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1986 The Clemente and Herminia Hinojosa Site, 41 JW 8: A Toyah Horizon Campsite in Southern Texas. Center for Archaeological Research, The University of Texas at San Antonio, Special Report 18. (p. 56-64)

All types and sizes of debitage occur in the MD2 category. Due to the ephemeral nature of the modification, many pieces of debitage classified as unmodified would probably be classified as minutely retouched and utilized if examined under magnification.

(MD3) Retouched Debitage with Concave Edge (N=43)

The MD3 category consists of modified debitage specimens that have a retouched concavity (semicircular notch) on at least one edge. Flakes or chips with irregular concavities or concavities formed by a single blow are not included in this group. Similar artifacts are usually referred to as "spoke shaves." It is often suggested that spoke shaves were used to smooth arrow shafts. The 41 JW 8 MD3 specimens are not uniform and vary considerably in the size and shape of the concave edge.

Bifacial Artifacts

Bifaces are two-sided pieces of chert that have been shaped by flaking on both faces. Most of the bifaces from 41 JW 8 are flake bifaces. That is to say, the bifaces were made from flake blanks rather than from an entire cobble (core biface). This is evidenced by the overall small size of most of the bifacial artifacts and the presence of flat flake plane remnants on many specimens. A few of the larger bifaces may be core bifaces.

The bifacial artifacts are divided into several functional and morphological groups. The smallest bifaces are arrow points. The distinctive size and shape of the arrow points from 41 JW 8 leave little doubt as to their functional identification. The larger complete bifaces and fragments of complete bifaces are described under the heading "Finished Bifaces." Four morphologically distinct groups of finished bifaces are defined. These four groups represent tool types that have been previously recognized in southern Texas. Functional differences are suggested for most groups based on morphology and microscopic examination although some functional overlap occurs.

The remaining bifacial artifacts are unfinished and fragmentary and do not fit into well-defined groups. These are divided into groups based on general morphological similarities. These bifacial artifacts were not microscopically examined.

Arrow Points

(A1) Contracting Stem (Perdiz) (N=99)

The A1 category consists of complete and identifiable fragments of small contracting stem arrow points (Figs. 4; 5,a-n). The blades are triangular with straight or rarely concave (recurved) or convex edges. The distal tips

are usually very sharp when preserved. The blades have very distinct shoulders that usually form downturned prominent barbs. A few specimens have right angle or rounded shoulders. The stems usually contract gradually with a pointed or rounded base. Three specimens have atypical stems that slightly expand before contracting (Fig. 5,a-c). These may be similar to "bulbar stem" points (Corbin 1963, 1974). Some crude arrow points (Fig. 5,d-f) appear to have never been completed. These are classified as **Perdiz** points rather than as **Cliffton**. The occurrence of a small number of obviously unfinished arrow points along with a much larger number of finished arrow points makes it clear that the **Cliffton** type has little validity (see Highley, Graves, and Judson 1978; Black and McGraw 1985).

The **Perdiz** points from 41 JW 8 are typically made on heat-treated tertiary percussion flakes using pressure flaking. No evidence of blade technology was observed. Flake platform remnants occur on both the distal and proximal ends. Over 90% of the complete specimens exhibit glossy flake scars, a greasy feel, and/or the pink discoloration typical of heat-treated chert. Many specimens (Fig. 5,g-i) have large remnant flake planes on one or both blade faces that have been minimally modified. Virtually all of the stems have been completely flaked on both faces. Edge beveling was often used to shape the arrow points and to resharpen broken blades. Several examples (Fig. 5,i,m,n) have stubby, reworked blades.

Sixteen stem fragments are classified as **Perdiz** points based on a comparison with the larger number of complete or nearly complete specimens. These stems (Fig. 5,j-l) are carefully shaped and bifacially worked, leaving no doubt as to their identity. The identification of these same types of fragments as **Perdiz** may not be possible at sites where many other types of arrow point fragments are in the collection. At 41 JW 8, the **Perdiz** arrow points are the only artifact type that has a thin, narrow, bifacially shaped pointed segment. When only the lower pointed proximal tip of the stem remains, they are classified as A4 specimens (miscellaneous arrow point fragments) due to the possible confusion with distal fragments. Special studies were made of the stem width measurements and **Perdiz** arrow point breakage patterns (see Section VII: **Perdiz** Arrow Point Special Studies).

Perdiz Metric, Attribute, and Wear Pattern Data

A careful macroscopic and microscopic study was done of 34 of the most complete **Perdiz** points. Table 3 presents the results of this study. Each of the major attributes of the **Perdiz** points is discussed.

Metric Data: Each of the 34 points was measured and weighed. In cases where a small portion of the artifact is missing, the measurements reflect the estimated dimension based on the assumption that the missing section is similar to complete specimens (i.e., the artifact was assumed to be symmetrical). The weight is not added to because the missing sections are mostly very tiny barb or tip sections. The **Perdiz** points show considerable variation in size although the standard deviations were not calculated. Length ranges from 14 to 37 mm and averages 22.9 mm. Width ranges from 10 to 24 mm and averages 13.2 mm. Thickness is less variable (probably due to the

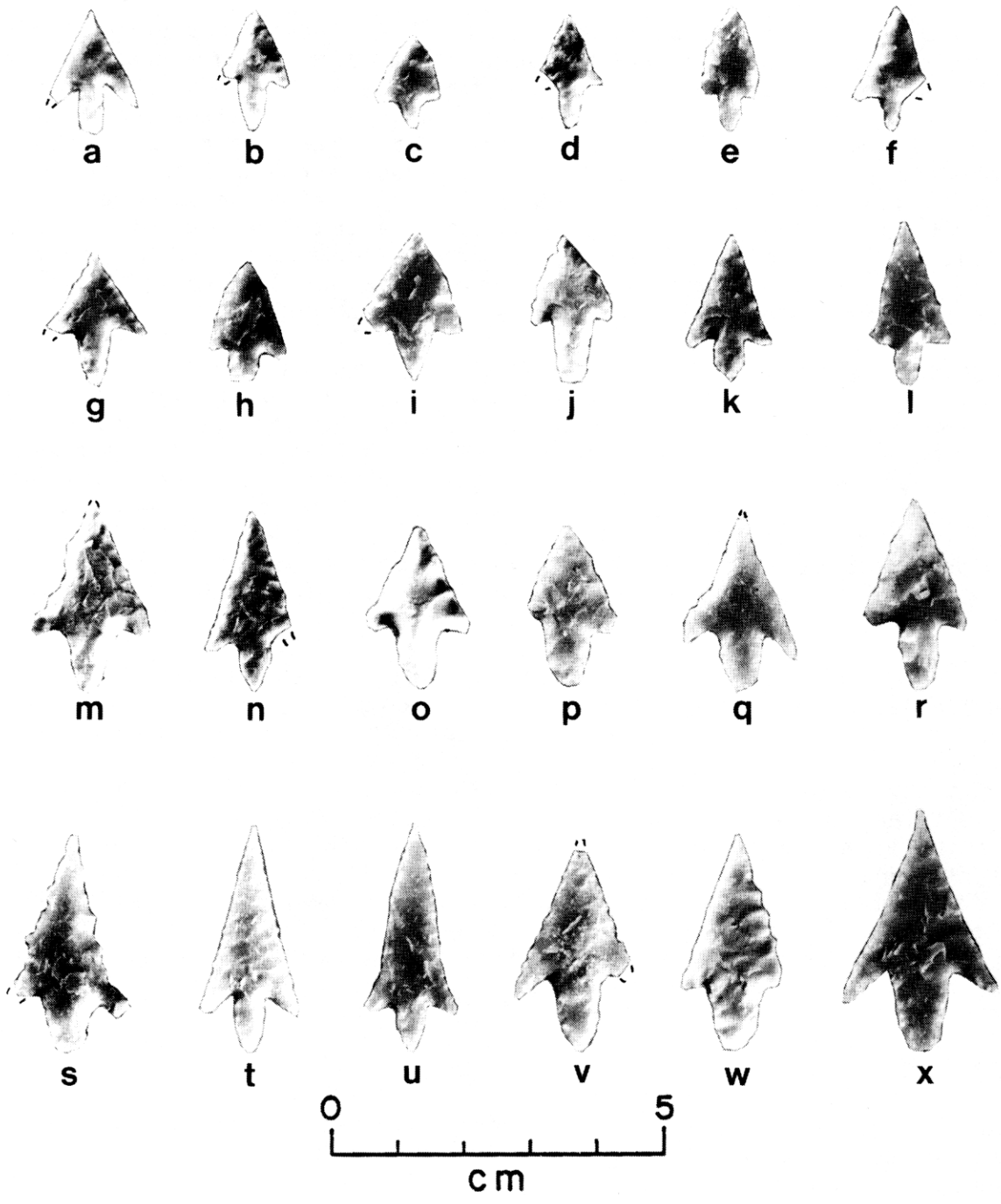

Figure 4. **Perdiz Arrow Points (A1).** Lot numbers: a, 316; b, 443; c, 312; d, 245; e, 327; f, 429; g, 443-1; h, 435; i, 437; j, 312; k, 429; l, 476; m, 157; n, 450; o, 456; p, 259; q, 445; r, 523; s, 107; t, 485-5; u, 110; v, 321; w, 294-5; x, 67.

fact that most were made on small, thin flakes), and ranges from 1.8 to 5.0 mm and averages 2.8 mm. Weight ranges from 0.3 to 1.5 g and averages 0.72 g. Stem width (measured at top of stem) ranges from 3.3 to 8.8 mm and averages 5.6 mm. Stem length ranges from 4.2 to 11.7 mm and averages 7.4 mm.

Chert Description: Most of the **Perdiz** points examined are made of fine grain, heat-treated chert. Tan, brown, and gray are the most numerous colors of chert, followed by pink, yellowish, and white. Over half of the specimens appear to be definitely heat treated (18), and eight others may be heat treated. Thus, the 34 specimens are for the most part made of good quality chert that was treated to improve the flaking quality. The illustrated specimens in Figure 4 show the fine workmanship of many of the 41 JW 8 **Perdiz** points.

Distal Morphology: Over half (18) of the complete specimens still have distal tips that are sharp to the touch. Six of the remaining specimens have noticeably dull tips, while the others have fractured or intermediate tip morphologies.

Blade Morphology: Six of the specimens have serrated edges. Most of these are only partially or slightly serrated. Thirteen have beveled blade edges. Edge beveling is a major blade flaking technique and is necessary due to the extreme thinness of many of the blade edges (i.e., the edges were too thin to biface). Edge beveling is commonly present on resharpened specimens. Based on obvious changes in edge angle, flaking technique, and blade shape, at least five of the specimens appear to have been resharpened.

Manufacture: Twenty-six specimens are completely bifacial. The remaining specimens have flake plane remnants on one (12) or both (7) sides. Platform remnants are present on the distal or proximal end of several specimens.

Microwear: The wear pattern study of the 34 **Perdiz** points involved a low power (10-40X) microscopic examination of all specimens followed by a high power (50-200X) microscopic look at four specimens with the heaviest wear. The major wear patterns observed are light to moderate blade edge and facial ridge rounding and polish, edge attrition, stem grinding, and stem edge and facial rounding and polish. In contrast to the end scrapers, the **Perdiz** points have neither heavy use wear nor consistent wear patterns. Instead, most **Perdiz** points appear to have comparatively little definite wear. The wear patterns that are present vary to some extent from specimen to specimen. Of the 34 specimens, seven have definite use wear, 11 have possible use wear, 12 are not worn, and four are indeterminate (plow damage prevented accurate use assessment).

One problem with **Perdiz** point microwear study is the difficulty encountered in distinguishing between edge attrition and abrasion due to use and edge damage caused by manufacture or resharpening. A number of specimens have edge-damaged blade edges that have crushing, rounding, and various types of microfractures that appear to this author to be the result of edge grinding, partial flaking, and edge resharpening rather than use wear.

The most consistent types of use wear on the **Perdiz** points are edge and ridge rounding and polish. On the blade edges, the rounding (abrasion) and polish

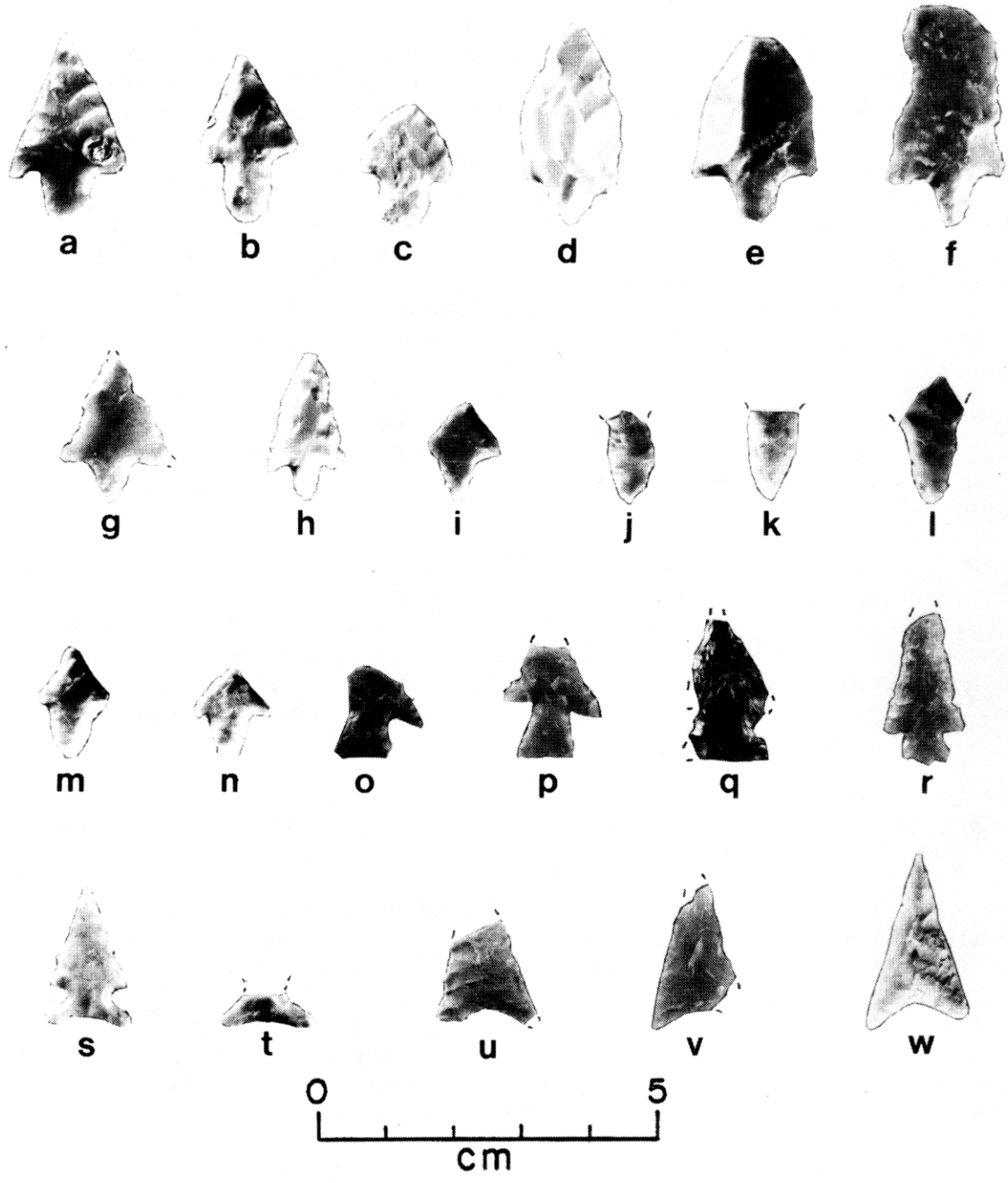

Figure 5. **Arrow Points.** a-n, **Perdiz** (A1); o-r, expanding stem with straight bases (A2:1); s,t, expanding stem with concave bases (A2:2); u-w, triangular (A3). Lot numbers: a, 523; b, 300; c, 443; d, 226; e, 379-1, f, 435; g, 236; h, 450; i, 383; j, 447; k, 157; l, 325; m, 366; n, 333; o, 519-2; p, 304-1; q, 107; r, 431; s, 366; t, 446; u, 328; v, 81; w, 478.

consistently occurs most heavily along the distal third of the blade. The edge rounding and polish are comparatively light and are confined to the immediate edge. Under high power magnification the polish appears to be only moderately reflective and covers an irregular surface (i.e., follows contours of irregularly rounded edge). No striations or built-up polish was observed. The edge rounding and polish are evenly present along the protruding sections of the blade and do not extend for any distance onto either edge aspect. Many of the specimens with edge rounding and polish also have light rounding and polish on the flake ridges on both faces. Once again, this was most noticeable on the distal third of most specimens. The facial ridge rounding and polish appear very similar to the edge wear and do not exhibit striations.

Edge attrition in the form of step fracturing, irregular nicking, and edge crushing was observed on many blade edges. Most specimens with these attributes are believed to be the result of resharpening and the accompanying edge grinding (platform preparation). However, on several specimens the edge attrition removed small areas of the rounded and polished edge and appear to be use damaged. These apparent use-damaged edges have bifacial edge damage (i.e., present on both aspects of the edge).

Wear was also observed on the stem edges and face. Many stem edges are heavily abraded by grinding but lack polish. A few specimens have light polish along the abraded stem edge. Ridge rounding and polish are noticed on the stem faces of some specimens. Most have only light to moderate rounding and polish, however, the polish seems to be more reflective than the polish observed on the blade. The most reflective polish was observed on the most prominent flake ridges near the central area of the upper portion of the stems. One specimen has noticeable polish that extends past the top of the stem (even with top of barb notches).

The interpretation of the **Perdiz** wear patterns is somewhat difficult in view of the absence of consistent wear patterns. Other researchers have had difficulty in evaluating arrow point wear as the "Stockton Point controversy" attests (Nance 1971; Hester and Heizer 1973; Sheets 1973). The lack of extensive or consistent wear may be a function of the tool type. Arrow points, used exclusively as arrow tips, would be expected to exhibit different types of wear depending on what was struck. Animal meat, hide, and bone are all likely to have been struck as are earth and wood (from misses or practice). In addition, the fact that **Perdiz** points are usually very thin and made of heat-treated material suggests that point breakage was very common. Given a comparatively short life span and the diversity of potential target materials, perhaps the inconsistent wear patterns and overall light use wear are to be expected.

The hafting modification (stems) and presence of stem grinding and occasional stem edge and facial polish strongly support the idea that **Perdiz** points were hafted. The most prevalent blade use wear patterns are edge and facial flake ridge rounding and polish. The light irregular nature of the polish is consistent with use produced by hide or meat (Keeley 1980). The presence of light polish on both the blade edges and face suggests penetration of soft material. The examined specimens from 41 JW 8 do not have any indications of scraper wear or heavy sawing or cutting wear. Thus, the hypothesis that

TABLE 3. **PERDIZ** (A1) ATTRIBUTE DATA

Lot Number	Provenience/ Level	Length	Width	Thickness	Weight	Stem Width	Stem Length	Heat Treatment	Macro Observations	Manufacturing	Missing Segments			
											Distal	Barb	Two Barbs	Stem
249-5	N107 E97 L.3	33	16	3.0	1.2	8.6	9.8	x	VST, BB	B		*		
523	N106 E94 L.2	28	18	3.5	1.3	8.3	6.5	x	ST, BB	B, FPB				x
107	Surface	33	18	4.2	1.5	7.0	7.2	?	ST, BB, SB	B, A		*		*
366	N76 E91 L.3	17	11	3.0	0.5	7.1	7.3	?	DT, BB, R	B, FPB				
316	N105 E96 L.1	19	13	1.8	0.4	3.6	7.2	x	VST	B, FP				
236	N92 E93 L.3	22	17	3.2	0.7	6.5	6.1	?	UF, BB	FPB	*			
67	N79 E90+E91 L.3	37	24	3.4	1.5	8.8	11.7	x	VST, BB	B, FPB				
321	N106 E96 L.1	32	20	3.4	1.2	7.0	11.3	?	BB, SB	B, FP	*	x		
333	N73 E92 L.2	14	12	2.4	0.3	6.2	7.0		DT, R	B, FP				
445	N110 E102 L.2	27	17	2.7	0.8	6.1	8.4		BB	FPB	*			
429	N108 E100 L.2	19	12	2.1	0.4	3.3	5.1	x	ST, BB	FP		x		
429	N108 E100 L.2	23	13	2.2	0.5	4.0	6.9		ST, SB	B	*			
435	N108 E101 L.2	19	12	2.2	0.5	5.0	4.8	?	ST, R	FP				*
437	N108 E102 L.1	23	15	2.6	0.7	6.1	7.8	x	R	B, FPB				
443	N110 E101 L.2	18	13	3.6	0.9	7.3	7.4		DT	B				
443	N110 E101 L.2	19	10	2.4	0.4	4.2	8.0	x	ST, BB	B, PP(?)				
384	N106 E95 L.2	23	14	4.9	1.3	8.1	7.6	x	ST	B				
523	N106 E94 L.2	29	16	3.5	1.2	6.1	10.7	?	ST	B, FP				
485-5	N109 E102 L.3	35	15	2.7	0.9	4.5	8.6	x	VST, BB, SB	B				
525-1	N110 E101 L.3	20	16	2.4	0.6	5.1	8.7	?	ST, BB	B, PP		*		
334	N73 E92 L.3	22	19	3.1	0.9	7.1	10.0	x	DT, R	B, PP(?)				*
456	N104 E94 L.5	25	16	5.0	1.3	6.8	9.2	x	DT	B, PP(?)				
450	N111 E102 L.2	27	14	3.0	0.7	4.9	8.0	x	ST, BB	B		x		
450	N111 E102 L.2	22	12	2.7	0.6	4.4	5.5		DT	FPB				
476	N108.5 E103 L.1	25	13	2.2	0.6	4.0	6.3	x	ST	B, FP				
312	N105 E95 L.1	23	12	2.7	0.7	6.1	9.8	x		B, PP	x			
312	N105 E95 L.1	14	10	1.9	0.3	3.5	4.2	x	ST	FP		*		
300	N109 E99 L.2	25	14	3.8	1.0	7.1	9.0	x	BB	B	x			
327	N108 E95 L.1	20	10	2.6	0.4	3.3	5.3		ST, BB	B, FP		*		
110	N125 E92 L.5	35	14	3.0	1.0	4.8	7.8	x	VST, SB	B				
74	N126 E92 L.1	26	13	2.8	0.9	6.8	8.6	?	BB, SB	FP	*	*	*	*
157	N92 E92 L.1	28	18	3.8	1.4	8.4	9.0			B, FP, PP				
245	N96 E83 L.2	17	10	2.2	0.4	3.3	6.7	x		FP		*		
259	N111 E92 L.2	25	14	3.3	1.0	7.5	8.2			B	*	*		

Note: All metric data are expressed in millimeters; weight is expressed in grams.

Legend:

Heat Treatment: x = heat treated; ? = possibly heat treated
Macro Observations: VST = very sharp tip; ST = sharp tip; DT = dull tip; BB = blade beveling; SB = serrated blade; R = resharpened; UF = unfinished
Manufacturing: B = bifacially flaked blade; FP = flake plane remnant one face; FPB = flake plane both faces; A = asymmetrical; PP = proximal platform
Missing Segments: * = tiny segment missing; x = significant segment missing

Perdiz points were indeed arrow point tips used as projectiles to kill mammals (judging from the faunal analysis, predominately deer, antelope, and bison), remains highly viable. Thorough replicative studies would be needed in conjunction with wear pattern analyses to conclusively demonstrate the specific function of the **Perdiz** arrow point.

(A2) Expanding Stem Arrow Points

Six expanding stem arrow points were found at 41 JW 8. All six fall within the broad descriptions of either **Scallorn** or **Edwards** arrow points. These specimens are not classified under either formal type because of the following factors: (1) all six 41 JW 8 specimens are atypical of the formally defined types; (2) all six were found in association with **Perdiz** points; and (3) the occurrence of atypical expanding stem arrow points has been recognized at several sites with well-defined Toyah assemblages (see Section XI). The expanding stem arrow points are divided into two forms according to basal morphology.

(A2:1) Expanding Stem with Straight Base (N=4; Fig. 5,o-r)

All four arrow point fragments have expanding stems and generally straight bases. The shoulders are distinct and are right angled to slightly downturned. The stems appear angular with straight stem edges and a straight base. All four specimens fall within the broad descriptive range of **Scallorn** arrow points (Suhm and Jelks 1962:285); however, they do not appear typical of most **Scallorn** points from south Texas (see Hall, Black, and Graves 1982:295). The atypical attributes include the relative small size, the relative thinness, and the angularity of the stem. Similar specimens have been found with well-defined Toyah assemblages at the Rowe Valley site in Williamson County (Prewitt, personal communication) and at 41 LK 201 (Highley 1986). At the Wheatley site, Greer termed similar specimens **Scallorn** points and used the presence of **"Scallorn"** points to argue that the Toyah and Austin phases overlapped in central Texas (Greer 1976:108, Fig. 16,i,j).

All four specimens are incomplete. The specimen from Lot 304-1 (Fig. 5,p) is noticeably asymmetrical, thin, and angular. The length is estimated at roughly 23 mm; it is 15.0 mm in width, 2.1 mm in thickness, 5.4 mm in neck width, and 8.6 mm in stem width. The specimen from Lot 519-2 (Fig. 5,o) is somewhat similar although less complete due to thermal fracturing. Only the stem measurements can be given; it is 5.8 mm in neck width, 7.0 mm in stem length, and approximately 9 mm in basal width. This specimen has a prominent shoulder formed by a downturned barb, which is not typical of the **Scallorn** type. The specimen from Lot 107 (Fig. 5,q) has a central knot (hinge fractured thick area) on one face and is thermally fractured. It is 8.5 mm in neck width and 6.3 mm in stem length. The specimen from Lot 431 (Fig. 5,r) has a right-angled shoulder and an angular stem. The base is unusual in that it has two incipient basal notches. The length is incomplete but is estimated to have been about 30 mm. It is 11.7 mm in width, 5.2 mm in neck width, 5.2 mm in stem length, and 6.8 mm in basal width.

(A2:2) Expanding Stem with Concave Base (N=2; Fig. 5,s,t)

A complete arrow point and an arrow point fragment from 41 JW 8 have expanding stems and concave bases. The complete specimen has a short, triangular blade and a short, expanding stem. The shoulder is right angled. Side notches form a distinctive flaring base on both specimens. The bases are comparatively wide and markedly concave. Both specimens fit within the **Edwards** type as defined by Sollberger (1967, 1978) although they are atypically small and far south of their usual south-central Texas distribution. Sollberger notes that the **Edwards** type is the largest arrow point in south-central Texas.

The complete specimen (Fig. 5,s) is 20.5 mm in length, 11.2 mm in blade width, and 6.5 mm in thickness. The stem length is 4.9 mm, the neck width is 6.6 mm, the basal width is 12.7 mm, and the depth of the basal concavity is 1.4 mm. It weighs 0.6 g. The fragmentary specimen (Fig. 5,t) has an approximate neck width of 6.5 mm, a basal width of 14.0 mm, and a basal concavity depth of 1.0 mm.

(A3) Triangular Arrow Points (N=3; Fig. 5,u-w)

Three unstemmed triangular arrow points were found at 41 JW 8. All three have concave bases and straight to very slightly convex or concave blade edges. One specimen (Fig. 5,u) has a deep, V-shaped concavity and resembles the **McGloin** which is found in the Nueces Bay area (Hester 1980b:106). All of the specimens share most of the attributes of the **Starr** arrow point (Suhm and Jelks 1962:287) although they lack the distinctly concave blade edges that are usually typical of the type. These three triangular points are not assigned to a formal type due to their low frequency and somewhat atypical characteristics.

A complete specimen from Lot 478 (Fig. 5,w) is 25.1 mm in length, 15.2 mm in width, 2.9 mm in thickness, 3.2 mm in basal concavity, and weighs 0.8 g. The fragmentary specimen from Lot 81 (Fig. 5,v) has a shallow basal concavity of approximately 2.3 mm. The length is estimated at about 26 mm and the width at 15 mm. It is 2.1 mm thick. The specimen, which resembles the **McGloin** type (Lot 328), has an estimated length of about 26 mm and a width of about 16 mm. It has a basal concavity of over 5 mm and a thickness of 2.8 mm.

(A4) Unidentifiable Arrow Point Fragments (N=85)

The A4 specimens consist of distal, medial, and lateral arrow point fragments that could not be confidently placed in any of the other groups. The majority of the A4 specimens are distal fragments. Most if not all of these are **Perdiz** fragments that have snapped stems. No metric measurements of A4 specimens are provided. The A4 specimens were included in the special study of **Perdiz** arrow point breakage patterns (Section VII: **Perdiz** Arrow Point Special Studies).