Twin Dalton Sites in St. Louis C

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This is the fourth article in a series written to document artifacts from destroyed or "lost sites" (Martens 2006, 2008, and 2009). This extremely valuable information would otherwise be lost to Missouri's archaeological database. It is hoped that these articles will also provide educational material for interested adults and students and encourage avocational archaeologists to document their finds.

The Twin Dalton sites, located on the Mississippi River bluffs near Creve Coeur Lake, were discovered by the author in 1969. Artifacts were collected at each site for several months as the land was cleared for a subdivision and Catholic church. These artifacts represent occupations ranging from the Paleoindian through Late Woodland periods.

Site Location

The sites were centered on the tops of adjacent hills, with elevations of 201.2 and 182.9 m amsl, respectively. These hill tops are about 305 m from each other and the site boundaries were about 76 m apart at their closest. The largest site (23SL591) was 16,190 m² and the other had a surface area of about 12,140 m². These locations provided ready access to the Missouri River bottoms as well as the forested uplands.

It was assumed that Creve Coeur Lake, a large natural lake along the Missouri River, would have been a significant attraction for the Dalton people at the two sites. Because the lake is a cutoff Missouri River meander or oxbow, a geomorphology and geoarchaeology expert was contacted to determine the age of this oxbow lake.

Dr. Edwin R. Hajic, who is familiar with the geomorphology of the Creve Coeur Lake area indicated that the lake is considerably younger than the Dalton period:

> [based on]…geomorphic criteria and correlations up and downstream, I'm fairly confident that channel abandonment and lake formation most likely occurred during the late Holocene, most likely around 3000–2600 ^{14}C B.P. [radiocarbon years before present], thus during the Late Archaic–Early Woodland (Hajic, personal communication 2009).

Temporal Periods

The 93 chipped-stone artifacts from the sites were assigned to Early Paleoindian through Late Woodland temporal periods (O'Brien and Wood 1998). There are also seven Late Woodland pottery sherds, as well as a ceramic pipe and a stone discoidal also attributed to the terminal Late Woodland period. The lithic artifact types from each site are listed by temporal period in Table 1, with the numbers and percentages of each noted. Artifact percentages for the combined sites are also presented. High percentages of Dalton material from the two sites (36.5% at 23SL591 and 60% at 23SL766) and the diversity of tool types suggest that they were primarily Dalton habitation sites. When artifacts from the sites are combined, the Dalton contribution is 44.1% of the total collection.

Sites with such large Dalton contributions are extremely rare in eastcentral Missouri, being the only examples out of more than 130 multicomponent sites personally recorded. Further, most of the recent archaeological literature covering this important period has concentrated on sites in Arkansas and Illinois.

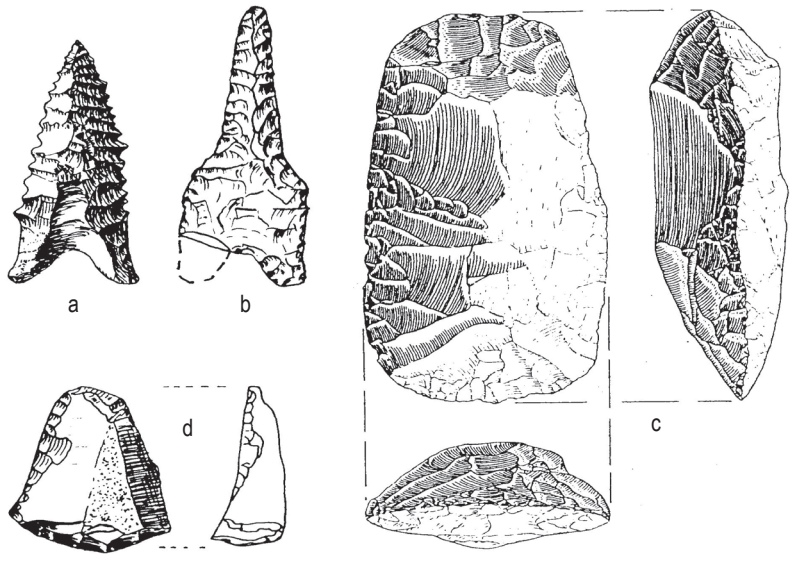

Figure 1. Major components of the Dalton tool kit: (a) Dalton point from the "Dalton site;" (b) point reworked into a drill/awl from Graham Cave; (c) adze from northeast Arkansas; and (d) end scraper from the Missouri Ozark border.

County (23SL591 and 23SL766)

Origins of the Name Dalton

The Dalton point was named by Carl Chapman (1948) for points found by Judge Samuel P. Dalton in Cole County, Missouri. Judge Dalton was an avid avocational archaeologist and a member of the MAS Board of Trustees for many years.

His description of the discovery of the type site, included in a discussion about looking for artifacts, follows:

> One never knows in advance where to look or what particular location will prove to be the best. When U. S. Highway No. 50, east of Jefferson City, was constructed across the flood plain [sic] of the Osage River, five or six feet of earth was borrowed from the adjoining area on the south to build an embankment for the road. This area soon eroded into deep gullies and ditches—bad lands, if you please, bare of all vegetation. Repeatedly, my wife asked me to look for arrowheads in this area, but I ridiculed the idea; then one day I looked—result, the discovery of the Dalton Culture material (Dalton 1960:108).

Dalton Lithic Tool Kit

The Dalton lithic tool kit has been described as including projectile points, drills/awls, adzes, and end scrapers (Figure 1). We are fortunate that the major elements of this tool kit were excavated from the alluvially sealed strata in front of Rodgers Shelter in Missouri (Goodyear 1982:386). These strata provided the first reliable radiocarbon dates for Dalton. The tool kit contained projectile points, a drill/awl, hafted and irregular end scrapers, and antler flakers. Additional artifacts included bifaces (probably preforms for points), adzes, retouched flakes (some with graver spurs), abraders, and rubbed hematite.

Projectile Points

Chapman (1975:245) named the point shown in Figure 1a Dalton Serrated because "generally there are serrations on the blade edges." Goodyear (1974:30) postulated a maintenance sequence for Dalton points that started with pristine serrated points with ground bases. Each resharpening produced a new serration and a bevel, with 80–90% of the points beveled on the right side. Eventually, the point could no longer be resharpened and was either discarded or reworked into a scraper or drill/awl. Broken points were also worked into scrapers. O'Brien and Wood (1998:73) pointed out that a good number of completed Dalton points do not have serrations, and when resharpened, have right-hand bevels.

Yerkes and Gaertner (1997:66–68) examined a number of serrated Dalton points under 80x magnification to determine use-wear characteristics. These points were from the Brand habitation and Sloan cemetery sites in Arkansas. This study clearly showed that the artifacts were used as projectile points and as butchering knives. Specifically, five points exhibited impact fractures and two also showed evidence of cutting meat or fresh hide. Two other points exhibited signs of butchering only. Examination of a drill/awl, similar to Figure 1b, showed that it had been used as an awl or reamer on leather.

Adzes

Morse first recognized the Dalton adze in 1969. Morse and Goodyear (1973:316–321) wrote the seminal report on this unique tool. They described the Dalton adze as "basically oval in outline with a gouge-like bit and heavily ground lateral edges." The haft edges are always ground and wear polish is restricted to the convex face of the bit. A sketch of a representative adze from this report is presented in Figure 1c.

Yerkes and Gaertner (1997:59–66) examined 15 Dalton adzes from Arkansas under 80x magnification. They found that all the tools had been used as adzes on seasoned or charred wood, or both. Adze use on charred wood produced a macroscopic sheen not found with seasoned wood usage. Interestingly, microscopic examination of this sheen revealed angular black inclusions—probably charred wood fragments. It is postulated that these adzes were used to fell burned trees and hollow out charred logs. The latter could be used for dugout canoes or wooden containers.

End and Side Scrapers

Morse (1973:23) noted that end scrapers "include steeply retouched varieties as well as transversely utilized and/or lightly retouched flakes." The former are generally triangular or fan shaped (Figure 1d), with the narrow end placed in a handle, whereas the latter are made from circular or oval-shaped flakes. Circular end scrapers either have two retouched working edges or occasionally have steep retouch on all edges. The forms used to make end scrapers range from blade-like flakes to biface thinning flakes with cortex. Morse (1973:23) defines side scrapers as "include[ing] laterally utilized and/or lightly retouched flakes and steeply retouched specimens."

Seven Dalton end scrapers were microscopically examined by Yerkes and Gaertner (1997:58–71) who found

Table 1. Lithic Artifacts from the Twin Sites Listed by Temporal Period and Type.

	23SL591		23SL766		23SL591 and 23SL766 combined	
Lithic Artifact Type	N	% of total	N	% of total	N	% of total
Paleoindian-Clovis	-	-	1	3.3	1	1.1
Point	-	-	1	-	-	-
Paleoindian-Dalton	23	36.5	18	60	41	44.1
Point	7	-	5	-	-	-
Point preform	2	-	-	-	-	-
Drill/Awl	-	-	3	-	-	-
Adze	6	-	3	-	-	-
Adze preform	1	-	2	-	-	-
End scraper	7	-	4	-	-	-
Side scraper	-	-	1	-	-	-
Early Archaic	13	20.6	1	3.3	14	15
Bass knife	1	-	-	-	-	-
Large knife	-	-	1	-	-	-
Cache River point	1	-	-	-	-	-
Graham Cave point	1	-	-	-	-	-
Hardin Barbed point	2	-	-	-	-	-
Hidden Valley Stemmed point	1	-	-	-	-	-
Jakie Stemmed point	1	-	-	-	-	-
Kirk Stemmed point	1	-	-	-	-	-
MacCorkel Stemmed point	1	-	-	-	-	-
Rice Lobed point	1	-	-	-	-	-
Searcy point	3	-	-	-	-	-
Late Archaic	12	19	5	16.7	17	18.3
Corner-notched point	2	-	-	-	-	-
Kampsville Barbed point	1	-	1	-	-	-
Merom point	2	-	1	-	-	-
Etley point	-	-	2	-	-	-
Sedalia-type drill	2	-	-	-	-	-
Biface scraper	-	-	1	-	-	-
Bifaces, flat base	1	-	-	-	-	-
Bifaces, rounded base	3	-	-	-	-	-
Digger, polished bit	1	-	-	-	-	-
Early Woodland	6	9.5	3	10	9	9.7
Contracting-stemmed point	5	-	3	-	-	-
Kramer point	1	-	-	-	-	-
Middle Woodland	3	4.8	2	6.7	5	5.4
Gibson point	1	-	-	-	-	-
Snyders point	1	-	-	-	-	-
Humpbacked scraper	1	-	1	-	-	-
Biface, rounded base	-	-	1	-	-	-
Late Woodland	6	9.5	-	-	6	6.4
Point	4	-	-	-	-	-
Perforator	1	-	-	-	-	-
Discoidal	1	-	-	-	-	-
Total	63	100	30	100	93	100

Table 2. Accepted Time Spans for Dalton Culture.

Time Span (rcybp)	Additional Comments	Reference
10,500–9900	Based on Rodgers Shelter data	Goodyear 1982
-	Dalton widespread by 10,500 rcybp	Anderson 2001:155
10,900–9900	Started at end of Clovis; agrees with Goodyear's end date	O'Brien and Wood 1998:55, 80

that all had been used to scrape or "curry" dry hide to make leather. Although they had only been used on dry hides, others may have been used on bone and wood. This type of usage is known from other Paleoindian sites. Specifically, microscopic examination of Clovis end scrapers from the Martens site (23SL222) showed that they had been used on a range of materials. Nine scrapers were used on hide, three were used on wood, and three were used on bone/antler (Kay and Martens 2004:49–50). Ahler's (1999:12) examination of the single end scraper excavated at this site showed that it had been used to work wet hide.

Geographical Extent

The area encompassed by the Dalton people has typically been defined by the presence of Dalton points, but even this simplistic approach has been questioned because of the point shapes/names included or excluded in the definition by different experts. Justice (1987:41) stated that the Dalton horizon is present across all of the southeastern states and extends west to parts of Nebraska and Texas, north into parts of Iowa, and east into Virginia.

O'Brien and Wood (1998:73) generally agreed with Justice's description, but noted that the highest concentrations of Dalton sites occur in Missouri and northeast Arkansas, with Dalton points found in all states to the southeast.

Koldehoff and Walthall (2009) consider the Central Mississippi Valley and adjacent Ozark Highland the Dalton heartland because of the abundance of Dalton sites. The north, east, and south boundaries are generally defined by the Missouri, Mississippi, and Arkansas rivers. The majority of this area is in Missouri and Arkansas, but portions are in adjacent states. They commented that Dalton "may have originated here; if not they [it] certainly flourished here" (Koldehoff and Walthall 2009:140).

Age and Duration of Dalton

Not surprisingly, experts disagree on the timing of the Dalton culture. However, they agree that it coincided with a global climate interval between the glacial Pleistocene and the warmer, dryer Holocene. Koldehoff and Walthall (2009) believe that Dalton people developed technologies geared towards the emerging resources of the early Holocene.

The end of the Pleistocene and the Early Paleoindian (Clovis) period, which coincided with the extinction of many species of megafauna, is placed around 10,900 radiocarbon years before present (rcybp) by Haynes (1991). This was followed by the Younger Dryas event, which was aptly named for an arctic flower, the Dryas. At the end of this event, the climate began a seven-degree warming trend which ushered in the Archaic.

The disagreement on Dalton timing results from the paucity of good radiocarbon data. Typically, Paleoindian archaeologists prefer to deal in rcybp rather than uncalibrated dates using B.C. or A.D. Depending on the time period, the calibration from radiocarbon years to true calendrical dates can add up to 2,000 years. Generally accepted time spans, comments, and references are provided in Table 2.

The Rodgers Shelter and Big Eddy sites in Missouri provided radiocarbon dates that partially support these Dalton ages. In 1982, Goodyear (1982) noted that there were two good Dalton radiocarbon dates from Rodgers Shelter: 10,530 ± 650 and 10,200 ± 300 rcybp. These dates resulted from carbon samples found in alluvially sealed strata in front of the shelter. They were obtained from well-preserved Dalton hearths containing flakes, calcined animal bones, and stone tools.

Excavations at the Big Eddy site, which was also alluvially sealed, provided cultural material and radiocarbon ages dating to the Early Paleoindian period (Hajic et. al 1998). The site exhibited intermittent use between ca. 11,200 and 10,700 rcybp. These deposits contained chipped-stone artifacts, including Gainey points attributed by some to a time period which is post-Clovis, but pre-Dalton.

Intensive occupational activity was indicated from ca. 10,500–10,300 rcybp, which provides the best series of dates for at least the early and middle part of the Dalton sequence in North America. This was followed by intermittent occupational activity between ca. 10,300 and 9800 rcybp. Considering only those measurements from the richest parts of the Late Paleoindian occupational sequence, which contained Dalton and San Patrice points, the mean age (with standard deviation) is 10,379 ± 110 rcybp (Neal Lopinot, personal communication 2008).

Dalton Artifacts

Tools collected from the Twin sites include projectile points, awls/drills, end and side scrapers, and adzes (Table 1). Preforms were also found, indicating that both projectile points and adzes were manufactured at the sites.

Projectile Points

Dalton projectile points and preforms from 23SL591 are shown in Figure 2. Point 2a exhibits a right-hand bevel from limited resharpening. The blade is not serrated. Point 2b has been heavily resharpened, but is not beveled. Point preforms 2c and 2d failed during fabrication. Point 2e is serrated and has a right-hand bevel. It appears that the

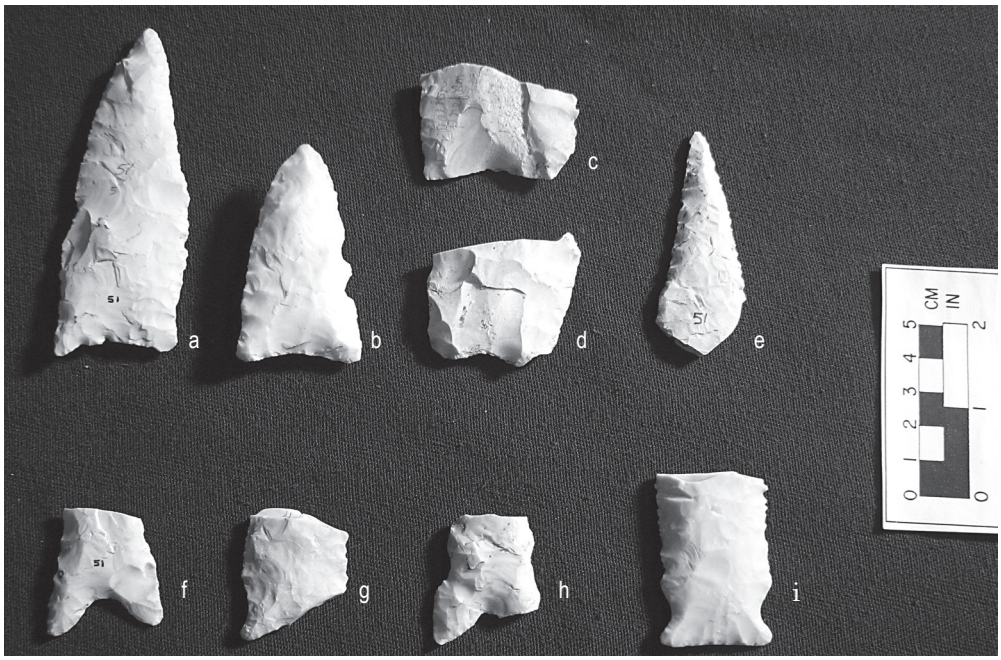

Figure 2. Dalton artifacts from 23SL591: (a–b, e–i) points and (c–d) point preforms. (i) Greenbrier type, considered to be from late in the Dalton times.

base was lost when the point was burned. The Greenbrier point type (Figure 2i) is "thought to represent an intermediate position in the development from Dalton to the later notched tradition…" (Justice 1987:42).

Dalton point bases (Figures 2f–h) exhibit bending fracture characteristics, as do two bases from 23SL766. This type of failure commonly occurred at the Martens site where 10 out of 14 broken Clovis points exhibited this failure mode (Martens et al. 2004:21). It was postulated that these Clovis points were broken during hunting, the shaft returned to the campsite for re-pointing, and the broken base discarded. The Dalton bases in this collection could have resulted from the same re-pointing scenario.

Representative Dalton points, drills/awls, and a reworked point preform from 23SL766 are shown in Figure 3. Point 3a is well made and exhibits significant resharpening with a right-hand bevel and delicate serrations. As discussed earlier, some Dalton points were reworked into drills/awls (see Figure 1b). The shaft and base from this tool type are shown in Figures 3b–3c. The broken point blade (Figure 3d) is serrated and the right edge has been reworked to a side scraper. Two Dalton point bases (Figures 3e–3f) exhibit bending failures like the three from 23SL591. Figure 3g is a point preform worked into a drill/awl.

End and Side Scrapers

Ten of the 11 end scrapers and the lone side scraper from the Twin sites are shown in Figure 4. The end scraper shapes range from the "classic" triangular or fan (Figure 4a) to irregular (Figures 4b–d), elongated (Figures 4e, 4i, and 4j), thin circular (Figure 4f), and thick circular (Figures 4g, 4k). Based on shape, it appears that most of these scrapers were hafted, the exceptions being those with circular shapes (Figures 4f–g, 4k). The thick circular scrapers (Figures 4g, 4k) are unusual in local Dalton assemblages. Ten of the end scrapers were made of Burlington chert and one (Figure 4d) was made of Salem chert.

The side scraper (Figure 4h) was more crudely made than the end scrapers. It is composed of Salem chert and still retains a good bit of cortex. The working-edge angles on the sides and ends are much shallower than those of the end scrapers. This tool is reminiscent of the "precision cutting" side scrapers recovered from the Martens site. Wear analysis of those tools demonstrated that they had been used to butcher and cut meat (Martens et al. 2004:29).

Adzes and Adze Preforms

Examples of the seven unbroken adzes and three adze preforms collected from the Twin sites are shown in Figure 5. The adzes range in length from 6.8–10.8 cm and the preforms from 9.2–12.5 cm. These data are compared with similar data from the Sloan cemetery site in Arkansas (Table 3). The Sloan site provided 27 useable and 4 exhausted adzes, as well as 11 preforms; they represent the largest documented

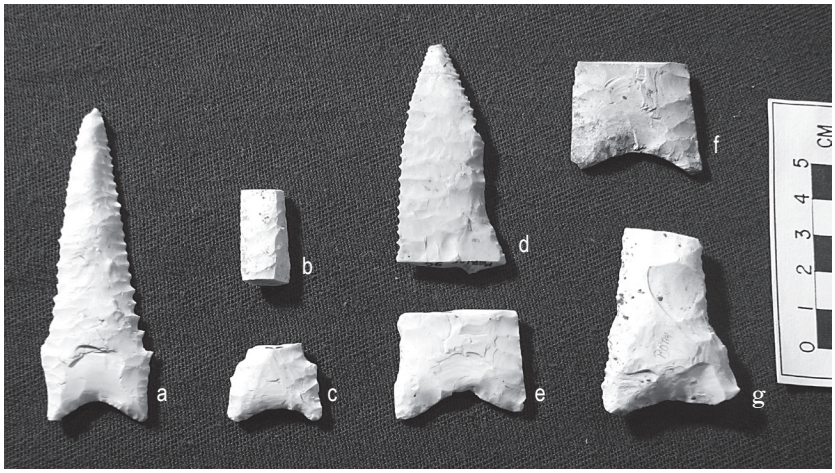

Figure 3. Dalton artifacts from 23SL766: (a, c–f) points; (d) point reworked into a side scraper; (b–c) drills; (g) point preform reworked into a drill/awl.

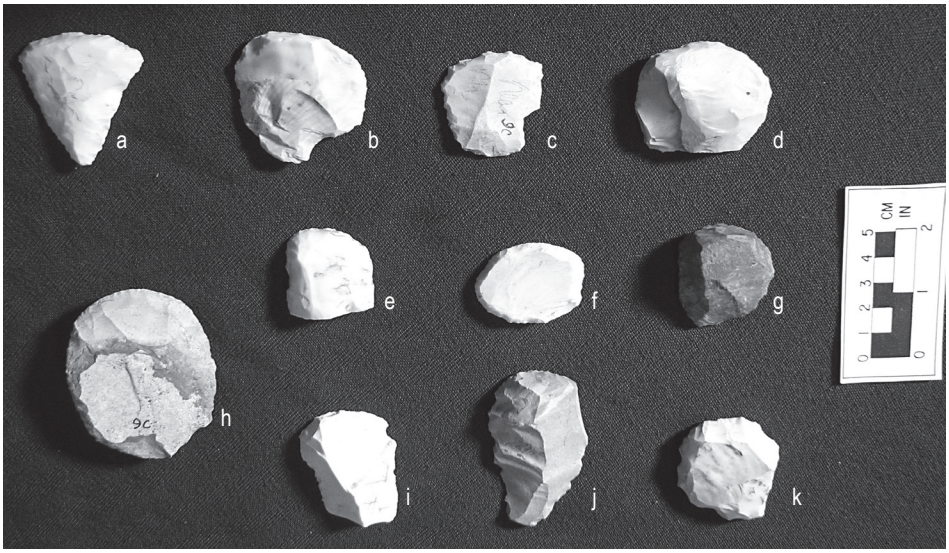

Figure 4. Dalton scrapers from the Twin sites: end scrapers (a–e, i–j) were hafted and (f–g, k) were hand-held; (h) side scraper, probably hand-held. Scrapers (a–b, d, g, j–k) from 23SL591.

collection of excavated Dalton adzes and preforms (Morse 1997:23–33).

Comparing data from the sites, it is evident that average lengths of preforms and useable adzes from the Twin sites are 2.2 and 1.7 cm greater than those from the Sloan site. This difference is probably due to the associated chert resources. Morse (1997:23) indicated that all of the Sloan adzes were made from Lafayette chert cobbles from Crowley's Ridge and most retain cortex remnants. On the other hand, those from the Twin sites were generally made from Burlington chert which often occurs as larger clasts. Consequently, lengths of the preforms and resultant adzes were not constrained by raw material at the Twin sites.

Based on the Sloan data, one can make two additional observations: 1) on average, preforms fabricated to a length of about 8.7 cm were reduced by about 1 cm as they were knapped into finished adzes; and 2) resharpening following use eventually removed another 1.6 cm. At that time, the length was about 6.1 cm. The shortened, exposed blade allowed the hafting to interfere with cutting and the adze blade was discarded.

Data from the Twin sites permit testing the first observation. The average preform length was reduced by about 1.5 cm during the final knapping of an adze (Table 3). We can confidently assert that, on average, 1–1.5 cm of preform length was lost as it was worked into an adze. It would be interesting to determine if Missouri Dalton adzes were also discarded when the lengths decreased to about 6.1 cm.

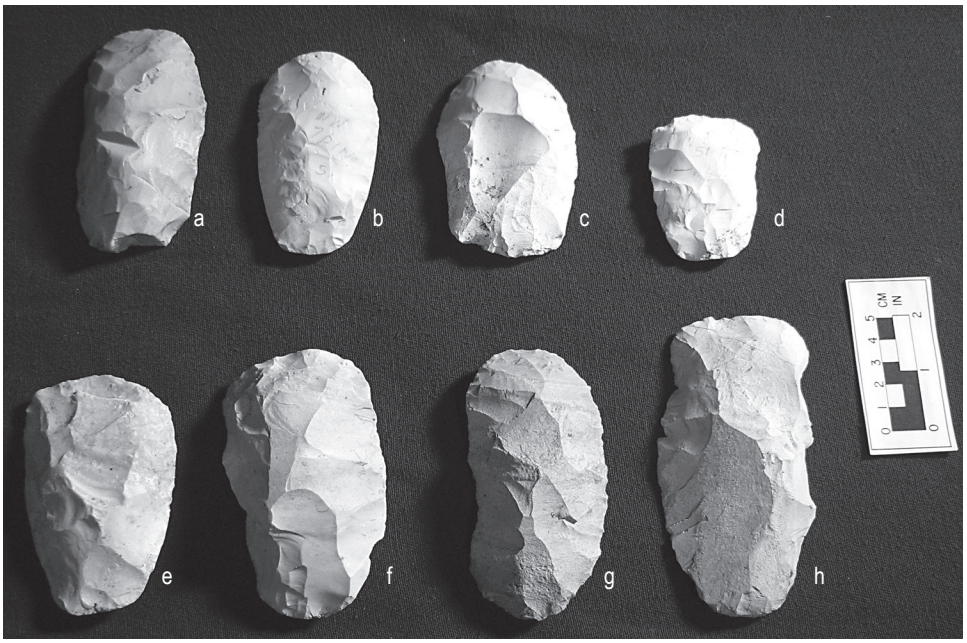

Figure 5. (a–f) Dalton adzes and (g–h) adze preforms from the Twin sites. Artifacts (a–d, g) are from 23SL591.

Clovis to Late Woodland Artifacts

Artifacts from cultural periods other than Dalton are discussed here. They represent about three-fifths of the diagnostic lithic materials and all of the ceramic artifacts from the Twin sites.

Early Paleoindian (ca. 9250–8950 B.C.)

A single Clovis point base was found at 23SL766. The base width of this point, 14.6 mm, makes it one of the smallest Clovis points from the St. Louis area. A total of 22 Clovis points with complete bases were found at the Martens site (23SL222), located about 7 km to the southwest. Basal widths in this group range from 12.6–26 mm. The two smallest, with basal widths of 12.6 and 16 mm, and the base from 23SL766 are shown in Figure 6.

Early Archaic (ca. 7500–5000 B.C.)

Fourteen Early Archaic artifacts were collected at the two sites. Site 23SL591 contributed 12 points and a knife, and the sister site contributed 1 knife. Representative artifacts include two Hardin Barbed points (Figures 7a–b; note

the left-hand bevel on 7a). The Hidden Valley Stemmed point (Figure 7c) was selected by Lopinot (2009) as representative of this point type. Well-made examples of a Graham Cave point and a Bass knife are shown in Figures 7d–e. Toby Morrow (personal communication 1997) identified the Bass knife and pointed out the heavy left-hand bevel.

Table 3. Adze Data from the Sloan and Twin Dalton Sites.

	Sloan Site (Arkansas)			Twin Dalton Sites (Missouri)	
	Adze Preforms	Useable Adzes	Exhausted Adzes	Adze Preforms	Useable Adzes
Number	11	21	4	3	7
Length Range (cm)	7.6–10.1	6.1–9.7	5.2–6.6	9.2–12.5	6.8–10.8
Average Length (cm)	8.7	7.7	6.1	10.9	9.4
Standard Deviation (cm)	.8	1.1	n/a	n/a	1.3

Six other point types from this period are shown in Figure 8. They include two Searcy points: point 8a with a left-hand bevel and point 8c which was reworked into a drill/awl. The Cache River point (Figure 8b) was reworked into an end scraper. The remaining points (Figures 8d–g) are: Jakie Stemmed, Kirk Stemmed, Rice Lobed, and McCorkle Stemmed. Interestingly, Justice (1987:85) places Jakie Stemmed, Hidden Valley Stemmed, and Searcy points as morphological correlates of the Kirk Stemmed point cluster. That means that points share the approximate age and range of attributes with others in the cluster (Justice 1987:12–13).

Late Archaic (ca. 3000–600 B.C.)

Representative Late Archaic artifacts from these sites are presented in Figure 9. Only two Etley points (Figures 9g–h) were found, and they came from 23SL766. All other artifacts in Figure 9 are from the sister site. Two small unnamed corner-notched points (Figures 9a–b) have been reworked into end scrapers. The other point types (Figures 9c–e) include Merom Expanding Stemmed and Kampsville Barbed. A Sedalia-type drill (Figure 9f) and a large broken biface (Figure 9i) complete this collection. A highly polished square bit from a digging implement was also found at 23SL766. This artifact was manufactured from Burlington chert and is about 7.4 cm wide and 1.7 cm thick.

Early (ca. 600–250 B.C.) and Middle Woodland (ca. 250 B.C.–A.D. 450)

Although Early Woodland sites are rare in the St. Louis area, nine points from this period are in the collection. Two of the contracting-stemmed points (Figures 10a–b), are from 23SL766 and the remaining points (Figures 10c–g) are from 23SL591. Points 10c and 10g have been reworked into drill/awl tools; point 10g is made of Cobden chert. The nearest source for this material is 164 km to the southeast in Union County, Illinois (Koldehoff 1985:19).

The large Creve Coeur Middle Woodland site is situated on the Missouri River bluffs, about 1.6 km north of the Twin sites. Leonard Blake, an MAS board member and avid avocational archaeologist, located and excavated this site. It is one of the largest Middle Woodland sites in eastcentral Missouri (Blake 1942; Martens 2001). Given the proximity, it is no surprise that there are Middle Woodland artifacts at the Twin sites.

Representative artifacts from this period are shown in Figure 11. The Snyders point (Figure 11a) was found at the Creve Coeur site in the 1960s during construction of a tennis court and is included for comparison. The rest of the material is from the Twin sites. Artifacts from 23SL591 include Snyders (Figure 11b) and Gibson (Figure 11c) points and a hump-backed scraper (Figure 11d). A similar scraper (Figure 11e) was found at 23SL766.

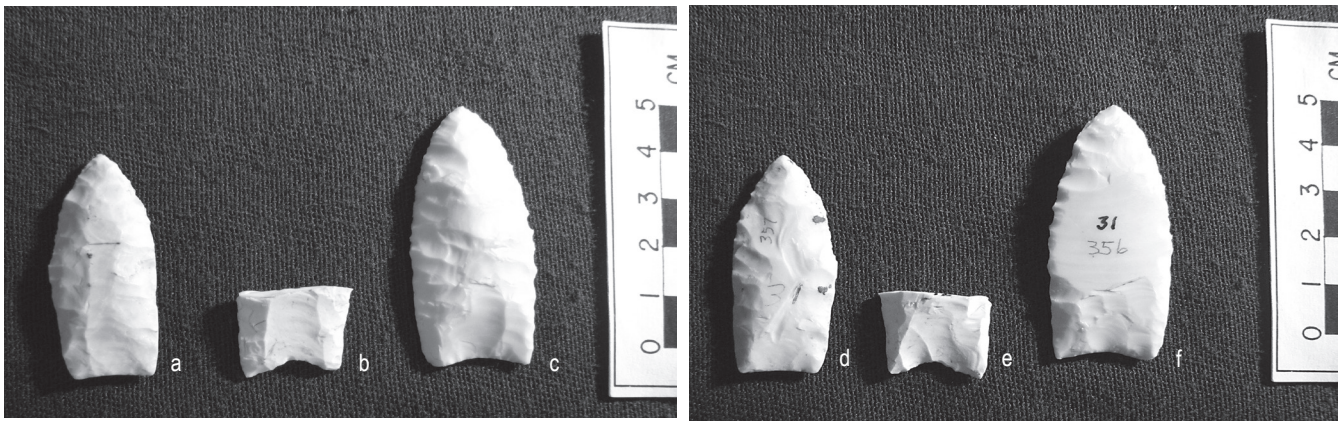

Figure 6. (a, c) Obverse and (d, f) reverse views of two small Clovis points from the Martens site (23SL222); (b) obverse and (e) reverse views of Clovis point from 23SL76.

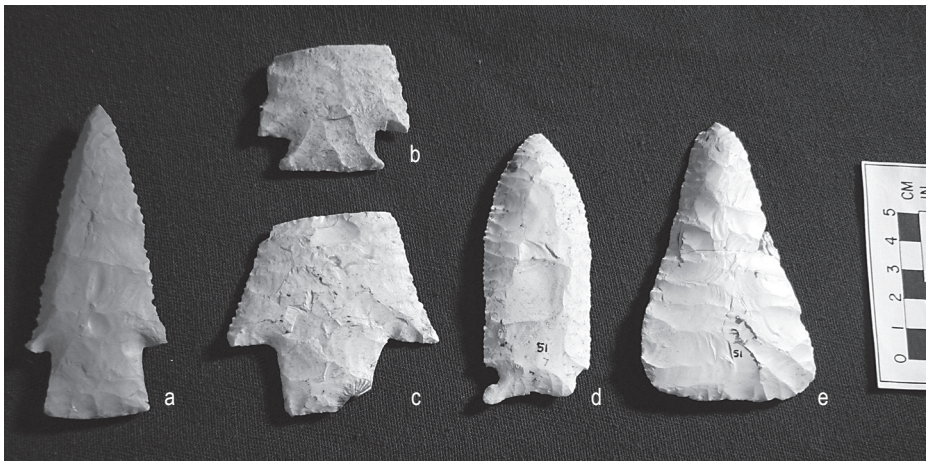

Figure 7. Representative Early Archaic artifacts from 23SL591. (a–b) Hardin Barbed; (c) Hidden Valley; (d) Graham Cave; (e) Bass knife.

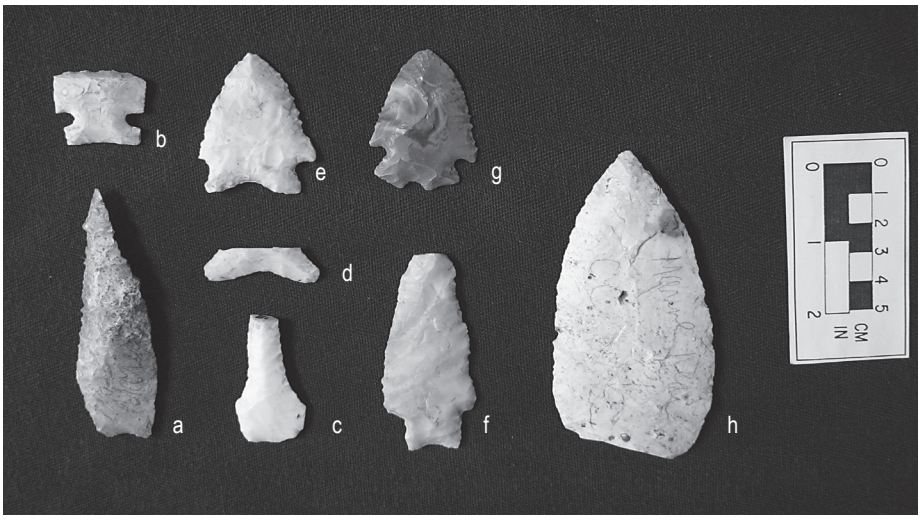

Figure 8. Early Archaic points from 23SL591. (a, c) Searcy; (b) Cache River; (d) Jakie Stemmed; (e) Rice Lobed; (f) Kirk Stemmed; (g) McCorkle Stemmed. (h) Unidentified knife from 23SL766.

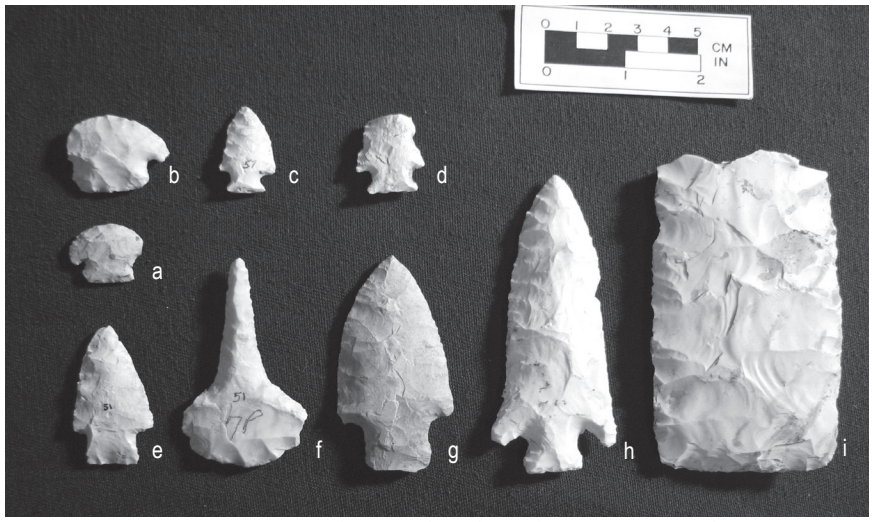

Figure 9. Representative Late Archaic artifacts from the Twin sites. (a–b) Corner-notched points reworked into end scrapers; (c–d) Merom Expanding Stemmed; (e) Kampsville Barbed; (f) Sedalia-type drill; (g–h) Etley; (i) well-made broken biface. The Etley points are the only artifacts from 23SL766 in this figure.

Late Woodland (ca. A.D. 450–900)

Lithic artifacts from this period were only found at 23SL591. The broken discoidal (Figure 11f) is made of diorite and is 5.7 cm in diameter. This type of discoidal is commonly found across the Mississippi River in western Illinois, where it is attributed to the Late Woodland Bluff culture. The projectile points range from well-made Scallorn points (Figures 11g–i) to a crude side-notched point made from a flake. Although the perforator (Figure 11j), also made from a flake, has been attributed to the Late Woodland period, it could have been made as early as the Early Paleoindian period.

Ceramic artifacts representing this period were found at both sites. Several refuse pits were uncovered during grading operations at 23SL591. One of these pits contained two sherds from a large, limestone-tempered, cordmarked bowl. The bowl diameter, based on the curvature of a 9-cm segment, was about 70 cm. This segment measured about 9 mm in thickness, and the top of the rim was flat. Sherds from four other cordmarked, limestone-tempered vessels were found at this site. Thicknesses ranged from 3.7–8.3 mm, and included another flat-topped rim sherd. Only one small, limestone-tempered, cordmarked sherd with a thickness of 6.7 mm was found at 23SL766.

The ceramic pipe (Figure 12) with the extension or prow on the bowl opposite the stem was found at 23SL766. Pipes with prows like this appeared in eastern Illinois during the Late Woodland Patrick phase (ca. A.D. 600) and persisted into the early Emergent Mississippian Dohack phase (ca. A.D. 850–900) (Kelly, personal communication 2009).

Summary

This report includes descriptions of 93 lithic artifacts from two adjacent sites in St. Louis County, Missouri. Although artifacts from other periods were present, the Dalton phase contributed nearly 45%

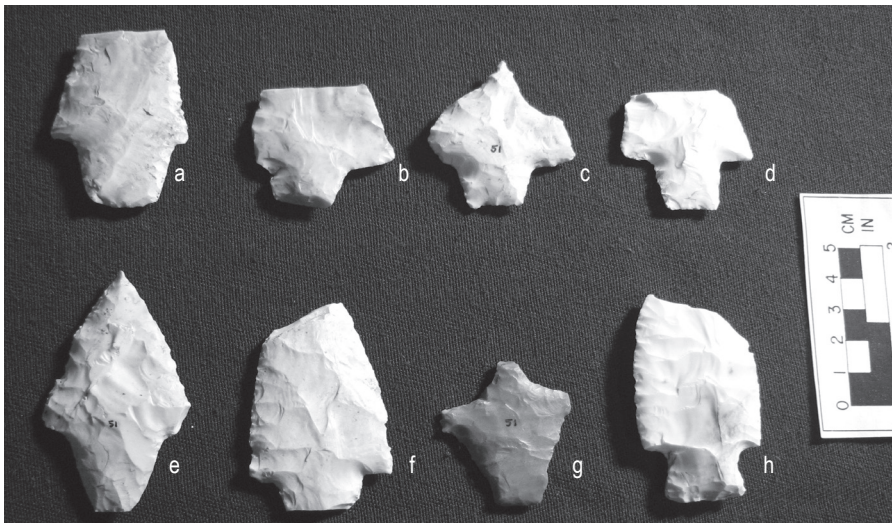

Figure 10. Early Woodland points from the Twin sites. (c, g) Points reworked into drill/awl form; (g) point made from exotic Cobden chert; (h) Kramer point. (a–b) From 23SL766.

Figure 12. Late Woodland ceramic pipe from 23SL766; note the prow on the bowl opposite the stem.

of the combined artifacts. Consequently, this phase and associated artifacts were discussed in detail. This included the Dalton lithic tool kit identified at Rodgers Shelter with associated points, adzes, end scrapers, and side scrapers. Point morphology discussions addressed fabrication, resharpening (sometimes with serrations and right-hand bevels), and final shaping into drills/awls.

Summaries of use-wear studies of Dalton artifacts showed that serrated points were used for both hunting and butchering meat, and that the drill/awl was used as a reamer to make holes in leather. Adze morphological characteristics and the results of use-wear analyses on these artifacts were covered. Studies showed that they were used on both seasoned and charred wood. The typical shapes of end and side scrapers were discussed along with use-wear studies of end scrapers, which showed that they were used on dry hides to make leather.

Current understanding of the geographical extent of the Dalton population, which expanded from the Missouri and northeast Arkansas heartland, was presented. Controversies relative to the age and duration of Dalton were discussed. The starting dates used by various investigators range from 10,900–10,500 rcybp, while end dates range from 10,000–9900 rcybp. The few radiocarbon dates fall into the middle and late part of this 1,000-year time span.

It was observed that bending fracture breakage of Dalton points from the Twin sites is similar to that for Clovis points from the Martens site. It was postulated that when points were broken during a hunt, the spear shaft was returned to the camp for repointing. It was also noted that the Dalton side scraper was similar to Clovis "precision cutting" side scrapers, which were used for butchering.

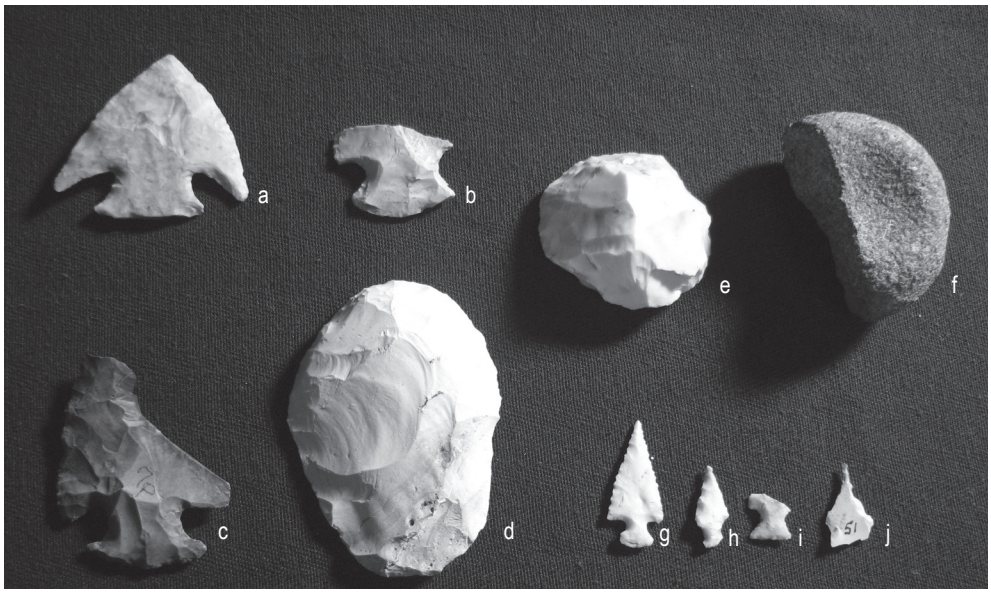

Figure 11. Middle Woodland artifacts: (a–b) Snyders points; (c) Gibson point; (d–e) scrapers. Late Woodland artifacts: (f) discoidal; (g–i) Scallorn points; (i) perforator. (a) From the nearby Leonard Blake Creve Coeur site; all other artifacts from 23SL591.

Comparisons of adze measurements from the Arkansas Sloan site and the Twin sites demonstrated that adze preform lengths were reduced 1–1.5 cm while working them into their final form. Depending on material availability, initial adze length ranged from 7.6–12.5 cm. The Sloan data also suggest that adzes were continually resharpened until they were about 6 cm long. At that point, they were too short for further use and were discarded.

Significant artifacts from the Early Paleoindian to Late Woodland periods were also discussed. The single Clovis point

found at 23SL766 is one of the smallest found in the St. Louis area. The left-hand resharpening bevel found on some Early Archaic points was demonstrated for Hardin Barbed and Searcy points and for a Bass knife. Two Late Woodland artifacts in the collection, a discoidal and a ceramic pipe, are commonly found in eastern Illinois.

The report concludes with a summary and illustrations of the artifacts representing temporal periods other than the Dalton period. This lithic material (N=52) represents occupations ranging from the Early Paleoindian through Late Woodland periods and amounts to about 56% of the total collection. The major contributors are: Late Archaic (N=17); Early Archaic (N=14); Early Woodland (N=9); Late Woodland (N=6); and Middle Woodland (5.4%) (N=5).

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