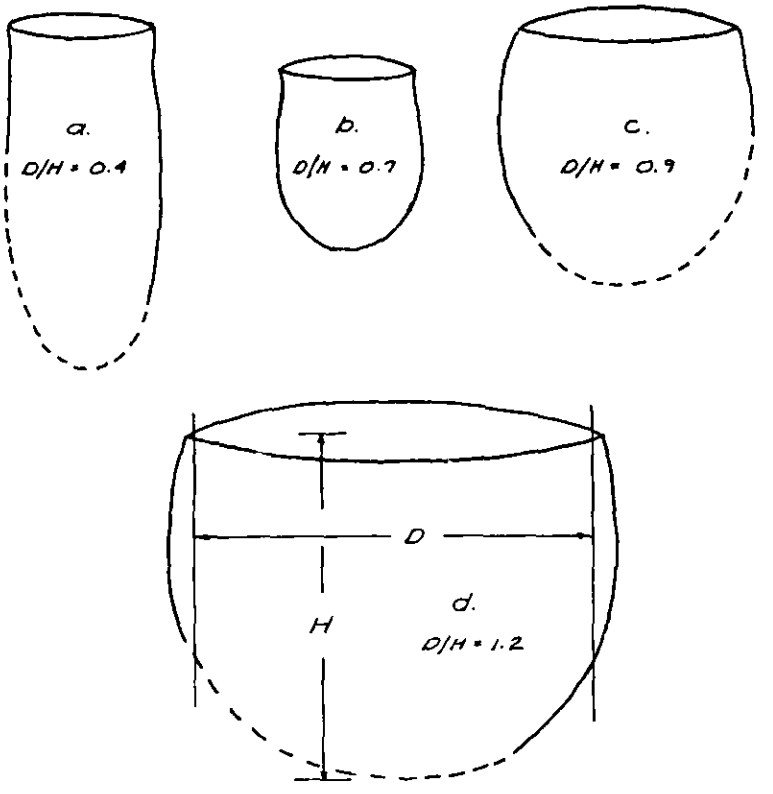
JOURNAL
HOUSTON ARCHEOLOGICAL SOCIETY

Number 87 April 1987



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ISSN-8756-8071

A Method of Estimating Numbers of Vessels Represented by Large Collections of Potsherds

W. Marshall Black

Introduction

Goose Creek pottery and its variants are usually recovered only as sherds. A large excavation may yield thousands (Wheat 1953; Hole 1974). Relatively few caches of sherds from one vessel have been recovered so that reassembly can reveal the parent vessel form or shape (Wheat 1953; Ambler 1967; Black n.d.). Archeological reports on Southeast Texas sites typically give only counts of sherds by levels (Hole 1974). Some utilize the taxonomy proposed by Aten (1983), but it deals only with the nature of the matrix (sand tempered, grog tempered, etc.) and neglects vessel form.

It would seem useful to have a method for approximating the numbers and size ranges of vessels represented by large sherd collections. From this we might deduce more about how the people lived. This paper proposes a method for such approximation.

Propositions

1. That a reasonably good correlation exists between average vessel diameter, D, and its surface area for given ratios of average diameter-to-height ratios, D/H.
2. That residual sherd size (area) is independent of parent vessel size.
3. That most of the sherds from vessels in use at a site (or in a stratum) remain at the site or were consumed at the site.
4. That exotic vessel shapes either do not occur or can be readily identified.

Arguments

Proposition 1 is the key to the proposed method in that a pseudo-vessel-diameter can be inferred from sherd examination — by holding it, properly oriented (a judgement call), over a drawing of concentric circles covering a suitable range of diameters. (There are other methods of doing this [Patterson 1980].) Wheat (1953) reports a range of *rim* diameters from 2.4 inches to 17.5 inches, with most falling between 8 inches and 12 inches. This was in western Harris County. Ambler (1967) illustrates twelve reconstructed vessels with a range of *rim* diameters from 5 inches to 14 inches and averaging 8.8 inches. This was from the eastern area of the county. It would seem that, on the basis of *rim* diameters, the range of interest lies between 4 inches and 14 inches. At any rate, the collection would dictate the range to be considered.

Sherd examination reveals nothing about vessel height, the second dimension needed to infer vessel surface area. This leads to the issue of vessel form. Shapes reported by Wheat (1953) and Ambler (1967) are reproduced in Figures 1 and 2. Childers (1965) describes a vessel from Galveston Island that fits Figure 2b. The author has helped reconstruct two vessels from the Baytown area which are similar to Figure 4f. Duke (1964) reports a small, shallow bowl from the same area. Other unreported reconstructed vessels have been observed by the author in private collections (Figure 4g). This sample, though small, does not include any highly variant examples.

The surface area of this family of vessel shapes can be approximated by use of a simple geometric model: a hemispherical base topped by a cylindrical wall. For a given average diameter D, the height H can be varied to yield a suite of diameter-to-height ratios, D/H. The average diameter is

not the rim diameter, rather it is a judgement call of that diameter of the upper wall portion which will average out bulges; the deviation of base shape from spherical has some impact on this call. Figures 1, 2 and 4 show judgemental values of D/H.

A D/H of 2.0 is simply a hemispherical shape, Figure 2d. A D/H of 0.4 to 0.5 is a tall, narrow vessel, Figures 1a and 2f. The author postulates that the D/H range of interest is from 0.5 to 2.0 and that a narrower range of 0.8 to 1.2 would probably contain the mean. D/H ratios of 0.8 to 1.2 provide large capacity relative to surface area, would not be unwieldy and, in the author's experience, are not difficult to form by coiling. This shape is far more likely to survive open firing than are the vessels with very low or very high D/H values when the diameter exceeds about 6 inches. This is a matter of achieving an even temperature overall. The average D/H ratio for all vessels shown in Figures 1 and 2 is 1.12.

Figure 3 is a sample graph showing area versus average diameter for a range of D/H ratios. The method of calculating the curves is explained in the Appendix. The *points* on this graph are intended to show the reasonableness of the proposed model. A suite of seven actual vessels, Figure 4, were carefully measured to determine the D/H ratio, the D value and surface area. Note that examples 4a-c are not strongly in the Goose Creek 'family.' Examples 4d-g are replicas made by the author. Table 1 gives the measurement data; the data for all seven vessels fit the correlation very well.

Proposition 2 says that in the long run large vessels do not yield proportionately large sherds and vice versa. Any earthenware vessel when first broken (either from use or during firing) will yield large sherds. But large sherds are invaluable to pottery manufacture by primative methods for shielding a vessel while it is being fired. This is but one use of broken pottery which leads to sherd size reduction. Midden traffic is another. Then there are natural forces that burial over 500 to 1000 years brings to bear. Fortuitous caches often yield large and clearly related sherds that can be reassembled to speak for themselves.

Thus the second step of the method is to estimate sherd area using drawings of square, rectangular and triangular shapes of various areas. Precision is not required.

Propositions 3 and 4 are not believed to be unduly tenuous. It can be argued that small cup- or bowl-like vessels are less susceptible to breakage, are easily transportable, and, therefore, more likely to be taken from the site during the often-postulated seasonal migrations. This would be a plausible explanation for a paucity of small vessels. The proposition might be better if it were written with 'vessels broken during manufacture or use' instead of 'vessels in use.'

Application

For appropriately selected, large collections of sherds (entire site, stratum, taxonomy, etc.), a histogram is plotted for (1) estimated sherd diameters and (2) estimated sherd areas. Figure 5 shows a hypothetical example of each. For this illustration, the calculated mean sherd area of 1.95 square inches is used for all diameters (Proposition 2). The data from the diameter histogram has been used with Figure 3 to derive Table 2. This table suggests that the hypothetical collection of 1820 sherds represents 22 vessels of the indicated sizes. This is based on an assumed D/H ratio of 1.0. A smaller number of vessels would be estimated using the curve for D/H = 0.8.

We presently have no way of judging the reasonableness of this number of vessels, but some trials might become *relatively* meaningful when other attributes of the sites are known.

A possible interpretation

Consider a hypothetical site, a shell midden in the upper Galveston Bay area. The shell deposit occupies an area 40 by 80 feet, and is of uniform 1-foot thickness. Ten test excavations each 10 square feet in area have been made at uniformly dispersed locations. Artifact recovery from each pit was similar. All data suggest a Late Prehistoric period of occupation. A total of 1802 sherds were recovered. The histograms of Figure 5 were derived from this collection.

The lead archeologist elected to adjust the number of vessels, as shown in Table 2, upward using a factor of 3, this being his estimate of the ratio of site volume to excavated volume. He thus contemplates the following table:

Size (D), inches	3.5	4.5	5.5	6.5	7.5	8.5	9.5	10.5	11.5	total
No. of vessels	3	3	6	9	12	15	9	6	3	66

First he sees a near-normal distribution. The median size is about 8.0 inches and the average is 7.8 inches. The most common is 8.5 inches. Over the history of the site around 66 vessels were broken. (Here he should also have workups at a lower [0.8] and a higher [1.5] D/H ratio. This would decrease the number by about 25% or increase it by about 33%, respectively.) He keeps in mind that basketry was probably in use, and believes that pottery was primarily used for liquids. Thus he might contemplate that the preponderant use of pottery was for family or small group cooking, the 7.5-to-8.5 inch size being ideal for this purpose. He might ponder whether use of small vessels for personal purposes was a trait; only 10% of the sample is 4.5 inches or less in diameter. He might ponder whether the relatively small number of the largest sizes is attributable to difficulty of manufacture or to a specialized use for which there was smaller demand — say, for canoes. What would he conclude if the diameter histogram, Figure 5, had been skewed leftward, indicating a large number of small vessels; or vice versa? Or suppose data from one site were skewed leftward and another rightward.

It is the author's contention that use of the proposed method of analyzing sherd collections would give us much to contemplate.

Summary

A method has been proposed for estimating the number of vessels, in size ranges, represented by a large collection of Goose Creek ware sherds. The method involves recording only two laboratory measurements (diameter and area) which do not involve great precision, i.e., undue work. The method depends heavily on judicious selection of the appropriate diameter-to-height curve, and this is admittedly the main weakness. Even so, trial usages of the method with D/H ratios of around 1.0 should produce valuable *relative* data among sites. Experience is needed. The method could be applied to other pottery wares using an appropriate geometric model.

Acknowledgments

The author wishes to thank Mr. Alan Duke for his review and contribution of references, and Mr. Mike Marshall for his guidance to sites and private collections in the Baytown area and loan of his vessel reconstructions.

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Editor's note: The author was strongly urged to use metric units, but he declined.

Appendix

Method of calculating plotting points for a curve of surface area versus average diameter for ranges of D/H values (Figure 3)

Model: Assume hemispherical base with cylindrical wall.

Symbols: D = diameter of cylindrical portion and, therefore, also the diameter of the hemispherical portion
H = total height of vessel
h = portion of total height that is cylindrical
A_c = surface area of cylindrical portion
A_s = surface area of hemispherical portion

Formulae:

$$A_c = \pi D h \tag{1}$$

$$A_s = \pi D^2/2 \tag{2}$$

Procedure:

(1) Select a D/H ratio for the curve, say 1.0.

(2) Select a suitable range of values for D, say 6, 8 and 10 inches.

(3) Calculate an h value for each D value. For D/H = 1.0, H = D and h = H - D/2.

D = 6 inches	8 inches	10 inches
h = 3 inches	4 inches	5 inches

(4) Calculate A_c via Formula 1:

A_c = 56.5 square inches	100.5 square inches	157.1 square inches

(5) Calculate A_s via Formula 2:

A_s = 56.5 square inches	100.5 square inches	157.1 square inches

(6) Calculate total area = $A_c + A_s$:

Area = 113.0 square inches	201.0 square inches	314.2 square inches

(7) Plot area on y-axis and D on x-axis. These points are on the D/H = 1.0 curve of Figure 3.

Note that for D/H = 1.0 the area of the cylindrical portion is the same as the area of the hemispherical portion — a special case.

Also, D/H = 2.0 is a special case in that this inherently describes a hemispherical pot or bowl; there are no cylindrical walls, i. e., h = 0.

If D/H is significantly larger than 2.0, we must resort to a different model — an edge segment of a sphere. Measurements were made on one known example — a small bowl from Peggy Lake (Duke 1964). The rim diameter is 6.75 inches and the height (H) is 2.06 inches. By projection from a photograph, the diameter (D) of the nearly spherical base was estimated to be 8 inches. Thus in this case D/H = 3.88 ≈ 4.0.

The surface area of an edge "slice" of a sphere is given by:

$$A = \pi D H = \pi D^2/(D/H) \tag{3}$$

With D/H = 4.0, formula 3 yields the following areas for diameters of 6, 8, and 10 inches:

A = 28.3 square inches	50.3 square inches	78.5 square inches

This curve has been plotted as a dashed line in Figure 3, labeled D/H = 4.0.

Table 1. Measurements of vessels shown in Figure 4

vessel number	rim dia. (in.)	max. dia. (in.)	avg.[a] dia. (D) (in.)	height (H) (in.)	D/H[a]	surf.[a,b] area (in.^{2})	example[c] no. of sherds
1	4.5	4.6	4.4	3.9	1.13	62	21
2	6.0	6.5	6.2	4.1	1.51	82	27
3	8.1	8.1	7.1	4.6	1.54	105	35
4	6.0	6.6	5.8	8.6	0.67	163	54
5	9.0	9.0	7.4	8.0	0.93	188	63
6	7.9	8.0	6.9	9.0	0.77	196	65
7	8.7	10.6	8.8	14.0	0.63	391	130

(a) "check" points plotted in Figure 3
(b) Circumference was measured at each inch (or fraction) of height.
(c) at an arbitrary 3.0 square inches per sherd

Table 2. Estimation of number of vessels — the hypothetical collection
D/H = 1.0

average diameter (in.)	vessel[a] area (in.^{2})	no. sherds[b] per vessel	no. sherds[c] recovered	no. of vessels represented by sherds recovered	probable[d] number of vessels
< 4 (avg. 3.5)			2		1
4.5	65	33	30	0.91	1
5.5	95	49	100	2.04	2
6.5	132	68	200	2.94	3
7.5	175	90	300	3.33	4
8.5	230	118	500	4.23	5
9.5	285	146	400	2.73	3
10.5	350	179	250	1.39	2
> 11 (avg. 11.5)			20		1
			1802		22

(a) from Figure 3 at D/H = 1.0
(b) at 1.95 in.^{2} per sherd; mean from histogram, Figure 5
(c) from histogram, Figure 5
(d) rounded up per Proposition 3

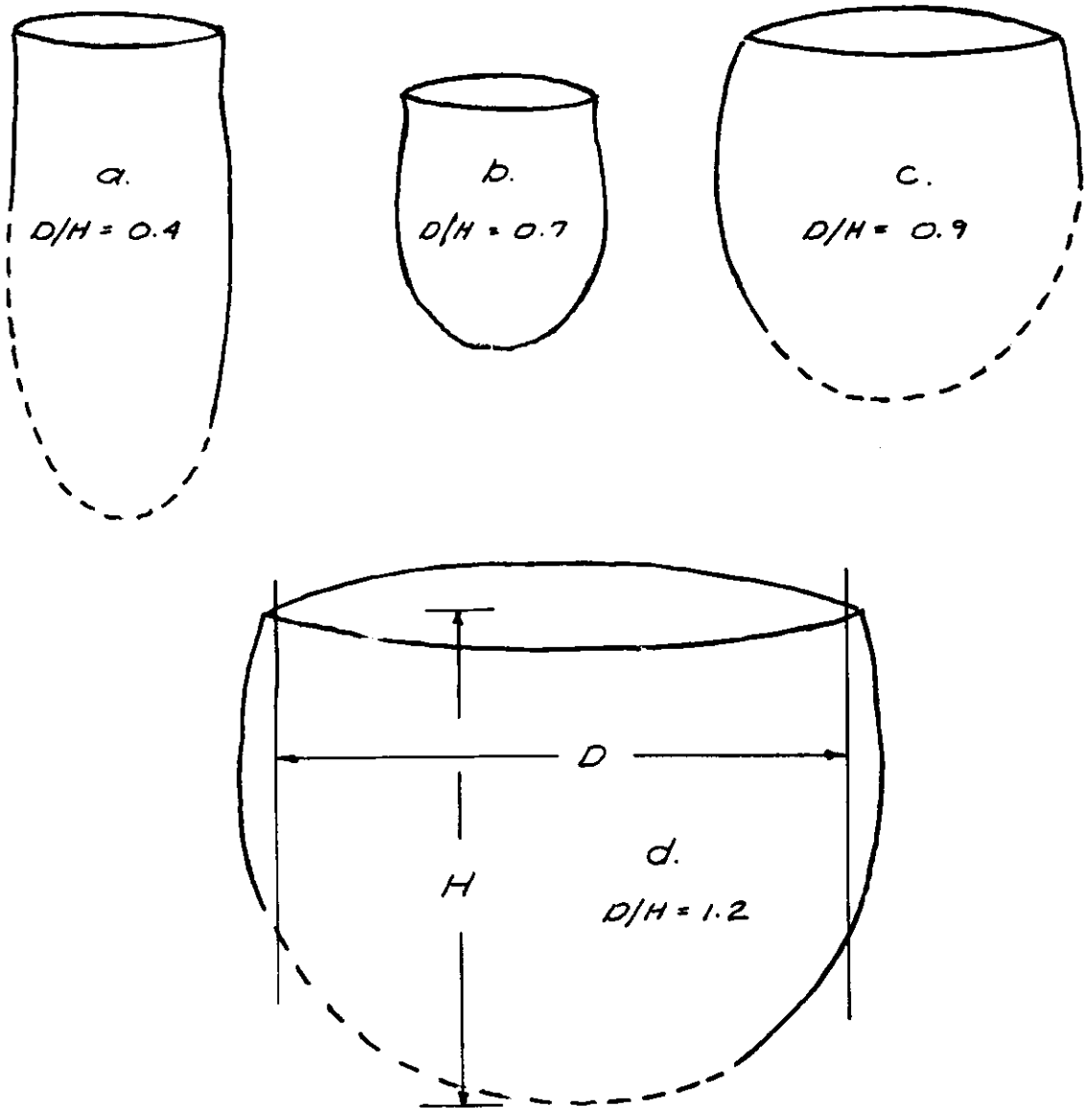


Figure 1. Vessel shapes (no scale available) (Wheat 1953)

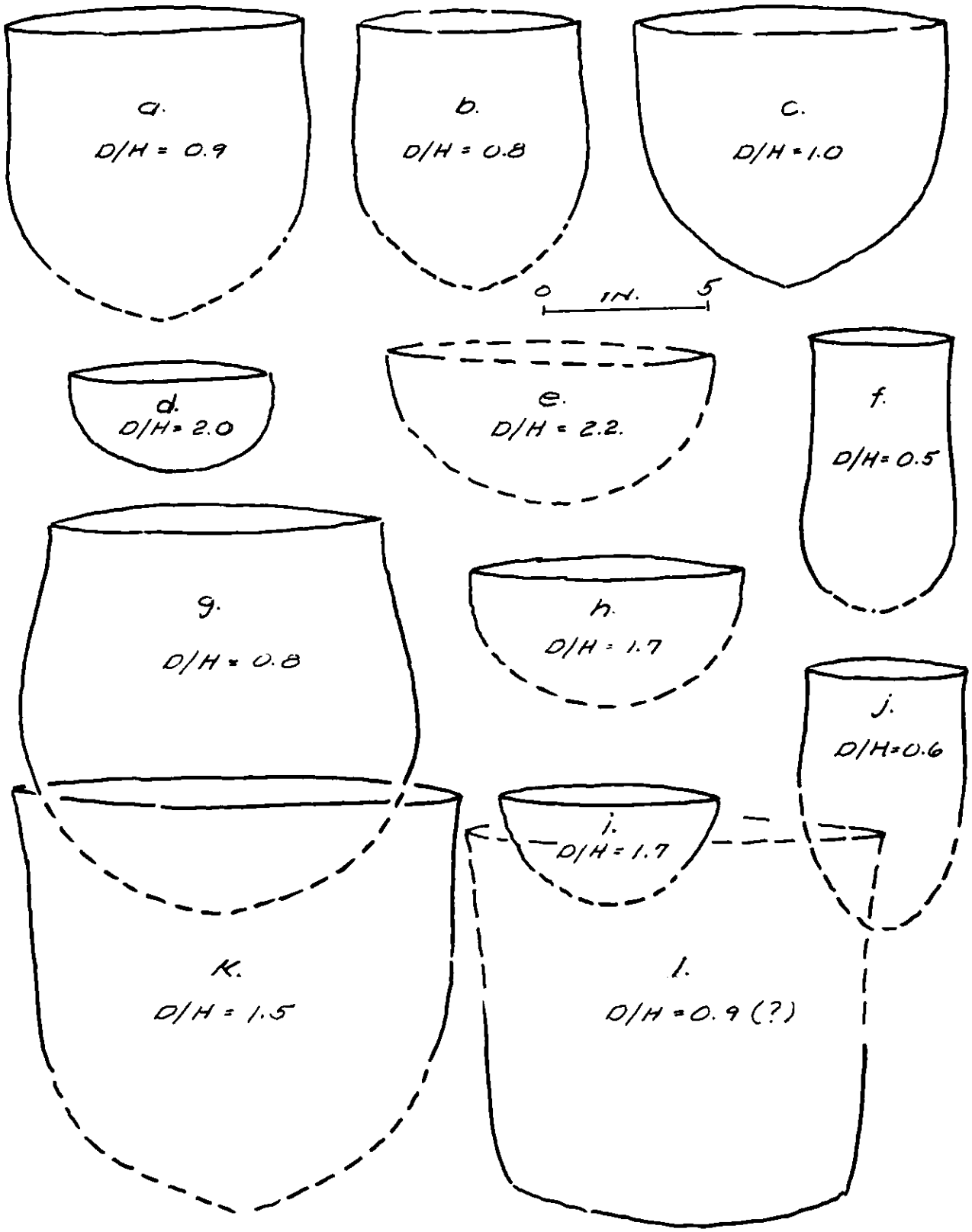


Figure 2. Vessel shapes (Ambler 1967)

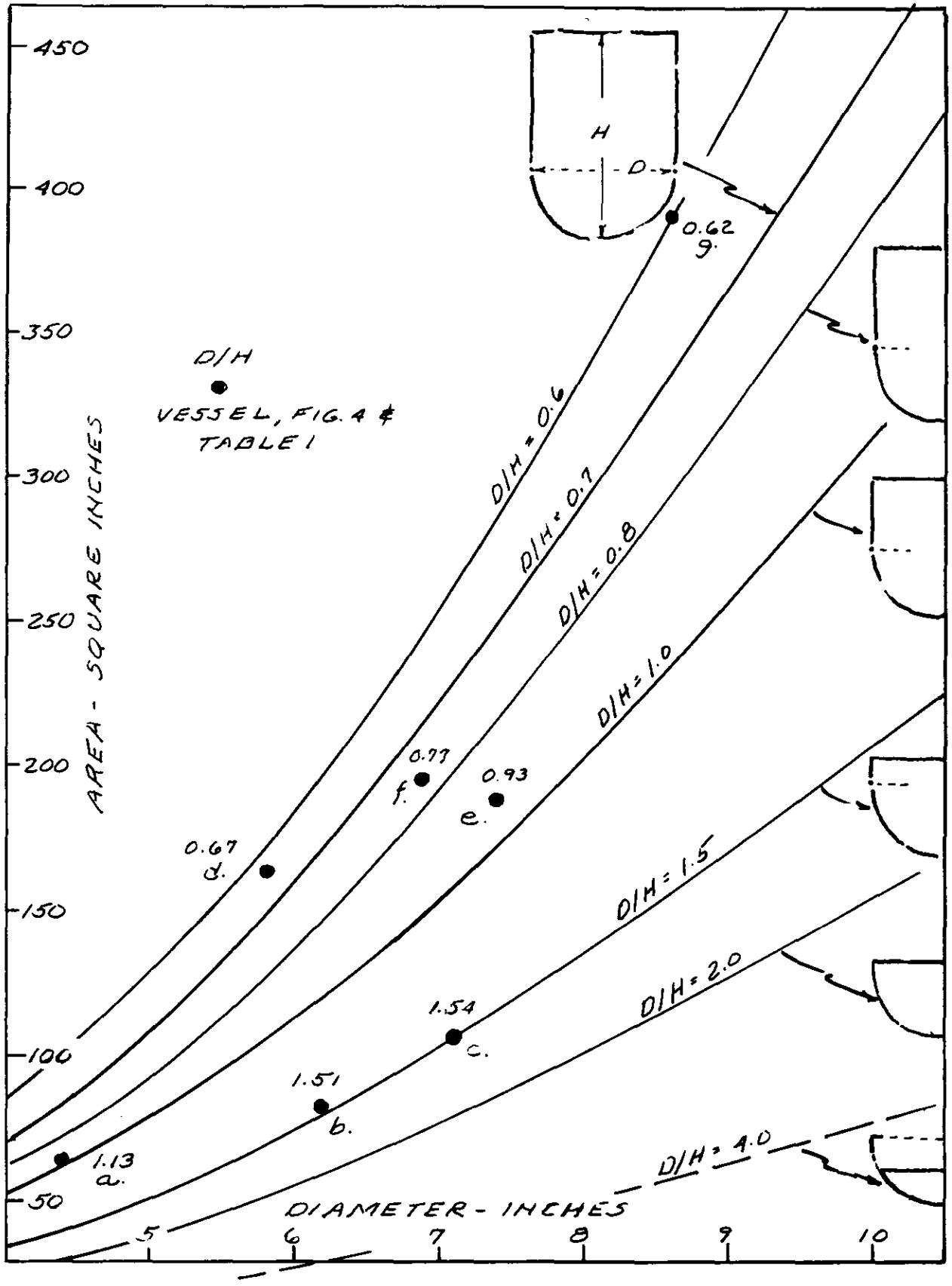


Figure 3. Sample D/H curves

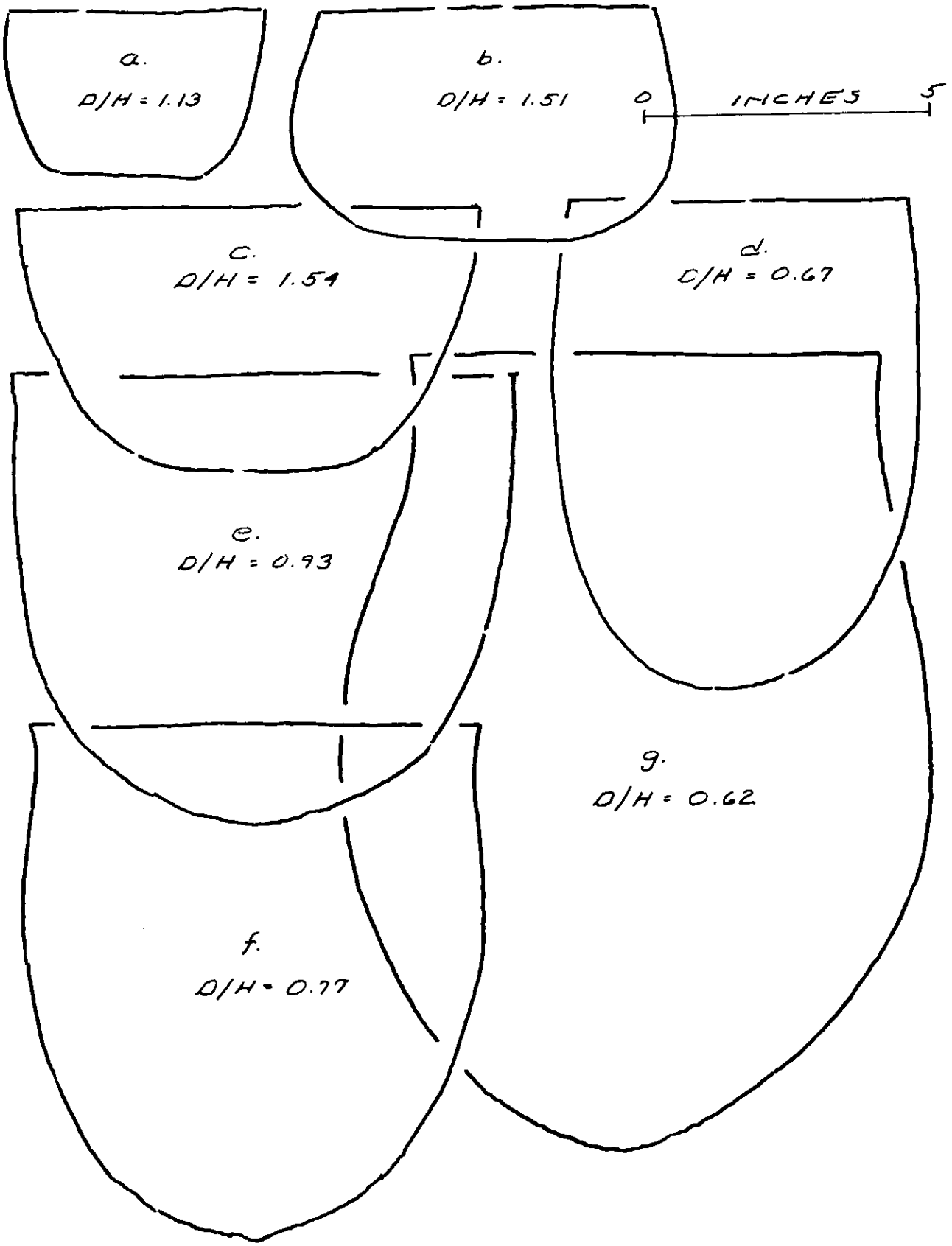
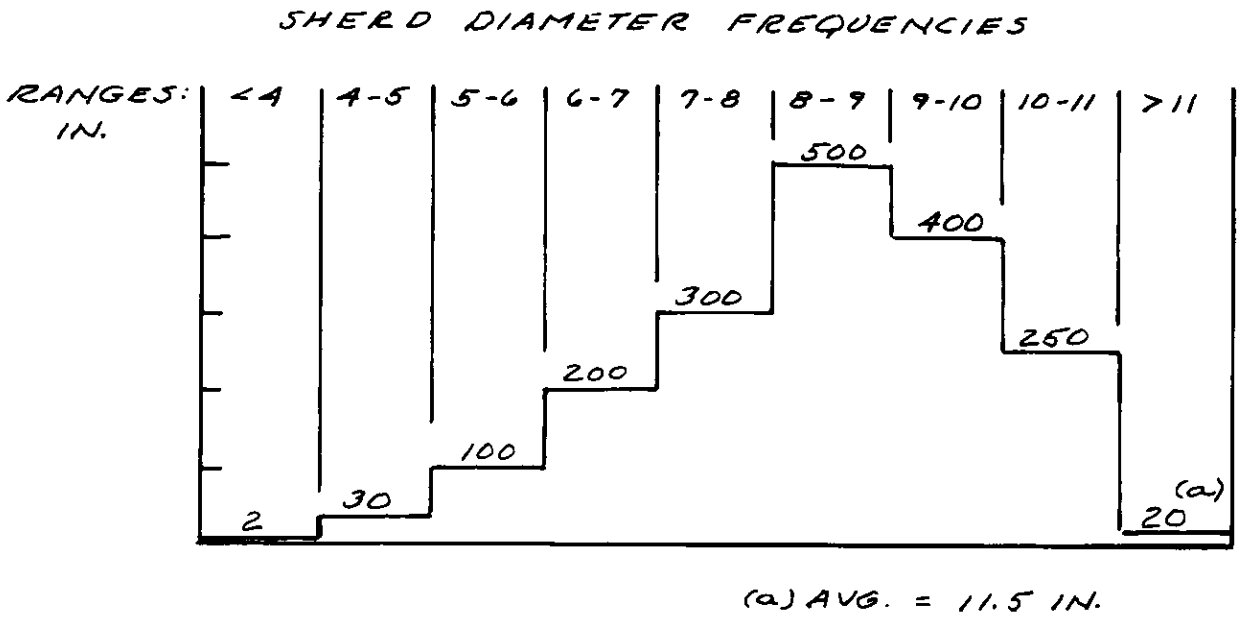


Figure 4. Vessel shapes measured for Table 1



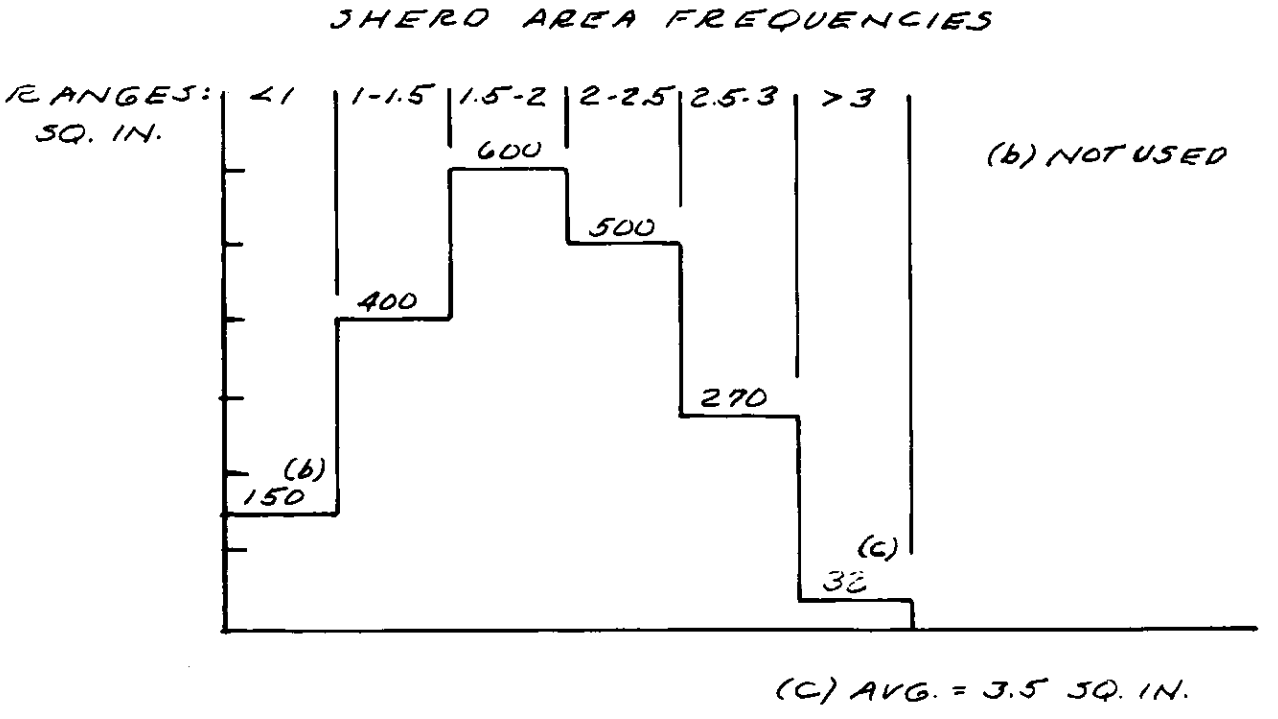


Figure 5. Histograms for a hypothetical collection of 1802 sherds

Test Excavations at Site 41FB32, Fort Bend Co., Texas

L. W. Patterson and J. D. Hudgins

Introduction

This article describes the results of test excavations at Site 41FB32 in Fort Bend County, Texas, done by the Houston Archeological Society on November 8, 1986. This is another prehistoric site that has been tested as part of a continuing program by HAS to contribute to the archeological data base of the upper Texas coast. Work was made possible through the courtesy of the landowner, Helen Ragsdale.

Site 41FB32 was originally found and reported by Joe Hudgins on the basis of surface finds of small flint flakes and freshwater shellfish remains. The location is on a high ridge that projects from the main high terrace on the bank of the San Bernard River. The general location is a mixture of woodlands and coastal prairie.

Excavation work was done under the overall direction of HAS Field Director, Sheldon Kindall. Participants in these excavations included Dave Atherton, C. Crittendon, Diane Crittendon, C. R. Ebersole, Joan Few, Lonnie Griffin, Troy Herndon, Joe Hudgins, Mike Johnston, Sheldon Kindall, Linda Moorrees, John Napier, Lee Patterson, Bill Schurmann, Dudgeon Walker and Mike Woods. Artifacts were later cleaned and sorted in laboratory sessions under the direction of David Pettus.

Results of these excavations provide data on the nature of this site, including approximate chronology and faunal subsistence details. Site 41FB32 appears to be a seasonal campsite that was used for a considerable time interval during the Middle and Late Archaic, and perhaps even earlier. This site is similar to nearby Site 41FB34 (Patterson and Hudgins 1986).

Test excavations of this type are an efficient way to obtain archeological data. A one-day effort with sufficient manpower can give a fairly detailed picture of the nature of a site with minimal overall site disturbance.

Excavation details

To test the nature of this site, six one-meter square test pits were dug as shown in Figure 1, drawn by Sheldon Kindall. Test Pits A, B and C were at a lower level on the downslope to the south toward the river. Test Pit D was at an even lower level on the side of the ridge, where there is considerable downslope to the east.

All soil was put through 1/4-inch screens. In Pit F, a 10-cm-square column was removed for fine screening in order to recover small-size materials such as fish bone.

Adjustments have been made in excavation levels to obtain equivalent time-period levels for the various test pits. There is a deep soil overburden on Pits E and F, possibly due to erosion deposits during modern farming. Other test pits had much less culturally sterile overburden. It appears that the ridge slope was less steep during the times of prehistoric Indian occupations.

All data presented here refers to equivalent levels (EL). For Test Pits A, B, C, E and F, equivalent levels were established by equating the top level of each test pit as the first excavation level where artifacts were found. The 0-10 cm EL for these pits were the following actual levels: A (10-20 cm), B (10-20 cm), C (10-20 cm), E (60-70 cm), F (70-80 cm). Several top strata of Pit D had apparently been removed by natural erosion, so the equivalent levels for Pit D were established by equating the soil change at the lowest excavation level of Pit D with the same soil change at the 80-90 cm EL of Pit F. This soil change was from a brown sandy soil to a light tan sandy soil.

Work on the various test pits did not progress at the same rate. Only Pits E and F were dug deep enough to reach culturally sterile soil.

Faunal remains

Faunal remains from this site consist of bone, gar scale and shell of freshwater shellfish and snail. As with nearby Site 41FB34 (Patterson and Hudgins 1986), preservation of bone materials was very good, due to high soil alkalinity maintained by the shell deposits. Remains of deer, turtle and gar seem to be common. W. L. McClure will do a separate detailed analysis of faunal remains from this site. A summary of the weights of bone materials recovered from each test pit for various equivalent excavation levels is given in Table 1, and a similar summary for shellfish remains is given in Table 2.

The use of shellfish at sites such as this should be regarded as the exploitation of just one additional food resource rather than as a major dietary adaptation, for two reasons. First, the available quantities of shellfish appear to have been limited. The amount of shellfish remains at this site is relatively low compared to that of a typical coastal Rangia brackish water shellfish midden. Second, freshwater shellfish would not have been a high-value food resource in terms of available food energy (Parmalee and Klippel 1974).

Clayballs

A number of fired clayballs were recovered in these excavations. Table 3 gives a summary of the weights of clayballs for each test pit at the various excavation levels. The use of fired clayballs in cooking operations covers a long time interval in this region, from the Paleo-Indian to the Late Prehistoric time period (Patterson and Hudgins 1983). At most inland sites, however, fired clayballs are not associated with shell deposits, as at this site and nearby Site 41FB34 (Patterson and Hudgins 1986).

Projectile points and chronology

Site 41FB32 appears to be an Archaic period site that was occupied for a long time period before the introduction of pottery in this region. The Archaic period in this region is a time interval of approximately 5100 years, from 7000 B.P. to 1900 B.P. (Patterson 1979:106). The Archaic period terminates by definition with the introduction of ceramics.

An estimate of the chronological sequence of this site is based on projectile point types. A Gary dart point stem was found at the 10-20 cm EL in Pit C (Figure 2A). Gary points are not very time-diagnostic as they occur over a long time interval (Patterson 1983:Table 1). A Pedernales dart point stem was found at the 40-50 cm EL in Pit B (Figure 2B), and a straight-stemmed dart point stem was found at the 70-80 cm EL in Pit F (Figure 2C). The straight stem might be associated with the Bulverde dart point type. Prewitt (1981:49) gives a time placement of 3400 B.P. to 2400 B.P. for the Pedernales point in central Texas, while Hall (1981:49) gives a date range of 4610 B.P. to 3530 B.P. for the Pedernales point at a site in Austin County. Prewitt (1981:79) gives a time placement of 4000 B.P. to 3400 B.P. for the Bulverde point in central Texas, immediately prior to the Pedernales point time range. Both the Pedernales stem and the straight stem had ground lateral edges. While edge grinding of Pedernales point stems is not common, this attribute was also noted at Site 41FB34 (Patterson and Hudgins 1986).

It is concluded that this site represents a long occupation sequence during the Middle and Late Archaic periods, perhaps starting even earlier in the Early Archaic period. Several miscellaneous

straight-stemmed Bulverde-like points were found at nearby Site 41WH19 (Patterson and Hudgins 1983) in what are judged to be the Early and Middle Archaic period levels. Over 80 cm of dense deposits of cultural materials at this site is another indication of a long occupation sequence.

Only stem fragments of dart points were found at this site; there were no whole dart points. It is common in this region to find high proportions of basal fragments of dart points. This appears to represent projectile points that were broken during the hunt. Then, broken basal fragments that remained hafted to the spear shaft were discarded at the campsite during replacement of the broken projectile point (Patterson 1980a).

Unclassified dart point fragments were found at the 50-60 cm EL in Pit B and the 30-40 cm EL in Pit F.

General lithic technology

Most of the chert flakes recovered here appear to be bifacial thinning debitage. The majority of the flakes are thin (under 5 mm thick), and several of the flake samples for test pits at various levels had exponential flake size distribution curves that are characteristic of bifacial reduction processes (Patterson 1982). In general, however, the flake sample sizes were too small to permit a good analysis of this type. The weights of flake samples are summarized in Table 4, and flake counts are given in Table 5. Another indication of biface manufacturing activities are the dart point preform fragments found at the 40-50 cm EL (Figure 2D) and the 30-40 cm EL (Figure 2E) in Pit A, and the large biface fragment found at the 80-90 cm EL in Pit E (Figure 2F). Other miscellaneous biface fragments were found at the 50-60 cm EL in Pit C, the 30-40 cm EL in Pit F, and the 40-50 cm EL in Pit F. A small quartzite hammerstone, 35 mm in diameter and 13 mm thick, was found in Pit B at the 70-80 cm EL.

All of the chert appears to be of fairly local varieties. There is evidence of heat treating of chert at all test levels, in the form of some flakes with reddish coloration, waxy luster or with potlid surface fractures.

The percentages of flakes over 15 mm square in Table 5 show a trend toward a higher proportion of large-size flakes in earlier time (at deeper excavation levels). This trend has been observed for other sites in this region, such as 41HR315 in Harris County (Patterson 1980b:Figure 19) and 41WH19 in Wharton County (Patterson 1984). A decrease in the proportion of larger size flakes toward later time is caused by changes in lithic manufacturing patterns. This trend in flake size distribution from lower to upper excavation levels is another indication of a long occupation sequence at Site 41FB32, as a short occupation sequence would not have much change in flake size distribution.

A summary of the remaining cortex on flakes of sizes over 15 mm square is summarized in Table 6. In general, the percentages of flakes with remaining cortex (primary or secondary flakes, covered with cortex or partially covered with cortex, respectively) are relatively low, in comparison with results of experimental work in flaking chert cobbles (Patterson 1981). This is an indication that trimmed lithic raw materials, instead of whole chert cobbles, were brought to this site. Another indication of this is the lack of worked chert cores. Only one chert cobble fragment was found, at the 40-50 cm EL in Pit F.

No formal type of unifacial stone tool was found at this site. This is consistent with a previous observation that the utilized flake was the main tool type used in this region during the Archaic period (Patterson and Hudgins 1985:162).

Summary

Site 41FB32 appears to have an occupation sequence of several thousand years during the Archaic period. This location represents a campsite of nomadic hunter-gatherers with significant use of freshwater shellfish from the adjacent river. As with nearby Site 41FB34 (Patterson and Hudgins 1986), the good preservation of faunal materials provides significant additional data on subsistence patterns in this region.

Results from work at this site are another example of the value of short-time test excavations in providing an efficient method to obtain detailed data on the nature of a prehistoric site.

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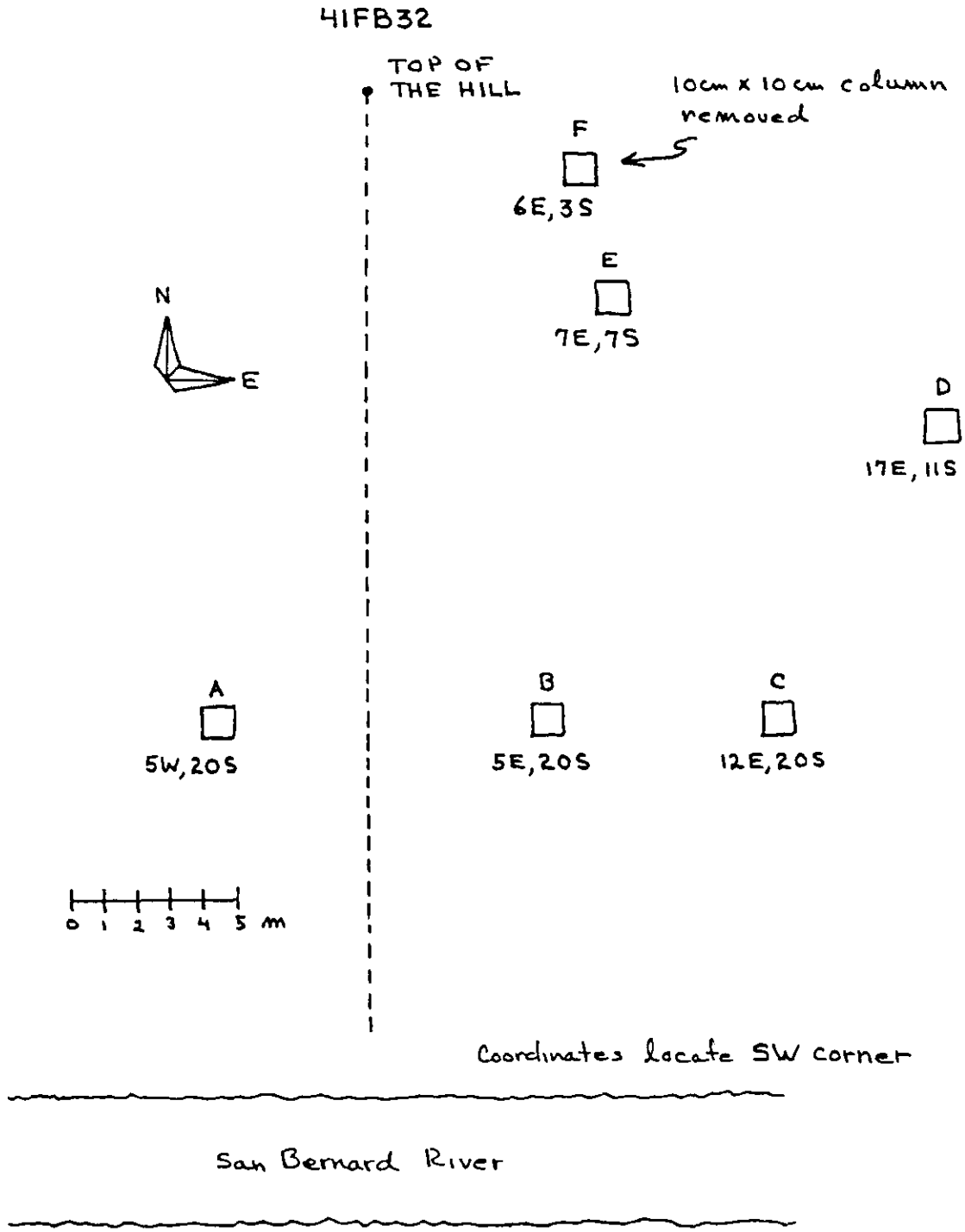
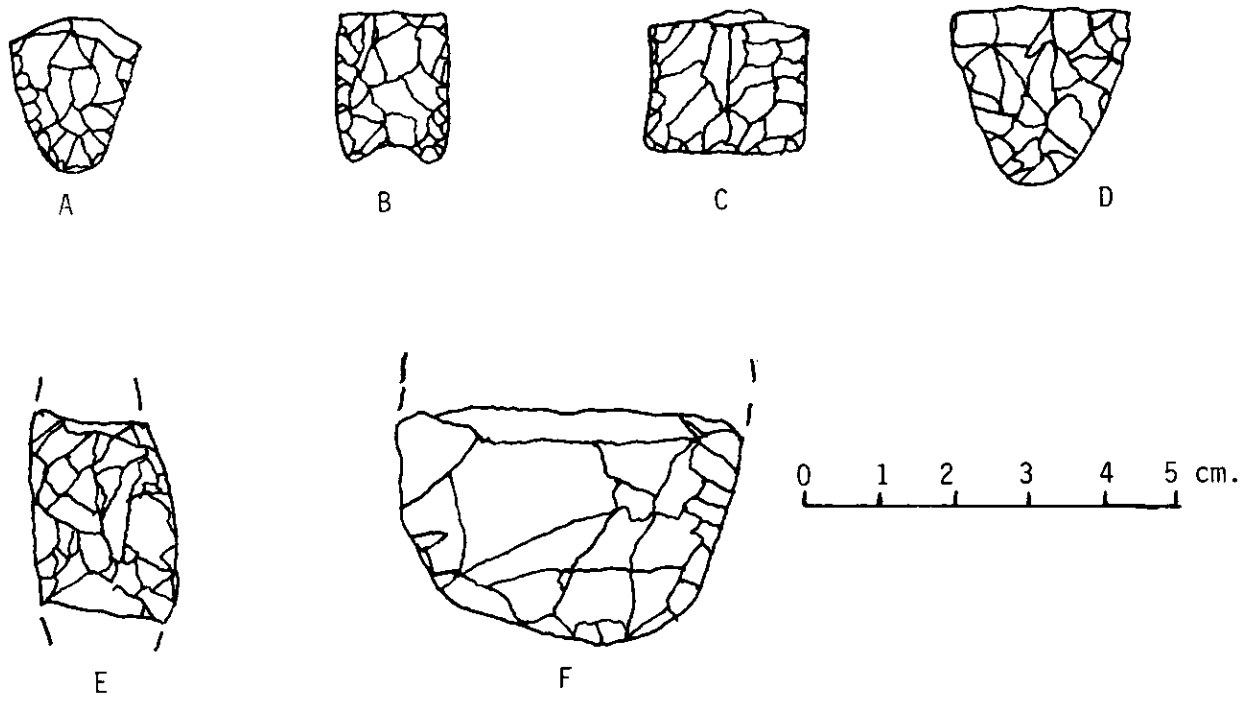


Figure 1. Site 41FB32 excavation layout



A - Gary stem; B - Pedernales stem; C - straight stem;
D, E - preform fragments; F - large biface fragments

Figure 2. Site 41FB32 lithic artifacts

Table 1. Site 41FB32 Bone Summary (weight in grams)

equivalent level, cm	test pit A	B	C	D	E	F
0-10	0.0	2.0	0.0	-	0.3	0.0
10-20	28.0	27.5	20.0	-	30.0	11.0
20-30	45.5	26.0	16.5	-	30.0	25.5
30-40	27.0	70.0	18.5	-	102.0	150.0
40-50	226.5	15.5	54.0	17.0	209.0	208.0
50-60	145.5	19.0	262.5	65.5	194.0	116.0
60-70	na	29.5	67.0	114.0	93.0	116.0
70-80	na	31.0	na	80.0	29.0	62.0
80-90	na	na	na	90.5	14.0	19.5
90-100	na	na	na	na	19.0	15.5

Table 2. Site 41FB32 Shell Summary (weight in grams)

equivalent level, cm	test pit A	B	C	D	E	F
0-10	1.0	22.0	0.0	-	9.0	0.0
10-20	142.0	45.0	55.0	-	3.0	21.0
20-30	90.0	86.5	64.5	-	39.0	8.5
30-40	125.0	229.0	66.0	-	306.0	366.0
40-50	761.5	52.0	354.0	63.5	604.0	412.0
50-60	0.0	82.5	635.0	359.0	743.0	119.0
60-70	na	138.0	624.0	562.0	5.0	30.0
70-80	na	110.0	na	902.0	86.0	200.0
80-90	na	na	na	1165.0	43.0	185.0
90-100	na	na	na	na	11.0	55.0

Table 3. Site 41FB32 Clayball Summary (weight in grams)

equivalent level, cm	test pit A	B	C	D	E	F
0-10	0.0	2.5	0.0	-	0.0	62.5
10-20	142.0	10.0	84.0	-	28.0	46.0
20-30	89.0	30.0	42.3	-	11.0	41.0
30-40	79.0	139.0	36.5	-	76.0	102.0
40-50	325.0	3.5	147.5	35.5	156.0	701.0
50-60	444.0	50.0	214.0	370.0	309.0	489.0
60-70	na	40.0	2231.0	506.0	12.0	255.0
70-80	na	112.0	na	941.0	128.0	824.0
80-90	na	na	na	800.0	219.0	1118.0
90-100	na	na	na	na	25.0	322.0

Table 4. Site 41FB32 Chert Summary (weight in grams)

equivalent level, cm	test pit A	B	C	D	E	F
0-10	0.4	0.2	0.0	-	0.0	0.0
10-20	2.0	2.5	3.0	-	0.7	0.0
20-30	3.5	0.7	2.5	-	3.0	13.0
30-40	10.0	6.0	6.0	-	14.5	25.0
40-50	11.0	3.0	10.5	13.0	10.0	34.0
50-60	lost	1.7	21.0	31.0	11.0	20.0
60-70	na	12.0	27.0	27.5	0.0	14.0
70-80	na	22.0	na	22.0	0.0	18.5
80-90	na	na	na	20.0	17.0	25.0
90-100	na	na	na	na	0.0	11.0

Table 5. Site 41FB32 Chert Flake Counts

equivalent level, cm	test pit A	B	C	D	E	F	total	% over 15 mm sq.
0-10	1	1	0	-	0	0	2	50.0
10-20	9	8	2	-	2	0	21	19.0
20-30	16	7	8	-	14	16	61	23.0
30-40	12	22	9	-	32	36	111	27.9
40-50	23	4	12	10	23	12	84	38.1
50-60	lost	5	9	29	9	23	75	56.0
60-70	na	12	12	18	0	15	57	57.9
70-80	na	7	na	31	0	18	56	42.9
80-90	na	na	na	26	1	20	47	44.7
90-100	na	na	na	na	0	3	3	100.0
total	61	66	52	114	81	143	517	39.7

Table 6. Distribution of Flake Types (in percent, for flakes over 15 mm sq.). The amount of remaining cortex determines flake type.

equivalent level, cm	type of flake primary	secondary	interior
0-10	0.0	0.0	*100.0
10-20	0.0	0.0	*100.0
20-30	7.1	21.4	71.5
30-40	0.0	16.1	83.9
40-50	6.3	15.6	78.1
50-60	7.2	9.5	83.3
60-70	6.1	18.2	75.7
70-80	0.0	20.8	79.2
80-90	4.8	9.5	85.7
90-100	0.0	*67.0	*34.0
total	4.4	15.6	80.0

* very small sample

Vertebrate and Molluscan Remains Recovered from a Site on the Murchison Ranch, Waller County (41WL15)

William L. McClure and Raymond W. Neck

Introduction

In 1982, the Houston Archeological Society recorded five archeological sites on the Murchison Ranch in Waller County, Texas. Patterson (1984) reported that artifacts and faunal remains were recovered from these sites, and limited excavations were reported for 41WL15. Surface collections and two test pits indicated that the site was occupied from Late Archaic times through the Late Prehistoric. Faunal remains recovered from this site are reported herein.

This site is located east of the Brazos River on a high terrace on the south bank of Clear Creek, about 1.5 kilometers upstream from the confluence of Clear Creek and the Brazos River. Soils are rather heavy, being tight silty clays. Two 1-meter pits were excavated. Excavators reported no evidence of obvious stratification or disturbance of the soil profile. Diagnostic cultural materials were limited to ceramics in pit B between 20 and 30 cm. Recovered faunal (molluscan and vertebrate) remains are given in Figure 1 and Tables 1 and 2.

Discussion

The molluscan remains from 41WL15 represent a moderately diverse fauna from a mesic deciduous woodland, probably a floodplain forest, with a small stream with quiet, well-oxygenated, non-acidic water. Terrestrial snail shells are characteristically large due to prime growth conditions. Most of the freshwater musssels are small individuals, indicating a small stream of relatively shallow water.

Vertebrate remains indicate utilization of a floodplain fauna, with heavy concentration on aquatic vertebrates and deer.

Presence of burned shell and bone indicates that some food material may have been cooked before consumption, although post-consumption fires could cause shells to be burned.

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Table 1. Molluscan remains recovered from 41WL15

	Pit A			Pit B						
	surf.	0 to 15	45 to 55 cm	surf.	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45 cm
Freshwater mussels										
Amblema plicata	1	2	1	1	2	8	5	10	7	18
Quadrula apiculata		2				4	5	8	1	11
Quadrula pustulosa mortoni		7		2	2	12,2	14,3	17,1	4	14,3
Tritogonia verrucosa		1			2		3	0,1		
Lampsilis teres						3		3	3	6
Leptodea fragilis							1	1		
Potamilus purpuratus						3		2	2	
unidentified umbo		2,2			1					
Terrestrial snails										
Mesomphix friabilis								1		2
Polygyra texasiana						1		1		
Mesodon thyroidus							2	4	1	1
Praticolella berlandieriana								2		
Rabdotus dealbatus						2	3	8	3	6

Paired numbers refer to (unburned, burned) shell; single numbers refer to unburned shell.

Table 2. Vertebrate Remains Recovered from 41WL15

Lepisosteus sp. (gar) — 4 scales and sculptured head bone
unidentified fish — one trunk vertebra of a (teleost) fish
Trionyx sp. (softshell turtle) — carapace fragment (at surface)
Terrapene sp. (box turtle) — 16 fragments (1 burned) of carapace and plastron
unidentified turtle — 28 fragments (6 burned) of carapace and plastron
Sylvilagus aquaticus (swamp rabbit) — right calcaneus and proximal half of a right femur
Odocoileus virginianus (white-tailed deer) — fragment of left mandible with teeth, 2 isolated teeth, 3 metatarsal fragments, and 3 metapodial condyles
large bovid (domestic cow, *Bos taurus*, or plains bison, *Bison bison*) — phalanx (at surface)
unidentified mammal — 177 fragments (22 burned), too fragmentary to identify but most could be deer

41WL15 Fauna

Pit A	depth below surface in cm	Pit B
C BD TM	0	C D M
C D FTM		C
	15	C DRFTM
C D M		CS TM
	25	CS FTM
M		CS D M
	35	CS D TM
M		CS FTM
	45	
C TM		
	55	
FTM		
	65	
TM		
	75	
C RTM		
	85	
M		
	95	

C = clam
S = snail
B = bovid
D = deer
R = rabbit
F = fish
T = turtle
M = misc. bone fragments

Figure 1. Distribution of faunal remains from pits A and B, 41WL15

The Barnhill Collection, 41WH18, Wharton Co., Texas

L. W. Patterson and J. D. Hudgins

Introduction

Detailed recording of surface collections from prehistoric sites can contribute significant data to the archeological record of a region. Archeological syntheses can be fully developed only if data from both surface collections and excavations are considered. Much of the archeological data for the upper Texas coast is available only in the form of surface collections, so that recording and publication of these collections is especially important for this region.

This article describes a surface collection from prehistoric Site 41WH18 in Wharton County, Texas made by L. E. Barnhill on his farm. Mr. Barnhill graciously permitted a group from the Houston Archeological Society to make a detailed study of this collection.

The HAS study group consisted of Richard Gregg, Joe Hudgins, Sheldon Kindall, Linda Moorrees and Lee Patterson. Artifacts were photographed, classified and measured. Data was obtained for use in this publication, for state records, and for a projectile point data bank that is being developed by Elton Prewitt.

Site description

Site 41WH18 is located on a horseshoe bend of a former creek. The creek bed has now been filled by land leveling operations for farming. The general area is a mixture of woodlands and coastal prairie. Food resources would have probably been good for prehistoric Indians. This is still an excellent deer hunting area. The many native pecan trees in this area would have been a significant food resource.

This site appears to have been a seasonal campsite with a long occupation sequence from the Middle Archaic period through the Late Prehistoric. A nomadic hunting and gathering lifeway was practiced by Indians in this region for thousands of years during the prehistoric time period (Patterson 1979).

Projectile points and chronology

The projectile point types found at this site are all common to this general area, as known from sites in Fort Bend and Wharton Counties (Patterson 1983:Table 1). This site is within the Western Transitional Zone (Patterson 1983:Figure 1) of the upper Texas coast, between the Brazos and Colorado Rivers. Projectile points in this zone appear to be influenced by technological traditions from central Texas as well as local traditions of the upper Texas coast. For example, the Pedernales dart point, which is common in central Texas, is also common in this zone, but is not common east of the Brazos River on the upper Texas coast.

Projectile points and other artifacts from Site 41WH18 are shown in Figures 1 and 2. Projectile points in this collection are summarized in Table 1.

Bulverde-like points may be the earliest projectile point type found at Site 41WH18. These are not true Bulverde points following the classical description (Suhm and Jelks 1962:169), but the specimens are similar in outline to Bulverde points. Prewitt (1981:79) assigns a time range of 4000 B.P. to 3400 B.P. for the Bulverde point in central Texas. Bulverde-like points occur approximately at this time and somewhat later on the upper Texas coast (Patterson 1980).

Table 1. Summary of projectile points, 41WH18

Darl	1
Pedernales	9
Kent	11
Kent-like	3
Yarbrough	2
Yarbrough-like	1
Gary	5
Bulverde-like	7
Ellis	1
leaf-shaped dart point	2
Perdiz arrow point	1
dart point fragments	4
dart point preforms	1

Pedernales points are one of the most numerous types in this collection. This point type has been found at several sites in this area, such as 41WH2 (Patterson and Hudgins 1980:Figure 3) and 41FB34 (Patterson and Hudgins 1986). Prewitt (1981:80) assigns a time range of 3400 B.P. to 2400 B.P. for the Pedernales point in central Texas, while Hall (1981:49) gives a date range of 4610 B.P. to 3530 B.P. for the Pedernales point at a site in Austin County. One Pedernales specimen in this collection has been extensively reworked and resembles a narrow version of a Meserve point (Figure 3). A large-size illustration of a typical Pedernales point from this collection is shown in Figure 4.

The Kent and Gary points found in this collection are not very time-diagnostic, as they can occur from the Middle Archaic through the Late Prehistoric (Patterson 1983:Table 1). Darl, Ellis and Yarbrough points in this collection are found in the Late Archaic and Early Ceramic periods, with an approximate time range of 3500 B.P. to 1400 B.P. One Perdiz arrow point which represents the Late Prehistoric was found at this site.

Some small potsherds have been found at this site, which is another indication of post-ceramic occupations, after the Late Archaic.

Other artifacts

This collection includes two bifacial chert knives. One specimen is stemmed (Figure 1 top right) and the other is finely finished except for a blunt straight-sided base (Figure 1 top left). One miscellaneous biface was found that may be an early stage of dart point preform manufacture. There is one bifacial drill in this collection (Figure 2 center left). All lithic artifacts are made from fairly local varieties of chert.

Both human and animal bone have been found on the surface of this site.

A round baked clay object (Figure 1 top center), 46 mm in diameter, was recovered here. It has a small hole in the center, and is perhaps some type of ornament. One long bone bead was found, made from a marine shell columella (Figure 1 bottom center). Similar beads from the Late Archaic have been found at a site in Austin County (Hall 1981:Figure 48).

Summary

Data from the Barnhill collection furnishes some diagnostic information on prehistoric Site 41WH18. This site has a fairly long occupation sequence of several thousand years from the Archaic period through the Late Prehistoric. The location conforms to the usual settlement pattern of this region, being a campsite located near a stream, used by nomadic hunter-gatherers.

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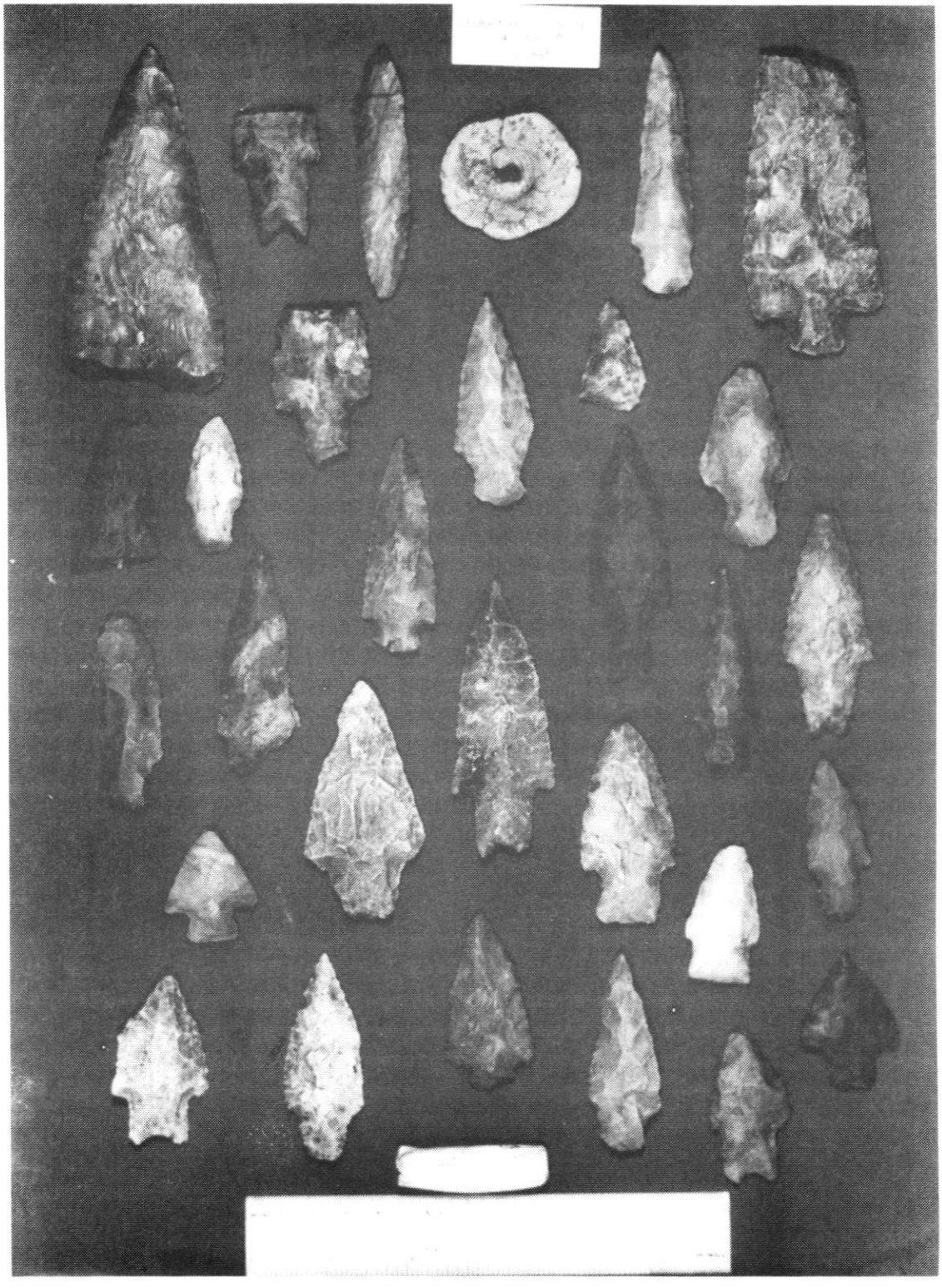

Figure 1. Barnhill collection, frame 1

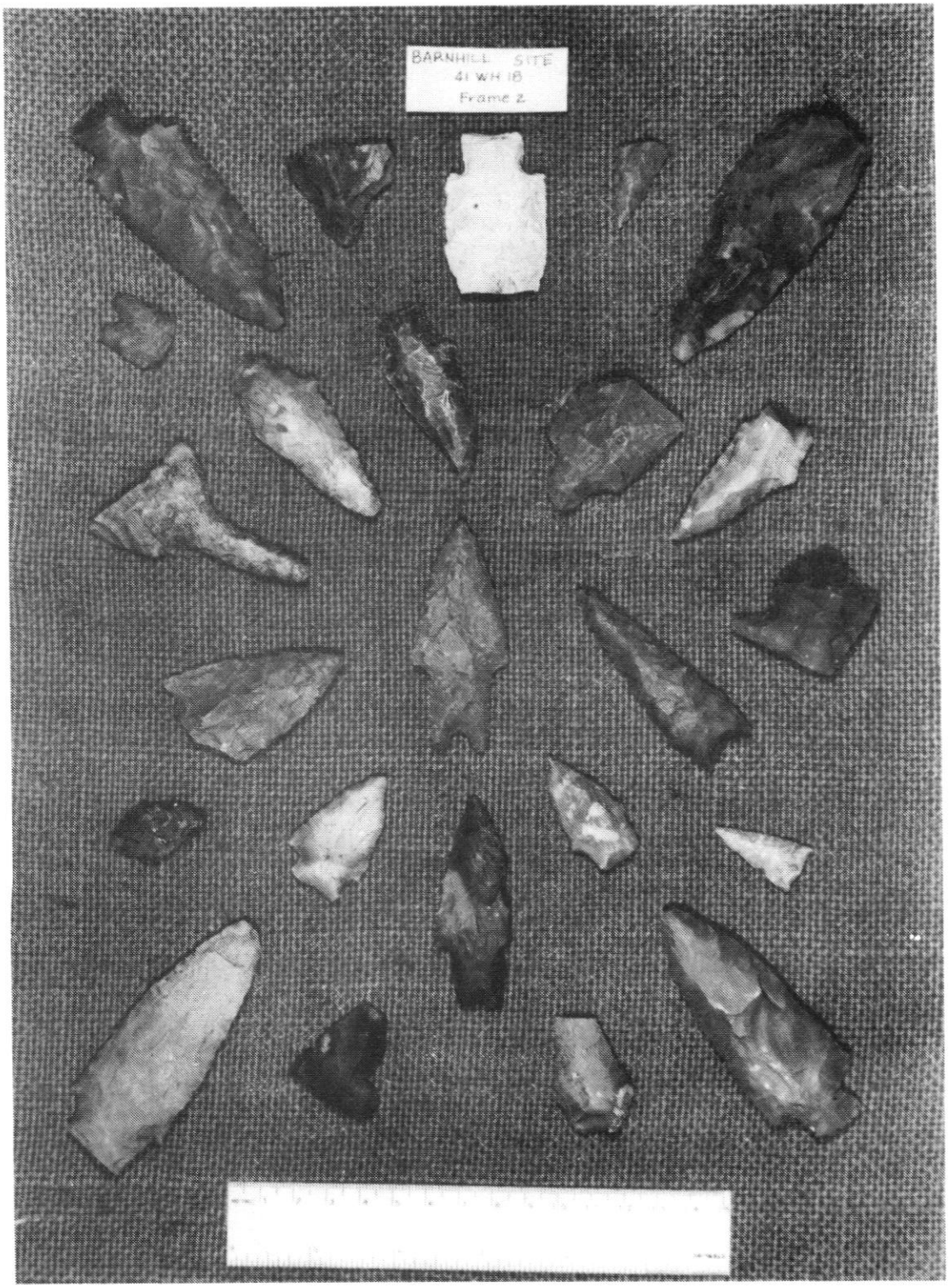

Figure 2. Barnhill collection, frame 2

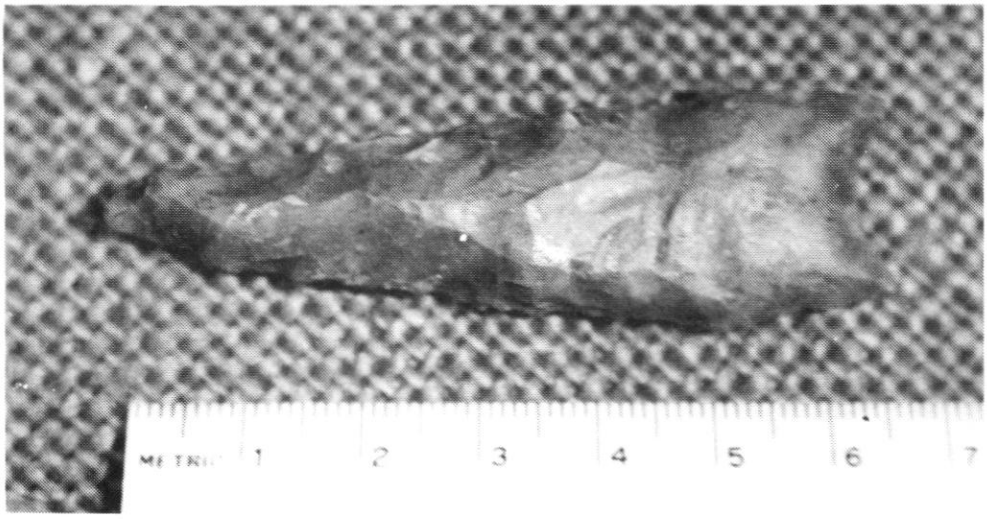

Figure 3. Reworked Pedernales point

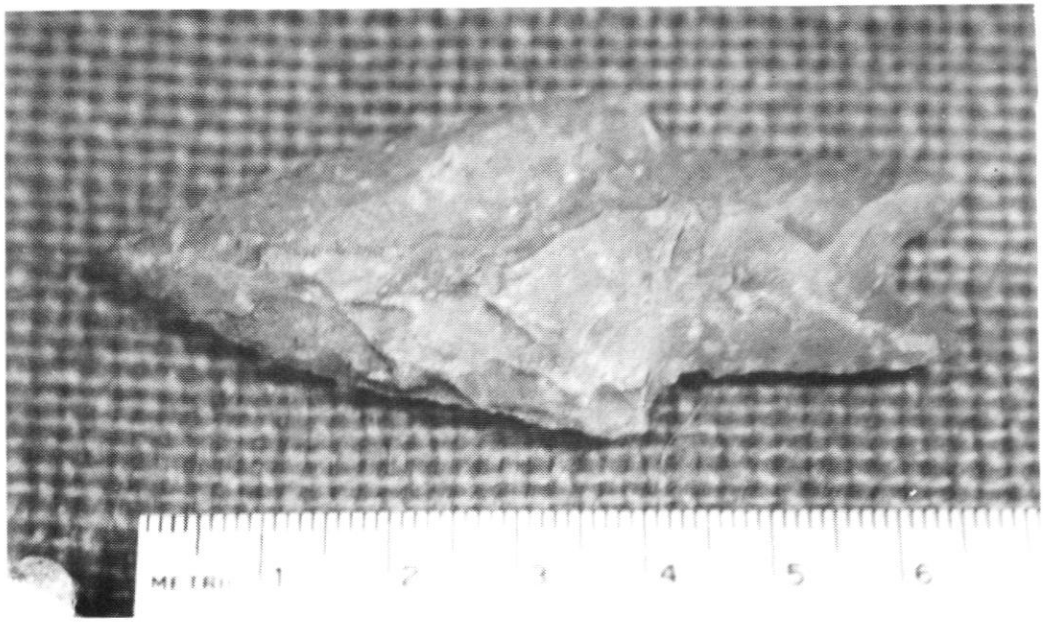

Figure 4. Typical Pedernales point

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