Middle to Late Prehistoric Period Transition

CA. 1,500 TO 1,350 BP

By about 1,500 BP, the Plains had been relatively stable in its modern distribution of vegetation for some time. The interval between ca. 2,000 and 1,000 BP was a period of infrequent drought that likely produced abundant and dependable animal resources (Vance 1991:155).

SONOTA PHASE (CA. 1,500 TO 1,350 BP)

Early ceramic assemblages associated with burial mounds in the Middle Missouri and adjacent areas have long been classified as a subset under the Besant phase in Alberta’s culture-historical classification systems (e.g., Reeves 1983a). The inclusion of Sonota material under the Besant rubric is an idea that continues to be maintained by many practitioners on the Northwestern Plains (i.e., Dyck 1983:114–115; Scribe 1997; Vickers 1986:85; Walde et al. 1995). Still, other researchers have suggested there is a cultural distinction between Sonota and Besant materials (i.e., Neuman 1975:82; Syms 1977:88–90). The previous section on the Besant phase outlines the position taken here, that two different cultural traditions and sets of material culture are represented.

Neuman (1975) provided the first definition of Sonota as a separate entity distinct from the Besant phase. He defined the Sonota complex on
the basis of materials excavated at Stelzer, Swift Bird, Grover Hand, Arpan, and Boundary Mound sites with additional data from the Baldhill, Schmidt, and Alkire sites, the Porcupine Creek Component at site 32516, and House 2 at the La Roche site (Neuman 1975). The sites were largely associated with the valley of the Missouri River in North and South Dakota. The name Sonota itself was derived from the proximity of these key sites to the South Dakota-North Dakota state line (SO for South, NO for North, and TA for Dakota) (Toom and Jackson 2001:14.2).

Basing his interpretation on eleven radiocarbon dates from six of the sites, Neuman (1975:88) suggested that the Sonota complex lasted between ca. 1,950 BP and 1,350 BP. Neuman (1975) indicated that the Sonota complex exhibited both campsites and burial mounds. Materials from campsites were not unlike other contemporaneous campsites, save the culturally diagnostic artifacts (especially pottery) and the presence of bone uprights. Sonota mounds, on the other hand, were unusual. On average, the mounds tended to be about 22 m in diameter by 1 m high with a pit in the center excavated about 0.5 m into the original ground surface. The pit usually contained numerous secondary burials of human remains along with offerings. Offerings included bison carcass segments as well as adornments such as pendants and beads made from bear, beaver, canids, shell (i.e., Olivella from the West coast, Dentalium from the northwest coast, and freshwater mussels found locally), fossils and copper (although rare). Other offerings included conoidal pottery, pottery pipe bowls, and pottery beads. Pottery vessels tended to have cord-marked or plain surface finishes and exhibited a row of punctates or possibly a series of arced, diagonally oriented, dentate stamps beneath a row of punctates (Neuman 1975:93). Bone tools such as flakers, fleshers, awls, and a squash knife have been recovered in the mounds but could also be found in the campsites. Chipped lithic tools were knapped almost exclusively from Knife River flint, although obsidian, chalcedonies, quartz, jasper, chert, and petrified wood were all utilized (Neuman 1975:91). Projectile point styles range from Besant-like points to long, slender, straight-based points with low, broad side notches. Other lithic tools typically recovered include a suite of knives, end scrapers, gravers, and utilized flakes. Importantly, among the ground stone tools recovered tend to be atlatl weights, suggesting that the projectile points were used with atlatl-and-dart technology. Evidence of shelters has only been recovered at the La Roche site in House 2, where post-mould patterns suggested a lightly framed ovoid structure about 20 ft long (~6.1 m) with
a central fire pit (Neuman 1975:90). With regard to culture contact and trade, Neuman (1975:94) suggested trade and/or contact between Sonota and other cultures was evident in: (1) exotic shell, obsidian, and catlinite recovered from the mound burials, (2) the mounds with centrally located pits and human interments reminiscent of Hopewellian sites, and (3) speculative evidence that Knife River flint and obsidian have been recovered to the east in Hopewellian sites.

Neuman (1975:81) acknowledged the presence of the Besant phase in the recovery of Besant side-notched points at campsites and kill sites on the plains of Montana, Saskatchewan, and Alberta. Archaeological sites that he considered Besant sites included levels at Mortlach, (Old) Women’s Buffalo Jump, Walter Felt, and Muhlbach. In his evaluation, he noted that a large number of points from Sonota sites closely resembled specimens labelled Besant points (Neuman 1975:82). Similarly, he observed that pottery recovered in Besant levels at the Walter Felt site resembles “Sonota complex and Plains Woodland ceramics” owing to their cord-marked exterior and profiles, indicative of a shoulderless vessel (Neuman 1975:82). Still, he remained firm that the Sonota complex was closely linked to Besant with the burial mounds of the former offsetting it from the latter owing to numerous exotic items indicative of contact with cultures further east (Neuman 1975:93).

Syms (1977:88) reiterated many of Neuman’s distinguishing traits of the Sonota complex, including utilization of bison, emphasis on Knife River flint, production of bone uprights, and burial mounds containing multiple burials. He more explicitly stated, however, that the projectile points are “a distinctive variation of corner-notched projectile points that subsume Besant and Samantha side-notched types” (Syms 1977:88). Syms (1977:89) excluded the La Roche site material from his Sonota complex, based on the barbed points and limited Knife River flint. He added to the “complex” a number of sites from south-central Manitoba, including the Richards kill site, Richards Village site, and Zeb-Montroy site, and a number of surface collections known from the area. The Richards Village site, for example, is a surface collection from a multicomponent site that was described as “Sonota material, almost all of Knife River flint points, one obsidian projectile point, pottery that appears similar to Sonota materials, atlatl weights, large bifaces, trade blocks and nodules of Knife River flint, large awls similar to forms found at Stelzer, and small grooved mauls like the Sonota specimens.” A burial mound appears to be associated with the site. On the
western Canadian plains, Syms (1977:90) considered the Besant and Samantha material at the Walter Felt site and the Muhlbach site to be more properly classified as Sonota, based on the recovery of the characteristic point forms, numerous flake points, heavy utilization of Knife River flint, and the presence of bone uprights. Syms (1977:90) suggested an age for the Sonota complex between ca. 1,950 BP and 1,150 BP. He noted that dates in the western Sonota sites are slightly later possibly suggesting a westward shift. Regarding trade with more eastern cultures, Syms (1977:90) pointed out that no large caches of socio-religious items from Hopewelian sites had been recovered although some form of contact was apparent in the small-scale exchange of shell, obsidian, and catlinite.

The Sites
To assess the various lines of thinking presented above, Sonota assemblages from Alberta with reliable radiocarbon dates are outlined below. These sites are used to critically evaluate the current view of the Sonota phase as it has been differentiated from the Besant phase (see Plate 23 and Figure 24).

One-Eleven (EgPn 111). EgPn 111 is a bison kill site that has been informally named the One-Eleven site (Thomas Head, personal communication 2005). The site is located on the west side of Calgary on a small hill above the Elbow River (Head et al. 2002). It was excavated between 1998 and 2000. A total of 176 m² was excavated to mitigate potential impacts from a proposed subdivision.

Thirty-four projectile point fragments were associated with the bison bone bed (Head at al. 2002). The researchers suggested that both Besant-Samantha (n = 25) and Pelican Lake (n = 8) points were recovered; one specimen was considered unclassifiable (Head et al. 2002:128–144, 195–200). A number of the points exhibited work only on their margins. This review considers the material to be Sonota, as flake points and corner-notched points commonly occur in Sonota sites. Other tools at the site included bifaces (n = 21), wedges (n = 5), retouched tools (n = 72), end scrapers (n = 20), side scrapers (n = 13), utilized debitage (n = 6) choppers (n = 7), hammerstones/manuports (n = 7), mauls (n = 1), and cores (n = 4). The lithic assemblage was dominated by chert, quartzite, and siltstone while the tool assemblage was dominated by chert, Knife River flint, siltstone, and quartzite. The ceramic assemblage (n = 18 potsherds) was interpreted as consisting of potsherds from two vessels. Vessel 1 exhibited evidence of a truncated fabric-impressed surface finish.
Illustrated are projectile points from the One-Eleven site (EgPn 111) (a–f); the Pigeon Mountain site (EgPt 28) (g–j); the Muhlbach site (FbPf 1) (k–o); Head-Smashed-In Buffalo Jump (DkPj) (p–r); the Echo Creek site (EhPv 78) (s–v); and EeOm 51 (w–bb).

Photo credit: Alberta Culture and Community Spirit (a–o, s–bb); Royal Alberta Museum (p–r).
FIGURE 2.4
Sonota sites within Alberta
while Vessel 2 had a smooth surface finish (Head et al. 2002:164–168).

The faunal assemblage had a minimum of forty-eight bison represented. The sample included both male and female animals. Generalized patterning in the distribution of elements suggested hide removal and segmentation of the carcass into manageable units (Head et al. 2002:94–102, 169). A single fetal bone was recovered. Given the preservation of other fragile bones, it would be expected that more fetal bones would be recovered if they were present (Head et al. 2002:86). Tooth eruption and wear and thin sectioning analysis, along with the lack of fetal bone, suggested a late fall/early winter occupation (Head et al. 2002:80). The authors suggested a loosely combined male/female herd that had moved on to its winter range (Head et al. 2002:91). Little evidence of burned bone was recovered from the site, suggesting it was not prevalent (Head et al. 2002:93). The faunal assemblage was considered to be almost entirely fracture by stone boiling activities (Head et al. 2002:107). Three radiocarbon dates were obtained — ca. 1,500 BP; 1,400 BP; and 1,370 BP (see Table 22) — suggesting a single kill event (Head et al. 2002:209).

EgPs 63. EgPs 63 is a campsite on a Bow River meander scar southeast of Lac des Arcs, located on the south side of the TransCanada Highway (Clarke et al. 1998:234). The site was excavated during the summer of 1995. A total of 40 m² was excavated. A pipeline project impacted the site. Two projectile point fragments were associated with a small debitage, bone, and faunal scatter (Clarke et al. 1998). Of the points, only the fragment of a base and a blade were recovered. The base falls within the range of Sonota points, but is made of quartzite. Other lithic tools include two relatively square scrapers, a side scraper, a core, a retouched flake, and two utilized flakes. The assemblage had a few pieces of Knife River flint (6.5%) with other locally available material much more common (Clarke et al. 1998:238–240).

The faunal assemblage was heavily weathered and consisted of 2,071 fragments. All 136 identifiable fragments were bison (MNI = 1) (Clarke et al. 1998:241). About 16 percent of the faunal assemblage was burned. The appendicular elements and concentrations of faunal suggested marrow and grease processing (Clarke et al. 1998:248). The quantities of bone suggested that processing was not a major activity and no hearths were unearthed to clarify the nature of the faunal (Clarke et al. 1998:257). No ceramics were recovered. A single radiocarbon date of 1,400 BP (Table 22) was obtained.
Table 2.2
Radiocarbon dates for Sonota sites (calibrated by OxCal 3.10 [Ramsey 2005])

<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>EgPn 111</td>
<td>[BETA-127233]</td>
<td>1480 +/- 70</td>
<td>-19.3‰</td>
<td>collagen</td>
<td>A.D. 420–670 (p=0.954)</td>
<td>Head et al. 2002:40</td>
</tr>
<tr>
<td>EgPn 111</td>
<td>[BETA-127232]</td>
<td>1410 +/- 60</td>
<td>-21.0‰</td>
<td>collagen</td>
<td>A.D. 530–730 (p=0.923); A.D. 740–770 (p=0.031)</td>
<td>Head et al. 2002:40</td>
</tr>
<tr>
<td>EgPn 111</td>
<td>[BETA-127233]</td>
<td>1370 +/- 60</td>
<td>-20.9‰</td>
<td>collagen</td>
<td>A.D. 560–780 (p=0.954)</td>
<td>Head et al. 2002:40</td>
</tr>
<tr>
<td>EgPs 63</td>
<td>[BETA-90057]</td>
<td>1410 +/- 60</td>
<td>-20.1‰</td>
<td>collagen</td>
<td>A.D. 530–730 (p=0.923); A.D. 740–770 (p=0.031)</td>
<td>Clarke et al. 1998:237</td>
</tr>
<tr>
<td>DkPj 1</td>
<td>[RL-331]</td>
<td>1410 +/- 100</td>
<td>-20.0‰</td>
<td>collagen</td>
<td>A.D. 420–830 (p=0.941); A.D. 840–870 (p=0.013)</td>
<td>Reeves 1978; Morlan n.d.</td>
</tr>
<tr>
<td>DkPj 1</td>
<td>[GX-1220]</td>
<td>1540 +/- 90</td>
<td>-20.0‰</td>
<td>collagen</td>
<td>A.D. 320–660 (p=0.954)</td>
<td>Reeves 1978; Morlan n.d.</td>
</tr>
<tr>
<td>EhPv 78</td>
<td>[BSG 1013]</td>
<td>1540 +/- 100 ?</td>
<td>charcoal</td>
<td>A.D. 250–300 (p=0.025); A.D. 320–670 (p=0.929)</td>
<td>Fedje 1986:57</td>
<td></td>
</tr>
<tr>
<td>EhPv 78</td>
<td>[BSG 1012]</td>
<td>1325 +/- 125 ?</td>
<td>charcoal</td>
<td>A.D. 400–1000 (p=0.954)</td>
<td>Fedje 1986:57</td>
<td></td>
</tr>
<tr>
<td>FbPf 1</td>
<td>[GSC-696]</td>
<td>1350 +/- 150</td>
<td>-20.0‰ charred bone</td>
<td>A.D. 400–1050 (p=0.954)</td>
<td>Gruhn 1969:144; Morlan n.d.</td>
<td></td>
</tr>
<tr>
<td>EeOm 51</td>
<td>[BETA-222820]</td>
<td>1290 +/- 40</td>
<td>-25.7‰</td>
<td>charcoal</td>
<td>A.D. 650–820 (p=0.943); A.D. 840–860 (p=0.011)</td>
<td>Beaudoin, personal communication 2008</td>
</tr>
</tbody>
</table>

Mühlbach (FbPf 1). The Mühlbach site is a bison pound southwest of Stettler (Gruhn 1969). The researcher suggested the kill occurred under “marshy” conditions; however, at present, the site is located in an area of low grass-covered sand dunes near poplar and willow patches at the Parkland-Plains interface (Gruhn 1969:130–135). The site was excavated in the summer of 1965. A total of 128 m³ was excavated, of an estimated potential 1,200 m³ for the entire site (Gruhn 1969:129–132).

Sixty-one projectile points were associated with a bison bone bed (Gruhn 1969:140). Both bifacial (n = 36) and flake points (n = 25) were recovered. Although originally classified as Besant projectile points (Gruhn 1969:143; Reeves 1983a), this review considers these projectile points to be distinct
from Besant specimens as described above. Other lithic tools included bifacial knives (one diamond shaped and one elongate), end scrapers (two square end scrapers), a possible perforator, five retouched flakes, two utilized flakes, and a polished pebble. The assemblage was dominated by Knife River flint, with a few artifacts made of black chert, silicified siltstone, and quartzite.

The bone bed was interpreted as a single component consisting entirely of bison bone. Few cranial bones were recovered. Most long bones had been fractured. Cobbles scattered throughout the bone bed were interpreted as hammers. Few bones were found in articulation. Mandibles were common and often appeared to have been stacked (Gruhn 1969:138). An MN1 of at least one hundred animals was estimated. Eleven bone uprights occurred at the site; seven appeared to form parallel lines about 2 m apart. No ceramics were recovered. A single date of ca. 1,350 BP (Table 22) was obtained for the site (Gruhn 1969:144).

Echo Creek (EhPv 78, 515R). The Echo Creek site is a well-stratified site at the east end of Vermilion Lakes, northeast of Banff (Fedje 1986:55). Five occupations were observed. The lowest occupation was considered Besant and was overlaid by a possible Avonlea occupation, an Old Women's occupation, an unassigned Late Prehistoric occupation, and a post-1890s historic occupation (Fedje 1986:55–56). The Besant occupation yielded four large side-notched atlatl points. Three of the specimens are elongate. The points are manufactured on local Banff chert, Norquay chert, and an unsourced blue-grey chert (Greaves 1994:15). Some retouch detritus also occurred. The faunal assemblage included bison and a small ungulate that could not be identified to species. Limited amounts of FBH and two hearths were recorded. Two charcoal radiocarbon dates obtained from the occupation were ca. 1,300 BP and 1,500 BP (Table 22). These projectile points and retouched artifacts mirror items from Sonota sites and the dates place the assemblage in the appropriate time period. Still, the trademark lithic raw material Knife River flint was not recovered.

Pigeon Mountain (EgPt 28). The Pigeon Mountain site is a campsite on the south side of the Bow River at the base of Pigeon Mountain (Clarke et al. 1998:2). The site is located on level ground crosscut by a seasonal drainage tributary of the Bow River. Two distinct components were observed. The upper component contained Old Women's material. The lower component, however, contained Sonota material. The site was excavated
during the summer of 1995. A total of 229 m² was excavated in the lower component (Clarke et al. 1998:8). A pipeline project impacted the site.

Thirty-two points (13 complete, 15 bases, 2 tips, and 2 refits) were recovered in association with fifty-five other tools, eleven hearths, nine FBR concentrations, lithic debitage \( n = 5,531 \) and bone fragments \( 2,340 \) (Clarke et al. 1998). The illustrations indicated that many of the tools were marginally retouched flakes. Originally classified as Besant (Clarke et al. 1998:107–108), this review argues they should be classified as Sonota despite the range of variation exhibited by the sample. Other tools in the assemblage included bifaces \( n = 3 \), scrapers \( n = 17 \), multidirectional cores \( n = 2 \), and utilized lithics \( n = 33 \). Knife River flint and obsidian dominate the raw material used in tool manufacture and in the debitage. The preponderance of retouch and resharpening flakes in the debitage suggested tool-use and maintenance at the site.

The faunal assemblage was mainly bison \( \text{MNI} = 16 \) although evidence of large and medium canid, elk, black bear, beaver, skunk, and two mollusc shells were recovered. A single bone awl was also present. The faunal assemblage had been heavily processed for marrow and grease. About 80 percent of the bone was concentrated around paired hearths and FBR features that presumably represent cooking and grease extraction (Clarke et al. 1998:193–206). No boiling pits, however, were identified at the site. Thirty-two fetal bison bones from at least two individuals suggested a late winter/early spring occupation (Clarke et al. 1998:154–160). No ceramics were recovered. No dates were available for the occupation.

EcOm 51. EcOm 51 is a Sonota-Avonlea campsite on an intermediate-level South Saskatchewan River terrace near McNeill on the Alberta-Saskatchewan border (Kozakavich 2001). Three distinct cultural components were observed. The uppermost and lowermost components were small scatters, while the middle component yielded the Sonota and Avonlea material. The site was tested by Green (2000) and excavated by Kozakavich (2001). A total of 31 m² was excavated (Kozakavich 2001:32). The site is in a pipeline right-of-way although it was avoided using directional drilling (Kozakavich 2001:74).

Three dart points, two arrow points, and five point preforms were associated with three hearths and a scatter of debitage and bone. Although the dart points were classified as Besant (Kozakavich 2001:54–55), this review reclassifies them as Sonota, based on the use of Knife River flint and
the elongate form of the dart points. The remaining points are Avonlea and Avonlea preforms. Importantly, one of the Avonlea points was made of Knife River flint, a lithic resource within the distribution of the Sonota phase. The campsite appears to have been co-occupied by people producing both Sonota and Avonlea points. The stratigraphic placement of the material, the spacing of hearths, and the use of Knife River flint in both point styles support an interpretation of co-occupation.

The tool assemblage also included a single ovate asymmetrical knife, numerous biface fragments, multidirectional cores \( (n = 6) \), unidirectional cores \( (n = 7) \), retouched flakes \( (n = 15) \), and a utilized flake. A wide range of lithic raw materials were used at the site dominated by quartzite, quartz, Swan River chert, and petrified wood. The predominance of middle stage debitage suggested the manufacture of expedient tools rather than retooling (Kozakavich 2001:73).

The faunal assemblage yielded few identifiable bone fragments among the numerous fragments recovered \( (n = 10,450) \). Eight shell fragments were also recovered. All the bone fragments are expected to be bison \( (MNI = 1) \) with the exception of a single canid mandible fragment \( (MNI = 1) \). Bone fragments less than 5 cm were commonly associated with hearths and the cultural occupation level. These bone fragments together with faunal suggested food preparation and processing. No pottery was recovered. A date of ca. 1,300 BP (Table 22) was obtained. This date is at the end of the Sonota phase in Alberta and the beginning of the Avonlea phase.

**Other sites.** A number of other sites exhibit traits similar to the aforementioned sites, but lack rigorous presentation in the literature. They are reviewed here as reasonable candidates for inclusion within the Sonota phase of Alberta.

Reeves’ (1978:158–159) excavations at the kill site of Head-Smashed-In Buffalo Jump produced Besant points from the youngest Middle Prehistoric period levels in both the South and North kill sites. Of the seven illustrated Besant points, five are made on Knife River flint (Reeves 1978:172). Unfortunately, the exact provenience of the specimens is not stated. The Besant material in the South Kill occurs immediately below an Avonlea layer dated to 1,415 +/- 95 BP (GX-1399) [the associated GAK-1,475 date is rejected, Blakeslee 1994] and above a Bracken level dated 2,005 +/- 80 BP (GX-1253). The Besant material in the North Kill occurs immediately below an Avonlea layer dated to 1,840 +/- 90 BP (RL-330) and 1,645 +/- 130 (GX-1252). It
is within a layer that is possibly intermixed with Bracken material, dated to
$1,330 \pm 100$ (RL-331) and $1,460 \pm 90$ BP (GX-1220). Reeves’ (1978) geolo-
cal cross-comparisons between the two excavations suggested that the
two dates from the Avonlea layer in the North Kill are in error as the other
three dates roughly correlate geologically and temporally. The two Avonlea
dates in the North Kill are too early. Also, in the next section, strong evi-
dence will be presented that Avonlea does not predate $1,350$ BP in Alberta.
It is not unreasonable to suggest the “Besant” (i.e., Sonota) material at Head-
Smashed-In Buffalo Jump dates between $1,500$ and $1,350$ BP as expected for
a Sonota assemblage. Still, a more rigorous evaluation of the points, their
context, and dates at Head-Smashed-In Buffalo Jump is warranted.

At the Calderwood Buffalo Jump (DkPj 27), Level 4 produced a single
elongate, straight-based point (Marshall 1988; Brink et al. 1987:72, fig. 2,
lower left). Morphologically it is not unlike some of the larger Sonota speci-
mens. Dawe (personal communication 2005) has indicated that it is made
of miscellaneous hydrated chert. The culturally unassigned level overlying
Level 4 produced four dates ranging between $1,300$ and $1,530$ BP, while a
Bracken level below dated to between $1,900$ and $2,200$ BP.

Hartell Creek (EgPi 1) site is a multicomponent site west of Strathmore.
Area A, on the east side of Hartell Creek, possesses eight occupation lev-
els. The first occupation was considered Besant, the second and third oc-
cupations Besant and Avonlea, the fourth, fifth, and sixth occupations Old
Women’s with some intrusive Middle period points, and the seventh oc-
cupation was considered Old Women’s. The eighth occupation lacks di-
agnostics but should date to the very Late Prehistoric/Early Protohistoric
period. Unfortunately the site was not radiocarbon dated. The Besant spec-
imens illustrated for Area A more closely resemble Sonota points (Murray
et al. 1976:234, plate 11, nos. 3 and 4). With this perspective, their co-
ocurrence with Avonlea in the second and third occupations would be
expected and does not require an explanation for the mixed assemblages.

Some surface collections also exhibit Sonota points. The Smith-Swainson
collection is a large surface collection of projectile points made on brown
chalcedony that strongly resembles Sonota materials. The find site was
near Stettler. Similarly, Project Past recorded the Fewkes collection (FdPh
19). This surface collection consists of numerous elongate projectile points
made of brown chalcedony; again, very similar in form to Sonota materi-
als. The find site was located near Alix, east of Red Deer (George Chalut,
personal communication 2008).
Sonota: Reviving the Neuman-Syms Perspective

The Sonota phase in Alberta can be distinguished from the earlier Besant phase by the presence of numerous elongate projectile points and flake points, intense utilization of Knife River flint, and post-Besant dates between 1,500 and 1,350 BP. As Syms (1977:90) alluded, Sonota sites date more recently in Alberta than most of those in the Middle Missouri, possibly indicating a population shift. As well, Sonota material in Alberta is represented by processing and kill sites, and an absence of campsites or burial mounds.

The projectile points associated with the Sonota phase have rarely been evaluated beyond likening them to Besant forms. Neuman (1975:17–18) provided the most detailed study of the points and outlined eleven groups (with one group being miscellaneous). Following Neuman’s (1975:17–18) classification, most of the specimens are broad, triangular, convex-sided points with low, broad side-notches exhibiting a slightly convex, straight, or slightly concave bases. Some of the straight-based forms can have fairly straight-sided blades and be rather long and slender. Syms (1977:90) noted the high frequency of points made on trimmed flakes. These flake points are common at the Muhlbach, One-Eleven, and Pigeon Mountain sites. Syms (1977:90) considered the Besant and Samantha materials at Walter Felt to be Sonota based on point form, use of Knife River flint, and numerous flake points. Recall that Kehoe (1974) classified Layer 13 as containing Samantha and Besant points. The large Samantha points (Kehoe 1974:106, fig. 3a, b) fall within the Sonota range, while the Coteau and McLean Besant points (Kehoe 1974:106, fig. 3e–j) reflect Besant as defined in this text. Large Samantha points also occur in the subsequent level, Layer 10. Kehoe (1973, 1974) has produced somewhat conflicting interpretations of this material. In one instance he considered the material Samantha, a transitional Besant-to-Avonlea layer (Kehoe 1973:164), while in the second instance he suggested that it is a mixed assemblage of Prairie side-notched and Samantha points (Kehoe 1974:105). For the purposes of this review, the large Samantha points made on Knife River flint are considered to fall easily within the Sonota point form as defined above. As for the remaining points, Avonlea specimens are difficult to misidentify. The assemblage represents a co-occupation by people who made Sonota and Avonlea points.

The non-projectile part of the lithic tool assemblage might also provide some possible avenues to differentiate Sonota from Besant. Relatively large ovoid bifaces/knives appear to be fairly common in both the Sonota
sites in Alberta and those in the Dakotas. Side scrapers are relatively common in the Alberta sites but were not noted in the Middle Missouri Sonota sites. Square-ended end scrapers were common across Sonota sites. Only a single bipolar core was noted in the Alberta sites, suggesting that such reduction techniques were not commonly utilized owing to abundant quarry materials. Retouched and utilized flakes appear to be very common across Sonota sites.

The lithic raw materials used at various Sonota sites show a heavy reliance on exotic sources. Based on this review, for the Sonota sites from Alberta discussed above, Knife River flint accounts for roughly for 25.8 percent of all the raw material, followed by obsidian (20.1%), miscellaneous cherts (17.7%), quartzite (11.5%), Swan River chert (7.4%), petrified wood (3.9%), and minor amounts of other materials. It should be noted that the high frequency of obsidian is somewhat misleading, as the majority of the flakes came from a single site and consisted largely of retouch flakes.

Pottery was only recovered from a single Sonota site in Alberta, EgPn 111. The small assemblage appeared to represent two vessels, based on rim sherds, conjoinable pieces, general similarities, and provenience (Head et al. 2002:164). The first vessel produced some sherds with exterior surfaces that exhibit smoothed fabric impressions, while the interior surface exhibits fabric impressions that have not been smoothed. A single potsherd that has a smooth exterior surface represents the second vessel (Head et al. 2002:167).

Canid remains, most likely wolf or dog, were recovered at almost every site. Individual specimens of fox, elk, deer, bear, beaver, skunk, and mountain sheep were also recovered. Most of this diversity came from the Pigeon Mountain site in the front range of the mountains. Regardless, just like sites in the Middle Missouri, there is an overwhelming reliance on bison for food. Wendy Unfried (personal communication 2009) suggested there is a lack of intensive processing at the kill sites in Alberta, which might indicate that immediate retrieval of meat was the objective of the kills.

Features were relatively common at the reviewed sites. Hearths were primarily surface hearths although a few basin hearths were noted. Concentrations of bone and FBR were noted. Large amounts of FBR were reported for every site reviewed except Muhlbach, and this is likely because it was an excavation within the pound rather than a peripheral processing area. Only a single site possibly contained a boiling pit. The Muhlbach site was the only excavation to produce bone uprights. This is somewhat surprising given how common bone uprights are in Sonota sites in the Middle Missouri area.
Sonota material has been mistakenly attributed to the Besant phase in areas adjacent to Alberta. In Saskatchewan, Sonota sites are very similar in nature to those in Alberta. Campsites, processing sites, and kill sites have been excavated. Burial mounds have only been noted in Manitoba. In terms of dating, there is a tendency for Sonota sites in Alberta to date relatively late compared to the known range of the Sonota phase. This, however, is not true across Saskatchewan. Sites in the southeast corner of the province can date as early as any Sonota sites in the Middle Missouri.

At the Mortlach (EcNI) site, Sonota material was recovered from Zone 3 (Wettlaufer 1955:36). Wettlaufer (1955:36) called this assemblage the Caron culture. It consisted of two relatively elongate points made on Knife River flint, an ovoid biface, a partial blade of Knife River flint, a number of scrapers, retouched flakes, and a hammerstone. Wettlaufer (1955:39) noted the predominance of brown chalcedony as the lithic raw material and the absence of pottery at the site. This material overlaid four successive Besant levels, Occupations 4A–D. Occupation 4B produced a radiocarbon date of $1,660 \pm 159$ BP (S-22). The distinct point form, presence of Knife River flint, and the date all strongly support the inclusion of this assemblage within the Sonota phase.

The Long Creek (DgMr) site produced a Sonota assemblage in Level 3 (Wettlaufer and Mayer-Oakes 1960:40–43). Wettlaufer and Mayer-Oakes (1960:41) considered this assemblage to be Besant, although two of the four points are very elongate forms (reminiscent of Sonota points) and an ovoid biface. Brown chalcedony was mentioned, but a review of artifact material type was lacking. Two small pieces of pottery were noted but considered intrusive (Wettlaufer and Mayer-Oakes 1960:43). The level overlaid a Pelican Lake assemblage and was overlain by an Avonlea assemblage. A date was not obtained for this material. Bryant’s (2002:126–139) reanalysis noted five points, all of Knife River flint, an ovoid biface, and four retouched flakes of Knife River flint. The true provenience of the pottery from this level was never clearly stated although a variety of lines of evidence suggested it is associated with the level (Bryant 2002:127).

EdOh 23, in the Great Sand Hills, was discovered in a dune blowout (Johnson 1983). The area produced two complete points, point fragments ($n = 5$), a large ovoid biface, retouched flakes ($n = 14$), and end scrapers ($n = 11$). Of these, all are made on Knife River flint, except two retouched flakes of green jasper, and a white chalcedony biface (Johnson 1983:42). Pottery was not noted at the site (Johnson 1983:44). A radiocarbon date of $1,755
light from ancient campfires  • trevor r. peck

+/- 115 BP (S-2348) was obtained (Johnson 1983:43). Although the date is somewhat early for Sonota in western Saskatchewan, the point forms and presence of Knife River flint otherwise match the profile.

The Fitzgerald site (ElNp 8) is a single-component bison pound site in the Moose Woods Sand Hills about 15 km southeast of Saskatoon (Hjermstad 1996). Although classified as Besant, the point assemblage falls within Sonota as it is defined here, with 122 bifacial and twenty-one flake points or point fragments. Knife River flint dominated the lithic assemblage for points and debitage (Hjermstad 1996:76–81). Three pottery sherds and a rolled ball of dried clay were recovered but are not diagnostic (Hjermstad 1996:81). Bone uprights were also observed at the site (Hjermstad 1996:90). Four radiocarbon dates were obtained for the site: 1,240 +/- 170 BP (S-3547); 1,350 +/- 140 BP (S-3546); 1,420 +/- 65 BP (Beta-69004); and 1,570 +/- 90 BP (Beta-69005) (Hjermstad 1996:25–28).

The Melhagen (EgNn 1) site is a bison kill site about 6 km south of Elbow, south-central Saskatchewan. The projectile point assemblage consisted of elongate and flake points made mainly on Knife River flint (Ramsay 1991:95–125). Trampling in the once muddy bone bed obscured the stratigraphy at the site (Ramsay 1991:15). Radiocarbon dates have been interpreted as representing more than one occupation (Ramsay 1991:148–153). If a very recent date is rejected (i.e., 890 +/- 205 BP, S-2857), two clusters of dates occur, with the older dates coming from the south and central parts of the site and the more recent dates from the north and western parts of the site. Respectively, the older and younger groups of dates are: (1) 1,085 +/- 110 BP (S-2855); 1,990 +/- 75 BP (S-1640); 2,040 +/- 90 BP (S-491); and (2) 1,655 +/- 115 BP (S-2856) and 1,790 +/- 55 BP (S-1641). At two standard deviations, however, the dates overlap (Ramsay 1991:150).

The Walter Felt (EcNm 8) site is a multicomponent site on a wooded terrace about 10 km south of Mortlach (Kehoe 1964:51; 1973:164; 1974:103). Level 13 is dated at 1,610 +/- 70 BP (S-200) and contained both Besant and Sonota materials, including seventeen pottery sherds. Kehoe (1974) noted two large Samantha points of brown chalcedony (i.e., Sonota points) amongst the eight Besant points, four of petrified wood and one each of chalcedony, jasper, argillite, and quartzite. The layer immediately above contains both Sonota and Avonlea materials with dates of 1,535 +/- 80 BP (S-201) and 1,535 +/- 90 BP (S-260). Some of this material was made on brown chalcedony (Kehoe 1965, 1974).
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The Garratt site (EcNj 7) is a multicomponent site on the alluvial flood plain on the west side of Moose Jaw Creek in Moose Jaw (Morgan 1979). Level 8 produced three points considered Besant-Samantha points (Morgan 1979:366–367). The points included one large specimen, a smaller flake point, and a base, of which two were made of Knife River flint and one of chert (Morgan 1979:366–370). The lithic assemblage as a whole consisted of 18.4 percent (n = 34) Knife River flint (Morgan 1979:366–370). A test pit about 50 m south recovered five pottery sherds exhibiting cord impressions and smoothing; the material was stratigraphically correlated to Level 8 of the main excavation described above (Morgan 1979:76, 90). While Morgan (1979:219) and Dyck (1983:120) have accepted the pottery as Besant, Syms (1977:92) suggested the pottery most resembles Sonota material. Morgan (1979:219) further acknowledged that the high frequency of Knife River flint in the lithic assemblage is diagnostic of the Sonota complex. Level 8 is dated to 1,990 ± 75 BP (S-409) (Morgan 1979:246). Interestingly, the subsequent occupation is an Avonlea component that produced nineteen Avonlea points and a single Sonota-like point (Morgan 1979:322; plate 25, S). Three dates were obtained for this level: 1,450 ± 70 BP (S-406); 1,280 ± 60 BP (S-408); and rejected date 6,100 ± 100 BP (S-407) (Morgan 1979:246). Level 8 of Garratt would appear to have more in common with Sonota than Besant.

The Crane site (DiMv 93) is a multicomponent campsite located on the Souris River northwest of Estevan (Gibson and McKeand 1992). Occupations vii–ix produced pottery and Sonota points, sometimes in association with bone uprights. The oldest Sonota occupation, Occupation ix, immediately overlaid an occupation dated to 2,050 ± 75 BP (S-3212). The subsequent Sonota occupation, viii, produced a date of 1,740 ± 65 BP (S-3211), while the most recent Sonota occupation, vii, produced a date of 1,680 ± 75 BP (S-3213) (Morlan n.d.). The significance of this sequence is that it illustrates a strong presence of the Sonota phase in southeastern Saskatchewan at an early date, prior to its expansion northwest.

EdNh 35 is a campsite/processing site on the second terrace of the deeply incised valley of Moose Jaw River, about 3.4 km upstream from its confluence with the Qu’Appelle River (Cloutier 2004:90–91). A total of 54 m² was excavated at the site, which produced a Besant/Avonlea component overlying a Pelican Lake Component. Radiocarbon dates from two features believed to be associated with the Besant/Avonlea component were 1,378 ± 45 BP (BGS-2340) and 1,283 ± 60 BP (BGS-2341), produced
from a hearth and a bone upright, respectively. The features \((n = 23)\) in the component included twelve hearths and eleven bone uprights. The Besant points were elongate, with five of six manufactured on Knife River flint. Knife River flint \((n = 136)\) is the fourth most common raw material behind Swan River chert \((n = 1,039)\), silicified peat \((n = 407)\), and unidentified cherts \((n = 203)\) (Cloutier 2004:115). Ceramics \((n = 143)\) had fabric impressions \((n = 42)\) and net impression \((n = 2)\) and were classified as Rock Lake Net/Fabric-Impressed exteriors, an Avonlea pottery type. Some sherds \((n = 16)\) were smooth and some \((n = 5)\) had cord-roughened exteriors not unlike Sonota pottery. Most of the fauna was considered to be bison (Cloutier 2004:118). Cloutier (2004:121–130) argued that the Besant/Avonlea occupation is a result of component admixture rather than the simultaneous occupation of the site by Besant and Avonlea. Given the revision of the Sonota and Besant phases outlined above, it is here suggested that this is a co-occupation of Sonota and Avonlea at campsite/processing site at about 1,400 BP.

Based on the recovery of Besant points in apparent association with pottery, other sites in Saskatchewan might fit into the Sonota phase. Sites to reconsider include Bennett (DjMw 27), Ratigan (DhMs 10), and Biggar Bone (FaNx 3) (Scribe 1997:106–113). Similarly, the recovery of numerous long, side-notched Besant points often made on brown chalcedony at the Bakken-Wright (DiOa 1) site, along the Frenchman River, may indicate another Sonota site in Saskatchewan (Adams 1975:152, 195, plate IX, row 1).

In Manitoba, the Partridge Hill (DiLw 2) site is southeast of Brandon. It produced four potsherds with cord-roughened surfaces in association with fifty-five lithics of Knife River flint and Swan River chert (Scribe 1997:69–72; Scribe and Nicholson 1994). The material was considered a Sonota assemblage (Scribe 1997:72).

The ‘Elk Love It’ (DiLw 12) site is southeast of Brandon. One hundred sixty-seven potsherds were recovered, including tool-impressed body sherds, sherds with incised decorations, smooth sherds, and cord-roughened sherds (Scribe 1997:73–81; Scribe and Nicholson 1994). A point was associated with this material but not described. Still, the lithic assemblage was mainly Knife River flint, followed by Swan River chert. Interestingly, Tongue River silicified sediment from South Dakota was fairly common (Scribe 1997:74–75). A date of 1,220 +/- 75 BP (Beta-59415) was recovered from the upper levels of the Sonota component while a date of 1,660 +/- 75 BP (Beta-59414) was recovered from the lower part of the same component (Scribe 1997:81; Morlan n.d.).
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The ‘A Place Where Things Are Put Away’ (DiLt 17) site is located adjacent to the McLaren Earthworks in southwestern Manitoba. The site is a multicomponent site that produced everything from Pelican Lake points to Late Side-notched points. Eight Plains Woodland potsherds were recovered in the same vicinity as Sonota/Besant and Avonlea points (Scribe 1997:83; Playford 1996:70). A co-occupation of the site by Sonota and Avonlea could not be demonstrated (Playford 1996:70).

The Richards site (DhLw 1) was assigned to the Sonota phase by Syms (1977) based on its similarity to Neuman’s (1975) material in North and South Dakota (see above). An analysis of the surface collected projectile points from the Richards site noted extensive use of Knife River flint and elongate projectile points (Paulson 1980:10). Illustrated specimens are identical to elongate, low-notched Sonota points (Paulson 1980, plate 2-4). Following Syms (1977:92), other diagnostic items recovered included long awls on blade-like flakes, small grooved mauls, atlatl weights, and large spoke-shaves (Paulson 1980:10).

At the Avery site (DhLs 2) in south-central Manitoba, Joyes (1970:210) described a Besant assemblage made largely of Knife River flint in association with cord-roughened pottery. This site might be a candidate to be reclassified as Sonota. Other sites in southwestern Manitoba that likely fall within the Sonota phase include United Church, Kain (Nicholson 1985, 1994), Mullet (Nicholson 1985; Scribe 1997:94), Calf Mountain (Joyes 1970:214), Vera (Nicholson and Hamilton 1997), and the Oak Lake Localities (Fardoe 1977).

In North and South Dakota, Neuman (1975) originally defined the Sonota complex using materials at the Stelzer (39dw242), Swift Bird (39dw233), Grover Hand (39dw240), Arpan (39dw252), and Boundary (32sl1) mound sites, with additional data from the Baldhill Mounds (32ba1), Schmidt (32mo20), and Alkire Mound (32si200) sites, the Porcupine Creek Component at site 32si16, and House 2 at the La Roche site. In addition to these sites are the following Sonota sites.

The High Butte (32me13) site is a butte top occupation site and associated “turf cut turtle effigy “in the Missouri Valley, near the Garrison Dam in central North Dakota (Wood and Johnson 1973). Fourteen points were recovered; they tend to be elongate with low notches and manufactured on Knife River flint (Wood and Johnson 1973:45, 51, 52, fig. 4a–f). Twenty-five body sherds and five rim sherds were recovered, representing four vessels. Both a grooved paddle creating simple stamp impressions and
cord-wrapped paddle whose impressions were smoothed were observed on the surface of the sherds. Decorations include bosses near the rim and tool impressions on the lip (Wood and Johnson 1973:42–44, 60, fig. 7). Charcoal from a hearth produced a date of 1,600 +/- 145 BP (N-1428) (Wood and Johnson 1973:70; Morlan n.d.)

Site 3201.270 is a stone circle site located on the southern edge of the Missouri River trench in central North Dakota (Fredlund et al. 1985:116). Fifty-two points were recovered, which were generally elongate with notches low on the lateral edges (Fredlund et al. 1985:134, fig. 6). Knife River flint accounts for a large part of the lithic material recovered at the site (Fredlund et al. 1985:135). Cord-roughed Plains Woodland pottery sherds were recovered but not described (Fredlund 1985:128). As well, seven bone uprights were noted (Fredlund et al. 1985:128). Fourteen radiocarbon dates suggested two periods were represented, an early occupation of about 1,550 BP and a later occupation of about 1,050 BP (Fredlund et al. 1985:137–138). Despite problems with associations this appears to be, at least in part, a Sonota campsite.

The Doaks Butte site (32BO222) is a large base camp on a high promontory (Doaks Butte) between the Little Missouri River and Box Elder Creek (Toom 2001). A wide range of points were recovered from the site but most fall within the range expected for the Sonota phase (Root et al. 2001:9.47, fig. 9–8). Knife River flint dominated the lithic and tool assemblage. Pottery recovered at the site is conical with cord-roughed exterior surfaces (Toom 2001:8.1). Ten dates suggest an age of about 1,750 BP (Toom 2001:5.61).

Naze (32SN246) is a multicomponent site that produced an early Sonota component with radiocarbon dates of ca. 2,003 +/- 43 BP (SMU-1758); 1,918 +/- 36 BP (SMU-1778); and 2,035 +/- 70 BP (UGA-1398) (Gregg and Swenson 1987:74). Twelve points were recovered. They were originally classified as nine Besant points, a Samantha point, and two Pelican Lake points (Gregg 1987:444). The generally elongate forms mixed with more corner-notched specimens fall within the range of variation expected for Sonota points. Large amounts of Knife River flint as well as obsidian from Obsidian Cliffs in Yellowstone, Rainy Buttes silicified wood, and porcellanite were all recovered (Gregg 1987:445). Some unsourced copper in the form of beads and an awl was also recovered. Potsherds were relatively common, often exhibiting exterior or interior bosses and mainly cord-roughened surfaces but sometimes smooth or fabric impressed (Gregg 1987:444).
Other sites in North and South Dakota that deserve consideration as Sonota sites include Highway 8, Nightstalkers Butte, Buffalo Lodge Lake, Beecher, Martain, Jamestown Mounds, Wounded Knee, Indian Hill and Natchke.

In Montana, the Whiskey Hill (24DW1001) site near Lambert in extreme eastern Montana is a surface-collected occupation site (Johnson 1977). Five points and nine pieces of pottery were recovered. The projectile points are elongate with low notches manufactured on Knife River flint (n = 1) and porcellanite (n = 4). The pottery is cord-wrapped impressed with smoothing on the inside and outside, with some sherds exhibiting a single row of bosses. A charcoal dated of 1,550 +/- 60 BP (Wis. 91.4) was obtained from an exposed hearth (Johnson 1977:35).

Antonsen (24GA660) is a multicomponent bison kill site located west of Bozeman in southwestern Montana (Davis and Zeier 1978; Zeier 1983). Two hundred eighty points were recovered. Most of the points exhibit an elongate form with notches low on the base (Davis and Zeier 1978:229, fig. 21.6; Zeier 1983, figs. 14–16, 19). Only a few specimens were made of Knife River flint, with the majority manufactured on basalt, obsidian, and a mix of cherts, chalcedony, and jasper (Davis and Zeier 1978:230). A single radiocarbon date was obtained: 1,605 +/- 90 BP (t-7027) (Zeier 1983:5). Interestingly, Davis and Zeier (1978:230) suggested that the Besant assemblage represented newcomers to the area, based on their apparent lack of familiarity with local rock types.

Wahkpa Chu’gn (24HL101) is a bison kill site near Havre in north-central Montana (Davis and Stallcop 1966). Excavations in Area B of the site produced a single occupation, consisting of a bone bed and large side- to corner-notched points (Davis and Stallcop 1966). These points were classified as Besant, with 40 percent of the specimens manufactured on milky to brown chalcedony (Davis and Stallcop 1966). In Davis and Stallcop’s (1966:41, plate 3) illustrations, some specimens are strikingly similar to the Sonota materials. A radiocarbon date for this material was not available.

The Mini-Moon site (24DW85) is a multicomponent site, with the upper component described as a Besant campsite, in the upper badlands of eastern Montana (Hughes 1991). Ten points were recovered but were neither described nor illustrated. Raw materials in the assemblage included porcellanite, Yellowstone River cobbles, silicified wood, and Knife River flint (Hughes 1991:28). There was no mention of pottery. A charcoal date
of 1,520 +/- 70 BP (Beta-10044) was obtained (Hughes 1991:28). Given
the previous review, it can be predicted that further research should find
that the Mini-Moon site produced elongate, side-notched points compara-
table to Sonota material.

The Kobold site (2BH406) is a multicomponent bison kill site that
may contain comparable material to the Sonota phase. The site is located
at the head of Rosebud Creek in southern Montana (Frison 1970:i). Level
III produced seventy points and point fragments (37 metamorphosed shale,
20 chert, 11 quartzite, and 2 obsidian) that are not unlike Sonota materi-
als (Frison 1970:16–17, fig. 12). The level is estimated to date to the Late
Middle period (Frison 1970:33)

Other sites in Montana that appear to exhibit traits of the Sonota phase
include the Dago Hill (24CA72) and Stelling (24CA73) bison pound sites
located west of Great Falls in west-central Montana. Both sites have been
destroyed, but collections of artifacts from each exist. Illustrations of points
from the Dago Hill site (Shumate 1976, figs. 4 and 5) and Stelling site (Shu-
mate 1976, figs. 8 and 9) exhibit the elongate point form with low notches.
At both sites the points are largely made of brown jasper and chert, but
Knife River flint specimens were noted (Shumate 1976:15, 25). A radiocar-
bon date, gak-1506, was not accepted (Shumate 1976:26; Reeves 1983a;
Blakeslee 1994). As well, a survey on the Canyon Ferry Reservoir, west-
central Montana, may have produced a number of Sonota points at Local-
ity VIII (Greiser 1986:159, fig. 1.47f–n).

In Wyoming, the Ruby site (48CA302) is a single-component bison
pound in the Power River Basin, in the northeast part of the state (Frison
1971). The illustrated points tend to be fairly elongate with low notches
on the sides or possibly corners of the specimens (Frison 1971, fig. 4). The
site has two dates: 1,670 +/- 135 BP (GX-1157) and 1,800 +/- 140 BP (M-
2348) (Frison 1991a:14, 1971:77). The points are morphologically quite
similar to the Sonota assemblages to the east, and the radiocarbon dates
place the material as a contemporary.

The Butler-Rissler site (48NA100) is a single-component campsites that is
located on a terrace of the North Platte River in central Wyoming (Miller
and Waitkus 1989:1). Twelve elongate, side-notched points were recov-
ered and classified as Besant or Samantha (Miller and Waitkus 1989:11–
12). The lithic assemblage was in excess of 90 percent cherts most likely
from Mississippian-age Madison limestone outcrops (Millar and Waitkus
1989:10). Many pottery sherds (n = 3419) were recovered. At least two
vessels are represented, based on rim and lip morphology and both have exterior cord-roughened surfaces. One vessel was decorated with a row of punctates below the rim while the other did not show decorative elements (Miller and Waitkus 1989:18; Miller et al. 1987). Two dates were produced for the site: 1,660 +/- 90 BP (Beta-17830) and 1,800 +/- 100 BP (Beta-25271; Eth-3782) (Miller and Waitkus 1989:23–24).

Other sites in Wyoming that could be included in the Sonota phase include the Muddy Creek site (48CR324) in south-central Wyoming (Hughes 1981; Frison 1991a:34), the Cedar Gap site (48NA83) (Frison 1991a:34; Meyer 1992), the Willow Springs site (48AB130) (Bupp 1981), and the Grayrocks site (48PL65) (Tibesar 1980).

To summarize, the Sonota phase began ca. 2,000 BP in North Dakota, South Dakota, and southeastern Saskatchewan. By ca. 1,800 BP, an expansion into Wyoming was underway but did not last longer than ca. 1,600 BP. By ca. 1,500 BP, Sonota had expanded into Montana and southern Alberta. For Alberta, this intrusion terminated the Besant phase. The abruptness of the event in time and the clear replacement of all aspects of Besant material culture by Sonota material culture suggest a movement of people out of the Middle Missouris, replacing the Besant people occupying southern Alberta.

Sites in the Middle Missouri consist of large tipi encampments, campsites, kill sites, and burial mounds. Similarly, sites in southeastern Saskatchewan tend to be tipi campsites and kill sites. As one moves to Alberta and Wyoming, areas occupied during the late Sonota phase, the sites tend to be mainly large kill sites. The preponderance of kill sites in Alberta and Wyoming is interesting. Wendy Unfreed (personal communication 2009) has suggested that a different subsistence pattern, with a focus on meat extraction at the expense of more extensive processing was being pursued. Perhaps Alberta, Wyoming, and Montana for that matter, were being exploited for bison resources as a hinterland, with people returning to the homeland in North Dakota, South Dakota, and southeast Saskatchewan. Alternatively, the pattern in Alberta may suggest winter exploitation of bison at the periphery of the Plains. Further, the sites may represent an abandonment of the Middle Missouri due to population pressures or economic issues relating to the Hopewell Interaction sphere.

Another perplexing aspect of the Sonota phase is its relationship with the Avonlea phase. There are a number of sites at which people of the Sonota phase and the Avonlea phase appear to have cohabited. The Miniota
site in western Manitoba is one of the earliest Avonlea sites. It is a residential occupation exhibiting fifty-six Avonlea points, thirty-eight unnotched points/preforms, and a single possible Sonota point (Landals et al. 2004:78–86). Knife River flint dominates the lithic assemblage (Landals et al. 2004:102). The site dates to ca. 1,550 BP. The Walter Felt site is located in south-central Saskatchewan. Layer 12 produced Sonota and Avonlea materials and dates of 1,535 +/- 80 BP (S-201) and 1,535 +/- 90 BP (S-260). Some of this material was made on brown chalcedony (Kehoe 1965, 1974). The Garratt site near Moose Jaw in south-central Saskatchewan produced nineteen Avonlea points, twenty-nine Avonlea preforms, and a Sonota point in Level 6. Three dates were obtained for the level: 1,450 +/- 70 BP (S-406); 1,280 +/- 60 BP (S-408); and rejected date 6,100 +/- 100 BP (S-407) (Morgan 1979:246). EdNh 35 is a campsite/processing site on the Moose Jaw River just upstream from its confluence with the Qu’Appelle River (Cloutier 2004:90–91). Five of six Sonota points recovered were manufactured on Knife River flint while four of eight Avonlea points were on Knife River flint. Knife River Flint accounts for about 12 percent of the lithic raw material at the site. Radiocarbon dates for the occupation were 1,378 +/- 45 BP (BGS-2340) and 1,283 +/- 60 BP (BGS-2341). Lastly, EeOm 51 is a campsite in southeastern Alberta that produced three Sonota points, two Avonlea points, and five Avonlea preforms. A date of 1,290 +/- 40 BP (Beta-222820) was obtained for the occupation.

Since exotic lithics such as Knife River flint are rare in Avonlea sites (Vickers 1994:15), it is possible that the people of the Sonota phase to the south provided a source for this desirable lithic resource. Added to this is the time gradient from east to west for the timing of the cohabited sites. Sonota and Avonlea occur together earliest in the east (i.e., Miniota) and continue to meet farther west later in time. Thus, the most recent site to exhibit Sonota-Avonlea cohabitation is EeOm 51 in Alberta. It is possible that Avonlea was replacing Sonota from east to west. The people of the Sonota phase appear to be openly meeting and cooperating with people of the Avonlea phase during this movement west, as witnessed in the cohabited sites. The movement west by Avonlea at the apparent expense of Sonota is not surprising from a technological perspective, as the Sonota phase utilizes dart technology while the Avonlea phase is the first archaeological culture on the Northern Plains to exclusively use bow technology (e.g., Vickers 1994:14).
After the last cohabitation of Sonota and Avonlea at EcOm 51 in eastern Alberta, Sonota sites no longer occur. The movement of Sonota out of the Middle Missouri and the parallel movement of Avonlea from northern Minnesota ceases with Avonlea occupying southeastern Saskatchewan and southern Alberta. One final intriguing observation about Sonota and Avonlea concerns their apparently disparate weapons technology. The Sonota dart, when viewed without a scale, appears quite similar to the Avonlea arrow point in morphology (Barry Newton, personal communication 2008).