Early to Middle Prehistoric Period Transition

CA. 8,600 TO 7,500 BP

Around 10,000 BP, a warming trend began, following the end of glaciation. Called the Hypsithermal interval, this period was the warmest postglacial episode. It reached a maximum between about 9,000 and 8,000 BP. The Hypsithermal interval may have ended as late as 4,000 BP.

PLAINS/MOUNTAIN COMPLEX (CA. 8,600 TO 7,700 BP)

During an archaeological survey prior to the construction of the upper Yellowtail Reservoir on the Bighorn River in south-central Montana and north-central Wyoming, Husted (1969) recovered numerous late Palaeoindian lanceolate points from a number of rockshelters. He named one of the point types Lovell Constricted after the nearby town of Lovell, Wyoming, and another point type of similar age Pryor Stemmed after nearby Pryor Mountain (Frison 1976:151). At both the Sorenson Rockshelter site and the Bottleneck Cave site, Lovell Constricted points were found stratigraphically below levels containing Pryor Stemmed points (Husted 1969). Lovell Constricted material dates to about 8,000 BP or slightly earlier, and is immediately postdated by Pryor Stemmed material (Husted 1969; Frison and Grey 1980).
Husted (1969:13) characterized Lovell Constricted points as medium to large lanceolate points with concave bases and a definite constriction of the lateral edges slightly distal to the base. The lateral edges above the constriction are smooth and convex while the basal edge varies from shallowly to moderately concave (Husted 1969:12–13). The cross-section is lenticular with parallel-oblique flaking (Husted 1969:13). Basal grinding covers the base and up to half the length of the point (Husted 1969:13). The Pryor Stemmed point is described as “a large point with convex, bevelled and serrated lateral edges and a stem with concave edges and base” (Husted 1969:14). The bevelling is alternate with uneven serration (Husted 1969:14). Shoulders are a product of an angle between the stem and lateral edges (Husted 1969:14). Husted (1969:83) coined these new point styles as they had not been observed in the better-known sites on the open plains to the east; they were restricted to the mountains and/or mountain-plain border region.

Although never construed as a cultural entity, Lovell Constricted points have been recovered in a number of sites in south-central Montana and north-central Wyoming. They have been recovered in Layer 14 at the Mummy Cave site and dated to ca. 8,000 BP (Husted and Edgar 2002). The lowest level in Pictograph Cave in south-central Montana produced two points very similar to the Sorenson and Bottleneck specimens (Mulloy 1958, figs. 6, 7, 8; Husted and Edgar 2002:98). These points are in the same layer as specimens that look like Pryor Stemmed points, as well as Castle River points (discussed below); however, no dates are available for the apparently palimpsestic occupation. Frison (1976:163) noted the recovery of Lovell Constricted points below Pryor Stemmed points at Medicine Lodge Coulee where they were dated to ca. 8,400 BP. The Lookingbill site produced four points of which two point bases (Frison 1983, fig. 4j, k) are similar to Lovell Constricted points, but dates are not available. The Lovell Constricted material at the Sorenson site dates to ca. 7,900 BP, while at the Bottleneck site it dates ca. 8,300 BP (Husted 1969:82). Generally, these points tend to be associated with chipped stone tools and fauna that include small amounts of bighorn sheep, mule deer, and bison. Grinding stones are also present, presumably used for processing seeds (Frison 1976:164).

The Pryor Stemmed horizon or bevelled projectile point complex is largely restricted to the Big Horn Mountain area (Frison 1976:165; Frison and Grey 1980). At the Medicine Lodge Creek site, Pryor Stemmed points were dated to ca. 8,200 BP; they were stratigraphically above Lovell
Constricted points (Frison 1976:165; 1992:328). Frison (1976:165) also reported Pryor Stemmed points at Schiffer Cave on the north fork of the Powder River on the eastern slopes of the Big Horn Mountains dating ca. 8,500 BP, and at rock shelter 48J0303 in the southern Big Horn Mountains dating ca. 7,900 BP. The Pryor Stemmed material at the Sorenson site, Occupation III, dates to ca. 7,600 BP, while at the Bottleneck site, Occupation III dates ca. 8,100 BP (Husted 1969:82). An undated specimen similar to the Pryor Stemmed type may also occur at Birdshead Cave in the lower part of Level II (Bliss 1950:189, fig. 58, L 11), in the Wind River Basin, Wyoming.

Initially, Husted (1969:81–97) suggested that a Mountain-Plains culture might exist coevally with the Cody tradition, or perhaps earlier. This echoed the findings at the Mummy Cave site where Cody materials were absent. In Alberta, Reeves (1969:28) agreed with this interpretation noting that DgPm 1 in Waterton Lakes National Park, like the Sorenson site in Husted’s (1969) study, produced Cody points in association with lanceolate points. Later he considered the same assemblage to fit into Swanson’s (1962:155) Mountain-Plains culture, which reflected the earliest people in the Rocky Mountains of southeast Idaho and western Montana (Reeves 1972:129). By 1973, Reeves (1973:1247) used the term Plains/Mountain to refer to late Early Prehistoric cultural complexes on the east flank of the Rocky Mountains from Wyoming to Alberta, in contrast to coeval northern Plains sites. Driver (1978:97–98) developed a classification system in which the Ptolemy subphase, ca. 9,000 to 7,500 BP, roughly coincided with the Reeves’ Plains/Mountain culture. Driver’s (1978:98) subphase relied on Agate Basin, Pryor Stemmed, Lovell Constricted, Lusk, and Cascade points as diagnostics. Although never formally defined, the archaeological material dating to about 8,500–7,500 BP from the east flank of the Rocky Mountains, at least in Alberta, has been labelled the Plains/Mountain complex.

The Sites

The lack of a clear definition for the Plains/Mountain complex in Alberta suggests an examination of assemblages immediately postdating the Scottsbluff-Eden phase might assist in delineating the range of cultural material for this period. Thus, in order to establish the nature of the Plains/Mountain complex, assemblages dating immediately after 8,500 BP with radiocarbon dates from good contexts will be outlined below. The following sites are used to formally establish criteria for the Plains/Mountain complex (see Plate 8 and Figure 9).
PLATE 8
Plains/Mountains points. Illustrated are DjPm 36, Welsch Locality, Component 1 (a and b); DjPm 36, Welsch Locality, Component 2 (c–h); DjPm 36, Welsch Locality, Component 3 (i, k–o); the Maple Leaf site (DjPo 47) (j); the Stonepine site (EgPn 480), Component 2 (p and r) and EhPv43 (q). Photo credit: Bison Historical Services Limited (a–i, k–p, r); Alison Landals (j), Alberta Culture and Community Spirit (q).
Figure 9
Plains/Mountain sites within Alberta
Maple Leaf (DjPo 47). The Maple Leaf site is a multicomponent site on a terrace immediately above the Crowsnest River, south of Bellevue in the Crowsnest Pass (Landals 1986:37; Driver 1982). The earliest component represented a bighorn sheep-processing site (Driver 1982) and a hunting stand or cache (Landals 1986:66). The component was recovered in clay that contained a bison kill dated to 7,200 +/- 230 BP (RL-876). The component overlay a layer of marl and underlay a layer of Mazama Ash. The site was found in 1973, tested in 1976, and excavated during 1977 and 1978 with 36 m$^2$ excavated (Landals 1986; Driver 1982). Driver (1982) presented material from the 1977 excavations in an analysis of the oldest component.

Two points were recovered in a backhoe trench beside the 1977 excavation. The points were recovered in the same basal clays as the sheep bones. One point was a Lovell Constricted point and the second was a non-diagnostic midsection (Reeves and Driver 1978; Driver 1982:270). In terms of the faunal assemblage ($n = 526$), the sheep bones were recovered in a small cluster, and were interpreted as *Ovis canadensis*. Some bone exhibits cut marks, ruling out natural death. At least three animals were present: two subadults and an adult. The absence of certain bones, such as phalanges, metapodials, vertebrae, and ribs, suggested discrete portions of the carcass were brought to this location from a kill site (Driver 1982:268–269). Butchering units likely included three forelimbs, two pairs of mandibles, a hindlimb, a distal hindlimb, and a small portion of a ribcage. A single fragment of a bison humerus shaft was recovered and was interpreted as an expedient meat-stripping tool (Driver 1982:269). Other faunal remains were scattered, sparse, and fragmentary; there was evidence of three bison and a canid (Landals 1986:56). No features or additional stone tools were noted in the main excavation areas. A single radiocarbon date was obtained for the site. Bison bone in the same stratigraphic context as the sheep bone produced a date of ca. 8,550 BP (see Table 7). This date fits well with those expected for Lovell Constricted material.

Stonepine (EgPn 480), Component 2. The Stonepine site is described above in the section on the Scottsbluff-Eden phase. Component 2 contained Lovell Constricted material below Mazama Ash (de Mille and Head 2001:56). Three points were recovered, including a Lovell Constricted point, a large corner-notched point, and a non-diagnostic corner-notched base. The corner-notched point is similar to contemporary Burmis barbed points (see Country Hills complex below). The remaining eighty-six tools
included bifaces (n = 8), end scrapers (n = 2), side scrapers (n = 3), a possible spurred scraper, wedges (n = 3), choppers (n = 4), retouched lithics (n = 8), a utilized flake, a hammerstone, anvils (n = 2), bipolar cores (n = 2), multidirectional cores (n = 17) and a unidirectional core. The lithic assemblage was dominated by sandstone (34.3%), siltstone (30%), and quartzite (19.1%), with minor amounts of chert (8.5%), chalcedony (1.4%), and quartz (1.3%).

### Table 7

<table>
<thead>
<tr>
<th>Site</th>
<th>Conventional ¹⁴C Age</th>
<th>¹³C/¹²C Ratio</th>
<th>Material</th>
<th>Calibration</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>EgPm 480</td>
<td>9540 +/- 70</td>
<td>?</td>
<td>collagen</td>
<td>8300–6500 B.C.</td>
<td>de Mille and Head 2001</td>
</tr>
<tr>
<td>DjPo 47</td>
<td>8630 +/- 270</td>
<td>-20.0%</td>
<td>collagen</td>
<td>8500–7000 B.C.</td>
<td>Driver 1982.267; Morlan n.d.</td>
</tr>
<tr>
<td>DjPm 36, C1</td>
<td>8390 +/- 120</td>
<td>-18.6%</td>
<td>collagen</td>
<td>7600–7050 B.C.</td>
<td>Van Dyke 1994:157</td>
</tr>
<tr>
<td>DjPm 36, C1</td>
<td>8180 +/- 110</td>
<td>-18.9%</td>
<td>collagen</td>
<td>7550–6800 B.C.</td>
<td>Van Dyke 1994:157</td>
</tr>
<tr>
<td>DjPm 36, C1</td>
<td>7170 +/- 80</td>
<td>-20.0%</td>
<td>collagen</td>
<td>rejected</td>
<td>Van Dyke 1994:157</td>
</tr>
<tr>
<td>DjPm 36, C2</td>
<td>8190 +/- 110</td>
<td>-17.4%</td>
<td>collagen</td>
<td>7550–6800 B.C.</td>
<td>Van Dyke 1994:148; Morlan n.d.</td>
</tr>
<tr>
<td>DjPm 36, C2</td>
<td>8160 +/- 110</td>
<td>-17.6%</td>
<td>collagen</td>
<td>7500–6800 B.C.</td>
<td>Van Dyke 1994:148; Morlan n.d.</td>
</tr>
<tr>
<td>DjPm 36, C2</td>
<td>7920 +/- 110</td>
<td>-17.2%</td>
<td>collagen</td>
<td>7100–6500 B.C.</td>
<td>Van Dyke 1994:148; Morlan n.d.</td>
</tr>
<tr>
<td>DjPm 36, C2</td>
<td>7890 +/- 110</td>
<td>-17.9%</td>
<td>collagen</td>
<td>7100–6500 B.C.</td>
<td>Van Dyke 1994:148; Morlan n.d.</td>
</tr>
<tr>
<td>DjPm 36, C3</td>
<td>8000 +/- 120</td>
<td>-18.4%</td>
<td>collagen</td>
<td>7300–6600 B.C.</td>
<td>Van Dyke 1994:188</td>
</tr>
<tr>
<td>DjPm 36, C3</td>
<td>7890 +/- 130</td>
<td>-22.4%</td>
<td>collagen</td>
<td>7100–6450 B.C.</td>
<td>Van Dyke 1994:188</td>
</tr>
<tr>
<td>DjPm 36, C3</td>
<td>7690 +/- 210</td>
<td>-20.2%</td>
<td>collagen</td>
<td>7100–6050 B.C.</td>
<td>Van Dyke 1994:188</td>
</tr>
<tr>
<td>DjPm 36, C3</td>
<td>7450 +/- 100</td>
<td>-18.6%</td>
<td>collagen</td>
<td>6470–6080 B.C.</td>
<td>Van Dyke 1994:188</td>
</tr>
</tbody>
</table>
The faunal assemblage \( n = 1,219 \) included remains of at least two bison, a moose or elk, a deer, and a canid. The bison limb elements were most numerous and fragmented, suggesting meat sections were brought to the campsite and processed for marrow (de Mille and Head 2001:78). Burned and calcine bone was also observed. A dark reddish soil stain was interpreted as a hearth; it contained bits of charcoal and burned bone. As well, 3,405.4 grams of FBR were recovered from the site, most of which was interpreted to have resulted from immersing hot rocks in water for stone boiling (de Mille and Head 2001:63).

The researchers noted the similarity in the form of the Lovell Constricted point to others at the Welsch site (DjPm 36 and DjPo 47, which date between 8,500 and 8,000 BP (de Mille and Head 2001:87). A single radiocarbon date of about 9,500 BP was obtained (Table 7; de Mille and Head 2001:85). Demille and Head (2001) suggested that the date is about 1,000 years earlier than expected and may possibly be associated with the underlying Scottsbluff material in Component 1 (de Mille and Head 2001:88).

DjPm 36, Welsch Locality, Components 1 to 3. DjPm 36, Welsch Locality, is located on a series of terraces at the confluence of the North Fork of the Oldman River and the Crowsnest River (Van Dyke 1994:116). The Welsch Locality was named after the landowner (Van Dyke 1994:117). Three components were identified with palaeosols at various depths across the various blocks. The site was originally recorded in 1965, tested in 1985–1986, and excavated in 1988–1990. Four excavation blocks (north, central, west, and south) yielded a total of 278 m² (Van Dyke 1994:116).

Component 1 was represented in both the north and west blocks. It produced a Lovell Constricted point and a large lanceolate point blade in association with a post-mould, a hearth, and a bone concentration (Van Dyke 1994:150). Other tools recovered included a biface, a pebble chert core, and a cobble core chopper. The lithic assemblage, although small, was dominated by siltstone, miscellaneous cherts, and quartzite (Van Dyke 1994:152, table 6). The faunal assemblage \( n = 5,230 \) yielded an undifferentiated small ungulate, a small mammal, at least four bison, and a bivalve shell (Van Dyke 1994:150). A fair amount of the bone was burned or calcine. While bone was generally scattered across the occupation floor, one concentration consisted of a portion of an articulated adult animal (i.e., vertebrae and ribs). A hearth feature produced a scatter of burned and calcine bone, unmodified cobbles \( n = 6 \), and FBR spalls \( n = 3 \). A cultural
origin for the post-mould seems likely but a firm interpretation of the feature was not provided (Van Dyke 1994:156). Three radiocarbon dates in the west block suggest an age of 8,200 BP (see Table 7; the youngest date was rejected) (Van Dyke 1994:157).

Component 2 was largely present in the south block of the excavation. Eleven projectile points were associated with a massive bone bed in an abandoned braided river channel system (Van Dyke 1994:157). The points included four Lovell Constricted/Cowley Stemmed points, one Castle River stemmed, a straight stemmed, and a lanceolate point. The remaining specimens were too fragmentary to be classified. Other tools included core tools \((n = 26)\), bifaces \((n = 9)\), retouched flakes \((n = 7)\), end scrapers \((n = 3)\), unifaces \((n = 3)\), and a hammerstone (Van Dyke 1994:157). The faunal assemblage \((n = 150,191)\) was mainly bison with evidence of deer, large and small canids, and bird. A minimum of 107 bison were represented in the excavated material (Van Dyke 1994:160). In addition, six identifiable and twenty-eight fragmented bison fetal bones were recovered. There were many butchering sections but a scarcity of direct evidence of butchering; only four bones exhibited cut marks, four bones exhibited impact scars, one bone had hack marks, and fifty-three bones exhibited green bone fracture. In addition, a radius had a projectile point tip stuck in it (Van Dyke 1994:166). Calcine and burned bone occurred in concentrations throughout the bone bed, in blackened soils. The size of the kill site and the lack of butchering led the researcher to question whether the mechanism of the kill was cultural or not. The site might represent a natural event that was scavenged. The researcher remained neutral on this issue (Van Dyke 1994:180). Ten radiocarbon dates were obtained for the bone bed. One date was an outlier \((i.e., 7,070 +/- 70 \text{ BP, Beta-38787})\); averaging the remaining dates produced an age of ca. 8,006 BP (Table 7). If the bone deposits in the deepest part of the channel are considered a separate event from the bone bed, an average of five dates produces an age date of 8,126 BP; the overlying material, estimated on four dates would average 7,857 BP. This supports the possible inference of two separate episodes of occupation.

Component 3 occurred in the west, north, and south excavation blocks. Five points were recovered: three Castle River stemmed points and two smaller stem fragments. An additional Castle River stemmed point was recovered from the backhoe spoil pile, which consisted of material from just above the occupation. Other lithic items recovered from the site included bifaces \((n = 4)\), an end scraper, a uniface, a drill, cores \((n = 6)\), marginally
retouched flakes (n = 5), a hammerstone, unmodified cobbles (n = 5), and FBR (n = 13). Silicified siltstone, quartzite, and argillite dominated the lithic assemblage. The faunal assemblage (n = 4,757) was dominated by bison bone fragments. Non-bison items included a large canid limb fragment, deer teeth, mandible and metapodial fragments, and a few small mammal fragments (Van Dyke 1994:184). A minimum of three bison was present, based on two left astragali and fetal bone. Well-defined features were absent but areas exhibiting surface burns or reddened soils were observed (Van Dyke 1994:185). In the west block a feature intersected during backhoe testing contained unmodified cobbles, FBR, stained soil, burned bone and flecks of charcoal; the distribution of debitage also centred on the feature (Van Dyke 1994:185). In the south block, a stone-lined hearth was identified with a scatter of bone and debitage. Four radiocarbon dates were obtained for this occupation. They suggested an age of about 7,700 BP (Table 7).

Narrows (DgPl 4). The Narrows site is located on a rocky spur that forms a constriction between the Upper and Lower Waterton Lakes in Waterton Lakes National Park (Milne Brumley 1971:75). The site received its name from this constriction. The site, with 64 m² excavated, is on a spit on the west side of the narrows. Discrete cultural components could not be defined because of disturbance and compressed stratigraphy (Milne Brumley 1971:78). A variety of point specimens was recovered, including one base of a lanceolate point interpreted as Lovell Constricted (Milne Brumley 1971:82–83).

Plains/Mountain: Transition from Spears to Darts in the Foothills/Mountains

A review of sites immediately postdating 8,500 BP illustrates that Alberta's cultural sequence is somewhat different from the sequence to the south developed by Husted (1969), Frison (1976, Frison and Grey 1980), and others. Still, lanceolate points comparable to Lovell Constricted defined in Montana and Wyoming occur in the eastern flanks of the Rocky Mountains in Alberta. They tend to date to ca. 8,500–8,000 BP. However, they exhibit a slightly different basal configuration not found in the south. By about 8,000 BP, these lanceolate points are found in contexts with Castle River stemmed points, with the latter becoming more common from shortly after 8,000 BP until about 7,500 BP. The Plains/Mountain complex is captured in this developmental sequence.
These lanceolate points do not appear to be true Lovell Constricted points as defined by Husted (1969). The specimen from DjPm 36, Component 1, most closely resembles Lovell Constricted (Van Dyke 1994:153). The other points from this period (i.e., Maple Leaf site, EgPn 480, the Narrows site, and Component 2 of DjPm 36) all exhibit a stem with subtle, multiple shoulders that lead into a gradually outwardly flaring stem. It might be best to think of these points as a northern variant of the Lovell Constricted point given their overall temporal, geographic, and morphological similarity. The subsequent Castle River stemmed points exhibit a fair amount of variability. The points have fairly pronounced shoulders with short, relatively straight stems that exhibit either a straight or concave base. In addition to the Castle River points, there were two small specimens (Van Dyke 1994:183, fig. 87d and e) that were very similar to a stem fragment recovered at the Hawkwood site in the foothills at Calgary (Van Dyke and Stewart 1985: plate 13, no. 1). Van Dyke (1994:188) noted that the Hawkwood stem fragment was associated with a Salmon River point and a Lusk point, and was dated to ca. 8,250 bp.

Another interpretation of this small data set would have the sequence from DjPm 36 providing a "study" of Lovell Constricted materials changing slowly to Castle River materials in situ. Recently, Hutchings (1997) suggested that fracture rates in Palaeoindian lanceolate points indicated that they were propelled by atlatls rather than thrown by hand. Hughes (1998) examined four hunting systems — thrusting spear, throwing spear, atlatl/dart, and bow/arrow — using engineering principles. Like Hutchings (1997), Hughes found evidence that atlatls were used with lanceolate points. Interestingly, she argued that the change from large lanceolate points to smaller notched points reflected the appearance of fletching on the darts; the fletching was interpreted as helping accuracy, velocity, and lift of the dart (Hughes 1998:397). Based on the assemblage from Mummy Cave, she suggested that the transition and the appearance of fletching was about 7,600 bp. This coincides roughly with the Alberta sequence, so the Lovell Constricted and Castle River materials possibly indicate the initial steps towards the transition. Thus, the wide range of projectile point variability at this time period may partially be reflecting experimentation taking place in the flight characteristics of the dart and atlat.

The limited sample of non-projectile point tools does not lend itself to further analysis. As mentioned, the recovery of the possible spurred scraper from EgPn 480 harkens back to a Palaeoindian past. In contrast,
the hammerstone and two anvils from the same site may reflect changing times when increasingly thorough processing was required within subsistence strategies. Still, an analysis of the functions of these early possible grinding specimens has yet to occur. The apparent recovery of a corner-notched point associated with the Lovell Constricted-like specimen at EgPn 480 is also notable and may relate to the subsequent Country Hills complex. The association of stemmed and corner-notched points, if valid, makes EgPn 480 comparable to the Hawkwood site in terms of exhibiting transitional hunting technology at an early time.

Taken as a group, the lithic raw materials from EgPn 480 and DjPm 36 show a heavy reliance on local sources. Quartzite, silicified siltstone, and siltstone each constitute about 20 percent of the raw materials. Fine-grained materials such as argillite (4%), chalcedony (2%), Avon chert (2%) and miscellaneous cherts (7%) occur infrequently. The fauna reflects the foothills/mountains location of the sites in this complex. Bison continue to be the most commonly recovered animal. Importantly, DjPm 36, Component 2, may represent a large bison kill. However, some scepticism on its cultural origin was outlined. Canids are also relatively common. Mountain sheep were clearly a focus at the Maple Leaf site. Deer and other cervids, such as moose or elk, appear to have been taken. A single bird is also represented in the faunal material from the sites.

Few features were associated with the sites of this complex. Surface hearths were observed in Components 1 and 3 of DjPm 36. A stone-lined basin hearth was also recorded in Component 3 of DjPm 36. Very little fbr was recovered in these sites. DjPm 36 produced three pieces of fbr in Component 1 and eleven pieces in Component 3. The only site with any real amount of fbr was EgPn 480. The general lack of pit features for stone boiling suggests the fbr is being created as spall from associated hearth ring rocks.

Other sites from areas adjacent to the province may fit into the Plains/Mountain complex. Conforming to Reeves’ (1973) original vision, these sites are located along the eastern flanks of the Rocky Mountains of Alberta with ties to similar sites in Montana and Wyoming. Some similar assemblages to the Plains/Mountain complex are known to the east in Manitoba. Pettipas (1985:50, fig. 4a, b) illustrated Manitoba points that resemble Lovell Constricted specimens. As well, Buchner (1981a:42, plate 7d–f) illustrated three specimens similar to Castle River stemmed points. Perhaps the Plains/Mountain complex represents more than people subsisting only in the
western foothills: the presence of similar material in the plains periphery to the east might signal an early forest/forest-edge adaptation.

A single specimen from Medicine Lodge Creek site in north-central Wyoming exhibits striking similarity to the northern Lovell Constricted points (Frison 1992:328, fig. 9.3a). The point was dated to ca. 8,050 BP. It postdates some specimens considered to be Pryor Stemmed points, contrary to Husted’s (1969) original classification. Otherwise, the above discussion of the southern Lovell Constricted points covers this poorly understood time period and point style.

Castle River stemmed points may have counterparts in the eastern slopes of the United States. Mulloy (1958:33, fig. 6, nos. 5, 6, 9–12) illustrated a series of points recovered in the oldest level of Pictograph Cave, Montana, in association with basally thinned and Scottsbluff points. They appear to exhibit the attributes of Castle River stemmed points.

The Paint Rock Canyon v (48BH349) site is a large rock shelter high in the wall of a deep canyon on the eastern slopes of the Big Horn Mountains, north-central Wyoming (Frison 1976:168, 1991a:40–41). Two occupations were observed with radiocarbon dates 8,140 +/- 150 BP (RL-391) and 8,340 +/- 160 BP (RL-160) (Frison 1976:168; Frison 1991a:27). Mountain sheep and mule deer were recovered from both levels. A distinct point and two similar bases were also recovered (Frison 1976:168, fig. 8.10e; Frison 1991a:73, fig. 2.38e–f). The Paint Rock Canyon v specimens are morphologically very similar to specimens of the same age from DjPm 36, Welsch Locality, Components 2 and 3. Frison (1976:168, fig. 8.10e) noted that a similar specimen and broken base were recovered at the Medicine Lodge Creek site. Frison (1976:168, 1991a:74) argued that these occur at the same time as the Pryor Stemmed complex but are significantly different, perhaps reflecting a variant of the form. The Lookingbill site in northwestern Wyoming also produced three basally indented points in association with a lanceolate point. They are quite similar to Castle River stemmed specimens and were estimated to date to about 8,000 BP (Frison 1983:9). Frison (1983:9) suggested this material may represent a transitional stage between terminal Palaeoindian lanceolate and Early Plains Archaic side-notched points.

At the Sawmill Canyon (10BT62) site in Birch Creek, eastern Idaho, a Pinto point was recovered during a series of tests (Swanson et al. 1964, fig. 36, jj). This specimen is strikingly similar to the Castle River specimens. It exhibits an indented base with parallel sides and soft shoulders that lead into a leaf-shaped blade. Swanson et al. (1964:72) labelled the specimen...
Pinto, based on similarities it exhibited to Wormington's (1957:165–166) Pinto Basin points in Riverside County, California. The aforementioned correlations to Alberta materials provide a better fit both morphologically and geographically.

In summary, Lovell Constricted projectile points exhibit strong similarities to their counterparts to the south, but subtle morphological differences are present. The components at the Welsch site might represent the development of this northern Lovell Constricted material into Castle River stemmed materials. Although a comparable sequence is not known to the south, examples of similar point forms do occur. The presence of similar forms to the east in Manitoba entice speculation that a forest/forest-edge adaptation may be represented in the Lovell Constricted/Castle River materials. Pryor Stemmed materials do not appear to be present in Alberta.

**Lusk Complex (ca. 8,300 to 7,500 BP)**

The Lusk complex is a poorly understood set of material that dates ca. 7,700 BP. The Lusk assignment falls upon a group of lanceolate points that immediately follow the Cody tradition on the Plains. Some of these points include Frederick, Angostura, Allen, and Haskett points. For some researchers, Lusk would fall within the Late Plano complex (Arnold 1985). Others would classify all the various point styles that follow the Cody tradition under the rubric of the Parallel-Oblique Point complex (Bradley 1993:260). Still others call this material the Lanceolate Point tradition (Pettipas 1996a:44).

A Lusk point is usually made on a flake with a triangular cross-section such that the projectile point tends to have a plano-convex cross-section. The base is usually concave compared to Frederick points and the flaking is more haphazard and less controlled (Irwin-Williams et al. 1973:51; Frison 1991a:69). Lusk points appear similar in form to the Angostura type (Irwin-Williams et al. 1973:51) or the Haskett type (Butler 1968).

Lusk material was originally identified at the Betty Greene site near Lusk, Wyoming (Irwin-Williams et al. 1973). Initially a date of ca. 7,900 was obtained for the site; however, it is now known to exhibit more than one component, bringing in to question the age of each component (Frison 1991a). Lusk material was also reported at Locality 11 of the Hell Gap site where it is believed to postdate the Frederick material at Locality 1 (Irwin-Williams et al. 1973:45). The age of the Lusk complex is estimated to be about 8,000 to 7,500 BP, based on the Hell Gap sequence (Irwin-Williams et al. 1973:52).
Frison (1991a:393–394) considered Lusk points to be technologically related to Frederick, Allen, and Angostura points. He argued that serial pressure thinning, which produced a parallel-oblique pattern, separates these points from Palaeoindian points. Holder and Wike (1949) have called this group of material the Frontier complex. Frison (1991a:394) argued that while Alberta and Cody technology developed on the plains, the Frontier complex developed in the high elevations of the interior mountain west. It is possible that Lusk materials bear some relationship to Plains/Mountain materials.

In Alberta, Reeves (1969:24) initially suggested that Lusk and Frederick complexes dated between 8,500 and 7,500 BP, based on surface collections similar to sequences known to the south. At the time, Reeves (1969:24) noted that both point forms were rarely encountered in surface collections, especially the Frederick point. In a subsequent report, Reeves (1972) listed sites in the Big Horn Canyon, the Mummy Cave site, and the Shoup Rockshelter as containing Lusk material. Recently, Vivian and Reeves (1999:24–26) provided a stronger argument for the Lusk complex in Alberta, citing Reeves' (1972:113) previous work as well as sites in the Crowsnest Pass, the Sibbald Creek site, Hawkwood, Tuscany, and more recently discovered EgPn 428. Despite these efforts, the Lusk complex remains poorly understood and rarely recognized in Alberta.

The Sites
Sites that exhibit Lusk points often have them as the sole diagnostic point in the component; however, they occasionally occur with notched point forms. The following reviews sites with Lusk points and associated materials that have been recovered from dated context within Alberta (see Plate 9 and Figure 10).

Hawkwood (EgPm 179). The Hawkwood site is a multicomponent campsite in two sediment basins on the south side of the lower slopes of Nose Hill in Calgary (Van Dyke and Stewart 1985). Six distinct components were recognized including, from oldest to youngest, Lusk, two unidentified, Mummy Cave, Oxbow, and an Old Women’s component. The Lusk occupation, Component 1, was only observed in a palaeosol in the east basin. During 1979–1980, a total of 62 m² was excavated within the east basin. The excavations mitigated anticipated impacts of a housing development.
PLATE 9

Lusk points. Illustrated are points from the
Boss Hill site (FdPe 4) (a–e); the
Hawkwood site (EgPm 179) (f–i);
the Scapa site (EIPa 1) (j);
DgPl 1 (k and n);
DgPm 1 (l and o);
DjPo 78 (m); and
the Tuscany site (EgPn 377) (p).

Photo credit:
Alberta Culture
and Community
Spirit (a–e, j, k–p);
Royal Alberta
Museum (f–i).
FIGURE 10
Lusk sites within Alberta
In Component 1, a Lusk point, a “Salmon River” point, an atlatl point, two point midsections, a point tip, and a stemmed base were recovered (Van Dyke and Stewart 1985:21–31). Other tools included a symmetrical bipoint lanceolate biface, ovate bifaces, a split pebble end scraper, spall tools (n = 2), a bifacial chopper, unifacial choppers (n = 2), retouched flakes (n = 6), a possible grinder, and cores (n = 37) (Van Dyke and Stewart 1985:21–31). The large number of cores suggested primary core reduction was occurring at the site. Most of the debitage was quartzite (59.7%) with some siltstone (20.1%) and pebble cherts (15%). Two of the chert tools were inferred to have been heat-treated.

<table>
<thead>
<tr>
<th>Site</th>
<th>Conventional 14C Age</th>
<th>13C/12C Ratio</th>
<th>Material</th>
<th>Calibration</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>EgPm 179</td>
<td>8330 +/- 330</td>
<td>-20.0‰</td>
<td>collagen</td>
<td>8300–6500 B.C. (p = 0.954)</td>
<td>Van Dyke and Stewart 1985:39; Morlan n.d.</td>
</tr>
<tr>
<td>EgPn 428</td>
<td>6840 +/- 70</td>
<td>n/a</td>
<td>rejected</td>
<td></td>
<td>Vivian and Reeves 1999</td>
</tr>
<tr>
<td>DjPo 78</td>
<td>1600 +/- 100</td>
<td>-20.0‰</td>
<td>collagen</td>
<td>rejected (not associated with material)</td>
<td>Morlan n.d.</td>
</tr>
<tr>
<td>EgPn 377</td>
<td>9950 +/- 120</td>
<td>?</td>
<td>10050–9200 B.C. (p = 0.954)</td>
<td>Oetelaar 2004b:735; Siegfried 2002</td>
<td></td>
</tr>
<tr>
<td>EgPn 377</td>
<td>7840 +/- 100</td>
<td>?</td>
<td>7050–6450 B.C. (p = 0.954)</td>
<td>Oetelaar 2004b:735; Siegfried 2002</td>
<td></td>
</tr>
<tr>
<td>EgPn 377</td>
<td>7610 +/- 70</td>
<td>?</td>
<td>6610–6350 B.C. (p = 0.937)</td>
<td>Oetelaar 2004b:735; Siegfried 2002</td>
<td></td>
</tr>
<tr>
<td>EgPn 377</td>
<td>7475 +/- 45</td>
<td>?</td>
<td>6430–6240 B.C. (p = 0.954)</td>
<td>Oetelaar 2004b:735; Siegfried 2002</td>
<td></td>
</tr>
<tr>
<td>EgPn 377</td>
<td>7310 +/- 45</td>
<td>?</td>
<td>6250–6060 B.C. (p = 0.954)</td>
<td>Oetelaar 2004b:735; Siegfried 2002</td>
<td></td>
</tr>
<tr>
<td>FdPe 4</td>
<td>7875 +/- 130</td>
<td>-20.0‰</td>
<td>bone</td>
<td>7100–6450 B.C. (p = 0.954)</td>
<td>Doll 1982:139; Morlan n.d.</td>
</tr>
<tr>
<td>FdPe 4</td>
<td>7750 +/- 105</td>
<td>-25.0‰</td>
<td>charcoal</td>
<td>7050–6440 B.C. (p = 0.954)</td>
<td>Doll 1982:139; Morlan n.d.</td>
</tr>
</tbody>
</table>

A single adult bison was represented in the faunal assemblage. The highly fragmented assemblage was interpreted as indicative of marrow extraction (Van Dyke and Stewart 1985:36). Burned and calcine fragments were recovered, suggesting the use of bone as a fuel. Fragments of some of the meaty bones such as the humerus and femur suggested transportation of limb elements to the site for processing. Two hearths were present. One
hearth (1.5 × 0.5 m) was represented by a soil stain associated with charcoal and small, unidentifiable fragments of burned and calcined bone (Van Dyke and Stewart 1985:38). The second hearth (0.4 × 0.2 m), a few metres to the southwest of the first, was also an elongate concentration of burned and unburned bone (Van Dyke and Stewart 1985:38). The two hearths were outside the areas suggested as shelters. Clusters of cobbles on the living floor have been interpreted as anchors for one or more shelters. A single radiocarbon date of about 8,330 BP was obtained (see Table 8). The excavators suggested that the inhabitants of the Hawkwood site stalked small herds of bison from this fairly open campsite during mild weather (Van Dyke and Stewart 1985:40–41).

**Tuscany (EgPn 377).** The Tuscany site is a multicomponent site in a depression near the edge of a terrace overlooking the Bow River Valley in northwest Calgary (Oetelaar 1998:2). Four cultural components were differentiated: the lowest was a Lusk component, followed by a Bitterroot component, then an Oxbow component, and lastly a Besant/Old Women’s component. A total of 92 m$^2$ was excavated in the main excavation area prior to the beginning of a housing development.

A single Lusk point was recovered from the lowest component of the site. Blood residue analysis suggested contact with a canid (i.e., dog, wolf, or coyote). Other tools recovered included biface fragments ($n = 2$), hammerstones, and an edge-modified flake. The faunal assemblage included elements from bison, elk, mountain sheep, deer, antelope, black bear, mountain lion, hare, cottontail, muskrat, vole, lemming, grouse and duck. A small hearth, 0.25 m in diameter, had a shallow basin-shaped profile. The faunal material was concentrated east of the hearth while debitage was adjacent to the southeast part of the hearth. Some FBR was recovered from the site. Although the FBR pieces were interpreted as products of rapid heating and cooling, the researcher warned that such conditions can be created by stone boiling, sweat bathing, or oven roasting (Oetelaar 1997:8).

Four radiocarbon dates were obtained from this component and one from beneath it (Table 8). The most reliable date came from charred plant remains from the hearth, which produced the age estimate of 7,840 BP (Siegfried 2002). The Lusk point was associated with this feature. The date of the underlying material was ca. 10,000 BP. In addition, purified bone collagen from a bone near the hearth produced an age estimate of 7,610 BP. The two other dates are slightly more recent.
EgPn 428. EgPn 428 is a campsite on a large bench below the west end of the Paskapoo Slopes, overlooking the Bow River on the west side of Calgary (Vivian and Reeves 1999:1). A single cultural component was observed below Mazama Ash. A total of 120 m² was excavated between 1996 and 1998 (Vivian and Reeves 1999). The excavation was part of mitigative action undertaken prior to the development of a subdivision.

One Lusk point and one Lusk base fragment were recovered in association with two activity areas (Areas 1 and 2) and a refuse disposal area (Area 3). Other tools recovered included bifaces (n = 2), biface fragments (n = 6), spurred scrapers (n = 5), end scrapers (n = 8), a graver/awl, spokeshaves (n = 3), burinated/spurred tools (n = 5), a utilized core, and utilized/retouched flakes (n = 9). An antler tine was the only non-lithic tool recovered; the item was highly weathered and no use wear was visible on it (Vivian and Reeves 1999:18). Within the lithic assemblage (n = 1,790), the vast majority of the raw materials used were quartzite (n = 1,443) and Banff chert (n = 283), with a few fine-quality materials such as cherts (n = 23) and a piece of obsidian (Vivian and Reeves 1999:19). The obsidian of the Lusk point was sourced by trace elements to Obsidian Cliffs, Wyoming (Vivian and Reeves 1999:30). The researchers argued that this early site exhibits a high number of formed tools and less expedient tools, in contrast to later cultural assemblages, especially those associated with mass bison kill sites (Vivian and Reeves 1999:20). The blood residue analysis, which indicated bison, bear, deer, sheep, and rabbit, illustrated that the inhabitants returned to the site from a variety of local resource areas (Vivian and Reeves 1999:20).

The faunal assemblage (n = 527) was highly fragmented. Although heavily mineralized and stained, it appeared that a few fragments were calcine or burned (Vivian and Reeves 1999:21). A few identifiable adult bison bones were recovered, as was a fetal or immature bison rib. A number of canid mandible fragments were found in the same unit. A highly weathered bear proximal humerus was recovered. An antler tine from a deer or elk was also found. Areas 1 and 2 were roughly circular areas, about 8 x 8 m, exhibiting the same range of tools and debitage. The researchers interpreted these locales as utilized by discrete domestic groups that shared food resources but maintained their own toolkits (Vivian and Reeves 1999:22). Large fragments of animal bones were discarded in the slough to the south, Area 3. A single date of about 6,840 BP was obtained from a composite sample of bone (Table 8). The date was rejected based on the point style
and stratigraphic position well beneath Mazama Ash. The site was interpreted as a warm-weather camp inhabited by two or more families on the northeast side of a slough between 7,750 and 9,000 BP.

Scapa Ribstone (ElPa 1), Basin 4, Component 1. The Scapa Ribstone site is a ribstone on a prominent knoll on the west side of Sullivan Lake with associated campsites (Hanna and Neal 1992). A pipeline passing near the site required mitigative excavations within a series of basins associated with the landform on which the ribstone was located. Basin 4 produced a stratigraphic sequence with a Lusk point in Component 1, a Burmis barbed point in Component 2, no diagnostics in Component 3, a layer of Mazama Ash, a Maple Leaf point in Component 4, Calderwood points in Components 5 and 6, and Pelican Lake material in Component 6. A total of 40 m² was excavated in Basin 4 but only 27 m² in Component 1.

A single large lanceolate Plano series point base was recovered in the lowest level. The concave base and size suggest it is a Lusk point. Other tools recovered include two cores, a core fragment, and four retouched flakes (Hanna and Neal 1992:96). Eighty-two pieces of debitage reflect mainly late-stage reduction. Petrified wood (48.8%), quartzite (34.1%), chert (8.5%), pebble chert (6.1%) and crystal quartz (2.4%) indicated that primarily local raw materials were used (Hanna and Neal 1992:96). One Montana chert flake and five Swan River chert flakes (7.3%) were considered exotic. The faunal assemblage consisted of three unidentifiable bone fragments (Hanna and Neal 1992:98). A small spalled rock was recovered as were thirteen unmodified cobbles, all randomly distributed. A radiocarbon date was not obtained for the component but it is stratigraphically below Mazama Ash.

Red Rock Canyon (DgPm 1). The Red Rock Canyon site is a multicomponent 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 Lusk, two Agate Basin, two Lerma, and two Scottsbluff points (Reeves 1972, table 6). Little bone or fiber was associated with these points but a range of lithic tools and debitage was present. An excavated basin hearth produced a date of about 8,220 BP (Reeves 1972:94). This age estimate falls well within the period expected for Lusk material rather than that of the other diagnostic materials, although an association between the hearth and any of the aforementioned diagnostics was not demonstrated.
Boss Hill (FdPe 4). The Boss Hill site, Locality 2, is located at the base of Boss Hill at the northeast corner of Buffalo Lake. The site produced a long sequence of occupations; the earliest occupation contained two Parkhill lanceolate points, five Boss Hill corner-notched points, and three unidentified point fragments. The remainder of the lithic assemblage consisted of nine bifaces, seven scrapers, a spokeshave, thirteen unifaces, seven cobble tools, four hammerstones, four anvils, and many other pieces of tool fragments and stone debitage (Doll 1982). The faunal assemblage consisted of elements representing five bison, three snowshoe hare, an elk, a black bear, a canid (possibly dog), a fox, a badger, a beaver, a muskrat, a jackrabbit, a few birds, a few fish, and a number of rodents (Doll 1982). All of this material was associated with two hearths, dated to about 7,800 BP (Table 8).

The Parkhill lanceolate points are Lusk-like in form but somewhat wider. In terms of the Boss Hill points, Peck (2006) argued that the two large Boss Hill specimens were fractured across the neck and that the small-bladed, complete specimens provide better examples for delineating a Boss Hill corner-notched type specimen. The redefined Boss Hill corner-notched points exhibit broad corner notching, and an expanding stem, a convex base, grinding on the notches and the base, and shoulders close to right angles but not square with the centreline of the point body. A specimen of similar age and form was noted at the Hawkwood site. As well, the large-bladed Boss Hill specimens that are missing their bases are not unlike the Salmon River specimen at Hawkwood, although all three points are fragmentary (Peck 2006).

Other sites. Four other sites merit mention with regards to the Lusk phase. DgPl 1 is multicomponent kill site and campsite located in the entrance to Pass Creek Valley in Waterton Lakes National Park (Reeves 1972:41). Two Lusk points were recovered from the lower of two levels along with Scottsbluff, Bitterroot, Salmon River, and McKean points. Reeves (1972:56) suggested that a series of closely spaced floors existed but presentation of the data indicates an inability to differentiate these occupations (see Reeves 1972, table 6).

The Mona Lisa (EgPm 3) site is located within the southwest side of downtown Calgary. It is situated on a large remnant terrace with three areas yielding archaeological materials: Localities A, B, and C. A bone bed found at Locality A and B that is overlaid by Mazama Ash was dated to 8,080 +/- 150 BP (gsc-1209) (Wilson 1980:6). At Locality C, the lower component underlying Mazama Ash produced a date of 8,545 +/- 280 BP.
While appearing to be cultural, neither of these occupations produced diagnostic materials.

In contrast, the base of a Lusk-like point was recovered in the earliest period of cairn use at Majorville Medicine Wheel (EdPc 1) (Calder 1977:74). The Lusk point was likely picked up as a curiosity during the earliest use of the cairn and included in the structure after its original use-life during Late Palaeoindian times. Otherwise there would be a gap of a few thousand years between the initial start of the cairn and subsequent use.

Lastly, FkOo 8 is a surface scatter at the prairie level above the North Saskatchewan River near its confluence with the Vermilion River (McCullough 1980). A single quartzite Lusk point was recovered in a ploughed field. The scatter also included a siltstone pebble spall and a hammerstone. The site had been ploughed except for an adjacent treed area. The pipeline project that instigated the survey was rerouted to avoid disturbing the treed area (McCullough 1980:35–36). The context of these finds make it difficult to be certain whether the specimens are Lusk points and what materials are associated with them.

**Lusk: Transition from Spears to Darts on the Plains**

An examination of sites containing lanceolate points with concave bases indicates that these often occur in single-component sites that date ca. 7,700 BP (EgPn 428, EgPn 377, and ElPa 1). These same point forms have also been recovered in association with other point forms, most notably corner-notched specimens (EgPn 179 and FdPe 4). Even in the subsequent archaeological culture, the Country Hills complex, the Everblue Springs site (EgPn 700) and EgPn 230 produced fragments of possible Lusk points within assemblages with barbed, triangular-bladed dart points. The range of point variation at this time mirrors that in the Plains/Mountain complex. It would appear that a transition from unfletched large darts (lanceolate) to fletched dart points may have occurred (Hughes 1998). Experimentation with various dart tips seems natural as the hunting system is being honed over time. This transition appears to have taken place largely during the Plains/Mountain complex and Lusk complex over roughly 1,000 years, from ca. 8,500 to 7,500 BP.

The Lusk toolkit includes bifaces, end scrapers, and retouched flakes; however, a few more pounding/grinding implements appear to be present. As well, a single exquisite bipointed biface from the Hawkwood sites stands out for its craftsmanship and form. The raw materials are largely local in origin. Quartzite and cherts were most prevalent, with petrified wood
and siltstone common. Few exotics were recovered although a Lusk point was manufactured on a piece of obsidian from Obsidian Cliffs, Wyoming.

The fauna at Boss Hill and Tuscany were highly varied and included bison, elk, mountain sheep, deer, antelope, black bear, mountain lion, hare, cottontail, muskrat, vole, lemming, canid (possibly dog), fox, badger, beaver, jackrabbit, grouse, duck, and a few fish. In contrast, EgPn 428 and Hawkwood yielded mainly bison and some canid. The difference in these assemblages may represent seasonal strategies or unrecognized cultural diversity. In terms of features, many of the sites exhibit one or two small hearths (Hawkwood, Tuscany, Scapa, and Boss Hill). FBR appears to consist of spalls produced from hearth rocks. At EgPn 428, two activity areas were delimited and interpreted as work areas for domestic groups.

There are few comparable Lusk sites on the adjacent plains. In Saskatchewan, surface finds of Lusk-like points have been noted (Dyck 1983:82–83), but only a single in situ site producing a Late Plano point is known, dated to ca. 7,800 BP (Amundson and Meyer 2003). The St. Louis site is located in central Saskatchewan above the South Saskatchewan River. Within a thin palaeosol was a Late Plano point, a scatter of fauna, FBR and debitage associated with a small hearth (Amundson and Meyer 2003:1). A radiocarbon date of 7,810 ± 70 BP (Beta-173609) was obtained (Amundson and Meyer 2003:1).

In Wyoming, at the Mummy Cave site, Layers 8 to 12 have numerous lanceolate points with concave bases that date between ca. 8,500 and 8,000 BP (Husted and Edgar 2002:178). This material may be considered Lusk because of the concave bases and lack of parallel oblique flaking (common on Frederick points). Material of similar form and age was also recovered at Medicine Lodge Creek (Frison 1992:328, fig. 9.3g–l). There, it dates to about 8,600 BP (Frison 1992:328). Husted (1969:31, figs. 13 and 14) also recovered Lusk-like points in the earliest occupation of the Mangus site in south-central Montana. This material dates to about 8,600 BP (Husted 1969:82).

In summary, the Lusk complex may represent the transition from spear or unfletched dart points to fletched dart points on the Plains. Apparently, point morphology was manipulated as a variable in utilizing this new technology. The subsistence base also exhibits change. Bison hunting is still prominent but a wide variety of faunal resources are being procured, at least at certain times, by the people who created the Lusk material. Evidence of pounding and grinding tools support an interpretation that resources are being used more thoroughly. These changes are likely in part a response to the Hypsithermal interval reaching its maximum around 9,000–8,000 BP.