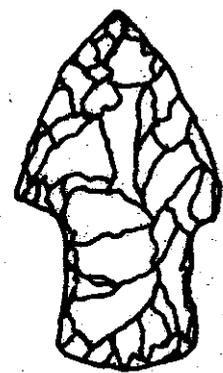
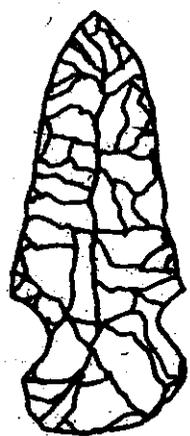
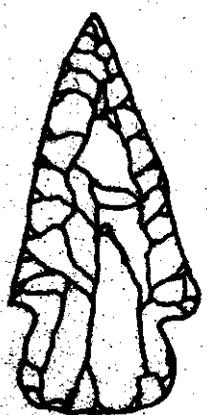
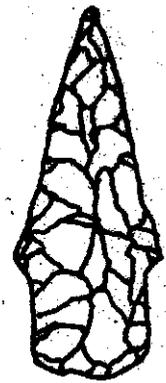
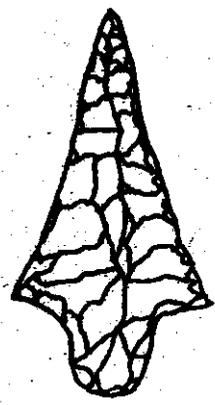
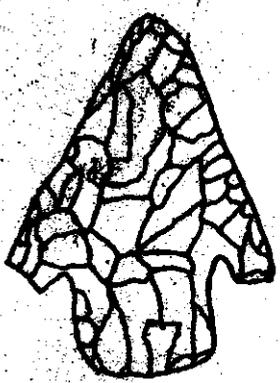


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THE OWEN SITE, 41HR315:
A LONG OCCUPATION SEQUENCE
IN HARRIS COUNTY, TEXAS
BY LELAND W. PATTERSON



PAT

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THE OWEN SITE, 41HR315: A LONG OCCUPATION
SEQUENCE IN HARRIS COUNTY, TEXAS

L. W. Patterson

INTRODUCTION

This is a detailed report on the Owen Site, 41HR315, in Harris County, Texas. This site is a complex of prehistoric occupations located in the Ravensway subdivision in the Cypress, Texas area, northwest of Houston. The author first learned of this site from a subdivision resident, Larry Edwards. Contact was then made with Carol Owen, of Chaparral Development, for details. A surface collection of artifacts was available that will be described here in the section on Location "A". Ms. Owen arranged permission for the Houston Archeological Society to do work here. The real estate developer generously provided an excavator machine on the first day of intensive work, which proved of great value in trenching tests to define site areas.

After original surface surveys were conducted by the author, intensive work by the Houston Archeological Society was started, and lasted from May to November, 1977. A large number of HAS members participated in this work, and appreciation is expressed for all individual contributions. Attendance slacked off as the summer became hotter. Richard Gregg and Mike Johnston are to be especially commended for their performance during this difficult period, in a hot, unshaded area.

Detailed reporting to the Texas Archeological Research Laboratory was completed by the end of 1977, and a preliminary report was published shortly thereafter (Patterson 1978).

The largest portion of this report deals with Location "C", which is an excavated area of site 41HR315. It represents the longest occupation sequence excavated to-date on the upper Texas coast. This site has been especially valuable in verifying a number of items, based on data from formal excavation, that were proposed earlier (Patterson 1976a) based on extensive surface surveys in Harris County. Some excavation work was also done at Location "E", which will be described.

Site 41HR315 has a number of interesting items, not previously available in any detail. Late Paleo and Early Archaic projectile points, such as Plainview, Angostura, and Early Stemmed, have not previously been found in-situ in this region. This site gives a good picture of the introduction and further technological development of the bow and arrow on the upper Texas coast. The proposed chronological sequence for aboriginal occupations in Harris County (Patterson 1976a, 1979) has been confirmed, although few absolute dates are yet available.

GENERAL SITE DESCRIPTION

Site 41HR315 is located on a high terrace above the south bank of Cypress Creek, except for Location "D" on the stream bank edge. There is a long sloping area from the main site down to the creek. Modern flood sediments have probably covered over possible indications of any lower level occupations, although Indians probably preferred the high, level ground of the main site area in any event.

Other than the general topography, there are no visible features to indicate the intensive prehistoric use of this site, shown by excavation and surface collecting. A later survey by the Texas Archeological Survey (Hale and Freeman 1978) has shown that long sections of Cypress Creek had extensive prehistoric use. The overall plan of this site is shown in Figure 1. Due to subdivision construction, little of this area remains undisturbed, and there appears to be little future research potential here.

Location "A" was discovered during construction of Jarvis Road. Subsequent excavator trenching tests show that this location was probably completely destroyed during road construction. However, diagnostic materials are available from surface collecting. The other prehistoric occupation areas of this site were found later by surface surveys, following light surface disturbances during land clearing operations.

Locations "B" and "D" will not be discussed in detail, as they are only light scatters of flint flakes. These areas may have only intrusive artifacts, introduced during construction activities. There were no indications that further testing would have been warranted.

This site is located in a mixed wooded area, typical of creek areas of this region. There are presently some freshwater shellfish available, but little indication of exploitation of this food resource by prehistoric Indians. Animals available would have included deer, turtle, bear, squirrel, raccoon, rabbit, wolf, and several other small animal species. Waterfowl were available seasonally. There are signs of the occasional presence of buffalo (Wheat 1953). Both land and water turtles were present. Deer and land turtle are the major faunal remains at archeological sites in this region. Due to soil conditions, only a few sites in this area have significant bone preservation. A number of wild plant foods are also available, but there is little preservation of floral remains to associate with subsistence activities. The entire prehistory of the upper Texas coast is characterized by hunting and gathering types of nomadic cultures (Patterson 1976a, 1979).

This is a typical inland type archeological site on the upper Texas coast, probably with seasonal, intermittent occupations. This region is located at the convergence of several ecological zones, including the Eastern Woodland, coastal plain, and the Great Plains. There are significant differences in cultural remains from inland and coastal margin sites here (Patterson 1979:109), and data on possible contacts between these two areas remains vague.

LOCATION "A"

Location "A" was discovered during the construction of Jarvis Road, and a surface collection was made by Carol Owen and Esta Coffey. Since this collection was of interest, excavator trenching and dirt screening was done in an attempt to further define this location. While a few flint flakes were found on the surface, trenching work found nothing of further interest. It appears that Location "A" was totally destroyed by construction activities.

The artifacts collected from the surface of Location "A" indicate preceramic Late Archaic and post-ceramic Woodland period occupations. Projectile points from this location are shown in Figure 2. These include Ponchartrain, Gary, Tortugas, Yarbrough, and Ellis types. A Palmillas point was also identified from a photograph of artifacts collected here, but is no longer available. Ceramics collected include 6 Goose Creek Plain, 1 Conway Plain, and 2 bone tempered sherds. There were 10 freshwater shellfish fragments collected.

Miscellaneous lithic materials collected here include 3 quartzite hammerstones, 5 miscellaneous cores, 15 thick chert chips, 1 large chert cobble and 1 piece of petrified wood. Extensive use of heat treating of flint was observed by the waxy luster and reddish discolorations of many specimens, including the large Gary dart point. Debitage included petrified wood, tan flint, brown flint and red jasper.

Flint flake sizes are as follows, based on side dimensions of squares used for measurement:

<u>flake size,</u> <u>mm square</u>	<u>number</u>	<u>% over 15 mm sq.</u>
40 to 50	2	1.1
30 to 40	15	7.9
25 to 30	25	13.2
20 to 25	62	32.6
25 to 20	86	45.2
10 to 15	<u>over 100</u>	<u>---</u>
total	over 290	100.0

The flake size distribution skewed toward larger amounts of smaller flakes is typical of systematic bifacial reduction (Patterson and Sollberger 1978), indicating that projectile points were manufactured at this location.

The Ponchartrain type dart point found here is of special interest. It indicates a possible contact with the Louisiana area in the Late Archaic period. McClurkan (1968) has previously reported a Ponchartrain point at Lake Livingston, to the north of this site.

LOCATION "E"

Location "E" is an area approximately 100 feet in diameter, where flint flakes were found on the surface. A team spent one day in excavation here to define this location, but results were rather meager. This team consisted of Lou Fullen, Marge Fullen, Richard Gregg, John and Karen Faggard, Pam and Kay Wheat and Bill McClure. Five test pits, each 50 cm squares, were made.

A few flint flakes were found in each test pit, as summarized in Table 1. There is a trend toward more larger flakes in the lower excavation levels. This type of change in flake sizes with time has been noted for other sites in Harris County (Patterson 1976a:fig. 5). A few other artifacts were found here, as summarized in Table 2. The potsherd at 50 to 60 cm is probably intrusive because of obvious rodent activity. Clay started here at depths of 57 to 60 cm, which is slightly deeper than the start of clay at Location "C".

The Kent point found on the surface is made of petrified wood and has some asphalt on the stem. Use of asphalt for projectile point hafting is known from other sites in inland Harris County, such as 41HR210 (Patterson 1975a), and demonstrates some contact with the coastal margin where pieces of asphalt can be found, washed up on the beaches.

LOCATION "C"

1. Excavation Program

Location "C" was found by the author as a scatter of flint flakes on a slope leading to Cypress Creek. Two parallel excavator trenches were made on this slope and dirt screened in an attempt to define the size of this location. Artifacts were found only at the south ends of these trenches at the top of the slope. The excavation plan for Location "C" is shown in Figure 3. Another shallow trench was then made perpendicular to the other trenches at the slope top, and a high density of artifacts was found. This last trench was later fully excavated manually as test pits C-1 to C-4. No further work was done with the mechanical excavator, and a manual excavation program of 42 test pits was executed to define this location. This finally turned out to be approximately a 10% sample of the site area at Location "C".

It became obvious that the main site area was located at the top of the creek bank slope, on the first high flat terrace. There were no obvious features on the surface. All excavation work was done with shaker screens having $\frac{1}{4}$ inch mesh screening. Artifact recovery was very good, including many flakes less than 10 mm square.

The excavation strategy was to put in randomly located test pits to define the entire area of Location "C". The number of test pits was limited by the amount of time available before road construction, which totally destroyed this location at the end of 1977. It is felt that a statistically significant sample size was obtained. All test pits were made on fairly level ground, except for C-47 which is slightly downhill on the west side. Test pits at Location "C" are labeled 1 to 47, but there is a numbering gap, and there are only 42 actual test pits.

There was no vandalism by pothunters during the excavation period, because the main site area was fortuitously enclosed by a fence as a construction equipment storage area. In certain strata, excavation was difficult because of hard clay. Excavation work was further slowed by high summer temperature and humidity.

Separate sample bags were used for each level of each test pit, to maintain samples for later study work. Test pits C-1 to 4 are 1.5 meter squares, and all other test pits are 1.0 meter squares.

2. Description of Stratigraphy

When Jarvis Road was constructed, clay from road excavation was graded onto Location "C" as a uniform layer 10 cm deep. This clay surface was the top for measurement of excavation levels. Sterile clay was encountered at 60 cm depth. Therefore, the significant levels of excavation go from 10 to 60 cm. A long occupation sequence was found in these levels. There were no apparent living floors found in the initial test pits, so excavations were made in arbitrary 10 cm levels. It now appears that 5 cm levels would have been better.

On most of Location "C", the stratigraphy was uniform, with sandy soil from 10 to 50 cm, and clay starting at 50 cm. A special test showed a total clay depth of a minimum of 100 cm below regular excavations.

During excavations and later analytical work, it became apparent that a high degree of mixing had occurred in certain test pits, probably from prehistoric erosional episodes. The test pits showing mixing were on the north side of the site. After the deep construction road cut was made through Location "C", Richard Gregg made a diagram of the soil stratigraphy shown in the west wall of the road cut. This profile is shown in Figure 4, and confirms the severe nature of prehistoric soil disturbance on the north side of the site. This profile also shows an original slope on the south side of the site, now filled and leveled with intrusive clay from construction work.

Because of apparent mixing of artifact types from different time periods, test pits C- 1,2,3,4 and 43 have been tabulated as mixed strata. Test pits c-26,35 are located on the modern clay fill on the south side of Location "C", and had negligible artifact yields (a few flint flakes). The limits of site disturbance on the north and intrusive clay fill on the south are shown in Figure 3, and have irregular shapes.

3. Excavation Level 50 to 60 cm

The deepest excavation level of Location "C" is 50 to 60 cm, and is judged to go from the Late Paleo through the Middle Archaic periods. All of the earliest dart point types were found from 55 to 60 cm. These include Plainview, Angostura, and Early Stemmed (Shafer 1977). Dart points from the 50 to 60 cm level are illustrated in Figures 5 and 6. Most dart point types classified here conform to descriptions given by Suhm and Jelks (1962). A San Patrice, Hope variety, point (Webb, et al 1971:fig. 3) was found at approximately 55 cm. This would place this point type at about the start of the Middle Archaic.

Although some stratigraphic mixing occurred, in some test pits, most of the other point types in this level occurred from 50 to 55 cm, which seems to represent the Middle Archaic period. The main point types of the Middle Archaic are Carrollton and Trinity points, with ground stem edges. The Bulverde point type seems to start during this period, but continues as a major type in the Late Archaic. Large Kent and Gary points were also found from 50 to 55 cm. These are usually assumed to be Late Archaic types, and could be due to stratigraphic mixing from above. However, Jelks (1978:80) has proposed a morphological relationship between Bulverde, Kent, and Gary points, and the possibility remains that all of these point types could have started during or near the end of the Middle Archaic. Wheat (1953:table 5) also found Gary points in a possible Middle Archaic level at a nearby site. A Schumla-like point was also found in this excavation level.

A summary of dart point types for each excavation level is given in Table 3, and a summary of Dart point preforms and fragments is given in Table 4.

Table 5 summarizes other types of artifacts found in each level at Location "C". Figure 7 illustrates some of the miscellaneous lithic artifacts from the 50 to 60 cm level. There is a prismatic blade industry present. There were one possible bifacial arrow point and two unifacial arrow points found in this level. The bow and arrow appears to have been introduced in or at the end of the Middle Archaic period, contrary to popular opinion of a much later date. Other lithic tools include graters, perforators, and a bifacial drill.

The use of red ochre, fired clay balls, and small smooth pebbles that do not occur here naturally are prominent in this excavation level.

4. Excavation Level 40 to 50 cm

Since excavations were made in arbitrary levels of 10 cm, some strata go through more than one major time period. In this level the bottom half represents the Late Archaic and the top half of 40 to 45 cm is the start of the post-ceramic Woodland period. Some pottery occurred at 45 to 50 cm, due to stratigraphic mixing in some test pits, but the majority of test pits had no ceramics below 45 cm. The start of ceramics is one of the few firm chronological markers on the upper Texas coast, with radiocarbon dates available. As far as projectile point typology is concerned, a fine line between the Late Archaic and Woodland periods does not appear to be important, as dart point styles continued from one period into the next. This continuity is shown even later in the Woodland period in the 30 to 40 cm excavation level.

Projectile points from the 40 to 50 cm level are illustrated in Figures 8 and 9. Some unifacial arrow points and inset blades possibly used for compound arrow points are shown in Figure 10. Major dart point types in this level include Gary, Kent, Bulverde, Darl, and Ellis. There are morphological overlaps in many of the stemmed point types, such as Gary, Kent, and Bulverde. Minor point types include Yarbrough, Palmillas, Wells, and some unclassified varieties. As shown in Table 6, there were 18 unifacial arrow points and 3 small points classified as transitional dart/arrow points.

Miscellaneous artifacts from the 40 to 50 cm level are illustrated in Figures 10 and 11. These include perforators, gravers, bifacial drills, prismatic blades, and a denticulate tool. Two bone pendants were found. The use of red ochre, fired clay balls, and small smooth pebbles continues to be significant, as in the earlier stratum below.

The two Carrollton points found at this level may be due to stratigraphic mixing or the continuation of this point type from the Middle to the Late Archaic. A small cache of 6 large flint flakes, 1 broken hammerstone, and 3 Bulverde points was found in test pit C-15 at this level.

5. Excavation Level 30 to 40 cm

The 30 to 40 cm level represents the last portion of the Woodland period and the start of the Late Prehistoric period. Evolved, standardized arrow points start here with the appearance of two Perdiz arrow points. The author has previously defined the Woodland period on the upper Texas coast as ending with the general appearance of standardized bifacial arrow point types (Patterson 1976a, 1979). There were 15 unifacial arrow points also found in this level.

Projectile points and other artifacts from the 30 to 40 cm level are illustrated in Figures 12 and 13. Dart point types include Ellis, Kent, Yarbrough and Williams. The 2 Bulverde points here seem to be late for this point type.

There are two examples here that the use of arbitrary excavation levels may have cut through a single occupation time at 40 cm. There is a well matched sandstone mano/metate set with the metate in the 40 to 50 cm level and the mano in the 30 to 40 cm level. There is a similar split of sharks teeth between the same two excavation levels. The reworked Carrollton point may be from an earlier time, and then reworked by the later occupants at this time period.

Three small transitional dart/arrow points occurred at this level. The use of red ochre, fired clay balls, and small smooth pebbles continues to be significant at this level. Prismatic blades are present, and graters and perforators were found. A variety of ceramic types are present and will be discussed separately.

6. Excavation Level 20 to 30 cm

The 20 to 30 cm level is well into the Late Prehistoric period. Three Perdiz arrow points were found and one arrow point classified as a Catahoula variant (Patterson 1976b, Webb and Baker 1976). Contrary to much popular opinion, dart points do not stop with the start of standardized arrow points. This level contained 2 Gary and 1 Kent dart points, as well as several dart point preforms and fragments.

Artifacts from the 20 to 30 cm level are illustrated in Figure 14. Miscellaneous artifact types are similar to the next lower level. The use of fired clay balls may actually fall off greatly before this level. Most of the clay balls found at the 20 to 30 cm level occurred in just one test pit, C-27. This could easily be an intrusive high level feature from the next lower level. Discussion of technological changes will be made separately.

7. Excavation Level 10 to 20 cm

The 10 to 20 cm excavation level is the highest stratum and represents the last part of the Late Prehistoric. No evidence of historic European contact was found. Arrowpoints recovered include 1 Perdiz, 1 unclassified bifacial point, and 5 unifacial points. Dart point remains include 1 Kent point, 3 dart point preforms, and 4 dart point fragments. Unifacial lithic tools include perforators, graters, and scrapers. A prismatic blade industry is present also at this level. Cultural remains recovered from this stratum are rather sparse, compared to the other excavation levels. Lithic artifacts from this level are illustrated in Figure 15.

8. Unplaced Materials

A large amount of material was recovered from mixed strata of test pits on the north side of the site. Some materials were also recovered from the surface and from excavator test trenches. Some types of artifacts found here were not found in the other test pits. Unplaced dart point types not found otherwise include Ensor, Tortugas, Refugio, Pedernales, and Williams. Unplaced arrow points not found otherwise include Alba and Scallorn. The only example of a distinctive incised pattern on pottery was also found in the unplaced materials. Some of the unplaced materials are illustrated in Figures 16, 17, and 18.

9. Faunal Remains

A summary of faunal remains is given in Table 7. No large pieces of bone were found. Most bone fragments were very small and not of diagnostic value. Some deer and land turtle remains were identifiable. There was one canine tooth found.

Nine Shark teeth were found at the interface of the two excavation levels at 40 cm. Bill McClure has had these identified as from the Carcharhinus family, possibly a Bull Shark. In any event, these teeth are from a shark type common to the Gulf Coast. This site is about 50 miles from the nearest saltwater habitat suitable for sharks.

Two bone pieces were made into pendants, shown in Figure 11. One is grooved and one has a drilled hole.

Although this site is located adjacent to a large freshwater stream, only three pieces of shellfish remains were found. Freshwater shellfish do not appear to be an important food resource in inland Harris County, as previously noted by Wheat (1953).

It would appear that deer and land turtle remained the most significant animal food types over the entire period of site occupation.

No floral remains were recovered to give data on plant foods utilized. However, there is some indirect evidence of wild plant processing in the form of the manos and metates found in the lowest three excavation levels.

10. Ceramics

A summary of ceramics recovered at Location "C" is given in Table 8. The total amount of pottery found is not large. As noted previously (Patterson 1979:109), pottery was not used very much on inland sites in Harris County, compared to the high use found at coastal margin sites.

Goose Creek Plain sandy paste pottery was the predominant type throughout the post-ceramic period. A very small amount of Goose Creek incised pottery was found. This is consistent with the author's previous survey work in this general area. Incised pottery is not a common trait in inland Harris County. No San Jacinto sherd tempered pottery was found here, that is common to late sites on the coastal margin.

Some Conway Plain type sherds were found in the two lowest post-ceramic levels. This is pottery tempered with very coarse sand grains. Aten, et al (1976:fig. 16) show this type to be one of the earliest in the Galveston Bay area, with use from AD 100 to 350.

Significant amounts of bone tempered pottery were found throughout the post-ceramic period on this site. This is consistent with other inland sites in Harris County (Patterson 1979:109). It is a contrast to the data of Aten, et al (1976:fig. 16) that shows bone tempered pottery in use only in the very late prehistoric period in the Galveston Bay area.

Table 8 shows that the maximum use of pottery was during the Woodland period, and that pottery use declined significantly in the Late Pre-historic. This is consistent with previous survey work (Patterson 1976a) of a large number of sites in inland Harris County.

11. General Lithic Remains

Other than projectile points, utilized flakes are the most important tool type here. Many flakes have cutting and scraping types of edge wear patterns, similar to those illustrated by Tringham, et al (1974). Most utilized flakes are probably from debitage generated in biface manufacture. Some formal types of unifacial tools are also present. These include graters, scrapers, notched tools and denticulates. A few bifacial drills are present in the lowest three excavation levels.

There are several indications of lithic manufacturing activities on this site. The large flint flake collection is one indication. Quartzite hammerstones and fragments were found at all levels. Abraders recovered are useful for edge preparation in lithic manufacturing. Some miscellaneous chert cores and chert pieces were found in the lowest three levels of excavation. It should be noted that there is no clear distinction in the literature between the terms "flint" and "chert". Heat treating of flint was used extensively during all time periods.

Most of the lithic raw materials used were petrified woods and cherts common to alluvial deposits of the Brazos and Colorado river systems. These are the nearest sources of raw materials. Some pieces of finer Edwards Plateau type flints were also found, but not as a common item. There were even a few pieces of fine grained quartzite common to the Dallas area. More local types of quartzite are coarse grained and only suitable for hammerstone use.

The predominant raw material at all levels is a light tan alluvial chert that is common at the nearest raw material sources. One dart point in the 40 to 50 cm level and two points in the 50 to 60 cm level are made of Edwards Plateau flint types. Flints similar to those found in the Georgetown and Lake Belton areas were found in small quantities on this site. Aside from the identification of some Edwards Plateau flints, the range of lithic materials used here is similar to a previous study of sites in this general area (Patterson 1974).

A summary of lithic flake sizes for Location "C" is given in Table 9 for each excavation level. Almost 17,000 flakes were recovered from clearly stratified test pits, and materials from mixed strata have not been included. Flake size percentages at all levels are skewed toward larger amounts of smaller size flakes. This data would form fairly smooth, exponentially increasing curves that are indicative of systematic bifacial reductions (Patterson and Sollberger 1978). In bifacial reduction, there will normally be a higher percentage of flakes under 10 mm square than flakes of 10 to 15 mm square. The data in Table 9 shows the opposite for flake recovery at this site, and illustrates the limitations of recovery when using $\frac{1}{4}$ inch screen size.

Changes in flake size distributions with time are shown in Figure 19. There is a trend toward higher percentages of smaller flakes in later time, as previously noted for other sites in this area (Patterson 1976:fig. 5). This will be discussed under Technological Changes. Another interesting feature of flake size distribution is that there are almost identical values of flake sizes for the two highest excavation levels. This may indicate a stabilization of lithic manufacturing Technology.

The amounts of remaining cortex on flakes is shown in Table 10, based on samples from test pits C- 24, 25, 28. This type of data can be useful in determining how much trimming of raw materials was done at quarry sites before transport to remote campsites. Primary flakes are covered with cortex, secondary flakes have some remaining cortex, and interior flakes have no remaining cortex.

There seems to be a trend toward more interior flakes in later time. This may show a trend toward more trimming of raw materials and selection of more interior flake blanks at quarry sites in later time. The absence of large numbers of residual cores at this site may indicate that most raw materials were imported as prepared flake blanks, rather than as whole cobbles and nodules as found at raw material sources. Some bifacial preforms may also have been imported.

12. Prismatic Blades

Data on prismatic blades found on this site is given in Table 11. Most of these blades are microblades (under 11 mm wide) or slightly larger. Related blade cores and core trim flakes are given in Table 5. Small amounts of prismatic blades can be generated fortuitously during biface manufacture. At this site, all of the elements of purposeful prismatic blade manufacture are present. Sollberger and Patterson (1976) have described the elements of prismatic blade manufacture.

Most prismatic blades found on this site are too small to be of value for use as generalized flake tools. Small prismatic blades are useful for making both unifacial points and inset blades for use as arrow point elements. The relationship of prismatic blades to the bow and arrow will be discussed further.

13. Miscellaneous Artifacts

A summary of miscellaneous artifacts found at Location "C" is given in Table 5. Small, smooth pebbles, usually 10 to 15 mm in diameter, occur at all levels of this site. These are not natural to this area, and are found on most local Indian sites. These may have been used in rattles (Patterson 1975a, Aten, et al 1976:41).

Significant quantities of red ochre were found. This material was probably used as a pigment for skin decoration.

Fired clay balls seem to have been used most extensively in the lowest three levels. These are probably connected with cooking functions. The use of fired clay balls may have diminished or stopped at the end of the Woodland period. A possible hearth feature consisting of burnt clay lumps in a pile forming an area of 20 by 30 cm was found at 24 cm depth in test pit C- 27. Other clay balls were also found in this same test pit. Since few clay balls were found in other test pits at this level, it may be intrusive from the next lower level.

A few very smooth large stones were found that may have been used for pottery smoothing.

A few manos and metates were recovered in the lowest three levels. A good example of a matched set made of sandstone was recovered at the interface of excavation levels at 40 cm. The mano is about 80 mm in diameter. The metate is 79 mm wide, 113 mm long and 42 mm thick, with one face worn to a concave shape.

Campsites such as this usually have few non-utilitarian artifacts. In this case, only the small smooth pebbles, red ochre, and bone pendants are devoted to more than direct subsistence activities.

14. Summary of Chronology

The author (Patterson 1979:106-110) has previously presented an approximate chronology for the upper Texas coast that applies to this site, as follows:

<u>Period Name</u>	<u>Time Range</u>
Paleoindian	Before 5000 BC
Early Archaic	5000 to 3000 BC
Middle Archaic	3000 to 1500 BC
Late Archaic	1500 BC to AD 100
Woodland	AD 100 to 600
Late Prehistoric	AD 600 to 1500

This is based on some dates from the Galveston Bay area (Aten 1971: fig. 10; Aten, et al 1976:fig. 16) and comparative information from adjacent regions.

Based on projectile point chronology and the starting point of ceramics at AD 100 (Aten, et al 1976:fig. 16), the following time periods are proposed for the stratigraphic sequence of site 41HR315, Location "C":

<u>Excavation Level, cm</u>	<u>Time Period</u>
55 to 60	Late Paleo/Early Archaic
50 to 55	Middle Archaic
45 to 50	Late Archaic
35 to 45	Woodland
10 to 35	Late Prehistoric

Stratigraphic thicknesses at this site are not linearly proportional to time. For example, the 50 to 60 cm level (10 cm thickness) may represent 3500 years, while a level of equal thickness in the Late Prehistoric may represent only a few hundred years. This is probably due to uneven soil deposition rates and periods of heavy soil erosion.

The Late Paleo/Early Archaic level of 55 to 60 cm contains Plainview, Angostura and Early Stemmed points, with San Patrice at the upper interface with the Middle Archaic. This level was too thin to establish a reliable stratigraphic sequence of projectile point types. Plainview is recognized as a Paleo type, and is probably the earliest point type here. Johnson and Holliday (1980:104) have given a summary of Plainview and related Golindrina point dating, which gives a range of approximately 8000 to 5000 BC for this projectile point series in Texas. This time range seems appropriate for the Plainview point at site 41HR315. Watt (1978:127) gives dates of 7300 to 7500 BC for a Plainview stratum at a site in the central Brazos River valley.

The Angostura point is another Paleo type found here, and has been dated by Alexander (1963) for central Texas, in a stratum with radio-carbon dates ranging from 6750 BP (4787 BC) to 9300 BP (7337 BC). Thus, the Angostura point falls into most of the later portion of the possible range for Plainview in Texas. The Angostura point has been dated in Oregon to a range of 4585 to 5975 BC (Aikens, et al 1977:25; Hanes 1977:table 2). Similar Agate Basin points cluster in a time range of 6000 to 8000 BC (Luchterhand 1970:11). Jennings (1974:118) gives a possible time range of 5000 to 7000 BC for the Angostura point at a site in South Dakota.

Shafer (1977:fig. 4) has placed a point type called Early Stemmed in the Early Archaic period in east Texas. Similar points (Figure 5e,f,g) in the 55 to 60 cm level of this site seem to verify Shafer's temporal placement of this point type.

The San Patrice point type has been difficult to place in time in east Texas (Patterson 1979:107). At this site, one point of this type was found at the interface of the Early and Middle Archaic, at 55 cm. More research needs to be done to establish a firm projectile point sequence for the Late Paleo and Early Archaic periods. The data base remains small for the upper Texas coast. Other projectile points from these time periods found on the upper Texas coast are from surface collecting (Patterson 1979:106)

The Middle Archaic period at this site contains projectile points that are consistent with adjacent regions for this time period. Carrollton and Trinity points are found also in the Middle Archaic on the upper Trinity River (Smith 1969). Prewitt (1974:fig. 7) places the Bulverde point in the Middle Archaic in central Texas. As mentioned, Gary and Kent types may start in the Middle Archaic or be present due to stratigraphic mixing with the next higher level. A precise stratigraphic sequence for projectile point types in the Middle Archaic is not possible for this site, due to the narrow thickness of the stratum.

The Late Archaic and Early Woodland are represented here by the 40 to 50 cm level. Previous work (Patterson 1976a, 1979) has shown that many projectile point types continue from the Late Archaic into the Early Woodland. Dart point types common to these periods on the upper Texas coast that are found on this site include the Gary/Kent series, Bulverde, Yarbrough, Darl, Ellis, Palmillas, and Refugio. Sites with components in these time periods are rather common in this region.

Dart point types such as Kent, Ellis, Darl, and Yarbrough continue into the Late Woodland period. Few significant changes in dart point typology are apparent for this time period, although some types may not continue into this period.

The exact point in time when standardized small bifacial arrow points became the predominant projectile point types has not been determined, but Aten (1971:fig. 10) places this at approximately AD 600. This has been defined by the author (Patterson 1976a, 1979) as the start of the Late Prehistoric period. Perdiz arrow points are found at this site in all levels of the Late Prehistoric. The temporal placement of other arrow point types found in this region has not been firmly established, so that a relative sequence is not available. Other arrow point types include Alba, Catahoula, Fresno and Scallorn, as major types on the upper Texas coast.

The chronology of ceramics has been previously discussed here. Projectile point sequences have been established on the upper Texas coast only for broad time periods. In many cases, this may be the only possible definition, as some point types last for long time periods.

Some use of the spearthrower (atlatl) seems to have continued in the Late Prehistoric, after use of the bow and arrow became predominant. Wheat (1953:table 5) shows dart points throughout the Late Prehistoric at nearby sites. At 41HR315, Location "C", there are dart points, dart point preforms, and dart point fragments at all levels of the Late Prehistoric.

15. The Bow and Arrow

The author (Patterson 1973a, 1976c) has previously proposed that the bow and arrow was introduced to Texas from the far north during the Archaic period, together with the introduction of technology for small prismatic blades. This places the introduction of the bow and arrow much earlier than the commonly accepted time of roughly AD 500. This site furnishes confirmation of this from a fully excavated sequence.

Unifacial arrow points (Table 6) start here during the Middle Archaic period, and continue in use throughout later periods. Unifacial inset blades (Table 5) that could have been used in compound arrow points are here also. The maximum use of unifacial arrow points is during the Late Archaic and Woodland periods, before standardized bifacial arrow point types became predominant.

A developmental sequence of standardized bifacial arrow points from similar dart point types has been proposed by the author (Patterson 1973b, 1976a). This may be seen on this site as transitional point types (Table 6) weighing 2 to 3 grams, found from 30 to 50 cm in the Woodland and Late Archaic periods. There are also two examples of bifacial arrow points weighing under 2 grams in the Middle and Late Archaic here (Table 6). The point of this type found in the Middle Archaic (Figure 7g) weighs 1.6 grams, and is 22.5 mm long, 12.9 mm wide, and 6.7 mm thick.

Data on transitional points found from 30 to 50 cm is as follows:

<u>Figure</u>	<u>L, mm</u>	<u>W, mm</u>	<u>T, mm</u>	<u>wt., gr.</u>
13A	40.3	13.9	5.7	2.8
13B	29.0	17.8	5.1	2.5
13C	25.6	17.3	5.6	2.2
9J	29.3	19.0	7.5	2.9
9K	31.4	20.0	7.2	2.3
9L	30.0	16.0	5.6	2.5

16. Lifeways and Technological Changes

While some technological changes are apparent on the upper Texas coast, a nomadic hunting and gathering lifeway seems to have persisted over the entire prehistoric period, with no evidence for the use of agriculture. Manos and metates are found during only the Archaic and Woodland periods at this site and others in the general area. This could indicate a type of processing of wild plant foods that was not practiced later in the Late Prehistoric period. Fired clay balls occur mainly during the Archaic and Woodland periods, which may indicate a change in cooking methods during the Late Prehistoric.

There are smaller amounts of lithic and ceramic remains in the Late Prehistoric at this site. This is consistent with other sites in this area (Patterson 1976a), and indicates less intense use of single sites in later time, although Late Prehistoric site components are more numerous. A more mobile type of lifeway may have existed in the Late Prehistoric, as previously proposed (Patterson 1976a). One of the following reasons may account for this late change to a more mobile lifestyle:

1. More movement to schedule a wider variety of food resources, due to increasing skill in local adaptation.
2. More movement forced by food resource scarcities, because:
 - a. climatic changes limited natural food resources, or:
 - b. population increases exceeded a comfortable carrying capacity of natural food resources.

Red ochre is most important during the Archaic and Woodland periods at this site. Small, smooth pebbles, possibly used in rattles, were in use over the entire period of this site.

Several indications of changes in lithic technology are apparent. The intensity of lithic manufacturing activities decreases in later time, as shown by less hammerstones and the discontinued use of abraders. Changes in the nature of lithic debitage shown in Figure 19 are very clear. Also, large pieces of flint and flake cores are not found here after the Woodland period. The increasing emphasis on the bow and arrow is, of course, a prime factor in changes in lithic technology. This may have been accompanied by changes in lithic procurement strategies (Patterson 1979b).

17. External Relationships

Projectile point types found at this site generally demonstrate the wide ranging patterns of a nomadic type lifestyle over long time periods. The Paleo type points found here have wide geographic distributions in North America. The Middle Archaic Carrollton and Trinity point types are found in the region to the north. Pedernales and Bulverde point types are common on the Edwards Plateau. Schumla and Refugio point types occur also on the central Texas coast. The San Patrice point has a distribution to the north and east of this region. Perdiz arrow points are found in east, central and south Texas. The author has noted that many Archaic type points found on the upper Texas coast are found also in Louisiana (Patterson 1975b). Ponchartrain points found on this site are an example of Louisiana area influences. Ceramics were also probably introduced from the Louisiana area.

Edwards Plateau flints found on this site show some contacts to the northwest. Bone tempered pottery may have been introduced from the Caddo area located to the north of this region (Dee Ann Story, personal communication).

Shark teeth found here indicate a contact with the coastal margin. The incised pottery designs found on this site are common at coastal margin sites. Asphalt used for projectile point hafting is another indication of contacts with the coastal margin.

While external relationships can be shown, these contacts seem to have had little effect on the primary lifestyle.

18. Conclusions for Location "C"

This site represents the longest occupation sequence excavated to-date on the upper Texas coast, with occupation from the Late Paleo to the Late Prehistoric. Occupation probably started before 5000 BC and ended at approximately 1500 AD. Data obtained here is consistent with other available information for this area (Patterson 1976a, 1979).

A number of proposals based on surface collections have been confirmed by the excavation of site 41HR315, Location "C". These include:

1. Early introduction of the bow and arrow, during the Archaic period.
2. Less use of pottery in the Late Prehistoric.
3. Several changes in lithic technology in later time.
4. Fairly early use of bone tempered pottery.
5. Indications of a more mobile lifeway in the Late Prehistoric.
6. The industry for small prismatic blades appears to start during the Middle Archaic together with the start of the bow and arrow.

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Table 1

LOCATION "E" FLAKE SIZE DISTRIBUTIONS

flake size, mm sq.	excavation level, cm: % of total flakes						
	0-10	10-20	20-30	30-40	40-50	50-60	60-68
under 10	40.0	50.0	61.9	39.4	19.2	28.1	0
10 to 15	40.0	45.0	38.1	45.4	50.0	15.6	33.3
15 to 20	20.0	5.0	0	6.1	23.2	40.7	41.8
20 to 25	0	0	0	9.1	3.8	3.1	8.3
25 to 30	0	0	0	0	3.8	9.4	8.3
30 to 35	0	0	0	0	0	3.1	8.3
total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
sample size	15	20	21	33	26	32	12

Table 2

LOCATION "E" MISCELLANEOUS ARTIFACTS

Surface: 1 Kent point, 1 microblade, 1 fired clay ball

30 to 40 cm: 1 Goose Creek sherd, 2 small smooth pebbles

50 to 60 cm: 1 biface fragment, 1 microblade, 1 small smooth pebble,
1 Goose Creek sherd, 2 fired clay balls

60 to 68 cm: 2 red ochre pieces, 4 fired clay balls, 1 hammerstone
fragment

Table 3

LOCATION "C" DART POINTS

<u>dart point type</u>	<u>surface</u>	<u>mixed strata</u>	<u>10-20 cm</u>	<u>20-30 cm</u>	<u>30-40 cm</u>	<u>40-50 cm</u>	<u>50-60 cm</u>	<u>total</u>
Gary	1	4		2		6	2	15
Ellis	1	2			2	5		10
unclassified					1	1	2	4
Kent		6	1	1	2	12	3	25
Darl		2			1	3		6
Ensor		1						1
Tortugas		1						1
Refugio		1						1
Carrollton		1			1(A)	2	6	10
Yarbrough		1			1	1		3
Pedernales		1						1
Bulverde		3			2	11	4	20
Williams					1			1
Palmillas		1				1		2
Schumla-like						1	1	2
Misc. triangular						1		1
Wells						1		1
Yarbrough-like						1		1
Early Stemmed							3	3
misc. expanding stem							1	1
San Patrice, Hope							1	1
Trinity							2	2
Plainview							1	1
Angostura							1	1
misc. side-notched						1		1
Ponchartrain						1		1
Total	2	24	1	3	11	48	27	116

(A)- reworked as scraper

Table 4

LOCATION "C" DART POINT PREFORMS AND FRAGMENTS

<u>excavation</u> <u>level, cm</u>	<u>preforms</u>	<u>blade</u> <u>frags.</u>	<u>stem</u> <u>frags.</u>
surface	2	1	1
mixed strata	13	5	9
10 to 20	3	0	6
20 to 30	6	3	5
30 to 40	11	9	22
40 to 50	19	10	33
50 to 60	<u>14</u>	<u>10</u>	<u>28</u>
total	68	38	104

Table 5

LOCATION "C" MISCELLANEOUS ARTIFACTS

artifact type	excavation level, cm						total
	surface	mixed strata	10-20	20-30	30-40	40-50	
prismatic blade cores	1	1				1	3
blade core fragments					1	1	2
blade core trim flakes		2	1	1	5	9	25
inset blades				2	5	7	17
Edwards Plateau flint	1	2	1	2	2	4	16
Dallas type quartzite		1		1		1	4
small smooth pebbles	2	61	87	131	248	272	917
red ochre		9	1	2	12	55	118
fired clay balls		172	13	117	246	392	1144
sandstone abraders		1			3	5	13
quartzite abraders						1	1
misc. bifaces		2			2	4	9
quartzite hammerstones		9		1	8	24	60
hammerstone fragments		12	5	1	11	40	100
gravers		2	1	3	21	11	47
perforators			4	5	12	12	42
denticulate tool		1				1	2
unifacial scrapers			1	1		1	4
petrified wood pieces				2		1	7
burned rock				1	6		7
clayball hearth feature				1			1
stemmed prismatic blade						1	1
end scraper on blade					1	1	2
notched tools					1	1	2
misc. chert cores					4	6	14
misc. chert pieces					3	7	20
pottery smoothing stones					2	1	3
manos					1	1	3
metates						2	2
bifacial drills						4	5
bifacial choppers						1	1
misc. hematite						6	14
lithic cache feature						1	1

Table 6
LOCATION "C" ARROW POINTS

point type	excavation level, cm						total
	surface	mixed strata	10-20	20-30	30-40	40-50	
Perdiz		1	1	3	2		7
Scallorn	1						1
Catahoula variant				1			1
Alba		1					1
unclassified bifacial			1			1	3
unifacial	3	4	5	7	15	18	54
preform		2				1	3
total	4	8	7	11	17	20	70
Transitional Dart/Arrow							
Gary/Perdiz					1	2	3
Kent/Perdiz		1			1		2
misc.					1	1	2
total		1			3	3	7

Table 7

LOCATION "C" FAUNAL REMAINS

item	excavation level, cm					total
	10-20	20-30	30-40	40-50	50-60	
misc. bone fragments	10	42	89	309	241	691
turtle shell	5	22	59	63	19	168
deer teeth				3	1	4
deer bone joints				1		1
misc. animal teeth				1		1
canine teeth				1		1
sharks teeth			4	5		9
bone pendants				2		2
freshwater shell	1	1			1	3

Table 8

SUMMARY OF LOCATION "C" CERAMICS

excavation level, cm	number of sherds				total
	Creek Plain	Creek Incised	Conway Plain	bone tempered	
surface			1		1
mixed strata	44	3	19	15	81
10 to 20	6			2	8
20 to 30	29			5	34
30 to 40	86		17	26	129
40 to 50	57	1	21	6	85
50 to 60	<u>1</u>		<u>1</u>		<u>2</u>
total	223	4	59	54	340

pottery type	excavation level, cm: % of sherds			
	10-20	20-30	30-40	40-50
Goose Creek Plain	75.0	85.3	66.7	68.7
Goose Creek Incised	0	0	0	1.2
Conway Plain	0	0	13.2	22.9
bone tempered	<u>25.0</u>	<u>14.7</u>	<u>20.1</u>	<u>7.2</u>
total	100.0	100.0	100.0	100.0

Table 9

LOCATION "C" FLAKE SIZE DISTRIBUTION SUMMARY

flake size, mm sq.	excavation level, cm									
	10-20		20-30		30-40		40-50		50-60	
	no.	%	no.	%	no.	%	no.	%	no.	%
under 10	723	33.1	1137	32.6	1210	27.2	934	19.4	373	18.3
10 to 15	1096	50.3	1774	50.8	2010	45.0	1887	39.2	677	33.1
15 to 20	300	13.8	456	13.0	800	18.0	1115	23.2	460	22.5
20 to 25	48	2.2	86	2.5	275	6.2	484	10.1	279	13.7
25 to 30	11	0.5	31	0.9	101	2.3	234	4.9	156	7.6
30 to 35	3	0.1	8	0.2	40	0.9	117	2.4	72	3.5
35 to 40	0	0	1	negl.	10	0.2	28	0.6	19	0.9
40 to 50	0	0	0	0	7	0.2	12	0.2	8	0.4
total	2181	100.0	3493	100.0	4453	100.0	4811	100.0	2044	100.0

total flakes 16,982

Table 10

REMAINING CORTEX ON FLAKES
(flakes over 10 mm square)

<u>level, cm</u>	<u>primary</u>		<u>secondary</u>		<u>interior</u>	
	<u>no.</u>	<u>%</u>	<u>no.</u>	<u>%</u>	<u>no.</u>	<u>%</u>
10 to 20	19	16.5	9	7.8	87	75.7
20 to 30	12	6.7	31	17.4	135	75.9
30 to 40	18	6.3	71	24.8	197	68.9
40 to 50	49	10.5	113	24.3	303	65.2
50 to 60	37	10.1	113	30.9	216	59.0

sample from test pits C-24, 25, 28

Table 11

LOCATION "C" PRISMATIC BLADE DATA

width, mm	excavation level, cm																	
	surface		mixed strata		10-20		20-30		30-40		40-50		50-60		total			
	no.	%	no.	%	no.	%	no.	%	no.	%	no.	%	no.	%	no.	%		
6	0	0	1	4.4	0	0	0	0	0	0	0	0	0	0	0	0	1	0.4
7	2	15.4	1	4.4	0	0	1	3.6	2	3.1	3	5.5	1	2.6	10	4.1	10	4.1
8	1	7.7	5	21.7	1	4.4	1	3.6	8	12.5	3	5.5	1	2.6	20	8.2	20	8.2
9	2	15.4	3	13.0	5	21.7	8	28.6	7	10.9	5	9.1	2	5.3	32	13.1	32	13.1
10	3	23.1	5	21.7	7	30.4	8	28.6	5	7.8	7	12.7	2	5.3	37	15.3	37	15.3
11	1	7.7	3	13.0	3	13.0	3	10.7	13	20.3	9	16.4	5	13.2	37	15.3	37	15.3
12	3	23.0	0	0	4	17.4	2	7.0	8	12.5	11	20.0	7	18.4	35	14.3	35	14.3
13	0	0	1	4.4	2	8.7	3	10.7	10	15.6	5	9.1	3	7.9	24	9.8	24	9.8
14	0	0	2	8.7	1	4.4	1	3.6	4	6.3	5	9.1	7	18.4	20	8.2	20	8.2
15	0	0	2	8.7	0	0	1	3.6	2	3.1	5	9.1	5	13.1	15	6.1	15	6.1
16	0	0	0	0	0	0	0	0	1	1.6	2	3.5	2	5.3	5	2.0	5	2.0
17	0	0	0	0	0	0	0	0	2	3.1	0	0	3	7.9	5	2.0	5	2.0
18	1	7.7	0	0	0	0	0	0	1	1.6	0	0	0	0	2	0.8	2	0.8
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	1	1.6	0	0	0	0	1	0.4	1	0.4
total	13	100.0	23	100.0	23	100.0	28	100.0	64	100.0	55	100.0	38	100.0	244	100.0	244	100.0
avg. width	10.4		10.0		10.6		10.4		11.5		11.5		12.8		11.1		11.1	
range	7-18		6-15		8-14		7-15		7-20		7-16		7-17		6-20		6-20	
blades as % of total flakes over 15 mm sq.					6.0		4.6		4.9		2.7		3.7					

Figure 1

Overall Plan of Site 41HR315

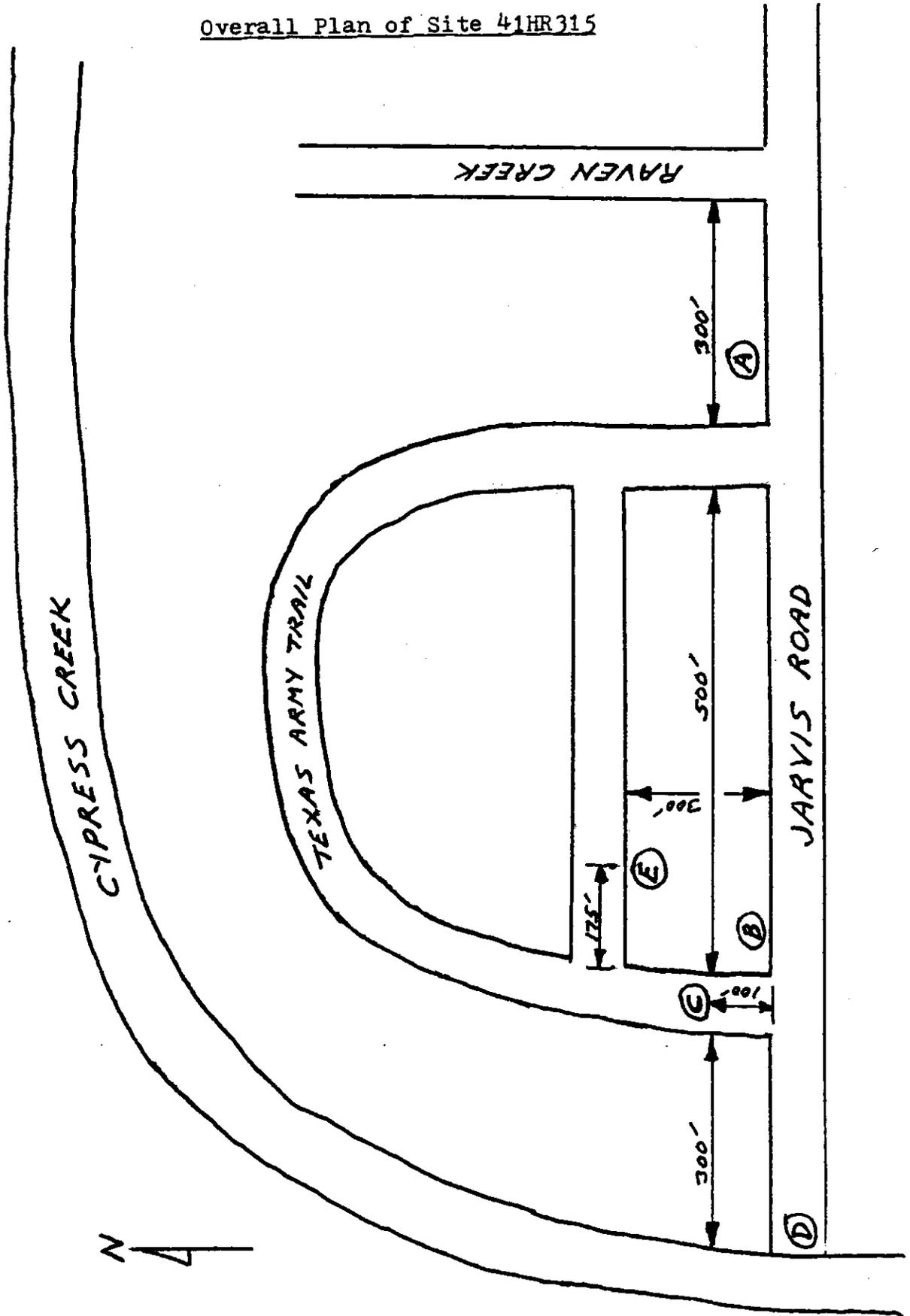
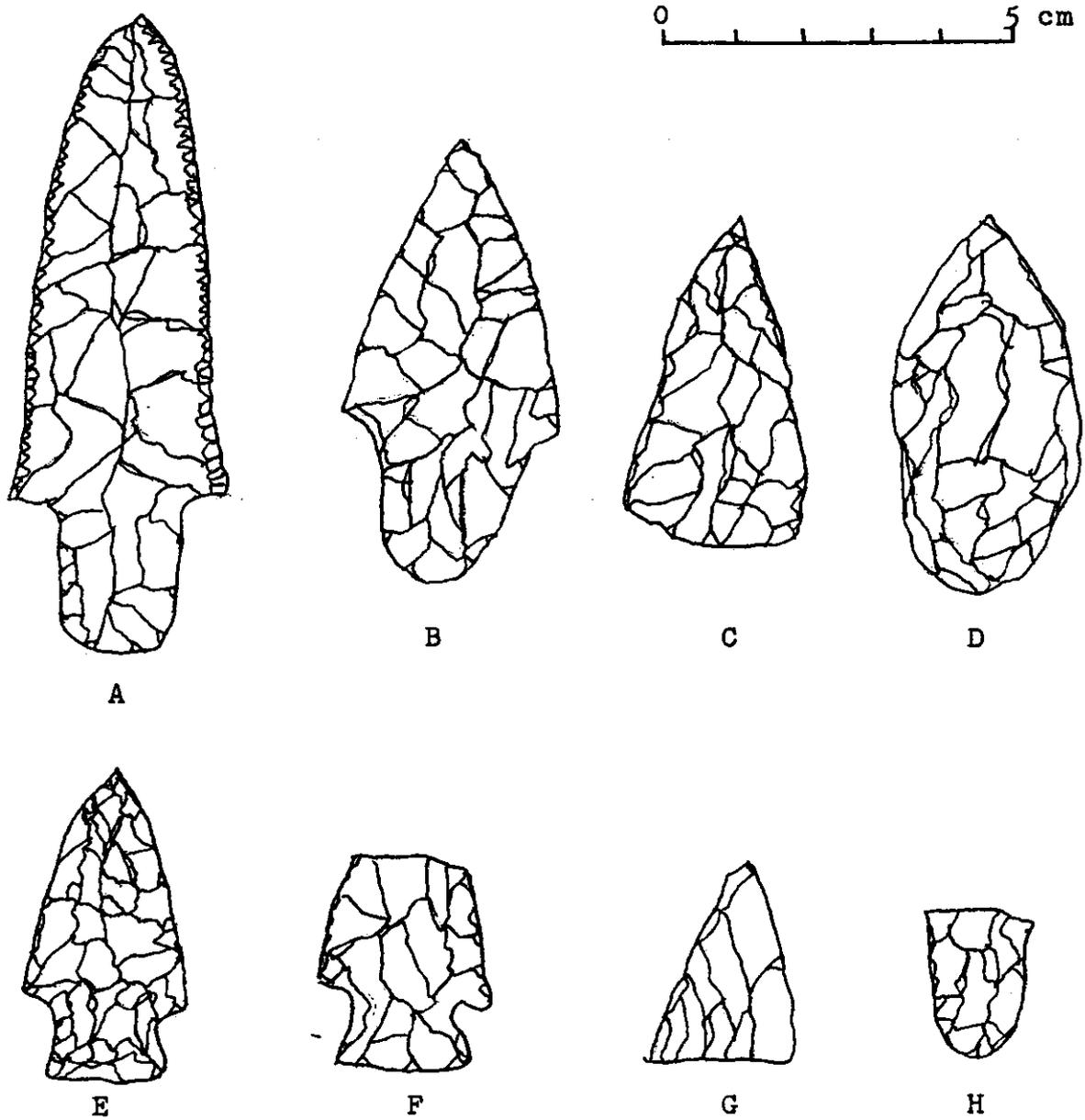


Figure 2

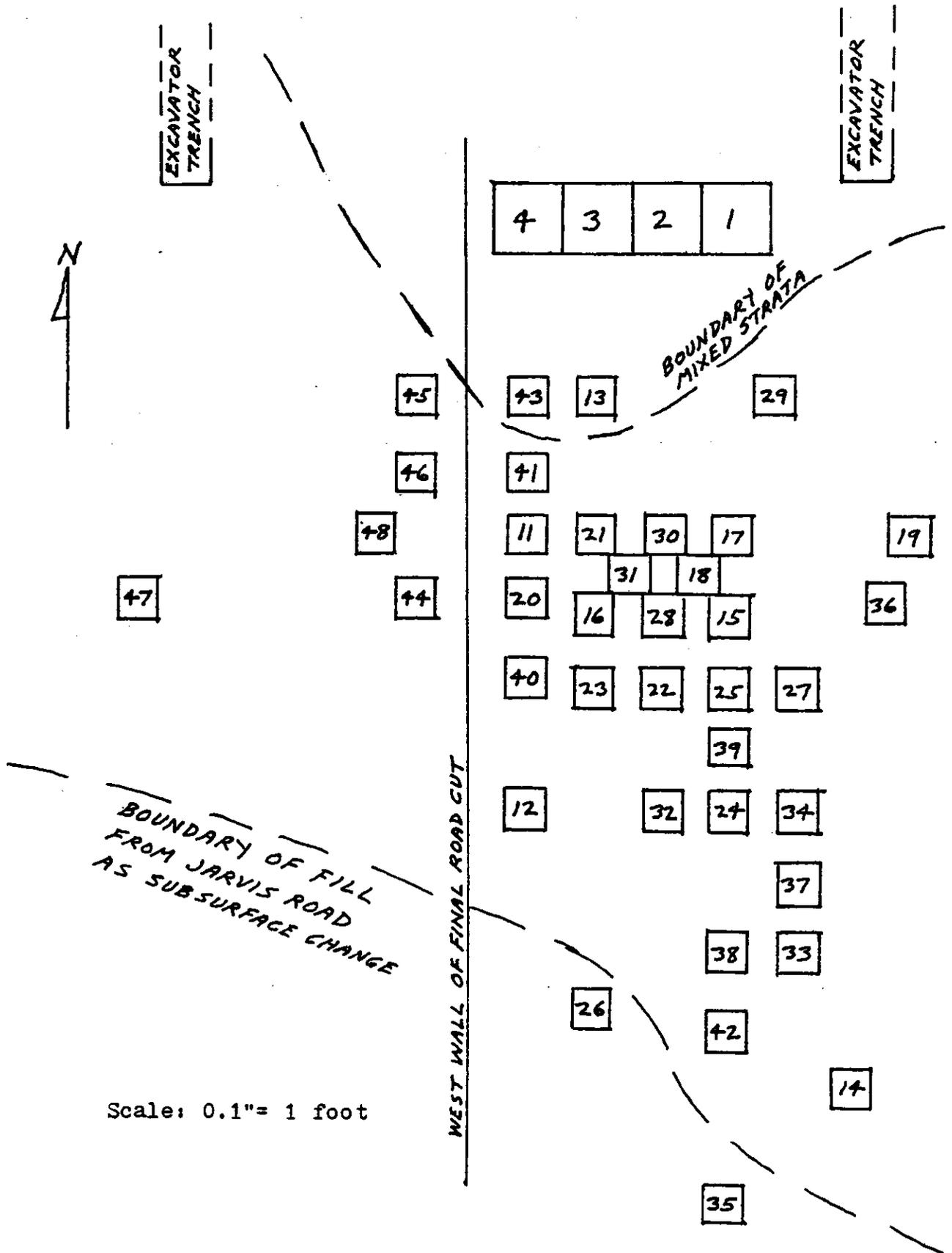
LOCATION "A" PROJECTILE POINTS



A- Ponchartrain; B- Gary; C- Tortugas; D- preform; E- Yarbrough;
F- Ellis; G,H- dart point fragments

Figure 3

EXCAVATION PLAN OF LOCATION "C"



Scale: 0.1" = 1 foot

Figure 4

STRATIGRAPHY OF WEST WALL OF FINAL ROAD CUT

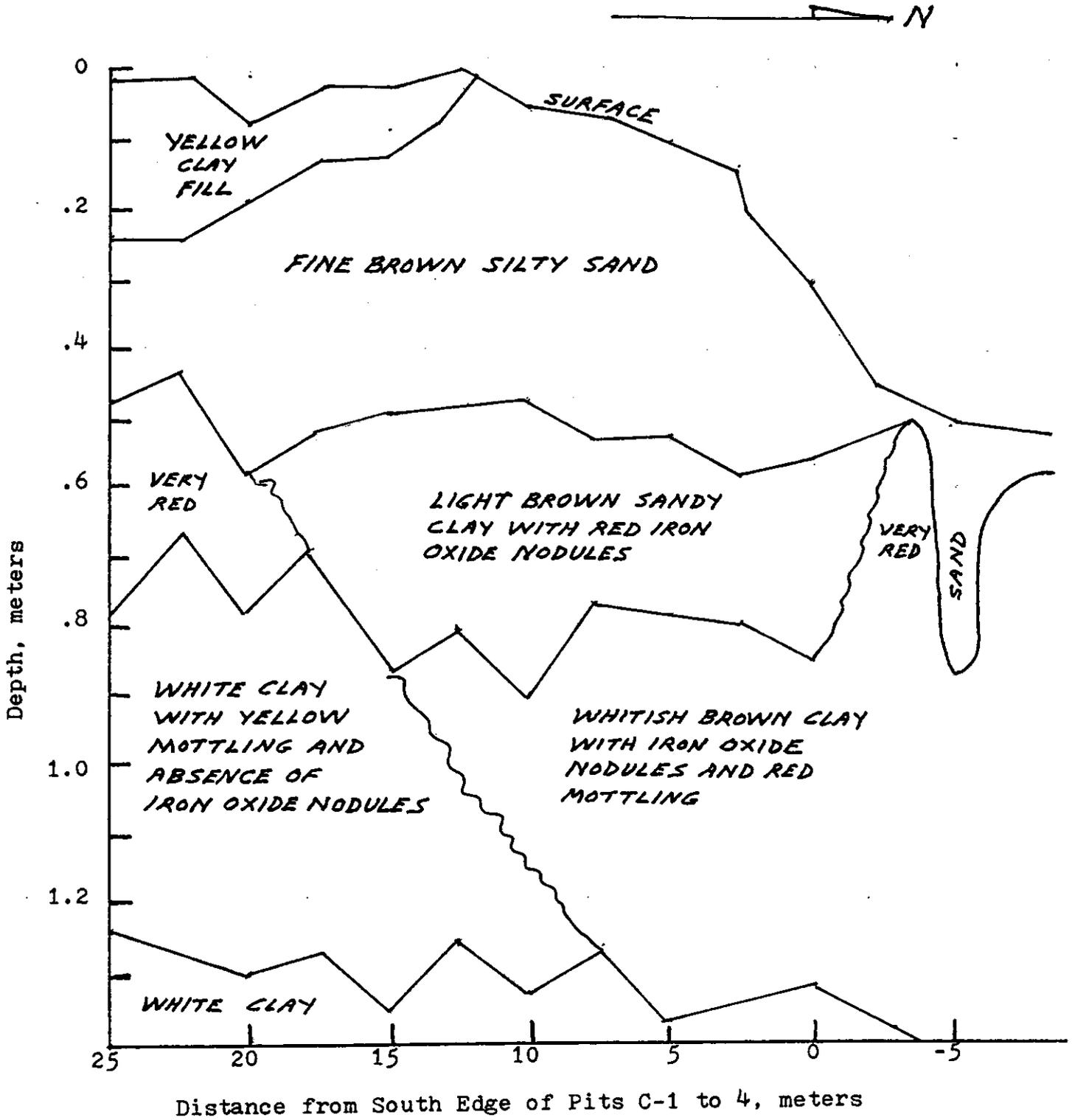
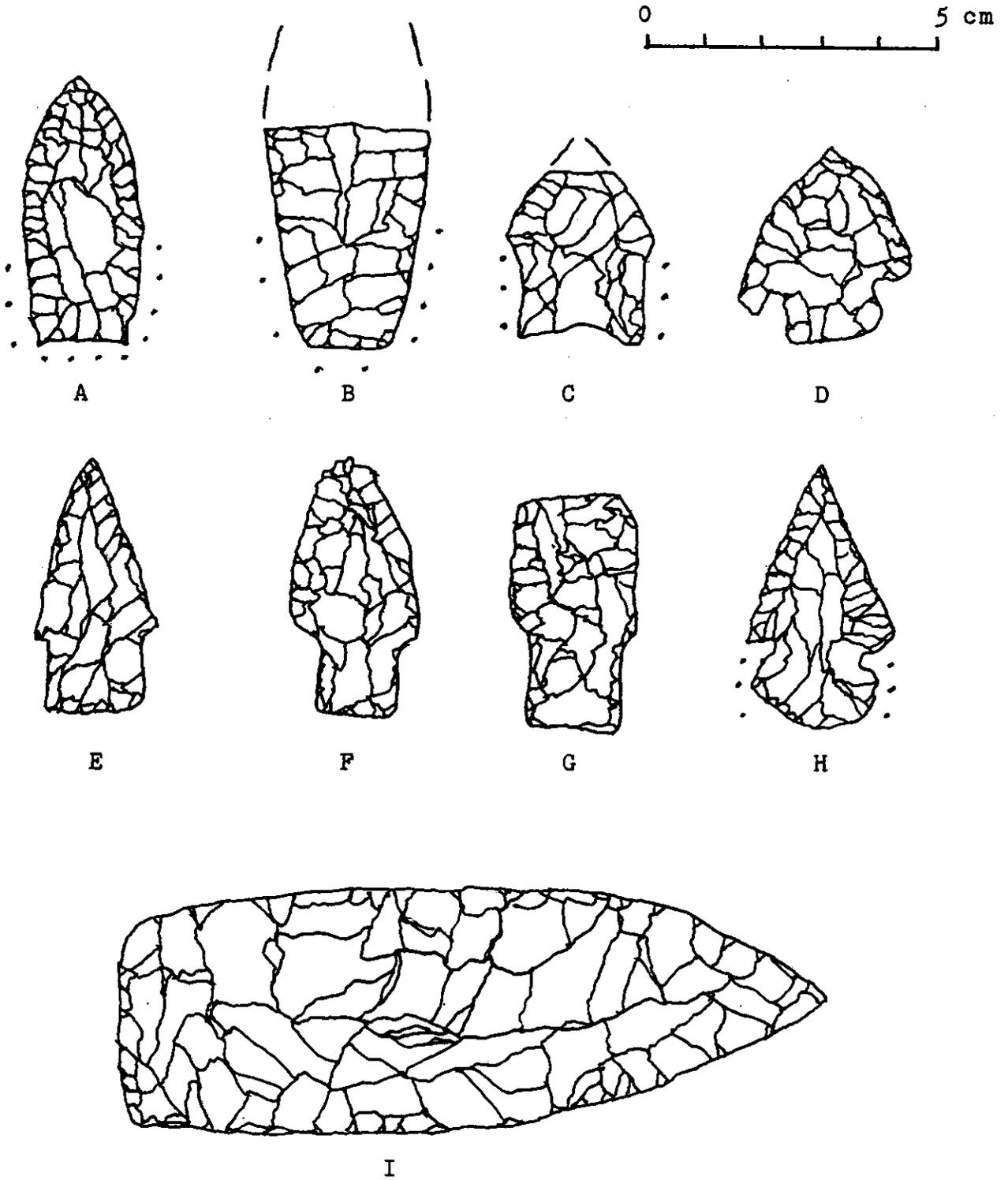


Figure 5

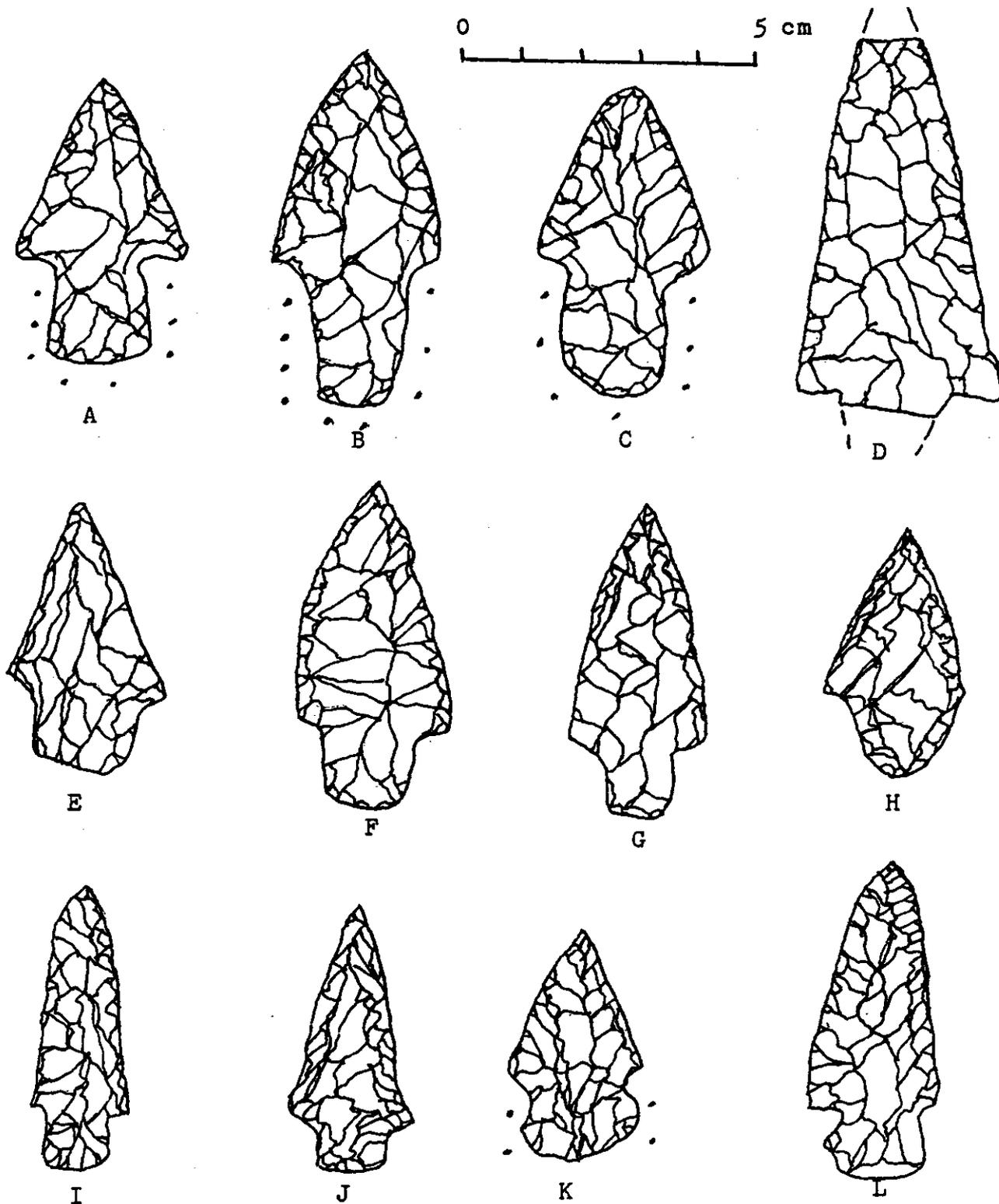
LOCATION "C" PROJECTILE POINTS, 50 TO 60 CM



A- Plainview; B- Angostura; C- San Patrice; D- Schumla-like;
E,F,G- Early Stemmed; H- Trinity; I- large preform (dots show
ground bases)

Figure 6

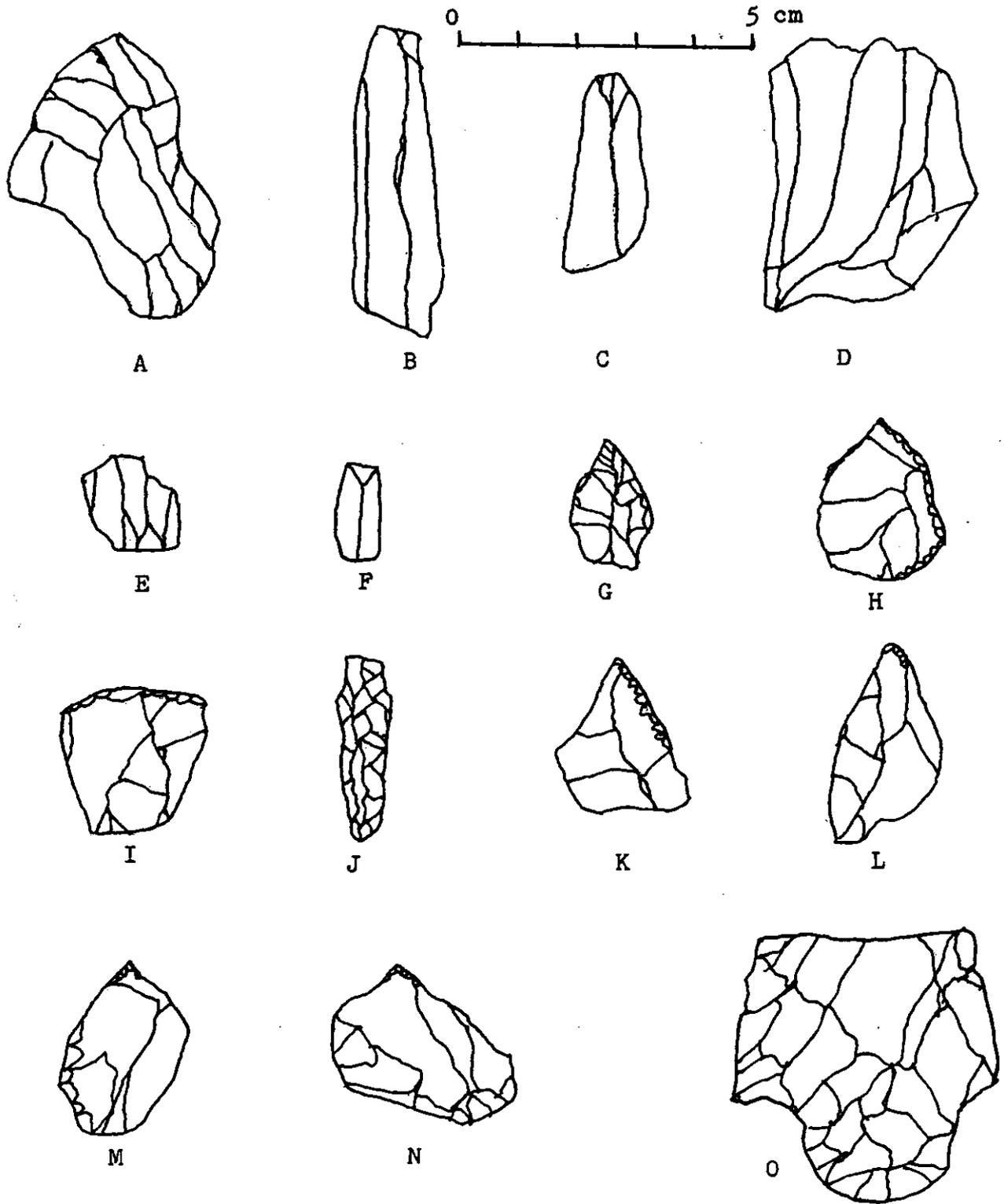
LOCATION "C" PROJECTILE POINTS, 50 TO 55 CM



A,B,C- Carrollton; D,E,F,G- Bulverde; H- Gary; I,J- Kent;
K- Trinity; L- misc. expanding stem

Figure 7

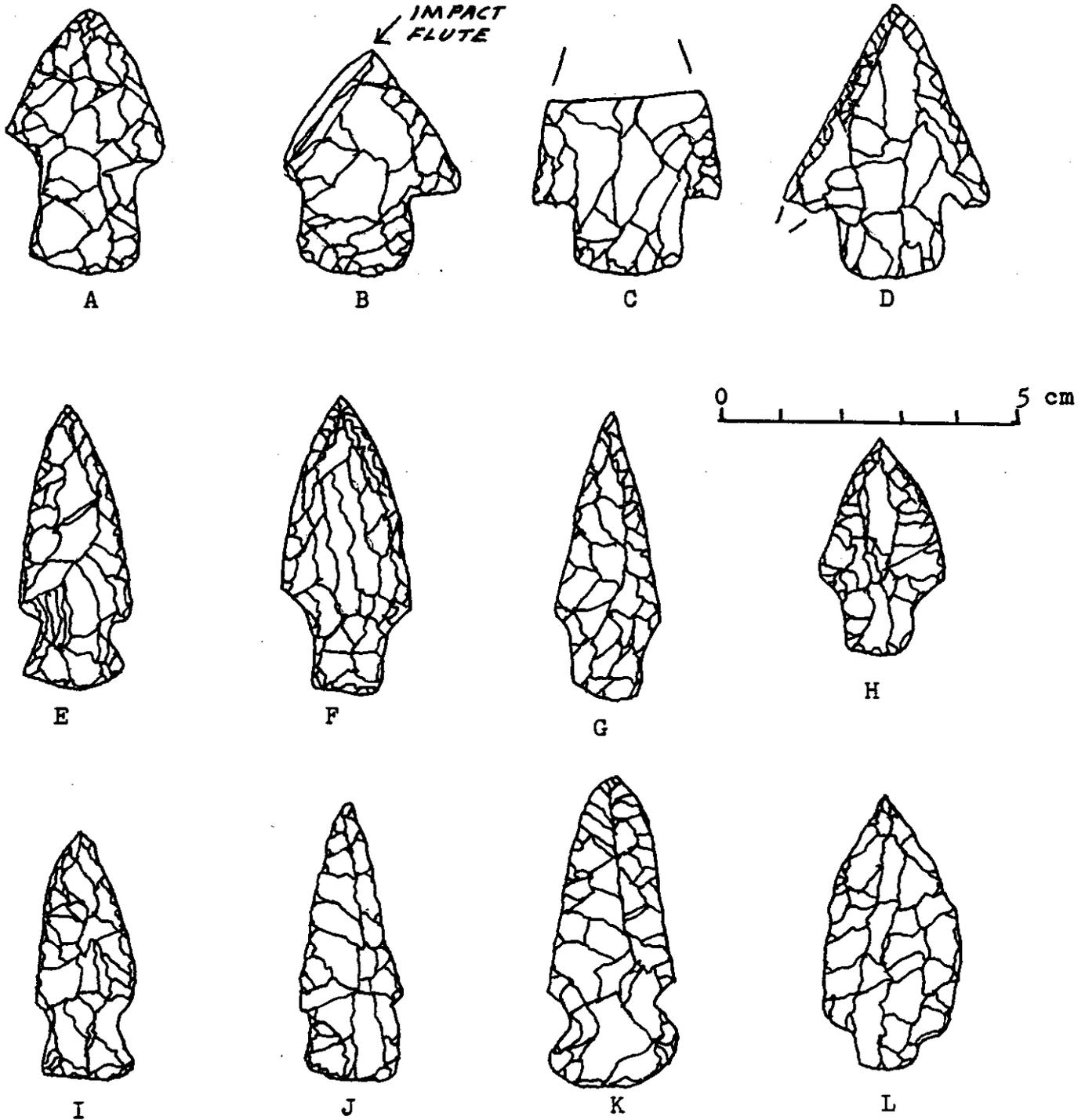
LOCATION "C" LITHIC ARTIFACTS, 50 TO 60 CM



A- microblade core; B,C- prismatic blades; D,E- blade core trim flakes; F- microblade; G- bifacial arrow point; H- unifacial arrow point; I- scraper; J- drill; K,L-perforators; M,N- gravers; O- stemmed preform

Figure 8

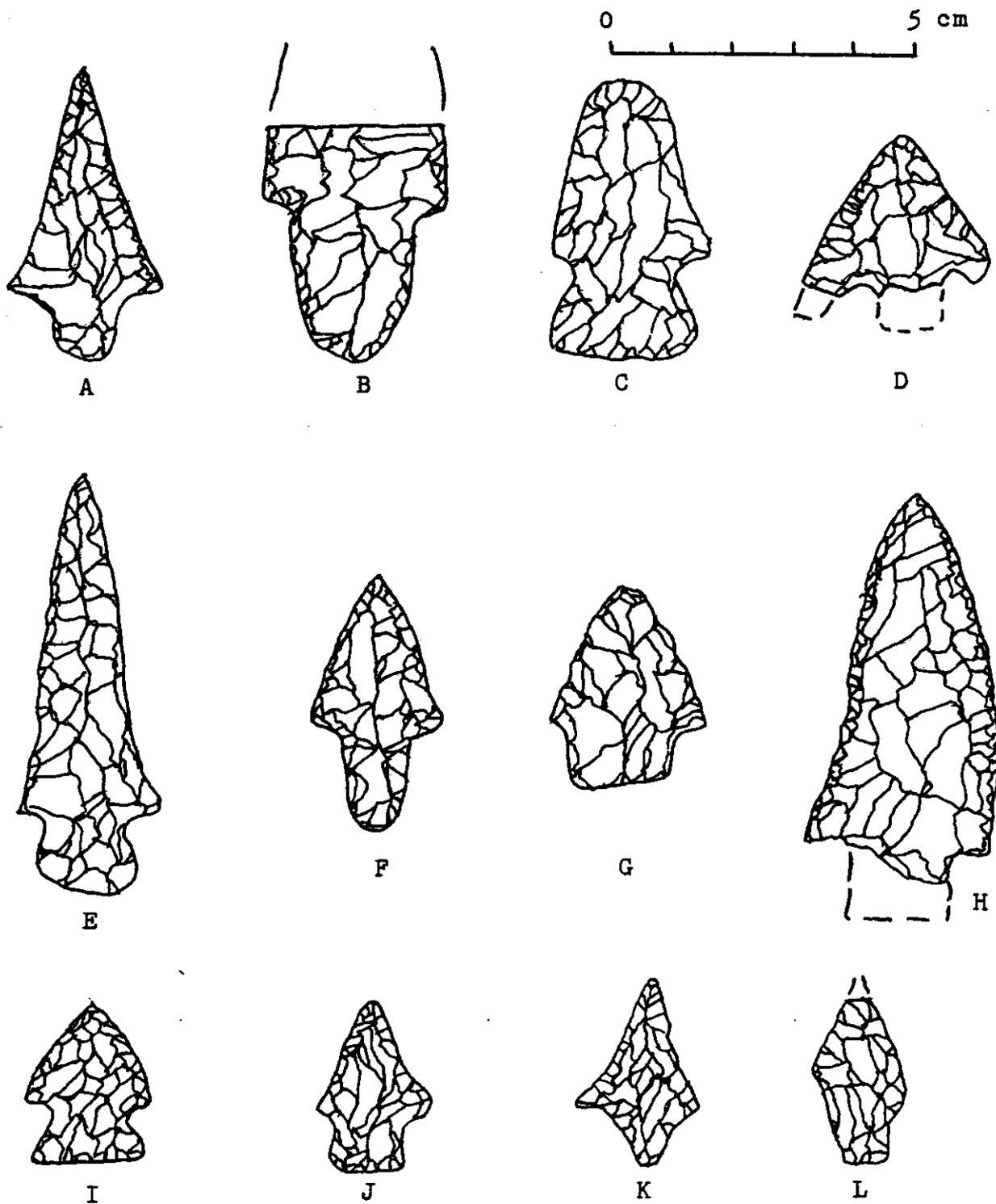
LOCATION "C" PROJECTILE POINTS, 40 TO 50 CM



A- Carrollton; B,C,D- Bulverde; E- Yarbrough; F,G,H- Kent;
I,J- Darl; K- misc. side-notched; L- unclassified

Figure 9

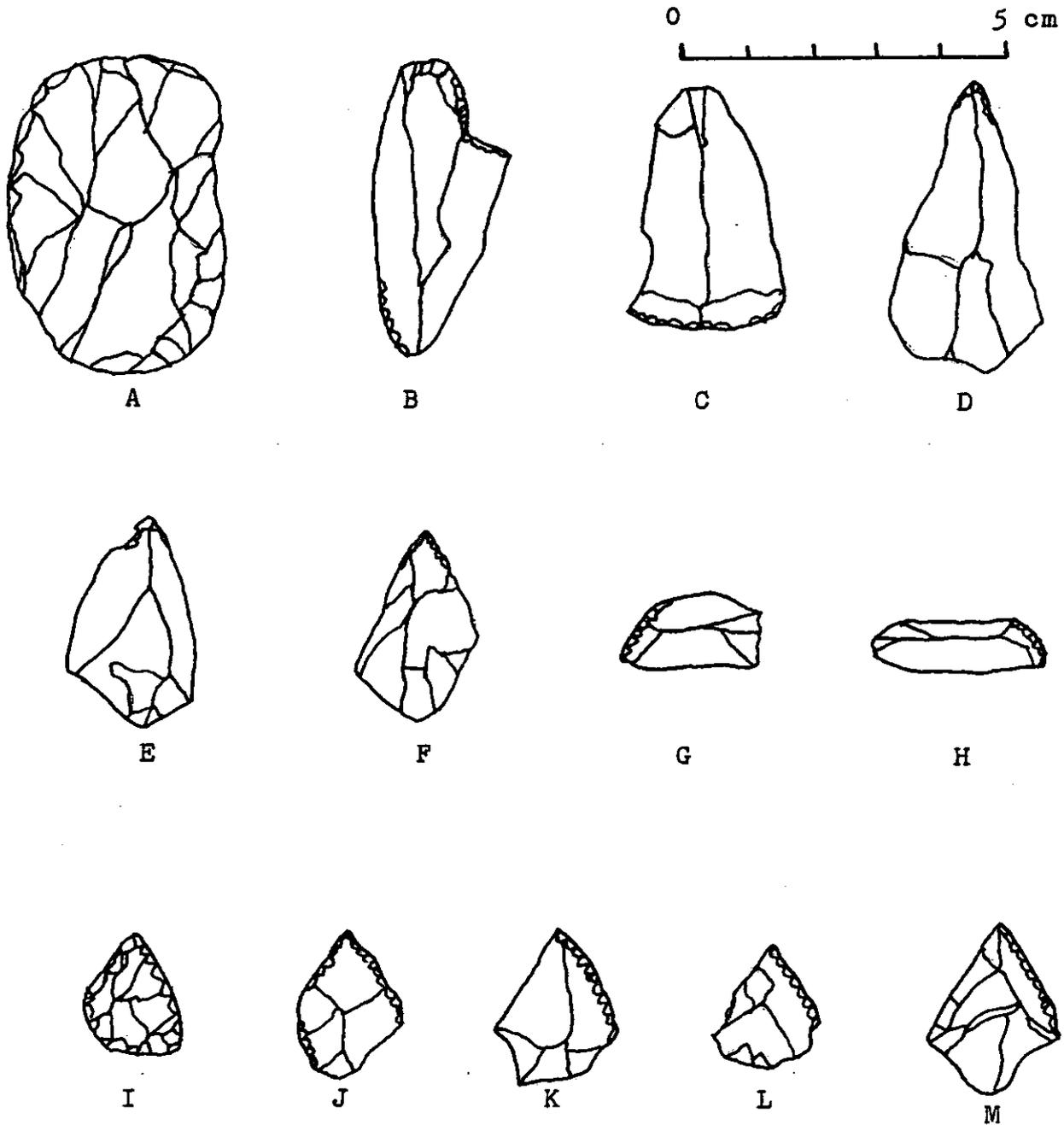
LOCATION "C" PROJECTILE POINTS, 40 TO 50 CM



A,B- Gary; C- Yarbrough preform; D- Schumla-like; E- Palmillas; F- Wells; G- Bulverde; H- Ponchartrain; I- Ellis; J,K,L- transitional dart/arrow points

Figure 10

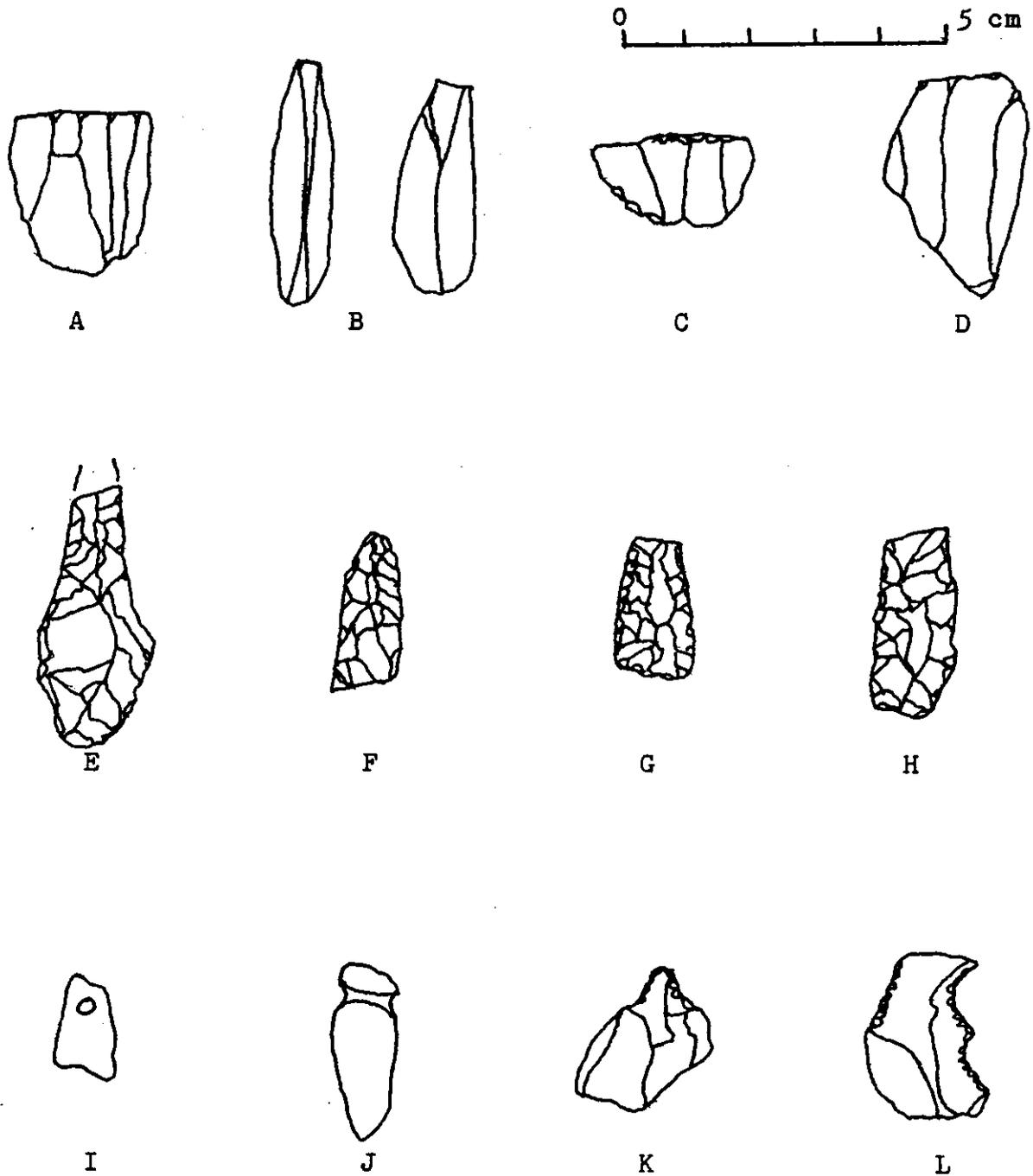
LOCATION "C" LITHIC ARTIFACTS, 40 TO 50 CM



A- preform; B- stemmed blade; C- end scraper; D,E,F- perforators;
G,H- inset blades; I- bifacial arrow point; J to M- unifacial arrow points

Figure 11

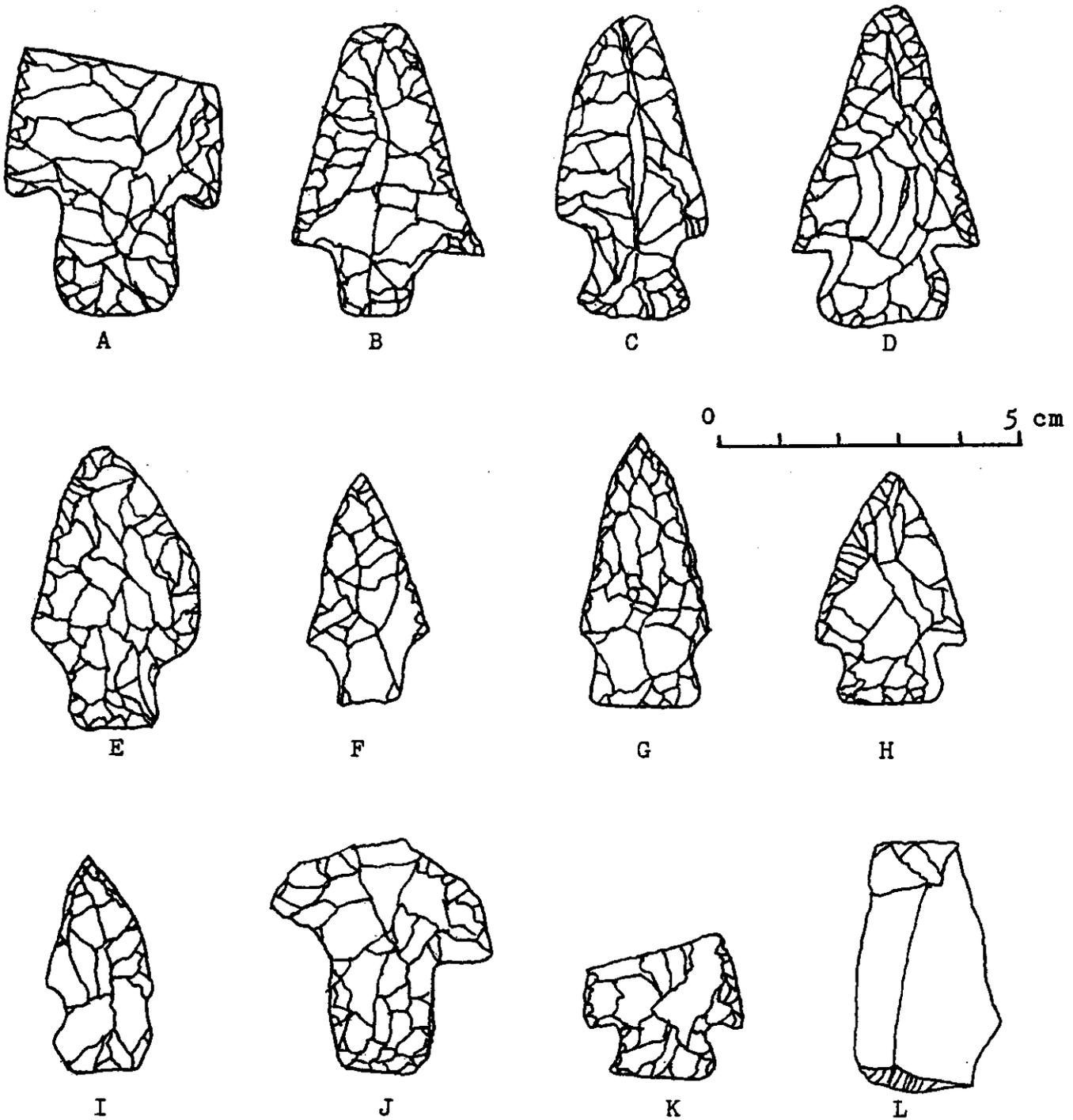
LOCATION "C" ARTIFACTS, 40 TO 50 CM



A- microblade core; B- prismatic blades; C,D- blade core trim flakes;
E to H- drills; I,J- bone pendants; K- graver; L- denticulate

Figure 12

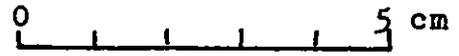
LOCATION "C" PROJECTILE POINTS, 30 TO 40 CM



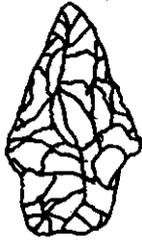
A,B- Bulverde; C- Yarbrough; D- Williams; E,F- Kent; G- Darl; H- Ellis;
I- unclassified; J- reworked Carrollton; K- Ellis; End scraper on a
prismatic flake

Figure 13

LOCATION "C" LITHIC ARTIFACTS, 30 TO 40 CM



A



B



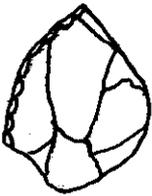
C



D



E



F



G



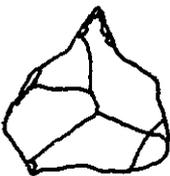
H



I



J



K



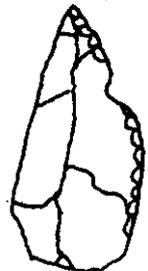
L



M



N

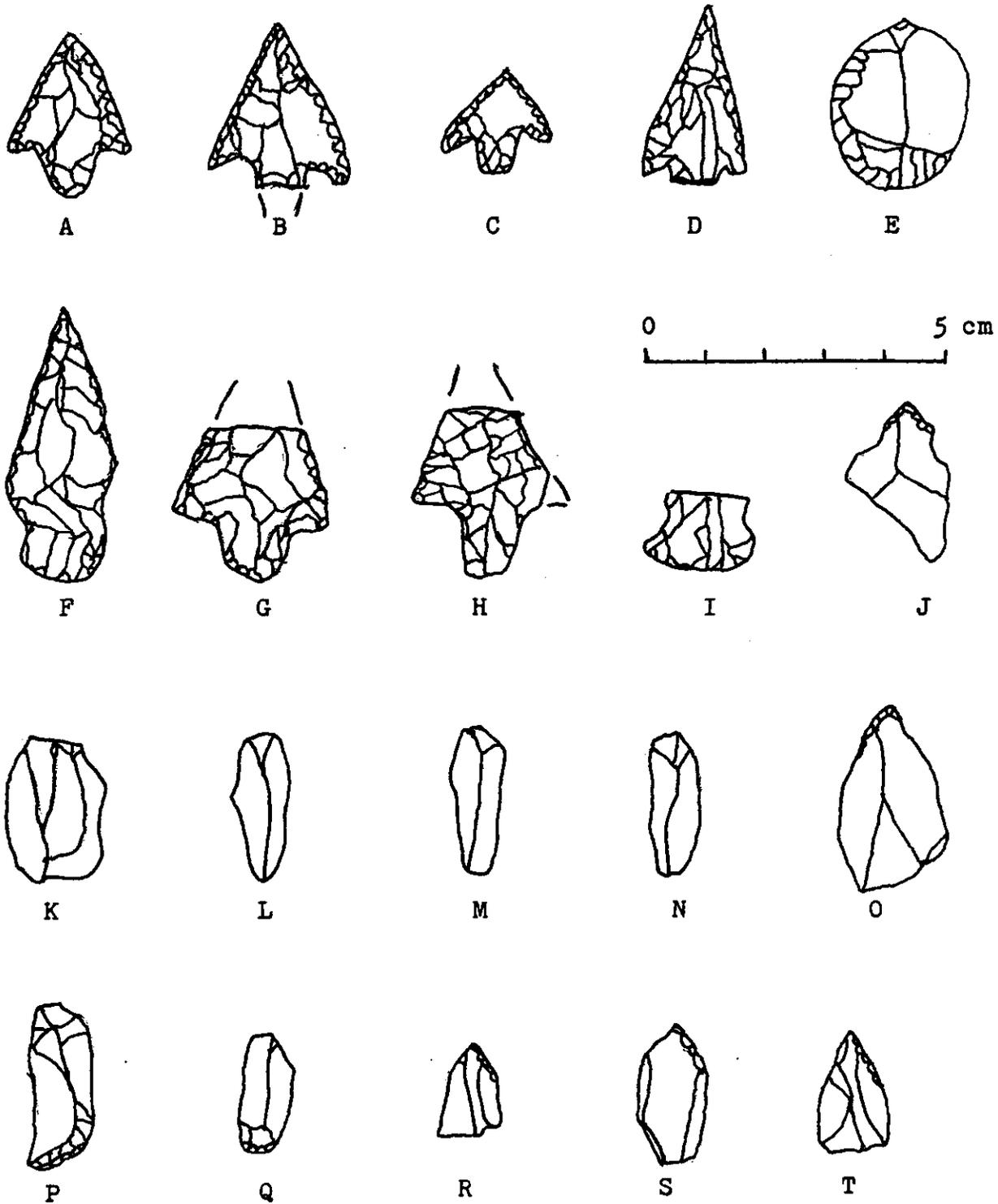


O

A,B,C- transitional dart/arrow points; D,E- Perdiz points; F to I- unifacial arrow points; J- inset blade; K,L- graters; M,N- prismatic blades; O- perforator

Figure 14

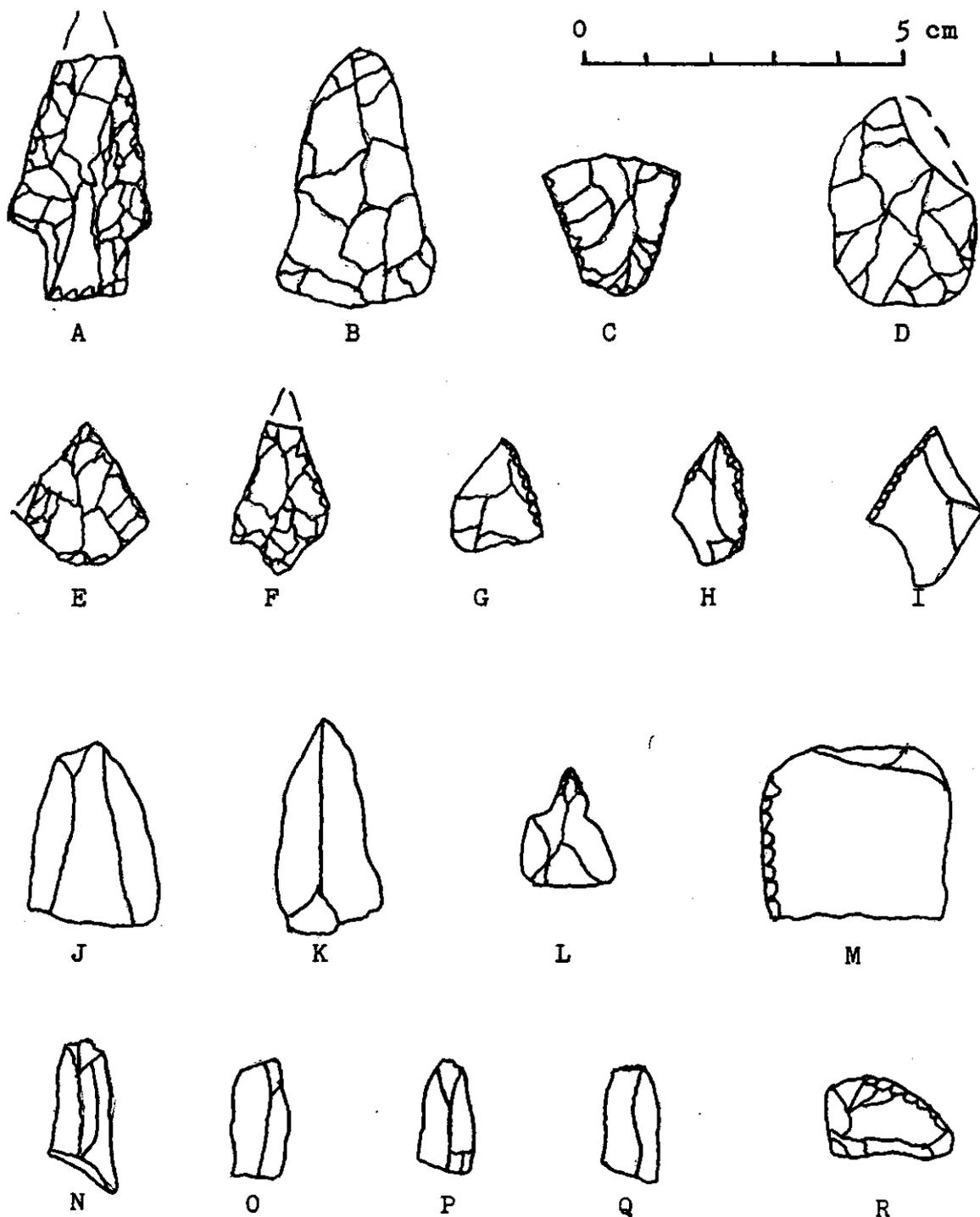
LOCATION "C" LITHIC ARTIFACTS, 20 TO 30 CM



A,B,C- Perdiz points; D- Catahoula variant; E- scraper; F- Kent point; G,H- Gary points; I- dart point stem; J- graver; K- blade core trim flake; L,M,N- blades; O- perforator; P,Q- inset blades; R,S,T- unifacial arrow points

Figure 15

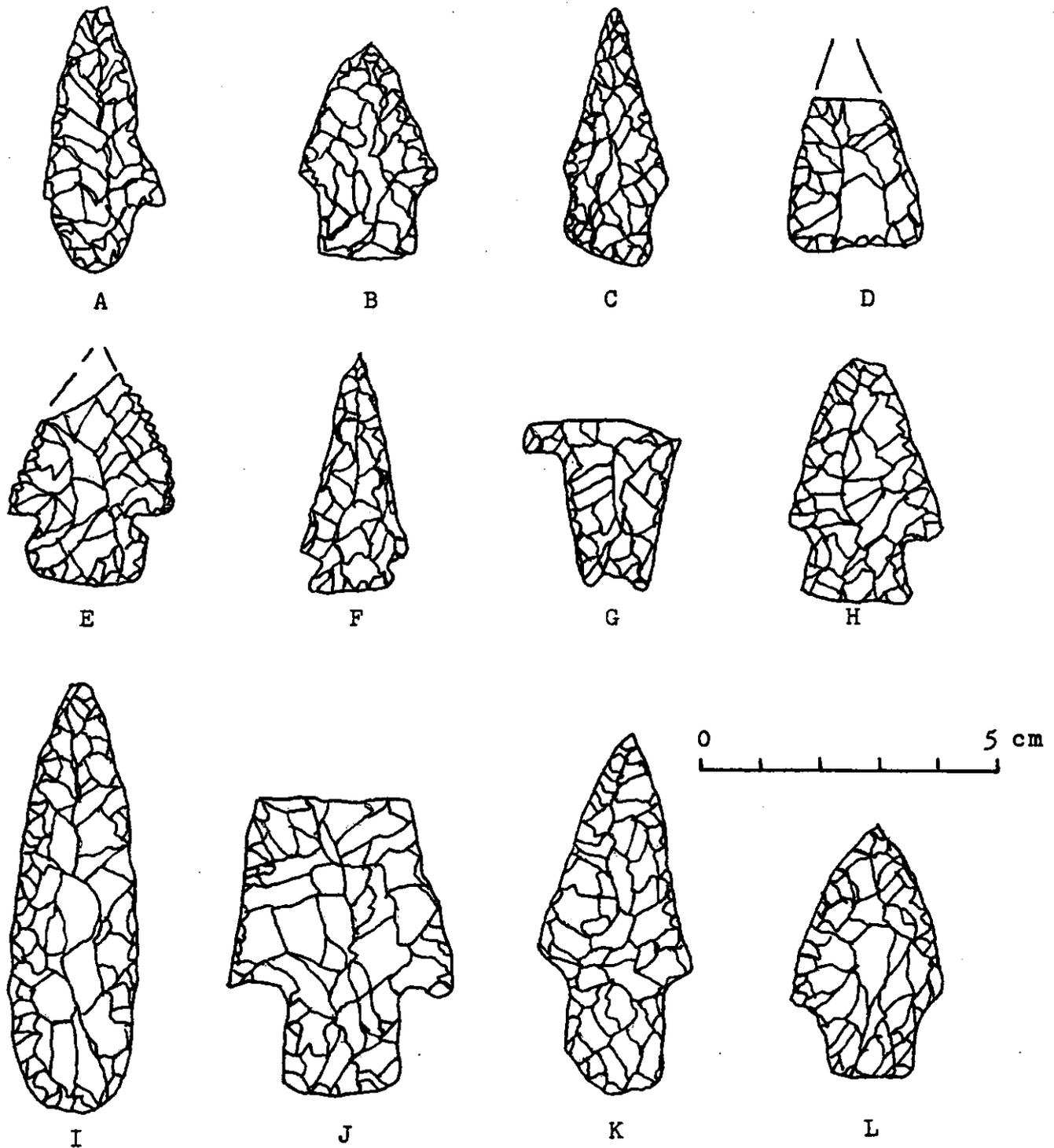
LOCATION "C" LITHIC ARTIFACTS, 10 TO 20 CM



A- Kent point; B,D- dart point preforms; C- dart point stem;
E- unclassified arrow point; F- Perdiz point; G,H,I- unifacial
arrow points; J- blade core trim flake; K,L- perforators;
M- scraper; N to Q- microblades; R- inset blade

Figure 16

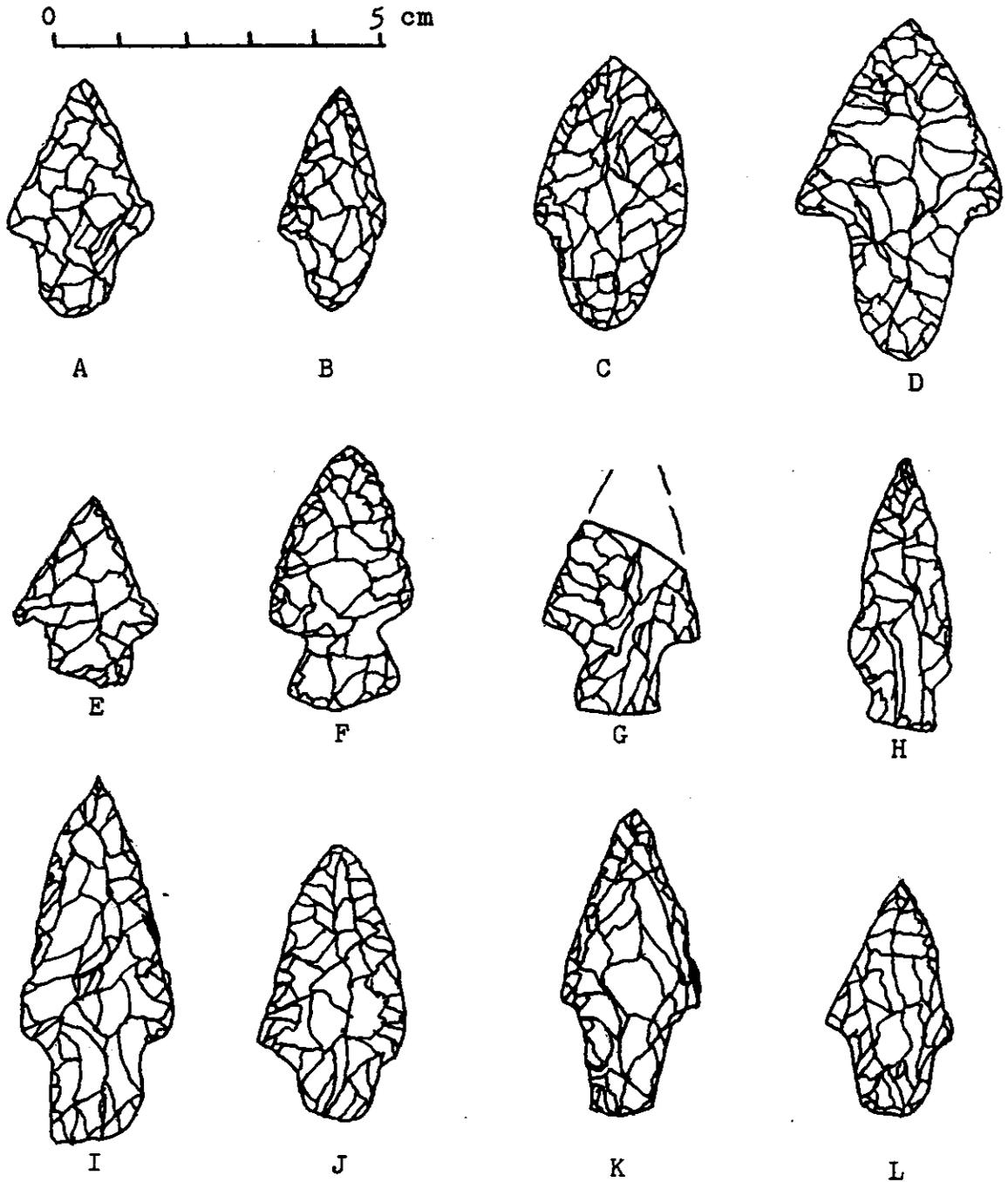
LOCATION "C" PROJECTILE POINTS, SURFACE AND MIXED STRATA



A- Kent; B,C- Darl; D- Tortugas; E- Palmillas; F- Ensor;
G- Pedernales; H- Yarbrough; I- Refugio; J,K,L- Bulverde

Figure 17

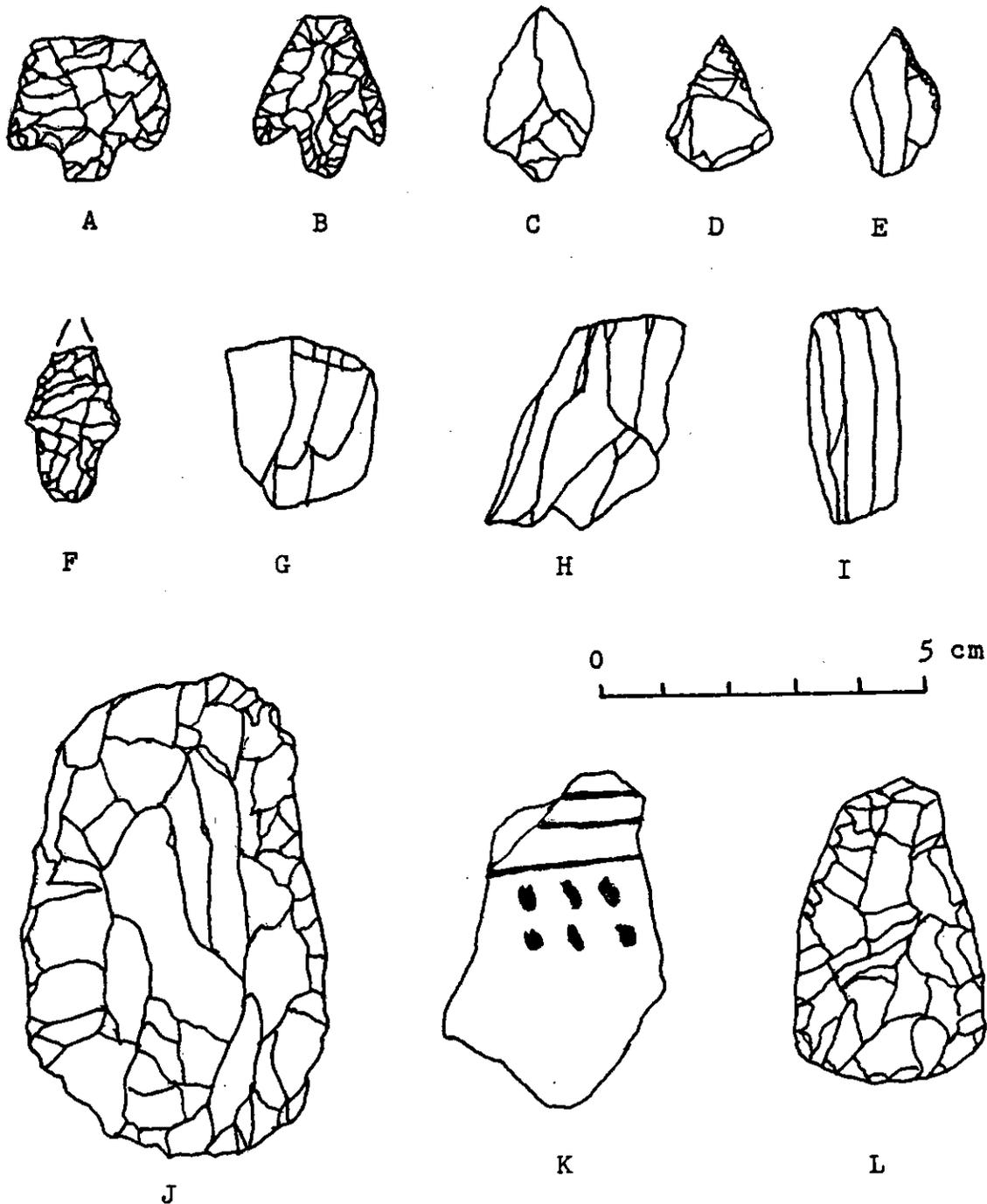
LOCATION "C" PROJECTILE POINTS, SURFACE AND MIXED STRATA



A to D- Gary; E, F, G- Ellis; H to L- Kent

Figure 18

LOCATION "C" ARTIFACTS, SURFACE AND MIXED STRATA



A- Alba point; B- Perdiz point; C,D,E- unifacial arrow points;
F- transitional dart/arrow point; G- blade core trim flake;
H,I- microblade cores; J- bifacial tool; K- Goose Creek incised
sherd; L- dart point preform

Figure 19

FLAKE SIZE CHANGES WITH TIME

