimen was produced using Folsom technology, not merely mimicking the classic point form.

Folsom: High Mobility with a Focus on Bison
The base of a Folsom point was excavated out of sediments that clearly relate to an Oxbow occupation (C. Ramsay 2005). Also, a single Midland base fragment has been recovered in the bottom layer of highly compressed stratigraphic sediments at the Sibbald Creek site. Based on the identical morphology between the Alberta Folsom specimen and ones found in the United States, there is no reason the former should not date to the same time period as the latter. Thus, the Folsom phase in Alberta is expected to date between ca. 10,900 and 10,200 BP. The geographic distribution of the Folsom phase covers much of the plains area during the Early Holocene. At this early time, the area of the plains expanded to include vast areas along the east side of the Rocky Mountains in Alberta and western portions of the eastern tall prairie and temperate forest in the mid-continent.

Recoveries in the United States suggest that Folsom points and Midland points are part of a single cultural entity, and it seems reasonable to expect the same relationship in Canada. In terms of other ancestral relationships, Folsom lithic organization has strong ties to the preceding Clovis phase (Bradley 1993:254). Concerning descendent populations, Frison (1991b:148) argued that Midland points or Folsom preforms (i.e., the unfluted portion of the Folsom point assemblage) exhibit similarities to Agate Basin points. “One can start with a large Folsom preform and instead of preparing it for fluting, simply continue a transmedial flaking process to produce the lenticular cross-section diagnostic of the Agate Basin point” (Frison 1991b:148). Frison (1991b:148) continued by noting that near-finished Agate Basin specimens from the Agate Basin component at the Hell Gap site look remarkably similar to pre-fluting stages of Folsom preforms. Bradley (1993), however, did not consider the relatively simple technology found in Agate Basin point manufacturing to have derived from Folsom technology.

Folsom mobility is discussed above in terms of the transportable nature of its technology with its heavy reliance on high-quality lithic raw
material sources. Gryba (2001) found that surface finds of Alberta Folsom points were ones commonly manufactured on exotic materials (ca. 50%), suggesting movement of raw materials, and likely people as well, in and out of what is now the province. This is in stark contrast to the preceding Clovis phase where very few points were made on exotic materials (< ca. 10%). In fact, Northern Alberta quartzite (n = 6), other quartzite, (n = 16), siltstone (n = 11), and black chert (n = 6) dominate the assemblage of sixty-one Clovis specimens in Gryba’s (2001) study. Furthermore, Gryba (2001:264) indicated that many of the exotic lithic raw materials in the Folsom surface finds were derived from the south or southeast. He suggested that sites such as Lake Minnewanka, Sibbald Creek, and Vermilion Lakes would have provided good winter base camps while summer was spent in camps around small Holocene Lakes such as Frank Lake, southwestern Alberta (Gryba 2001:263).

As mentioned above, Folsom material is known from the provinces and states adjacent to Alberta. A brief review of this data will help place Alberta’s data into perspective. In British Columbia, for example, a possible Midland point from the Pink Mountain site (HhRr 1) near Fort St. John was recovered (I. Wilson 1987). A number of Folsom points are known from Saskatchewan (C. Howard 1939; Kehoe 1966a; Storck 1973). Folsom finds in Saskatchewan are all surface finds; none are from excavated contexts. Howard (C., 1939) illustrated three Folsom specimens and noted a fourth from the area west of Regina. Kehoe (1966a:533–534) recorded an additional nine Folsom specimens from west of Estevan (n = 3), south of Woodrow, northeast of Mortlach, near Roseray, southeast of Regina, near McCord, and in the Great Sand Hills northeast of Maple Creek. Storck (1973:4) illustrated a single Folsom point from the McKillop collection recovered near Moose Jaw.

For Manitoba, Gryba (1966) documented a Midland point recovered near Benito. The specimen is manufactured on Swan River chert. Gryba (1966:238) suggested that the geomorphological evidence indicated a point of recovery located on former Glacial Lake Agassiz or a smaller ice-bound lake. In this vein, Boyd (2000:30) reviewed the location of other known Folsom surface finds in the province. He noted five Folsom sites and a possible sixth unconfirmed site. Boyd (2000:31) argued that part of the Folsom land-use pattern was the utilization of recently drained proglacial lake surfaces. These areas would have been treeless fens, predisposed for entrapment or mass-drive methods possibly employed by bison-hunting
Folsom people (Boyd 2000:31). Still, the low productivity and uneven distribution of resources within the lake margin area likely accounts for the relative paucity of early Palaeoindian material in southwestern Manitoba (Boyd et al. 2003).

Montana has also produced Folsom material (e.g., Davis 1988). The MacHaffie site in the foothills near Helena was an open campsite with three occupation levels (Forbis and Sperry 1952). The Folsom material was recovered from the bottom occupation and included two Folsom points as well as choppers, scrapers, knives and flake knives; faunal remains included bison, deer, wolf, and rabbit (Forbis and Sperry 1952). The excavators noted the bison were larger than modern species. The Indian Creek site is south of the MacHaffie site, in the foothills southeast of Helena. Occupation 1 of the Downstream Locality produced basal fragments from two Folsom points, one Clovis point, and seven channel flakes, amongst other tools (Davis and Greiser 1992). Initially dated at 10,980 +/- 110 BP (Davis and Greiser 1992), more dates (e.g., ca. 10,600 and 10,400) and further analysis suggested an upstream Folsom occupation and a downstream Clovis occupation (Davis and Bauml 2000).

To summarize, Folsom exhibits some traits that overlap or are found in the preceding Clovis phase, such as fluted lithic technology and an adaptation towards high mobility. At the same time, it is set apart in that the range of site types suggest a stronger familiarity with the landscape. In Alberta, local materials are more prevalently used in manufacturing Folsom points compared to Clovis points, again suggesting increased familiarity with the landscape. In terms of subsistence, the Folsom and Clovis phases are similar. Large mammals are still a focus but bison become prevalent on the menu during the Folsom phase, likely because of the changing environment.

**SIBBALD PHASE (CA. 10,500 BP)**
As early as the 1950s, fluted points that are short and stubby had been recognized from artifact collections in Alberta (Wormington and Forbis 1965:86, 88, fig. 27c). Not only were these specimens shorter in length than Clovis points, but they also often exhibited basal thinning rather than fluting. Specifically, fluting is a term generally reserved for cases where a single large flake has been detached up the middle of a point preform, while basal thinning refers to the removal of a series of smaller flakes of similar size, as many as three to five, that have been struck from the base of a point preform (Gryba 1988:10).
Gryba (1985:30) has observed that the small, stubby, multiple fluted point form has also been reported for Alaska and the Yukon (Clark 1984; Clark and Clark 1983), Charlie Lake Cave in northeastern British Columbia (Fladmark et al. 1988:376), and Saskatchewan, where they have been referred to as “atypical” fluted points (Kehoe 1966a, fig. 4). Gryba (1988:31) indicated a number of these small, basally thinned points have been reworked, thus creating their diminutive size. He proposed that since such reworked points were more common in the north than the south, it might have been the difficulty in procuring stone during winter months in the north that led to retooling of the fluted points (Gryba 1988:31). This model, however, fails to acknowledge that a number of these “stubby” points do not exhibit signs of resharpening but appear to have been shaped as stout forms. It also assumes contemporaneity with Clovis points, which is not likely given that a specimen from Charlie Lake Cave dates to about 10,500 BP.

As noted above, short Clovis points recovered in Alaska or the Yukon Territory are called Northern Fluted points (Clark 1984). Most of these have been found on the surface, making their age difficult to determine. Blood residue analysis has recovered evidence of mammoth on Northern Fluted point specimens, suggesting potential contemporaneity between Clovis and Northern Fluted points (Loy and Dixon 1998). Although no formal analysis has been conducted, it is possible that some of the shorter Clovis points in Alberta are related to the Northern Fluted point material.

The rubric of Northern Fluted points may not accommodate all the variability within the small fluted specimens. In 1983, a single short, basally thinned point was recovered from a deeply buried context at Charlie Lake Cave in northeastern British Columbia. Eight 1-x-1-m units were excavated around a sandstone bedrock ridge at the south end of Charlie Lake near Fort St. John (Fladmark et al. 1988). Eleven cultural components were defined. The lowest component produced a basally thinned or fluted point, a retouched flake, a keeled core, a perforated schist bead, and six flakes (Fladmark et al. 1988:376–377). The Charlie Lake Cave specimen was very short (ca. 4 cm) and triangular in shape. Radiocarbon dates for this component include: 10,450 +/- 150 BP (SFU 300); 10,380 +/- 160 BP (SFU 378); and 10,770 +/- 120 BP (SFU 454) (Fladmark et al. 1988:375). The basally thinned point was considered comparable to the two specimens recovered at the Sibbald Creek site (Fladmark et al. 1988:377).

The Sibbald Creek site (EgPr 2) provided the first in situ evidence of the time-depth of basally thinned triangular points in Alberta. The site
represents a campsite on a low terrace, exhibiting a shallow and poorly stratified series of occupations overlooking Sibbald Flats in the foothills of the Rocky Mountains near Banff (Gryba 1983). In 1980, a block area of 159 m$^2$ was excavated. Based on projectile point form, it was determined that a record of at least 10,000 years was compressed into 50–55 cm (Gryba 1983:37). In the lower sediments, a Scottshull point, an Alberta point base, a Midland point, three Agate Basin points, two Mount Albion points, a drill, and a retouched flake were associated with two basally thinned triangular points (Gryba 1983:62–69). The radiocarbon date obtained from the lowest sediments with charcoal was 9,570 +/- 320 (Gx-8808) (Gryba 1983:24, 122–123). However, the lab noted that it is possible that the date was too old owing to equipment failure (Gryba 1983:123). While this makes the date suspect, the sequence of burial supports the interpretation that basally thinned triangular points are old specimens in a long sequence of occupations.

The basally thinned specimen from Charlie Lake Cave exhibits fairly distinct morphology, even from other small fluted and basally thinned points including Clovis and Northern Fluted points. The Charlie Lake specimen is exceptionally stout and exhibits a triangular outline form with basal thinning, not fluting. As well, firm dates that indicate an age of ca. 10,500 BP also distinguish the point from other fluted material. The fluted points from the Sibbald Creek site are also quite stout with triangular outline forms. They, too, are basally thinned, not fluted. A firm date for this material could not be determined. Thus, it would appear that there may be Clovis points in the province, as well small Clovis-like points that are not unlike the Northern Fluted points found in Alaska and the Yukon, and even smaller basally thinned triangular points that apparently postdate both these point forms and also postdate Folsom points. Following previous usages, these small point forms will be referred to as basally thinned triangular points, or stubbies.

The Sites

There are two sites that have produced in situ material in the province. First, the Sibbald Creek site has been briefly discussed above; it lacks discrete stratigraphy and dates from good contexts. Second, the Twin Pines site (EkPu 8) produced a basally thinned point from well-defined stratigraphic context in the James Pass Meadow, southwest of Sundre. A third site, the oldest cultural materials from the Vermilion Lakes site, is the appropriate
age but diagnostic material was not associated with the level so its affiliation is uncertain (see Plate 4 and Figure 5).

Sibbald Creek (EgPr 2). The Sibbald Creek site is located in a large open meadow at the fringe of the foothills in Sibbald Flats, west of Calgary. The site provided evidence of a highly compressed sequence of cultural material in which Late Side-notched projectile points were recovered near the surface and basally thinned triangular points were recovered in the deepest sediments (Gryba 1983:37). The site was excavated in response to a highway construction project. In 1980, a major block area with outlying smaller blocks totalling 159 m² was excavated.

Two basally thinned triangular projectile points were recovered at the base of the excavations (Gryba 1983:66, fig. 30b, c). The points were recovered between 40 and 45 cm bs. One specimen is complete with a re-worked tip, a single flute on one surface and multiple fluting on the other, and made on dull green crystalline siltstone (Gryba 1983:66). The other specimen is two co-joining pieces, triangular in shape, with a large flute on one surface and numerous flake scars on the other, and is made on fine-grained black siltstone or chert (Gryba 1983:68). A possible channel flake was present higher in the profile at 30–35 cm bs (Gryba 1983:69). Other lithic diagnostics recovered in close association with the basally thinned triangular points include the base of a Scottsbluff point, an Alberta point base, a Midland point, three Agate Basin points, and two Mount Albion points (Gryba 1983:62–69).

Twin Pines (EkPu 8). The Twin Pines site is a multicomponent campsite located in James Pass Meadow just inside the front range of the Rocky Mountains, about 100 km northwest of Calgary. Six occupation levels
were recorded at the site (Beaudoin et al. 1996:121; Ronaghan 1993). From oldest to youngest the cultural occupations include materials representing the Sibbald phase, the Agate Basin/Hell Gap complex, the Plains/Mountain (Lovell Constricted) complex, the Mummy Cave complex with Salmon River-like points, and two occupations with Besant-like specimens (Ronaghan 1993:88–89; Ronaghan and Dawe 1998).

A single basally thinned triangular point was recovered from the lowest occupation. Fifteen other lithic tools were recovered: a scraper/plane, three unifacially retouched end scrapers on expanding flakes, ten marginally retouched flakes, and a marginally retouched blade-like flake (Ronaghan and Dawe 1998). Local siltstone accounts for about 95 percent of the assemblage. Small amounts of fauna were recovered, with most occurring as calcine bone fragments (Ronaghan and Dawe 1998). The identifiable element in this cultural level was a bison tibia fragment. Four radiocarbon dates are available on bone from this occupation (see Table 3). The occupation was interpreted as a short-term campsite exploited by mobile hunters using a highly curated toolkit.

### Table 3

<table>
<thead>
<tr>
<th>Site [Lab No.]</th>
<th>Conventional (^{14}C) Age</th>
<th>(^{14}C/^{12}C) Ratio</th>
<th>Material</th>
<th>Calibration</th>
<th>Reference</th>
</tr>
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<tbody>
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<td>EkPu 8 [TD-3000]</td>
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<td>?</td>
<td>collagen</td>
<td>10100–9400 B.C. ((p = 0.954))</td>
<td>Ronaghan 1993:89; Beaudoin et al. 1996:122</td>
</tr>
<tr>
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<td>-18.5‰</td>
<td>collagen</td>
<td>9670–9270 B.C. ((p = 0.954))</td>
<td>Brian Ronaghan, personal communication 2009</td>
</tr>
<tr>
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<td>-19.3‰</td>
<td>collagen</td>
<td>9770–9300 B.C. ((p = 0.954))</td>
<td>Brian Ronaghan, personal communication 2009</td>
</tr>
<tr>
<td>EkPu 8 [CAMS-13192]</td>
<td>9990 +/- 80</td>
<td>-18.5‰</td>
<td>collagen</td>
<td>9900–9250 B.C. ((p = 0.954))</td>
<td>Brian Ronaghan, personal communication 2009</td>
</tr>
</tbody>
</table>

Vermilion Lakes, Locality A (EhPu 8, 153R). The Vermilion Lakes site is located on a debris-flow fan on the north side of the Bow River Valley just west of Banff (Fedje 1986). The western excavation block, or Locality A, produced a stratified site with thirteen occupations, of which seven were well separated. The bottom occupation produced five hundred lithics, a few tools, and the bones of sheep, deer, an unidentified large ungulate, and a squirrel-sized rodent. Two small surface hearths and a hearth associated
with post-moulds and lithic and faunal debris were also identified. The post-moulds coincided with the extent of the lithic and faunal detritus, suggesting a dwelling (Fedje 1986:36). Dates recovered from this occupation included 10,270 +/- 110 BP (Riddl); 10,390 +/- 140 BP (SFU 348); 10,570 +/- 150 BP (Riddl 85); 10,410 +/- 400 BP (Riddl 216); 10,660 +/- 650 BP (Riddl 215); 10,900 +/- 270 (SFU 314); 11,000 +/- 480 BP (SFU 348); and 9,200 +/- 1300 (SFU 348) (Fedje 1986:36). The dated materials were derived from two separate blocks but produced similar mean dates of ca. 10,400 BP. Unfortunately, no diagnostic materials were recovered in this occupation within these excavations. Fedje (1986:38) suggested this occupation might be attributable to Folsom or Clovis. The lack of exotic lithics and the site’s geographic location within the front range of the mountains likely indicates an association with the Sibbald phase. Landals (2008) argued that the calibration of the radiocarbon dates allows for the Vermilion Lakes site to be amongst the oldest sites in the New World, leaving a Folsom or Clovis affiliation a possibility.

Sibbald: The Beginning of Regionalization

Additional research will be required to clarify the relationship between reworked Clovis/Northern Fluted/basally thinned triangular points. The nature of Folsom material, on the other hand, is likely distinct enough in morphology and temporal span to avoid being reconsidered. Importantly, the fluted and basally thinned points in Alberta are expected to have been produced from ca. 11,050 BP to about 9,900 BP. This is a time span that, no doubt, includes Clovis material during the earliest times and stout basally thinned stubbies during more recent times. Regardless, a stronger understanding of the relationships between fluted and basally thinned points based on excavated sites is needed. Given the problem with the classification of the fluted and basally thinned projectile points, it is difficult to differentiate specimens without associated radiocarbon dates. There are no sites in Saskatchewan, Manitoba, or Montana with radiocarbon dates, but reworked Clovis/Northern Fluted/basally thinned triangular points are known from surface collections.

Alaska has produced a site with small triangular points with basal thinning. The Broken Mammoth site is located near the confluence of Shaw Creek and the Tanana River in east-central Alaska (Holmes 1996a:312). The middle palaeosol produced dates of 9,690 +/- 960 BP; 10,270 +/- 110 BP; 10,790 +/- 230 BP; and 10,290 +/- 70 BP (Holmes 1996a:314).
The fauna recovered included bison, elk, caribou, small rodents, ground squirrel, snowshoe hare, possible otter, swans, geese, ducks, other birds, and fish (Holmes 1996a:314). Two or possibly three hearth smears with associated hearth stones were recorded; lithics and fauna were recovered within and around these features (Holmes 1996a:317). Artifacts included a point base with slight basal thinning (Holmes 1996a, fig. 6-6n), and an almost complete triangular point (Holmes 1996a, fig. 6-6 m), possibly reworked, exhibiting basal edge grinding. Other lithics included numerous tiny flakes, retouched flakes, large biface fragments, hammers, and anvils. As well, a small, eyed, bone needle was recovered.

Similarly, Swan Point also produced small triangular points. It is located on the Shaw Creek Flats in the central Tanana Valley in central Alaska (Holmes 1996b:319). In a palaeosol encountered at a depth of 50–55 cm bs, cultural material associated with hearth charcoal was recorded. A date of 10,203 +/- 80 BP was obtained. Artifacts recovered included thin triangular points, small lanceolate points with convex to straight bases, gravers, and pebble choppers/hammerstones (Holmes 1996b).

Broken Mammoth and Swan Point exhibit a number of features that make it tempting to draw parallels with the Sibbald phase in Alberta. Most alluring are the form of the projectile points and the age of the deposits from which the points have been recovered. Furthermore, bifacial technology is dominant while microblade technology is absent. The lithic raw materials tend to be local in nature; exotic materials that require long-distance trade or movement are not present. These sites are also located in the front ranges of the mountains or large open valleys within mountain systems. Ronaghan and Dawe (1998) summarized the evidence as follows: “There appears to be an emerging pattern of Late Pleistocene/Early Holocene use of the postglacial landscapes of the so called Ice-free Corridor. All of the occupations identified to date are too late to have bearing on the initial peopling of the interior of North America, and in fact, most probably represent colonization from the south.” Although tenuous, it is possible that the people of the Sibbald phase were adapted to a specific niche; this would be quite different from the preceding Clovis hunters who used landscape in a homogeneous fashion, but more similar to the Folsom bison hunters on the late Pleistocene/early Holocene plains.
AGATE BASIN/HELL GAP COMPLEX
(Ca. 10,200 to 9,600 BP)

Agate Basin and Hell Gap represent two distinct point types, with the latter developing from the former (Frison 1991a:62). These two point types comprise the earliest point forms of the Plano tradition. Generally speaking, the term Plano has come to refer to any group of assemblages exhibiting lanceolate points with parallel flaking, starting with Agate Basin times and lasting into the early Hypsithermal (Arnold 1985). Differing usages of the term exist. Pettipas (1982) provided a developmental review of the various perspectives concerning the term Plano.

Agate Basin points were named for the Agate Basin site in eastern Wyoming. Significantly, Agate Basin material has always been found stratigraphically above Folsom material despite the possible temporal overlap suggested by radiocarbon dates (Frison 1991a:59). Roberts (1942) conducted the initial work at the site and was influenced in naming it by its location in the Agate Basin on a tributary of the Cheyenne River. Hell Gap points were named for the Hell Gap site in the Hell Gap Valley in southeastern Wyoming (e.g., Irwin-Williams et al. 1973). In this text, these cultural entities are lumped together in a single complex because of their close relationship and the general paucity of in situ recoveries in the study area. To the south in the United States, Agate Basin sites are usually found as discrete from Hell Gap sites. On occasion, however, Agate Basin projectile point assemblages, such as the relatively large assemblage of points at the Agate Basin site, include specimens that display the beginnings of the distinctive shouldering of the Hell Gap projectile point. The Agate Basin materials at the Hell Gap site are inferred to date between ca. 10,500 and 10,000 BP while Hell Gap materials at the site are inferred to date between 10,000 and 9,500 BP (Irwin-Williams et al. 1973:52).

Morphologically the Agate Basin projectile point is a long, narrow point with a relatively thick cross-section, likely designed for easy penetration (Frison 1993b:243). The related Hell Gap point is a modified Agate Basin point with slight shoulders; this change does not appear to have had a functional purpose (Frison 1993b:243). The beginnings of the distinctive shouldering of Hell Gap projectile points can be seen in the relatively large Agate Basin point assemblage from the Agate Basin site (Frison 1991b:148). Bradley (1993) suggested that the makers of Hell Gap points chose to terminate the point manufacturing process at an earlier stage than did the makers of Agate Basin points. Still, the basic sequence was the
same, with percussion thinning and shaping giving way to pressure thinning and flaking (Bradley 1993:258). The degree of finishing was similar between Agate Basin and Hell Gap points. For Hell Gap points, specifically, finishing techniques included either pressure flaking the face of the tip and stem only, or pressure thinning/shaping the majority of the point surface (Bradley 1993:258). Frison (1991a) noted that the point style is easy to secure into either a notched or socketed haft.

As noted above for the Folsom phase, Frison (1991b:148) considered Midland points and/or Folsom preforms to exhibit strong similarities to Agate Basin points. In sharp contrast, Bradley (1993) argued that the relatively simple technology found in Agate Basin point construction could not have derived from Folsom technology. Yet, Shelley and Agogino (1983) provided further evidence of a technological link between Folsom and Agate Basin. The recovery of a serrated, point-sized artifact in the Agate Basin level of the Hell Gap site was reinterpreted from a cutting tool to a blank prepared with platform isolation (Shelley and Agogino 1983). The platform isolation technique used in thinning serrated Agate Basin points is very similar to platform isolation employed in preparation to flute Folsom points (Shelley and Agogino 1983:118). Shelley and Agogino (1983) suggested that this manufacturing change might have been the result of attempts to increase successful tool completion rates. Ultimately, the fate of Agate Basin and Hell Gap technology may be that it was ancestral or developmental to Alberta, Cody, and Eden point styles (Agogino and Galloway 1965:190).

Agate Basin and Hell Gap sites tend to focus on the procurement of bison. The Agate Basin component at the Agate Basin site attests to the bison-centered subsistence strategy (Frison 1991a:164–170). Frison (1991a:166) argued the Agate Basin bison kill at the Agate Basin site was the product of an arroyo trap in which about twenty animals in a nursery herd were driven into a steep-banked area and dispatched. Similarly, the Carter/Kerr-McGee site is an Agate Basin/Hell Gap bison kill/processing site (Frison 1984, 1991a:170). Bison kill sites associated with Hell Gap points include the Casper site (Frison 1974, 1991a:170–177), the Hell Gap component at the Agate Basin site (Frison and Stanford 1982), and the Jones-Miller site (Stanford 1978a; Frison 1991a:171–172).

In contrast, the Agate Basin component at the Mangus site in Montana produced only mule deer and cottontail (Husted 1969:34). Similarly, the Sister’s Hill site in north-central Wyoming is a Hell Gap site that produced antelope, mule deer, porcupine, and small rodents (Agogino and Galloway
The Allen site, an apparent Agate Basin site, produced antelope, deer, coyote, fox, prairie dog, rabbit, fish, freshwater mussel, a variety of birds, and, of course, bison (Bamforth 1991b). While bison was a significant aspect of both Agate Basin and Hell Gap subsistence, diets at this time were clearly flexible enough to exploit other species.

The focus on bison procurement during the Agate Basin/Hell Gap complex has left other aspects of this archaeological culture less well explored (O’Brien 1984). Lithic raw material utilization during this time, for example, has not been well studied. Still, it appears lithic procurement was more locally oriented for the Agate Basin/Hell Gap complex compared to earlier times. For example, surface collections in North Dakota have revealed Folsom finds that were dominated by Knife River flint while Agate Basin/Hell Gap finds included chert, porcellanite, and Swan River chert as well as Knife River flint (Ahler and McGonigal 2001:1). At the Tim Adrian site in western Kansas, O’Brien (1984) has data suggesting Hell Gap people extracted Niobrara jasper at a local outcrop to make tools. Similarly, Bamforth (1991b) found most of the lithics at the Allen site to be recoverable within a 75- to 100-mile (~120–160-km) radius.

Possible habitation structures were uncovered in the Agate Basin deposits at the Hell Gap site, Locality 11. The possible structures were described as a circular arrangement of post-moulds about 2 m in diameter with a superimposed arc of roughly the same size post-moulds, and a short series of post-moulds running straight through both roughly north–south (Irwin-Williams et al. 1973:47, 51, fig. 10). There were no features within the proposed structures but there was correlation between the occupational debris and the post-mould distribution (Irwin-Williams et al. 1973:47).

The geographic distribution of Agate Basin and Hell Gap materials is limited to the Northern Plains. In Montana, the Indian Creek site produced a deeply buried Agate Basin/Hell Gap component (Davis 1986; Davis and Greiser 1992:266) and the Mangus site contained a possible Agate Basin component (Husted 1965). In North Dakota, the Beacon Island site near New Town has produced twenty-three complete or fragmentary Agate Basin points (Ahler and McGonigal 2001). There are a number of Agate Basin and Hell Gap sites in Wyoming. As previously noted, the Hell Gap site in southeastern Wyoming has both Agate Basin and Hell Gap occupations. The Agate Basin site in east-central Wyoming has an Agate Basin bison kill component. The Sister’s Hill site is a Hell Gap site in north-central Wyoming. The Brewster site is an Agate Basin site in eastern Wyoming. Agate
Basin and Hell Gap occur together at the Carter/Kerr-McGee site in north-eastern Wyoming. In Colorado, the Frazier site is an Agate Basin site and the Jones-Miller site is a Hell Gap kill site (Stanford 1978a). In western Nebraska, the Allen site appears to represent Agate Basin occupations (Bamforth 1991b). In western Kansas there is a Hell Gap quarry site (O’Brien 1984).

The Sites
As noted above, for the purposes of refining Alberta’s culture-historical record, Agate Basin and Hell Gap material have been lumped together in a single complex. This is justified based on the overlap in form and their association during recovery at a few sites such as the Carter/Kerr-McGee site. As with the preceding Palaeoindian materials in Alberta, very few Agate Basin/Hell Gap occupation sites have been recorded in situ (see Plate 5 and Figure 6).

**Plate 5**
Agate Basin / Hell Gap points.
Illustrated are points from the Eclipse site (EhPv 14)(a–d); the Lindoe site (EaOp 9)(e); and DgPm 1(f and g).
Photo credit: Alberta Culture and Community Spirit.
Figure 6
Agate Basin sites within Alberta
Vermilion Lakes, Locality A (EhPv 8, 153R). The Vermilion Lakes site, Locality A, is located on a debris-flow fan on the north side of the Bow River Valley west of Banff near Highway 1 (Fedje 1986:25). The site is discussed in the above section on the Sibbald phase. In Occupation 6a, a single reworked Agate Basin/Hell Gap point was recovered in association with two circular hearth features and surrounding activity areas (Fedje 1986:34). The only other formed tool recovered was a pointed biface preform. An additional 500 lithics were recovered from this level. The faunal assemblage included sheep and large ungulate. Table 4 presents the three accepted radiocarbon dates obtained for the site. Fedje (1986:34) calculated an average date of 9,650 BP.

Vermilion Lakes, Locality B (EhPv 8, 502R). The Vermilion Lakes site, Locality B, is located over a ridge in the next valley to the east of Locality A (Fedje 1986:26). It too was recovered in debris flows; however, only four occupations were differentiated at this locale (Fedje 1986:38). Again, historic material (Occupation 1) was recovered near the surface. This overlaid Middle Prehistoric material. Under the Middle Prehistoric material was a faunal assemblage that could not be conclusively identified as culturally created. Beneath the indeterminate material was an Agate Basin occupation. A single Agate Basin point was recovered in association with lithic and bone items scattered around a probable hearth (Fedje 1986:38). The material was retrieved from 1.4 m beneath the surface and was limited to about a 10-m² area (Fedje 1986:38). The point was constructed on an exotic sandy chert and was reworked on one side. Approximately 100 lithic and bone fragments were recovered. Table 4 presents three radiocarbon dates that were obtained from materials in this level. Fedje (1986:40) concluded that these dates, with an average of 9,910 +/- 95 BP, fit well with those expected for an Agate Basin occupation.

Eclipse (EhPv 14, 62R). The Eclipse site is a multicomponent campsite located on the north side of the Trans-Canada Highway just east of the Minnewanka Interchange (Fedje 1988:25). Two cultural layers were encountered. Late Prehistoric material was recovered in the A Horizon, overlying Hell Gap material about 0.5 m below the surface. A total of 6.5 m² were excavated at the site. The site was assessed in response to construction associated with the Trans-Canada Highway (Fedje 1988:1).
### Table 4

Radiocarbon dates for Agate Basin / Hell Gap sites (calibrated by OxCal 3.10 [Ramsey 2005])

<table>
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<tr>
<th>Site</th>
<th>Conventional $^{14}$C age</th>
<th>$^{14}$C/$^{12}$C Ratio</th>
<th>Material</th>
<th>Calibration</th>
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<td>10700–8400 B.C. (p = 0.954)</td>
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<tr>
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<td>9700 +/- 130</td>
<td>? collagen</td>
<td>9450–8650 B.C. (p = 0.954)</td>
<td>Fedje 1986:34; Morlan n.d.</td>
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<tr>
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<td>Fedje 1986:40; Morlan n.d.</td>
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<tr>
<td>EhPu 14</td>
<td>9850 +/- 140</td>
<td>? carbonized fat</td>
<td>9900–8800 B.C. (p = 0.954)</td>
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<td>EaOp 9</td>
<td>9900 +/- 120</td>
<td>-25.0‰ organic sediment</td>
<td>10500–9100 B.C. (p = 0.954)</td>
<td>Bryan 2000:2, 1966:6</td>
<td></td>
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<tr>
<td>EaOp 9</td>
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<td>-20.0‰ collagen</td>
<td>n/a</td>
<td>Bryan 2000:2</td>
<td></td>
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<tr>
<td>EkPu 8</td>
<td>9750 +/- 80</td>
<td>? collagen</td>
<td>9400–8800 B.C. (p = 0.954)</td>
<td>Ronaghan 1993:898</td>
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Six stemmed spear points were recovered from the site. Two were fairly complete examples of Hell Gap points while the remaining four were basal fragments fitting within the Hell Gap range of variability. Other recovered tools included a point preform, an ovate biface, biface fragments ($n = 4$), a side scraper, a spall chopper, a cobble chopper, a scraper on a spall, hammerstones ($n = 2$), retouched/utilized flakes ($n = 13$), burin spalls ($n = 4$), a
unidirectional core, a discoidal core, core fragments (n = 14), and a groundstone soapstone pendant. Lithic debitage (n = 4,988) was dominated by local siltstone (52.3%), cherts (31%), and quartzite (16%), with the remainder (0.5%) being non-local cherts, chalcedony, and soapstone (Fedje 1988:32).

No faunal material was preserved in the main block at the site, likely because of soil conditions, but many stone tools for working organic materials were recovered (Fedje 1988:32). The lithics suggest core reduction and biface reduction for the purpose of rehafting tools. The burin spalls suggest use on moderately hard objects and were interpreted as the detritus from chisel-like tools for preparing wood or bone sockets for new points (Fedje 1988:34). Other general camp activities such as hide working were represented, as evidenced by the scrapers (Fedje 1988:35). A hearth provided a centre for much of the activity at the site. Three radiocarbon dates of ca. 9,800 BP were obtained from the hearth feature (Table 4).

Minnewanka (EhPu 1). The Minnewanka site is located on a bench on a valley wall overlooking the confluence of the Cascade River and Devils Creek near the former’s confluence with the Bow River. A reservoir has raised water levels, periodically inundating the site. Landals (2008) excavated at a number of locations at the site between 1997 and 2001. An Agate Basin-like point was recovered from Operation 18, Occupation 2/3. It was associated with a flake tool, a scatter of lithics, and a few badly deteriorated bison bones. Much of the lithic assemblage was manufactured on local silicified sandstone and grey quartzite (Landals 2008:166). Landals (2008:165) noted the similarity of the point to specimens from the nearby Eclipse site. A single date of ca. 10,000 BP was obtained for the occupation (Table 4; Landals 2008:162).

Lindoe (EaOp 9). The Lindoe site is a bison kill site located on the north bank of the South Saskatchewan River about 16 km downstream from Medicine Hat (Bryan 2000:2). The site was named after its discoverer, Luke Lindoe, an avocational archaeologist (Bryan 2000:2). It contains at least two occupations: an upper occupation preserved in aeolian sand and a lower occupation consisting of a bison bone bed partially embedded in a peat bed. The site was excavated in the summer of 1966, including a west area (36 m²), an east area (32 m²), and a test unit (4 m²). A bulldozer trench was cut between the two main excavation blocks to examine the stratigraphy.
A complete projectile point was found on the sand talus slope immediately below the peat containing the bone bed. The specimen is a brick-coloured siltstone not found in the overlying layers. It is leaf shaped with round shoulders gradually converging near the midsection to form a parallel-sided stem (i.e., a Hell Gap point) (Bryan 2000:6–7). A small retouched scraper of silicified wood may have also eroded out of the bone bed. Otherwise, all the flaked stone artifacts excavated from the site are inferred to have been recovered from the poorly developed soils and deflated basins within the later dune deposits that overly the bone bed.

The faunal assemblage suggested the animals were larger than modern bison, perhaps belonging to Bison occidentalis, but horn cores were not recovered to substantiate this inference (Bryan 2000:3). Evidence for human agency within the bone bed came from five broken ribs cut repeatedly by a knife, and a deep cut at the base of the head of a left humerus (Bryan 2000:5). As well, an intentionally fractured tibia was found, and the edges of the broken shaft may exhibit use wear (Bryan 2000:5).

A radiocarbon date on the peat layer produced an age of ca. 9,900 BP; bone found in the peat provided a date of ca. 9,700 BP (Table 4). The latter date was established at the Gakushuin Lab and is not considered valid (Blakeslee 1994). The peat dates from the peat layers are solid, and bone was found projecting into the peat. The correlation of the early date and the Hell Gap point suggest the site is a Palaeoindian kill.

**Gap (DlPo 20).** The Gap site is a poorly understood multicomponent campsite located along the Oldman River in the front range of the Rocky Mountains (i.e., the “Gap” of the Livingstone Range) (Reeves and Dormaar 1972:325). The site, recorded by Forbis (1966) during a survey for a proposed dam, had largely been destroyed by earlier road construction. In 1968, Reeves and Dormaar (1972) conducted salvage excavations at the site. A total of 64 m² was excavated (Reeves and Dormaar 1972:328–329). Four cultural levels were encountered. The upper two levels, the Third and Fourth Occupations, were above Mazama Ash but did not contain diagnostics. The Second Occupation contained a Bitterroot/Blackwater side-notched point. A broken lanceolate point, considered to be Agate Basin, was found on the surface at the site. The excavators suggested it derived from the earliest occupation. A radiocarbon date of 9,600 +/- 240 BP (Gx-0956) from the earliest levels supports this interpretation (Reeves and Dormaar 1972:330; Morlan n.d.).
Red Rock Canyon (DgPm 1). The Red Rock Canyon site is a multi-component campsite on the east side of Red Rock Canyon, about 8 m above the channel, in Waterton Lakes National Park (Reeves 1972:47). Four cultural levels were recognized. The lowest level contained two Agate Basin points as well as two Lusk, two Lerma, and two Scottsbluff points (Reeves 1972:332, table 6). These points were recovered with widely scattered lithic tools and debitage but very little bone or FBR. An excavated basin hearth was recorded, 0.30 m in diameter by 0.2 m deep, with three small post-moulds evenly spaced around about 0.2 m from the rim. A single radiocarbon date on charcoal from the hearth produced a date of 8,220 ± 260 BP (gx-1435) (Reeves 1972:94). This date matches expectations for Lusk material, but is late for Agate Basin.

Twin Pines (EkPu 8). The Twin Pines site, as described above, is a multicomponent campsite located in James Pass Meadow just inside the front range of the Rocky Mountains, about 100 km northwest of Calgary. Possible Agate Basin/Hell Gap material occurred in the second lowest of six occupations (Ronaghan 1993:88–89; Ronaghan and Dawe 1998).

Three projectile point bases were recovered: a concave-based, basally thinned lanceolate point; a parallel-sided, slightly concave-based point stem; and a point tip (Ronaghan and Dawe 1998). All the specimens are extremely finely flaked, with the latter exhibiting collateral pressure flaking. Ronaghan and Dawe (1998) suggested the classification of the points was problematic: their square appearance suggested similarities to the Cody complex but shoulders are not present. The level was dated to about 9,750 BP (Table 4) (Ronaghan and Dawe 1998; Beaudoin, personal communication 2007). Ronaghan and Dawe (1998) concluded that the material seemed most similar to the stemmed points of the Agate Basin/Hell Gap complex. Other lithics recovered from the occupation included eleven bifacial knives, some end scrapers, some retouched flakes, some large “boat-shaped” cores, and four choppers.

Other sites. Four other assemblages deserve to be mentioned as Agate Basin/Hell Gap sites. First, the Bad Waters (DgOp 15) site is a surface collection of an Agate Basin assemblage from the north side of the Milk River (Graspointer 1980:87). Two Agate Basin points and at least twelve lithic items including bifaces and flakes were found together on the open plains (Graspointer 1980:87). Second, the Dancehall (DjPp 3) site is
a multicomponent campsite located on the south bank of the Crowsnest River at its outlet from Crowsnest Lake. At least one Agate Basin point was recovered from the lowest component of the site (Loveseth 1980). Third, the Crowsnest Valley campsite (DjPp 8) is located on the north bank of the Crowsnest River directly across the river from the Dancehall site. Driver (1983:12) identified as many as five Agate Basin-like point bases from the six 2×2-m and one 1.5×1.5-m units that were excavated. Although the stratigraphy at the latter two sites was not conducive towards detailed analyses of discrete components, they appear to exhibit cultural deposition over the last 10,000 years (Driver 1983:12; Loveseth 1980). Fourth, the North Bellevue (DjPo 81) site is a possible Agate Basin site within the village of Bellevue in the Crowsnest Pass (Driver 1976). In 1974, during a survey in the townsite, Reeves (1976) recovered a bison skull along with campsite refuse at 250 cm below 3rd Street. It was dated to 9,860 +/- 320 BP (n/a-39) (Table 4; Reeves 1976; Morlan n.d.). The following year, Driver (1976) noted that a local collector had found an Agate Basin point under 2nd Street in what were inferred to be the same silts.

Agate Basin/Hell Gap: Continuity from Folsom to Scottsbluff?

There are very few dated Agate Basin/Hell Gap sites in the province. The well-dated components (i.e., Vermilion Lakes Localities A and B, Eclipse, and Twin Pines), as well as the sites with less secure dates (Lindoe, Gap, and North Bellevue), suggest an Agate Basin/Hell Gap occupation between 10,200 and 9,600 BP. All of the sites documented above, with the exception of the Lindoe and Bad Waters sites, are located in the foothills and mountain area. The large bison kill sites commonly reported for Agate Basin/Hell Gap sites to the south are almost absent from the Alberta record. With the possible exception of the Lindoe site, the sites in Alberta represent small campsites exhibiting domestic activities rather than the large bone beds associated with kill sites. Agate Basin/Hell Gap sites are equally uncommon in the known archaeological record of the provinces and states immediately surrounding Alberta.

In Saskatchewan, very few Agate Basin/Hell Gap sites are known. The Parkhill (EbNj 4) site near Moose Jaw is an Agate Basin surface find (Ebell 1980). Ebell (1980) reported the site produced over three hundred artifacts of which 137 are Agate Basin points. Chert and Knife River flint comprise the majority of the lithic raw materials. In the 1980s, Dyck (1983) reported that the Parkhill site was one of the few known Agate Basin sites
in the province and that it had likely been destroyed. Dyck (1983:66) further noted that fifteen other Agate Basin/Hell Gap point surface finds were known in the province; all were located within the southwestern and south-central area.

The evidence of Agate Basin/Hell Gap peoples is even less common in Manitoba. Gryba (1968) found a large lanceolate point with parallel flaking in Swan Valley (FbMi 5). Both Agate Basin and Scottsbluff points had been recovered as surface finds near the site, but the actual affiliation of the specimen could not be determined. The Duck River site (ElMb 10) is an Agate Basin occupation site in Manitoba consisting solely of lithics. Haug (1981) argued that the assemblage provided evidence of butchering, hide working, and woodworking. Mapping of these activity areas indicated that a structure such as a windbreak might have been present at the site. Saylor (1975) excavated a possible Palaeoindian site (DhLb 1) on the Campbell Strandline of Glacial Lake Agassiz in southeastern Manitoba. The strandline was estimated to have formed about 10,000 to 9,500 BP. No diagnostics were recovered but two bifaces, a retouched flake, and six scrapers were found (Saylor 1975:240). For Saylor (1975), the geological age of the site suggested an Agate Basin or Hell Gap affiliation. In this vein, Pettipas (1996a:38) recognized both an early stemmed tradition (Agate Basin, Alberta, Scottsbluff) and a later stemmed tradition (Lusk) with the former existing only west of the Campbell strandline and the latter being found both east and west of the Campbell strandline.

Montana has produced the Indian Creek site. It is the first in situ Hell Gap component in the state (Davis 1986; Davis and Greiser 1992:266). The material is deeply buried, providing one possible reason for the general paucity of recoveries of such sites on the Northern Plains. The Mangus site has a possible Agate Basin component (Husted 1965). In contrast to the deeply buried Indian Creek material is information from surface finds that indicate Agate Basin and Hell Gap points are the most commonly surface-collected Palaeoindian point types in Montana (Davis 1986:28).

In summary, Agate Basin/Hell Gap sites in Alberta are coeval with their counterparts to the south. Yet, in Alberta, sites are largely restricted to small campsites while a wider range of sites including large bison kill sites are known to the south. A possible exception is the Lindoe site in southeastern Alberta, which consists of an extensive bison bone bed. Associations with cultural materials at this site, however, have yet to be demonstrated. As with all previous Palaeoindian sites in Alberta, archaeological visibility
is likely one agent behind the differences in the numbers and range of sites between northern and southern areas of the plains.

**Alberta Phase (ca. 9,600 to 9,000 BP)**

The Alberta phase is characterized by the Alberta point. It is related to Scottsbluff material as part of the Cody tradition. Wormington (1957:134) first recognized the Alberta point, which she named, as a distinct style while examining a number of surface collections recovered in Alberta. She noted: “They resemble [Scottsbluff points] sufficiently that it seems probable there is some close relationship. They differ, however, in a number of respects. They are larger, the stem is longer, the base is slightly convex, and the tip is somewhat blunted. It is suggested that they be called Alberta points” (Wormington 1957:134).

The first Alberta points recovered in situ were excavated at the Hell Gap site. From 1959 through 1966, Harvard University and the University of Wyoming excavated at the various localities of the Hell Gap site in the Hell Gap Valley of southeastern Wyoming (Irwin-Williams et al. 1973). Locality 1 was interpreted as a multicomponent occupation site starting with a Goshen workshop, followed by a Folsom/Midland campsite, an Agate Basin workshop, a Hell Gap temporary camp, an Alberta living surface, a Cody occupation, and two Frederick components (Irwin-Williams et al. 1973:44–45). The Alberta component had a restricted distribution in the northern part of the locality. Irwin-Williams et al. (1973:48) suggested that the Alberta point reflected a trend from earlier Hell Gap times, exhibiting a constriction in the lower part of the point to delineate a stem. Although originally defined as Scottsbluff (Irwin and Wormington 1970), Irwin-Williams et al. (1973:48) later recognized the Alberta point with its stem about one third the length of the piece, its parallel-sided base, and abrupt shoulders. A radiocarbon date of ca. 8,600 BP in the level above the Alberta material led to the estimated age range of 9,500 to 9,000 BP for the Alberta complex at the Hell Gap site (Irwin-Williams et al. 1973:52). A re-evaluation of the Hell Gap site’s stratigraphy questioned the traditional unilinear model of culture change in the Palaeoindian sequence, but did not specifically address the Alberta material, leaving the relationship of Hell Gap, Alberta, and Cody uncontested (Sellet 2001).

Shortly after the Hell Gap excavations, Forbis (1968a) excavated the Fletcher site, a bison kill site in southern Alberta. He recovered six points from a deeply buried bone bed, four of which he classified as Alberta points.
The remaining two fragmentary specimens could equally be considered Alberta points. Scottsbluff material was recovered, but only from the spoil pile of the dugout that initially exposed the site. Directly dating the bone bed initially proved problematic, leading to a limiting date based on seeds in the underlying clay layer (Vickers and Beaudoin 1989). A subsequent date on seeds from within the bone bed corroborated the limiting date, suggesting an age of about 9,500 BP (Beaudoin and Lemmen 2000). While this age suggests an Alberta occupation, Scottsbluff material was found at the site, complicating this interpretation. Still, in another investigation of the site, Quigg (1976:108) observed faunal remains in two closely spaced living floors (2–5 cm apart), allowing for speculation that an Alberta component was found in situ by Forbis, while the overlying Scottsbluff material was only recovered on the surface in the dugout spoil pile.

The Hudson-Meng site is the only well-dated, single-component Alberta site on the Northern Plains (Agenbroad 1978a). The site is an arroyo bison kill site in northwestern Nebraska that was excavated in the late 1960s and the 1970s (Agenbroad 1978a). Based on three radiocarbon dates, an age range of 9,820 to 8,990 BP was suggested (Agenbroad 1978a:116). A total of twenty Alberta projectile points and point fragments were recovered (Agenbroad 1978a:67–80). Agenbroad (1978a:80–85,122–124; 1978b) was prompted by the recovery of a Cody knife to reassess the relationship between the Alberta complex and the later Cody complex as the latter was usually associated with Cody knives. He suggested that this evidence provides justification for the inclusion of Alberta material under the Cody complex (Agenbroad 1978a:122–124, 1978b).

Frison (1991a:62) recognized the Alberta complex on the Northern Plains. He observed that it likely dates between 9,800 and 9,000 BP (Frison et al. 1996:13). He also recognized possible regional variants of the Alberta point: Alberta-Cody i and Alberta-Cody ii points (see Bradley and Frison 1987:199–231). The only site from which these point styles have been recovered is the Horner site in northwestern Wyoming. These point styles exhibit subtle technological differences from the later Cody material that constituted the bulk of the Horner site material. Two radiocarbon dates thought to be associated with the Alberta-Cody points were close to ca. 10,000 BP. The potential age, coupled with Alberta-like point morphology, suggests this material may be a regional variant or transitional point of the Alberta complex, but a relationship with the Scottsbluff material or an as-yet undefined complex is also possible (Frison
Other than a refinement of lithic technology, represented by Eden and Scottsbluff points, little separates points of the Cody complex from those of the preceding Alberta, so they were called Alberta-Cody (Frison et al. 1996:15).

The Sites

In situ assemblages exhibiting Alberta points are rare on the Northern Plains. Fortunately, the province of Alberta has produced one of the more classic examples of such a site, the Fletcher site. As noted above, the interpretation of the Fletcher site is not without problems. Other sites in Alberta have yielded Alberta points. However, like Fletcher, they too have problematic interpretations or lack dates (see Plate 6 and Figure 7).

**Fletcher (DjOw 1).** The Fletcher site is a bison kill site in gently rolling terrain, just south of a crescent-shaped esker ridge. It is located a few kilometres north of Chin Coulee in southwestern Alberta (Forbis 1968a:1–2). The site was named for the leaseholder at the time of discovery, Frank Fletcher. It was found by Armin Dyck who observed numerous bones and Palaeoindian points around a recent dugout. He reported the find to the Glenbow Foundation. The bone bed is 200–250 cm bs in clay pond deposits resting above culturally sterile clay deposits and below aeolian sand deposits (Vickers and Beaudoin 1989). Forbis (1968a) did not mention the extent of his excavations at the site, but a subsequent visit by Quigg (1976) involved the excavation of five 2×2-m test pits, with Rodrick Vickers conducting the most recent excavation (2×2 m) at the site (Vickers and Beaudoin 1989). Only Forbis’ (1968a) excavations recovered diagnostic material.

Four Alberta points were found in situ within the bone bed (Forbis 1968a:4–5). Four Scottsbluff points were recovered as surface finds. Two fragmentary specimens that were found in situ were not classified, although these are strikingly like Alberta points (Dawe 2004; Forbis 1968a:3–4, fig. 1d, h). Two aberrant points are small and possibly reworked Palaeoindian points (Forbis 1968a:3). A possible corner-notched point exhibiting good craftsmanship appears to have been found in association with the bone bed. Four other small points from the surface, however, exhibited poor craftsmanship and inferior raw materials; they likely date to a later time (Forbis 1968a:5). Other tools recovered from the site included a Cody knife (Forbis 1968a:7, fig. 2h), gravers (n = 2), a spokeshave, a side scraper, end scrapers
Alberta (phase) points. Illustrated are points from the Bayrock site (DkPb 2) (a); the Wally’s Beach site (DhPg 8) (b–d); EhPv 43 (e and f); the Fletcher site (DjOw 3) (g and h); and GgQt 10 (i and j). Photo credit: Glenbow Museum (a); Shane Tolman (b–d); Alberta Culture and Community Spirit (e–j).
Figure 7
Alberta (phase) sites within Alberta
(n = 2), bifaces (n = 2), a reamer, a hammerstone/anvil, and a grooved maul (Forbis 1968a:8; Dawe 2004). The grooved maul is potentially a very early example of this tool form but, based on the lack of other mauls of comparable age, the Fletcher specimen has been regarded with some scepticism (Wormington and Forbis 1965:120; Forbis 1968a:7).

All the bone recovered during Forbis’ (1968a) excavations was considered bison. As an aside, Quigg (1976:109) noted that his excavations at the site produced a bison bone bed, as Forbis had described, with the addition of a single deer phalanx. The bones were in particularly poor condition but some evidence of butchering was observed. The surface on which the bone bed rested dipped to the southeast but not sufficiently enough to conduct a jump. No evidence of posts for a corral was observed, nor was evidence for miring the animals in a marsh identified (Forbis 1968a:3). More recently, interpretation of biotic remains from the site suggested permanent water was present at the Fletcher site, lending support to a scenario in which bison that became mired in mud at the edge of a water body were ambushed (Beaudoin and Lemmen 2000:23).

Numerous attempts have been made to date the bone with unsatisfactory results owing to its condition (see Forbis 1968a:2; Quigg 1976; and Vickers and Beaudoin 1989). A sample of Cyperaceae (sedge family) seeds from clay deposits beneath the bone bed provided a lower limiting date of ca. 9,400 BP, and seeds recovered from the bone bed provided a date of ca. 9,500 BP (see Table 5). These dates are similar to dates for Alberta points recovered at Hudson-Meng (Agenbroad 1978a:115–117) and dates estimated for the Alberta component at the Hell Gap site (Irwin-Williams et al. 1973). While the association of the Alberta points and the Scottsbluff material at Fletcher is unclear, the recovery of the Alberta points in the bone bed and the dates available suggest an early Cody event represented by Alberta points.

Bayrock (DkPb 2). The Bayrock site is a bison kill site observed eroding from a highway cut north of Taber (Wormington and Forbis 1965:116). An extinct form of bison with a cobble chopper inside its skull was found eroding from the road cut, suggesting human involvement in its death. Further along the same formation, an Alberta point made on distinctive dull red material, lithic debitage, and fragmentary bison bone were collected. Excavations at the kill site recovered lithic debitage of the same dull red material, increasing the likelihood of an association with the point. Except
for two spokeshaves, few tools were recovered during the excavation. The bone bed was six inches (~15 cm) thick in places and represented a large number of animals. A date on wood underlying the bone bed produced a maximum age estimate of between ca. 10,500 BP and 11,000 BP (Table 5). It is reasonable to infer that this is an early Cody bison kill that yielded an Alberta point.

<table>
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<td>seed</td>
<td>9250–8600 B.C. (p = 0.954)</td>
<td>Beaudoin and Lemmen 2000:22</td>
</tr>
</tbody>
</table>

Norquay (EhPv 15, 156R). The Norquay site is a camp-Quarry site along the north and south side of the Trans-Canada Highway about 200 m east of the Norquay-Highway 1 Interchange in Banff National Park (Fedje 1988:5). The highway bisected the site in 1958. In 1983, an initial investigation excavated 18 m² on the north side and 27 m² on the south side of the highway (Fedje 1988:5). While the site was well stratified, the south side exhibited cryoturbation, making the recovery of an Alberta point in a palaeosol underlying a Mazama Ash layer difficult to interpret (Fedje 1985:4). In 1986, an additional 57 m² were excavated in three blocks (west, central, and east) when landscaping on the north side of the highway threatened 25 percent of the remaining site. Two cultural layers were observed. The single Alberta point recovered in a pre-Mazama Ash context during the 1983 assessment could not be positively related to the 1986 excavations (Fedje 1988:21). Still, Fedje (1988:210) noted that a distinctive red chert from this component was also found in Cody points recovered from the Minnewanka site (356R). The Bayrock site, mentioned above, also exhibits an Alberta point manufactured on a distinctive red material. Other tools recovered at the site include biface fragments (n = 3), a hafted biface, end scrapers (n = 3), choppers (n = 2), cores (n = 28), retouched lithics (n = 4), utilized lithics (n = 13) and a preform.
In general, lithic debitage and tools were concentrated in well-defined activity areas. Exotic or good-quality lithic materials dominated the tool assemblage and debitage, a hallmark of Palaeoindian technology.

The faunal assemblage (n = 2,092) was in poor condition. All preserved bone was charred, a condition likely required for preservation (Fedje 1988:11). No hearth or fBR features were recorded. Only bison and/or large ungulates were found. Lithic debitage and bone tended to concentrate around large boulders found at the site. Fedje (1988:11) interpreted the boulders as knapping locations and/or anvils for butchering.

As noted above, a single Alberta point was recovered in a pre-Mazama Ash context at the site in 1983, but could not be directly linked to the lowest component revealed in the 1986 excavations. Given that both years of excavation were conducted to depths below a layer of Mazama Ash and exhibit rare red chert found predominantly in Alberta phase sites, a tenuous link to the Alberta phase is inferred.

Wally’s Beach (DhPg 8). The Wally’s Beach site consists of lithic and faunal material deflated during drawdown on part of the bottom of the St. Mary Reservoir near Cardston, southwestern Alberta (Tolman 2001). Two Scottsbluff, four Eden, and thirty Alberta points were recovered from the surface (Tolman 2001; Dawe 2004). Tolman (2001:104) noted that Knife River flint was used continuously through time at the site, but peaked during the Cody tradition based on weight of diagnostic tools by raw material. A possible Alberta cache of twenty-two items within a 3-m radius included two Alberta points, four end scrapers (two spurred), three large broken flakes (possibly blanks), six small flakes of Knife River flint and two non-Knife River flint flakes (Tolman 2001:106).

Other sites. Numerous other sites exhibiting Alberta material are worth noting. The Timberline site (EhPv 43), overlooking Vermilions Lakes in Banff National Park, produced what appears to be an Alberta point base recovered in a 15–20-cm veneer of sediment on a moraine (Fedje 1985:4). Russell Johnston recovered Cody material at several locales near Cereal in east-central Alberta (Pettipas 1980; Wormington and Forbis 1965:56–97). Adams (1976:13) noted that the Russell Johnston Collection included six Alberta points, as well as seventy-three Scottsbluff, seventeen Eden, and five Cody knives. FiQh 26 produced the base of an Alberta point amongst other Palaeoindian material within compressed stratigraphy near Cadomin.
(Meyer et al. 2007). As well, an unusual assemblage of material from a cultivated field at GgQt 10 near Beaverlodge may represent Alberta material (Fedirchuk et al. 1998:306–314). Numerous other sites in the province have yielded Alberta points from surface contexts. Dawe (2004) has conducted an invaluable study of Cody materials in the province. Sites with Alberta points from his comprehensive list also include materials from private collections.

Alberta: Earliest Point Style of the Cody Tradition

Alberta points are rarely recovered from excavated contexts within or outside Alberta. With the exception of the Hudson-Meng site (Nebraska) and potentially the Hell Gap site (Wyoming), excavated Alberta assemblages are often recovered from problematic contexts across the Northern Plains. Within Alberta, the Fletcher site produced Alberta points within a bone bed dating to 9,500 BP, but Scottsbluff points were also recovered from the spoil pile that revealed the site. At the Bayrock site, an Alberta point was indirectly associated with the bone bed, which in turn was indirectly dated by a limiting date of ca. 10,500 BP. The Norquay site is problematic in that the Alberta point was recovered in a pre-Mazama Ash context that could not be directly linked to the lowest component revealed in the subsequent excavations and a date was not obtained. At the same time, the possibility cannot be dismissed that unspoiled Alberta assemblages occur and date earlier than Scottsbluff assemblages.

Yet, the Alberta and Scottsbluff point forms exhibit such a striking resemblance. The Cody knife, so common to the Cody tradition, was found at the Hudson-Meng site and Fletcher site bone beds. The similarity of the morphology of the point forms and the continued use of the Cody knife provide overlap between the two phases. Arguably, the Alberta point and its associated materials represent a distinct, early variant of the Scottsbluff materials. As such, Alberta and Scottsbluff-Eden are the diagnostic points of the Cody tradition. The Alberta point variant of the Cody tradition dates from ca. 9,800 to 9,000 BP. The Alberta point is the sole diagnostic point of the Alberta phase, although Cody knives do occur but are a diagnostic of the tradition as a whole. Further research may attest to the validity of this relationship whether synchronic, diachronic, or otherwise.

British Columbia has produced a number of Alberta points, all in the northeast part of the province. Roberts (1984:15–16) reported that five localities produced Alberta points; these were observed in a collection procured in the area of Lone Prairie. At the Pink Mountain site (HhRr 1),
a rather lanceolate Alberta point was recovered (Wilson 1987:217). In Saskatchewan, surface finds of lanceolate stemmed points are common south of the North Saskatchewan River (Dyck 1983:78). Dyck (1983:80, fig. 10.6b, d–g) illustrated a few surface collected Alberta points, including specimens from the Craik area, EcNk 1 in the Boharm area, and the Osage area. Phenix (1965, in Forbis 1968a:6) noted surface finds of Alberta points in west-central, south, and east-central parts of the province. For Manitoba, Pettipas (1996a:44) noted that several decades of archaeological fieldwork in the province had shown that, with few exceptions, artifacts of the early stemmed point tradition (i.e., Alberta and Scottsbluff) were restricted to the southwestern corner of the province above the western Campbell strandline of Lake Agassiz.

For northeastern Montana, Jerde (1981) reported the surface recovery of an Alberta point at the Buried Fence Line site (24sh560) and the McKean Ridge site (24sh578). In the adjacent Rocky Mountains, Davis et al. (1989) have defined the Alder complex. The complex was identified at the Barton Gulch site near the Ruby Reservoir in southwestern Montana. Ten lanceolate points with parallel-oblique flaking, labelled Ruby Valley points, were recovered in an occupation dated to ca. 9,400 BP. The researchers noted that morphologically similar points are distributed throughout the Rocky Mountains, especially southwestern Montana, east-central Idaho, and northwestern Wyoming (Davis et al. 1989:8). Frison (1991a:77) remarked that this recovery pushes the age of parallel-oblique flaked assemblages back in time, coeval with earliest Cody tradition times.

At the Benz site at the Knife River flint quarries in North Dakota, Root (1998) excavated a Cody occupation. He recovered a resharpened Alberta point and two Scottsbluff point bases in a trench. The latter were associated with a palaeosol that did not extend to where the Alberta point was recovered, making their association indiscernible (Root 1998:62). Further, the Alberta point appeared to be in disturbed context. The excavation of 11 m² at the locale of the Scottsbluff material exposed numerous lithic concentrations at various levels, suggesting several occupations. A date on a hearth excavated beneath the Scottsbluff points produced an age of about 9,500 BP (Root 1998:63). Thus, the date from the hearth is earlier than other Cody occupations, and an association with the Alberta phase occupation is possible (Root 1998:63). In South Dakota, the Trail Draw site (39pn97) is a surface find of an Alberta point in the Black Hills just north of the Hudson-Meng site (Cassells 1986:40).
In north-central Wyoming, Frison (1992) excavated the deeply stratified rockshelter called the Medicine Lodge Creek site. At least twenty cultural layers of Paleoindian material were recorded. Alberta points appear to have been recovered from a layer dated to ca. 9,600 BP. The Alberta material is separated from Scottsbluff material (ca. 8,830 BP) by layers containing other cultural material (Frison 1992:328, fig. 9.3m, n, r, s). In northeastern Wyoming, Frison (1991a:62) excavated the Carter/Kerr-McGee site, a multicomponent site with a mixed Alberta/Scottsbluff component. The site is a bison processing site from which Scottsbluff and Eden points were recovered among the bones, while Alberta points were recovered at the bottom of the bone bed. Dates for the site could not be obtained because of the lack of charcoal and the disintegrated nature of the bone (Frison 1984:292). Frison (1984:298) considered the Alberta material as a different complex not associated with the overlying Scottsbluff/Eden bison processing site. Further, in east-central Wyoming, Frison (1991a:62) reported a surface find of an Alberta point near the Agate Basin site, although there is no Alberta component within the Agate Basin site itself. In Yuma County of Colorado, Gebhard (1949:132, fig. 48b) illustrated a specimen identified as Scottsbluff, but which is more consistent with Alberta point morphology. Colorado appears to delimit the most southwestern extent of the Alberta point style. Forbis (1968a:6) refers to a possible specimen in Nebraska. Blackmar and Hofman (1997:10) noted the recovery of two Alberta points in Oklahoma. Similarly, Wyckoff (1992:47–48) illustrated a number of specimens he feels exhibit attributes of Alberta points. Oklahoma is likely the southeastern extent of the Alberta point.

In summary, with the exception of the Hudson-Meng site and the Hell Gap site, excavated Alberta assemblages are often recovered from problematic contexts across the Northern Plains. The province of Alberta has produced a number of Alberta phase sites that exhibit problematic contexts including Fletcher, Bayrock, and Norquay. Despite these issues, the Alberta phase appears to present a distinct projectile point that predates Scottsbluff-Eden material. The recovery of Cody knives at Hudson-Meng and Fletcher indicate continuity between Alberta and Scottsbluff-Eden phases. Furthermore, the point forms are morphologically similar, also arguing for continuity. It remains to be established whether there are cultural ties between Alberta material to earlier Agate Bain/Hell Gap material and to later Lusk material.
SCOTTSBLUFF-EDEN PHASE (CA. 9,000 TO 8,600 BP)

The Scottsbluff point derived its name from the town of Scottsbluff, Nebraska. It was near the Scottsbluff townsite in 1932 that the first point of this type was recovered in an excavated context (Barbour and Schultz 1932, cited in Wormington 1957:118); surface finds of this point type had been made prior to this time, but never in situ (Wormington 1957:118). Similarly, in 1940, an Eden point was first recovered from excavated context at the Finley site. The site is near the town of Eden in Wyoming, from which it derived its name (Wormington 1957:124). The difference between a Scottsbluff point and an Eden point is that the latter is much narrower in relation to its length, has a less strongly indented stem, and usually has collateral flaking that produces a diamond-shaped cross-section (Wormington 1957:124). During 1949–1950, excavations at the Horner site near the town of Cody, Wyoming, produced both Scottsbluff and Eden points in association with a diagnostic knife that had a transverse blade that was stemmed on one side: the Cody knife (Wormington 1957:128). This complex of archaeological materials was termed Cody, after the nearby town (Jepson 1953).

The story of the Scottsbluff-Eden phase has a connection to the province of Alberta. During the droughts of the 1930s, surface collections were made by Russell Johnston from blowouts near Cereal in east-central Alberta (Wormington and Forbis 1965:57). Following the suggestion of Marie Wormington, Johnston maintained careful records on the sequence in which artifacts were being uncovered at various blowout sites. By following this method, he was the first to recognize the association of Eden points, Scottsbluff points, and stemmed knives (Wormington and Forbis 1965:56). Johnston named this associated material “Little Gem,” but prior publication had labelled it the Cody complex (Jepson 1953; Wormington and Forbis 1965:56). In Alberta, Reeves (1969:24) first proposed the Alberta-Cody complex, which he dated ca. 9,500 to 8,500 BP. At the time, Alberta archaeologists were only aware of the Bayrock and Fletcher sites. In his review of the literature, Vickers (1986:36–45) indicated little reason to accept or revise the model for the Cody complex in Alberta. For Saskatchewan, Dyck (1983:79–83) included Cody material within the Lanceolate Stemmed tradition, which he estimated lasted from ca. 10,150 to 8,600 BP.

In the United States, Frison (1991a:66) considered the Horner site to be the type site for the Cody (Scottsbluff-Eden) complex because of the
occurrence of Scottsbluff and Eden points and the various forms of Cody knives. The site was dated to ca. 8,800 BP. The Cody material at the Hell Gap site was estimated to date between ca. 8,800 and 8,400 BP and contained Scottsbluff points, Eden points, and Cody knives (Irwin-Williams et al. 1973:52). Radiocarbon dates for the Finley site were ca. 9,000 BP (Frison 1991a:26, 66). The Scottsbluff material at Medicine Lodge Coulee was dated to ca. 8,800 BP (Frison 1991a:66, 1992:328). In general, Scottsbluff-Eden material is considered to date roughly 9,400–8,200 BP (Frison et al. 1996:15).

Challenges to the concept of the Cody complex have been presented. Not all materials from this time period have been classified as Cody complex despite their distinct appearance. At the Olsen-Chubbuck site in northeastern Colorado, Wheat (1967) originally classified the points from the bone bed in the arroyo kill site as variants of the Scottsbluff point. Subsequently, he reclassified this material as Firstview and San Jon points, based on subtle differences in form (Wheat 1972:140–155). The site was dated to ca. 8,500 BP (Wheat 1967). Similarly, Wheat (1979:72) proposed that the Cody-like material at the Jurgens site, north of Denver, be classified as the Kersey complex. The site also dates to ca. 8,500 BP (Wheat 1979). The Firstview and Kersey complexes exhibit assemblages very similar to the Cody complex. Frison (1991a:178–186) included Olsen-Chubbuck and Jurgens within his review of Cody sites.

Similarly, Pettipas (1980) noted that the Little Gem complex was often subsumed under the Cody complex. He and Russell Johnston, the man who named it, viewed it rather as a co-phase or a phase related by a common past or projectile points to the Cody complex. He suggested the Little Gem materials could be differentiated as they included different point styles (i.e., Sandia-like, Agate Basin-like, Lerma-like), as well as microblades, microblade cores, corner-tanged pendants, and six classes of side scrapers, among other artifact types. The Cody complex, on the other hand, includes bifacial side scrapers, shaft smoothers, denticulates, and four classes of bifaces (Pettipas 1980:17). While the combinations found in the Little Gem complex are possible, the collection techniques used to establish the Little Gem complex could also have led to spurious correlations. There are now many sites on the Northern Plains that confirm the Scottsbluff-Eden pattern.
The Sites

Sites with in situ Scottsbluff assemblages are fairly common on the Northern Plains, but rare in Alberta. As with the earlier Alberta phase, the sites that have been excavated in Alberta tend to be problematic in terms of either stratigraphic separation or their dates. This leaves correlation with the sequence in the United States as a basis for much of our understanding (see Plate 7 and Figure 8).

J-Crossing (DjPm 16). The J-Crossing site is a small lithic workshop located on a 10-metre-high terrace on the south side of the Crowsnest River. In 1988, backhoe testing encountered deeply buried material below Mazama Ash. During 1988–1989 a total of 96 m² was excavated. Material was concentrated in two areas.

Component One produced a Palaeoindian point base and point blade (Van Dyke 1994:112). The shape and size of these specimens suggest they are Scottsbluff points. Other tools recovered include two bifacial knives, two cores, an elongate pebble, and a possible grinding stone (Van Dyke 1994:112). The lithic debitage (n = 839) was dominated by black and grey cherts and a few pieces of Knife River flint (n = 2). The faunal assemblage consisted of two pieces of freshwater shell, a probable deer phalanx, five bison bone fragments, and about eight hundred miscellaneous mammal bone fragments (Van Dyke 1994:112–113). Burned and calcine bone fragments were recovered within a 5-m² area, along with two unmodified cobbles. A single radiocarbon date of ca. 8,600 BP was obtained (see Table 6).

Component Two did not yield any diagnostic tools. It did contain two cores, a cobble-core hammer, a spokeshave, a side scraper, retouched flakes, and an end/side scraper. The latter tool appears to have been made on a reworked stemmed point. The faunal assemblage included a freshwater shell, two rabbit bones, a small/medium canid bone fragment, an ungulate limb bone, and numerous miscellaneous bone fragments (Van Dyke 1994:114). A concentration of burned and calcine bone fragments occurred in this locale as well. A single radiocarbon date was obtained of ca. 9,600 BP (Table 6).

The dates are contradictory as the older date is associated with the material in the western excavation block (Component 2), which stratigraphically is 50 cm above the other material (Component 1), so is inferred to be older. Van Dyke (1994:115) suggested the rejection of either would be premature given the knowledge of Scottsbluff at the time. Few Cody (Scottsbluff-Eden) sites predate 9,000 BP (Frison 1991a).
Scottsbluff points. Illustrated are points from FlOt 2 (a); the J-Crossing site (DjPm 16) (b and c); the Stonepine site (EgPn 480), Component 1 (d); Head-Smashed-In Buffalo Jump (DkPj 1) (e and h); the Wally’s Beach site (DhPg 8) (f and g); and EkPo 10 (i). Photo credit: Fedirchuk-McCullough and Associates (a); Bison Historical Services Limited (b–d); Royal Alberta Museum (e and h); Shane Tolman (f and g); Laurie Milne and John Brumley (i).
Figure 8
Scottsbluff-Eden sites within Alberta
Given the recovery of Scottsbluff points in association with a radiocarbon date of ca. 8,600 BP, it would seem reasonable to infer that the 9,600 BP date could be associated with Alberta material, or be reconsidered.

**FhQl 4.** FhQl 4 is a multicomponent site located on the west site of Brule Lake at Swan Landing, along the Athabasca River north of Jasper (Ball 1986b:133). At least three cultural occupations were observed in an eroding cut bank exposed during gravel and sand quarrying. The lowest occupation, Level 33, produced a reworked Cody point made on black siliceous siltstone (Ball 1986b). Dawe (2004) classified the point as an Alberta point, but the stem width is narrow, the shoulders have been very reworked, and the basal edge is not particularly convex. A few other lithic items were recovered but their proveniences have not been fully disclosed. Two dates on charcoal of about 8,600 BP were obtained for the level (Ball 1986b:147–150). These dates fit nicely within the range expected from the Scottsbluff-Eden phase (Table 6).

**Fletcher (DjOw 1).** A discussion of the Fletcher site has been presented above in the section on the Alberta phase. The site’s relevance to the Cody-Eden phase rests in Quigg’s (1976:108) observation of the two closely spaced living floors (2–5 cm apart) mentioned above. It leaves open the possibility that sediments with Scottsbluff material overlying Alberta material may be present at the site. Conversely, the materials may all be from the same stratigraphic level.

### Table 6

<table>
<thead>
<tr>
<th>Site</th>
<th>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>DjPm 16</td>
<td>[AECV 1198C]</td>
<td>8580 +/- 160</td>
<td>-19.3‰</td>
<td>collagen</td>
<td>8300–7200 B.C. (p = 0.954)</td>
<td>Van Dyke 1994:110</td>
</tr>
<tr>
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<td>9600 +/- 210</td>
<td>-15.5‰</td>
<td>collagen</td>
<td>rejected</td>
<td>Van Dyke 1994:110</td>
</tr>
<tr>
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<td>[AECV-10CX]</td>
<td>8630 +/- 100</td>
<td>-25.0‰</td>
<td>charcoal</td>
<td>8200–8100 B.C. (p = 0.954)</td>
<td>Ball 1986:147–150; Morlan n.d.</td>
</tr>
<tr>
<td>FhQl 4</td>
<td>[S-2178]</td>
<td>8675 +/- 270</td>
<td>-25.0‰</td>
<td>charcoal</td>
<td>8500–7000 B.C. (p = 0.954)</td>
<td>Ball 1986:147–150; Morlan n.d.</td>
</tr>
</tbody>
</table>

Radiocarbon dates for Scottsbluff-Eden sites (calibrated by OxCal 3.10 [Ramsey 2005])
Stonepine (EgPn 480), Component 1. The Stonepine site is a multicomponent campsite situated west of Calgary in a prominent basin that drains northwest into the Elbow River (de Mille and Head 2001:54). In 1998, 65 m² were excavated prior to the start of a residential development (de Mille and Head 2001:56). The site had four occupation levels. The lowest occupation, Component 1, exhibited Cody materials. Component 2 had Lovell Constricted material stratigraphically located beneath Mazama Ash. Component 3 exhibited Estevan material from above Mazama ash. The uppermost occupation, Component 4, was Old Women’s material.

In Component 1, a single point base was recovered and tentatively classified as Scottsbluff (de Mille and Head 2001:65). Other tools recovered included bifaces and biface fragments (n = 4), a uniface, end scrapers (n = 2), a retouched lithic, and a multidirectional core (de Mille and Head 2001:65). Quartzite dominated the assemblage, followed by siltstone and sandstone. The faunal assemblage (n = 109) consisted mainly of unidentifiable mammalian fragments. Four unidentifiable bone fragments were burned. A single radiocarbon date was obtained from a small piece of bison bone: 5,850 ± 40 BP (Beta-127236) (de Mille and Head 2001:70). Problems during processing led the researchers to reject this date. However, a radiocarbon date obtained from a small piece of bison bone in the overlying occupation, Component 2, produced a date of 9,540 ± 70 BP (Beta-127235) (de Mille and Head 2001:85). The researchers suggested the date is likely associated with underlying Scottsbluff material in Component 1. Still, it appears to be a few hundred years earlier than what is expected for Scottsbluff material and over 1,000 years too early for the Lovell Constricted material recovered in Component 2 (de Mille and Head 2001:88).

EfPi 17. EfPi 17 is a multicomponent campsite located on the valley edge above the Bow River southeast of Carseland (Hanna 2002:51–65). The site has two occupations: a lower Scottsbluff component and an upper Pelican Lake component. Three excavation blocks were opened with Scottsbluff material recovered from the west block, where 28 m² were excavated (Hanna 2002:ii). Subsequent to mitigative action, the site was developed into a subdivision and golf course.

Six point fragments, including three Scottsbluff point base fragments, a point tip, a point midsection, and a notched point fragment (possibly Pelican Lake), were recovered from the lower component (Hanna 2002:70–73). Other tools recovered were bifaces (n = 2), scrapers (n = 2), a chopper,
a hammerstone, unidirectional cores \((n=4)\), retouched flakes \((n=12)\), and a utilized flake. The tools were almost exclusively chalcedony and chert. Still, the vast majority of the assemblage was tools made on quartzite, with small amounts of quartz and miscellaneous cherts. Obsidian from the site was analyzed using x-ray fluorescence and identified as originating from the Bear Gulch quarries in eastern Oregon (Hanna 2002:75).

The faunal assemblage consisted of two pieces of weathered ungulate long bone, one of which was subsequently destroyed for a radiometric date. No features were identified but clusters of similar debitage suggested remnant activity areas (Hanna 2002:64). Fifty-one pieces of small, angular FBR were found scattered across the site. A single radiocarbon date of \(3,120 \pm 40\) BP (Beta-157613) was obtained from bone thought to be contextually associated with the lower Scottsbluff component. The date reflected an age expected for the overlying component and was interpreted to be intrusive (Hanna 2002:76–77). While mixing appears to have occurred at the site, most of the recovered materials seem to be consistent with a Scottsbluff-Eden occupation.

**EkOp 10, Occupation 2.** EkOp 10 is a campsite/workshop on a knoll in gently rolling terrain north of Oyen. The excavations were conducted to mitigate a highway program. A total of 16 m\(^2\) was excavated at the site: 6 m\(^2\) in Sub-area A and 10 m\(^2\) in Sub-area B. Sub-area A produced a single occupation with most of the material coming from 0 to 10 cm bs. Sub-area B exhibited two occupation levels: an upper occupation at 5 to 15 cm bs and a lower occupation at 45 to 70 cm bs. No diagnostic material was found in the upper occupation, but a reworked Scottsbluff point was recovered in the lower occupation (Milne Brumley and Brumley 1977:42–43, 45).

The Scottsbluff point was manufactured from a non-local mottled pink and white chert that may have been heat treated, as suggested by its waxy feel and greasy lustre (Milne Brumley and Brumley 1977:45). Other tools recovered included end scrapers \((n=4)\), a biface, a retouched lithic, a multidirectional core, pebble cores and fragments \((n=44)\) and heavily chipped/pecked artifacts \((n=5)\). Black chert and chert pebbles dominated the lithic assemblage, although some exotic materials were found. No evidence of bone was recorded, no features were observed, and no radiocarbon dates were obtained for this occupation.
Nezu (HhOu 36). The Nezu site is located on a knoll above the Muskeg River northeast of Fort Mackay in northeastern Alberta. The site was named after ancient Lake Nezu, believed to have existed about 9,100 BP, as evidenced in sedimentological analyses (Saxberg and Reeves 2003:310). The site contained stemmed Scottsbluff points along with lanceolate Plano types and constricted, concave-base specimens similar to James Allen points (Saxberg and Reeves 2003:309). Other tools recovered include large bifaces, large bifacial cores, dorsally finished scrapers, and retouched flakes. Blood residue on the tools suggested that bison, moose, beaver, bear, canid, and miscellaneous cervids were hunted. A few bones were recovered but none had enough organic matter to date (Saxberg and Reeves 2003:300). At least seven other sites in this area share similar traits with the Nezu site, including Scottsbluff points, large triangular bifaces, a lithic reduction technology represented by large flakes produced from prepared cores, and a variety of scrapers, especially large dorsally finished end scrapers (Saxberg and Reeves 2003:300). To summarize, according to Saxberg and Reeves (2003), Scottsbluff points have also been recovered from HhOv 123; Eden points have been recovered from HhOv 4, 159, and 196; and HhOv 165, 166, and 198 did not produce diagnostic material but exhibited other materials similar to the Cody tradition. The researchers considered Frison’s (1992) discussion of the breakdown of the separation between the subsistence organization on the open plains and the foothills and mountains during Cody tradition times. They further noted that Cody materials have been found over a large geographic range, including as far east as western Ontario, Michigan, Wisconsin, as far west as Colorado, and as far north as northeastern British Columbia and northeast Alberta (i.e., Nezu).

Sibbald Creek (EgPr 2). The Sibbald Creek site is described above for the Sibbald phase. The base of a Scottsbluff point (Gryba 1983:64, fig. 28, C) and an Alberta point base (Gryba 1983:64, fig. 28, D) were recovered in the lower part of the sediments in association with two basally thinned points, amongst others (Gryba 1983:62–69). Three radiocarbon dates were obtained but were not considered representative of the age of the associated points.

Little Gem Complex, Johnson Locality (EfOs 1). The Little Gem complex, as mentioned above, consists of a series of surface collections made by Russell Johnston near Cereal, east-central Alberta (Wormington and Forsbis 1965:57). Adams (1976:13) noted that the Russell Johnston Collection
included seventy-three Scottsbluff, seventeen Eden, and six Alberta points, and five Cody knives. Russell Johnston indicated that many of these points appear to have been made on exotic raw materials (Pettipas 1980:79).

**Head-Smashed-In Buffalo Jump (DkPj 1).** Head-Smashed-In Buffalo Jump is a large campsite/kill site located near Fort Macleod. Best known for its stratified sequence of bison kill site deposits, it was also the recovery locale for two Scottsbluff point bases. In 1949, Boyd Wettlaufer recovered the points as a result of the excavation of previous fill from a cattle dugout in a spring channel that bisected the kill deposits. The points are manufactured on obsidian from Burns, Oregon, and Knife River flint from North Dakota (Dawe 2004). The original spot from which the points were recovered has never been revisited by archaeologists.

**Other sites.** Three other sites merit mention. First, DgPl 68 is a multi-component site in Waterton Lakes National Park (Reeves 1972:75). Although no Scottsbluff points were mentioned, Plate 18, no. 24, is clearly a Scottsbluff specimen, but labelled as Besant, from Occupation 1. Second, the Red Rock Canyon site (DgPm 1) in Waterton Lakes National Park contains two Scottsbluff points, amongst other Palaeoindian styles, near a hearth that produced a date of roughly 8,200 BP (Table 6). It could not be determined which points were associated with the hearth. Third, FlOt 2 produced a Scottsbluff point in a ploughed field with excavated materials clustered in five of twenty-six 1×1-m units (Haley et al. 1982:46–76). A total of 452 lithic artifacts were recovered with 9.4 percent consisting of fine-grained grey-white quartzite. Over half of the items were recovered from beneath the plough zone (Haley et al. 1982:48).

Early on, Wormington and Forbis (1965:185) noted the prevalence of Scottsbluff material in surface collections within the province. They stated that “the first intensive occupation of Alberta appears to have been by people with a lithic complex characterized by Scottsbluff and Eden points and Cody knives” (Wormington and Forbis 1965:185). As of 2005, Dawe (2004) tallied the known Scottsbluff and Eden points, as well as Cody knives that have been found in the province. Specifically, he reported that there are 330 Scottsbluff points, 103 Eden points, and 23 Cody knives, along with 122 Alberta points and 43 miscellaneous Cody complex-like points, known from the province. These materials provide strong evidence of a substantial occupation in Alberta during late Palaeoindian times.
Scottsbluff-Eden: The First Major Occupation?

Despite some arguments to the contrary (e.g., Pettipas 1980; Wheat 1967, 1979), the Scottsbluff-Eden material in Alberta, and abroad, consistently exhibits key diagnostics, including Scottsbluff points and/or Eden points and/or Cody knives. Scottsbluff points were recovered in good stratigraphic context at the J-Crossing site, FhQ1 4, EgPn 480, EfPi 17, and EkOp 10, and under noteworthy conditions at the Fletcher site, Sibbald Creek, Head-Smashed-In Buffalo Jump, DgPm 1, and various sites around Fort MacKay. Scottsbluff points occur in all of these sites, while Eden points and Cody knives are less frequent. As Dawe’s (2004) tabulations indicate, there are large numbers of Scottsbluff points relative to both Eden and Cody knives. The Scottsbluff-Eden material in the United States and that for the Alberta sites (Table 6) dates to between ca. 9,000 and 8,500 BP. As Meyer (1985:30) noted, Cody “dates range from 9,000 through to 8,500 years ago. Dates as much as 500 to 1,000 years younger have also been obtained but have generally been rejected by the researchers.” Under the convention used in this text, this archaeological material entity is termed the Scottsbluff-Eden phase of the Cody tradition, rather than Cody complex.

Wormington (1957:136) described the Scottsbluff point as fairly wide relative to its length, with a parallel-sided or somewhat triangular blade that is lenticular in cross-section with horizontal flaking that is essentially parallel. Two types of Scottsbluff points are often recognized: Scottsbluff I (described above) and II (Wormington 1957:137). The latter subtype tends to exhibit a triangular blade with more pronounced shoulders and a flared base (Wormington 1957:137). The Eden point is much narrower than the Scottsbluff in relation to its length; it has a less strongly indented stemmed, and it usually has collateral flaking that produces a diamond-shaped cross-section (Wormington 1957:124). Importantly, our knowledge of the technology behind the manufacturing process has increased (e.g., Bradley and Stanford 1987).

Numerous tools have been identified with Scottsbluff-Eden assemblages, but only one single diagnostic non-projectile tool form, the Cody knife, has been identified. It is “a transverse blade and is usually stemmed on one side” (Wormington 1957:128). Other tools commonly associated with Cody assemblages include scrapers, bifaces, engraving tools, perforators, choppers, pounders, and rubbing stones (e.g., Forbis and Sperry 1952:128; Frison 1984; Irwin and Wormington 1970; Irwin-Williams et al. 1973; Wormington 1957:128).

Concerning lithic raw material use, Frison (1991a:66) noted small
amounts of Knife River flint and Yellowstone Obsidian amongst more southern exotic materials recovered at the Horner site. In Alberta, the impression from surface collections is that exotic materials, especially Knife River flint, were common in tool manufacture. Dawe (2004) provided evidence to support this impression, noting that about a quarter of all Scottsbluff points, in the province are manufactured on Knife River flint. Still, quartzite accounts for about a fifth of the Scottsbluff points as do miscellaneous cherts (Dawe 2004). EgPn 480 and EfPi 17 produced reasonably large lithic assemblages. At the two sites, quartzite accounted for about 65 percent of the lithic assemblage, while more siliceous materials such as chalcedony (3.1%) and miscellaneous cherts (8.6%) were less common, and were usually employed to make tools.

Many Scottsbluff-Eden sites, including Horner, Finley, Carter/Kerr-McGee, Franca, and Jurgens, attest to the entrapment of bison as a major subsistence strategy (Frison 1991a:181). At the Horner site, in addition to bison, faunal material from deer, antelope, wolves, rabbits, turtles, and birds was recovered (Jepson 1953:20). As the distribution of the Cody tradition is expanded, a broader range of fauna is being considered under subsistence. At the Gorto site in Michigan, net sinkers, which suggest that fish were taken, were found in association with the Cody tradition (Buckmaster and Paquette 1988). In northern Alberta at the Nezu site, blood residue and faunal material suggest that bison, moose, caribou, beaver, and rabbit were taken. At the J-Crossing site in southwestern Alberta, faunal evidence for bison, deer, small canid, rabbit and freshwater shell was recovered. In Alberta, with the possible exception of the Fletcher site, large-scale bison procurement localities have yet to be located.

Features are rare in Scottsbluff-Eden sites. Besides the obvious concentrations of bones in bone beds, few other features are noted. For example, at Locality 1 of the Hell Gap site, no features were noted (Irwin-Williams et al. 1973). At the Horner site, burned areas were interpreted as hearths, and some possible pits were unearthed (Jepson 1953; Frison and Todd 1987). The Niska site, in Saskatchewan, provided evidence for a hearth in association with Scottsbluff material (Meyer 1985). For the Carter/Kerr-McGee site, Frison (1984) suggested that bone arrangements indicated that meat units were stacked and frozen for future use. For the sites in Alberta, some Cody occupations exhibited small amounts of burned bone but no obvious hearths, perhaps suggesting unprepared surface hearths that have eroded because of their exposed positions.
Scottsbluff-Eden sites occur over a fairly large area. The greatest number of sites occurs in the high plains. Sites also occur as far north as northeastern British Columbia, northern Alberta, and south-central Saskatchewan. Scottsbluff material has been found as far west as western Ontario and Michigan, and as far south as Texas. Because of the large number of Scottsbluff-Eden sites, especially in the high plains south of Montana, the following review is restricted to areas immediately adjacent to Alberta.

In south-central British Columbia, Carlson (1994:124) reported a Scottsbluff point in the Sewell Collection from the Vanderhoof locality in the central interior. In northeastern British Columbia, Roberts (1984:16) reported seven localities that produced Scottsbluff points from surface contexts. Raw materials of these finds include black obsidian \( (n = 3) \), tan chalcedony \( (n = 1) \), and various cherts \( (n = 4) \).

In southwestern Saskatchewan, Meyer (1985) excavated 2.4 m\(^2\) in two blocks at the Niska site. The west block produced a hearth in association with a Scottsbluff stem fragment, as well as other tools. The eastern block produced two stem fragments associated with a variety of tools. Surface finds that initially drew attention to the site included two complete points, three stem fragments, five Cody knives, twelve end scrapers, a concave uniface, and a utilized flake. Most of artifacts were manufactured on grey porcellanite or Knife River flint. Because of variation in the toolkit, Meyer (1985:31) did not infer that the Niska assemblage entirely conformed to the Cody tradition. The only accepted radiocarbon date for the Scottsbluff Component was 8,475 +/- 650 BP \( (S-2510) \) (Meyer and Liboiron 1990:299).

The Heron-Eden site is located near Prelate in southwestern Saskatchewan (Corbeil 1995; Linnamae and Johnson 1999). It is a Cody bison-processing site. Projectile points are mainly Scottsbluff points (Linnamae and Johnson 1999:21, fig. 4a–e, k), some points are Eden points (Linnamae and Johnson 1999:21, fig. 4f, l), and one is possibly an Alberta point (Linnamae and Johnson 1999:21, fig. 4j). Other lithic tools included end scrapers, unifaces, burins, bifacial choppers, and retouched flakes (Linnamae and Johnson 1999:22–26). The lithic assemblage emphasizes chalcedony, quartzite, miscellaneous chert, and jasper, with minor use of other materials. A minimum of thirty-seven bison was represented, with the majority of those identified as males, but also some as females and immature animals (Corbeil 1995; Linnamae and Johnson 1999:18). Two separate kills, a bull herd and a nursery herd, may be present. Five radiocarbon dates
fall between ca. 10,200 and 9,000 BP, with a mean of 9,080 BP. There are probably two components, an earlier Alberta component and a later Scottsbluff-Eden Component.

For the McLeod site, Joyes (2000:47-48) reported eighty-five Scottsbluff-Eden points and five Cody knives possibly associated with other artifacts in a blowout near Radville in southeastern Saskatchewan. Two miniature points, similar to those described by Bonnichsen and Keyser (1982) for Montana, were recovered. At Quill Lakes in east-central Saskatchewan, Novecosky (2002b) reported twenty-three Scottsbluff points, four Eden points, a Cody knife, and a drill, amongst other artifacts in a cultivated field. The Dunn site (Ebell 1988) is a surface site in south-central Saskatchewan that contained a large number of points classified as Firstview and Kersey. Joyes (2000:49) considered the McLeod site to be a Cody kill/processing site closely related to the Dunn site 53 km to the northwest. Cody knives are also known in Saskatchewan. Ebell (1982) describes three Cody knife surface finds from southern Saskatchewan while Joyes (2000:48) notes the Saskatchewan total is twelve.

In Manitoba, few Scottsbluff-Eden and related types have been recovered. When they are recovered, they are almost invariably found on and above (west of) the western Campbell strandline of Lake Agassiz suggesting they were used when Glacial Lake Agassiz stood at the Campbell level at ca. 10,000–9,500 BP (Pettipas 1996b:86). Most Scottsbluff points are known from west of the strandline while a single Scottsbluff point, likely curated and later deposited, was found east of the strandline (Pettipas 1996b; Wowchuk 1990).

The MacHaffie site south of Helena, Montana, produced two Scottsbluff components overlying two Folsom components (Forbis and Sperry 1952; Davis et al. 1991). The open-air campsite also produced other tools including scrapers, knives, flake knives, choppers, and sandstone abraders in the Scottsbluff components. The fauna included bison, antelope, rabbit, and ground squirrel (Forbis and Sperry 1952). Radiocarbon dates of approximately 8,600 BP for Component 1 and about 8,200 BP for Component 2 were obtained for the Scottsbluff material (Davis et al. 1991:19). Helmick (1984) reports on surface finds of one Eden point and one Scottsbluff Type II point to the west of Helena at Canyon Ferry Lake. Bonnichsen and Keyser (1982) discuss three diminutive Scottsbluff points from various surface locations in Montana. Although their function is unknown, they illuminate the difficulty in defining the Cody tradition.
Excavations at deeply stratified Mammoth Meadow produced two levels of Cody material. However, the upper Cody level was intermixed with Bitterroot points, while the lower level contained an unusual Cody lithic workshop that also produced a lanceolate corner-notched point (Bonnichsen et al. 1992). Jerde (1981) reported a number of Scottsbluff and Eden points from northeastern Montana. In southwestern Montana in the Upper Yellowstone Valley, Lahren (1976; Frison et al. 1996:15) recorded a Scottsbluff component at the Myers-Hindman site dated to ca. 8,900 BP that contained bison, deer, elk, mountain sheep, and canids. In south-central Montana, Mulloy (1958:31–33) recovered Eden Valley Yuma points, now called Scottsbluff, intermixed with basally thinned points, Lovell Constricted points, and Castle River points in the lowest level of Pictograph Cave. The Pryor Mountains, in south-central Montana, produced Scottsbluff material dated to ca. 7,700 BP at the Pretty Creek site (Loendorf et al. 1981, cited in Frison et al. 1996:15). The Sorenson site in the Bighorn Canyon area in south-central Montana also produced a possible Scottsbluff blade fragment in Occupation 1 associated with Agate Basin-like and Alberta-like base fragments (Husted 1969:11). The occupation produced a date of ca. 8,000 BP.

Another cultural phenomenon in Montana of the time was the Hardinger complex (Davis 1988, 1993). This complex is a set of material with distinctive, basally indented projectile points recovered from Barton Gulch site east of the Ruby Reservoir in southwestern Montana. The points — Metzal points — were recovered from two living floors dated to approximately 8,700 BP. This material appears to represent a manifestation of a Plains/Mountain cultural adaptation coeval with Scottsbluff material (Frison 1991a:77). This archaeological complex has not been recovered in Alberta.

Gregg (1986) provided a review of the Cody tradition in North Dakota. Much of the evidence is from surface finds. At the Benz site, however, Root (1998) identified a Cody occupation in a 11-x-14-m trench. Two Scottsbluff points were recovered in a palaeosol at one end of the trench and an Alberta point in disturbed context was noted at the other end of the trench. A total of 11 m² at the Scottsbluff occupation produced multiple occupations. The date from the surface of the palaeosol was ca. 8,590 BP while a hearth feature into the palaeosol dated to ca. 8,600 BP (Root 1998).

In summary, the Scottsbluff-Eden phase exhibits cultural continuity from the preceding Alberta phase. Projectile point morphology between the phases is strikingly similar and Cody knives provide overlap in a diagnostic tool
form between the two phases. Scottsbluff-Eden campsites (i.e., J-Crossing, Stonepine, EfPi 17, EkOp 10) in Alberta appear to exceed the number of kill sites (i.e., Fletcher). To the south, kill sites for this phase are more commonly reported in the archaeological literature. Archaeological visibility could account for the lack of Scottsbluff-Eden sites but one would expect bone beds to be more visible than small campsites. Perhaps the sample of overall sites is simply too small to address this issue. The ultimate fate of the Cody tradition is not clear. The stemmed point tradition continues on the Plains in the Lusk complex, but little evidence is available to link these cultural entities.