

**ARCHAEOLOGICAL INVESTIGATIONS
OF A SHELL MIDDEN [41 HR 39]
AT DE ZAVALA POINT, HARRIS COUNTY, TEXAS**

Anna J. Taylor

**With Contributions By
Robert F. Scott IV, Anne A. Fox, and Joseph H. Labadie**

**Department of the Army, Galveston District,
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**Center for Archaeological Research
The University of Texas at San Antonio
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Project Performed for the
Department of the Army, Galveston District, Corps of Engineers
Under Contract No. DACW64-85-M-0199
For Consideration of the Old River Fleet and Shipyard
Department of the Army Permit Application No. 17151

Principal Investigator
Dr. Thomas R. Hester

Center for Archaeological Research
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ABSTRACT

Archaeological investigations at site 41 HR 39 on De Zavala Point in Channelview, Harris County, Texas, were conducted by personnel from the Center for Archaeological Research, The University of Texas at San Antonio from December 16 through December 22, 1984. The site is recorded as an aboriginal shell midden with a historic component which will be impacted by the proposed disposal of dredged materials under the Department of the Army Permit Application No. 17151, during industrial development of the area. The field investigations were conducted for the Department of the Army, Galveston District, Corps of Engineers, to determine the eligibility of the site for recommendation for nomination to the National Register of Historic Places.

Field work at site 41 HR 39 involved excavating nine shovel tests, two 1-m² controlled test units, five backhoe test pits, and five backhoe trenches, mapping and photographing the site, and gathering artifacts exposed by wave action along the bluff which marks the northern and eastern limits of the site. Analysis of the site stratigraphy and cultural materials indicates that the site contains a stratum of **Rangia cuneata** shell with prehistoric and historic materials in a dark, sandy clay loam matrix. The shell midden stratum overlies a sterile clay matrix. Most, if not all, of the site appears to have been disturbed by bioturbation, erosion, historic dredging, and other historic occupation and utilization of the site area.

The research potential of the remaining historic component and the aboriginal shell stratum at 41 HR 39 appears to be low. The site is therefore recommended to be not eligible for nomination to the National Register of Historic Places.

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James Bradley and Jack R. Lillard of Channelview, employees of the Old River Fleet and Shipyard, provided the archaeologists with information about the site and donated their private collections of artifacts from the site to the Center for Archaeological Research, The University of Texas at San Antonio (CAR-UTSA), for curation.

The field crew consisted of A. J. Taylor (field director) and Joe Labadie and George Deaton (archaeological field crew members) of the CAR-UTSA. Both Deaton and Labadie contributed their experience and enthusiasm to the project. Cathy Dodt processed the materials in the laboratory at the CAR-UTSA and also recorded the necessary data for the *Rangia cuneata* seasonality study. Joe Labadie examined, recorded, and described the prehistoric ceramics. Anne Fox of the CAR-UTSA identified and provided information concerning the historic ceramics and glass, and some of the metal items. Robert F. Scott IV of Alto, Texas, analyzed the vertebrate faunal materials. Kenneth Brown of the CAR-UTSA contributed advice about the lithic analysis. Jan Stokes and Carolyn Good of the COE contributed information concerning soil formation in the project area. David Hafernik, Stephen Black, Fred Oglesby, and George Deaton drafted the maps and profiles for this report. The lithic and ceramic artifacts were illustrated by Margaret Greco. Sharon Quirk and Ann Young of the CAR-UTSA both provided much assistance and support, during their editing and preparation of the report. Mary Lou Ellis of the CAR-UTSA took care of the many matters necessary for the operation of the project.

Dr. Thomas R. Hester (principal investigator), Director, and Jack D. Eaton (co-principal investigator), Associate Director, of the CAR-UTSA, provided supervision, support, and encouragement throughout the project.

INTRODUCTION

Archaeological investigations were conducted at site 41 HR 39 on De Zavala Point (Fig. 1) by personnel from the Center for Archaeological Research, The University of Texas at San Antonio (CAR-UTSA) for the Department of the Army, Galveston District, Corps of Engineers (COE). The site is located within the community of Channelview, in eastern Harris County, Texas, at the confluence of the Old River and Buffalo Bayou (Figs. 2-5). The site consisted of a *Rangia cuneata* shell midden with a historic component.

The Galveston District, COE is processing Department of the Army Permit Application No. 17151, Old River Fleet and Shipyard, Applicant, to dredge a 30.5 m x 84.0 m area in the Old River (an abandoned channel of the San Jacinto River) and dispose of the material on De Zavala Point, which will include the site 41 HR 39 locality (Stokes 1984:attachment A). Dredged material will be placed behind an existing 1-m high bulkhead on the north shore and on the northeast corner of De Zavala Point (Figs. 4,a; 5,b). The authority for the permit is detailed in Section 10 of the River and Harbour Act of 1899, and in Section 404 of the Clean Water Act of 1977. The authority for the archaeological investigations is detailed in Section 106 of the National Historic Preservation Act, as amended, and the 36CFR800 implementing regulations for the National Historic Preservation Act.

The purpose of the study was to assess the eligibility of site 41 HR 39 for nomination to the National Register of Historic Places, as specified in the Scope of Work (Department of the Army, Galveston District, Corps of Engineers). The archaeological investigations consisted of the excavation of nine shovel tests, two 1-m² controlled test units, five backhoe test pits, and five backhoe trenches at the site.

ENVIRONMENTAL SETTING

Site 41 HR 39 is on top of a 6.1-m high bluff of De Zavala Point, overlooking the Old River to the north. The point of land upon which the site is situated is at the confluence of the Old River and Buffalo Bayou (Fig. 1).

GEOLOGY

The Quaternary geologic period coastal terraces of the Texas coastal plain predominantly consist of a series of off-lapping terraces parallel to the coast, which were deposited during interglacial stages and were formed by alluvial and deltaic sedimentation. The most recently formed coastal terrace is the Beaumont Formation, which is by the Gulf and is from 30,000 to 37,000 years old. Evidence of ancient and recent sedimentary depositional environments can currently be seen in the general Galveston and Houston, Texas, vicinity. During the Pleistocene geologic epoch the Trinity, San Jacinto, Brazos, and Colorado Rivers transported suspended mud and bottom-load sand which were deposited in Gulf Coast deltaic areas. Within these areas were meander belt loops which deposited sandy point bars and formed natural levees; mud and silt deposited during periodic flooding created floodplains and sandy crevasse splays. Between ca. 12,000 and 3500 B.P., a rise in the

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sea level resulted in a marked northward regression of the coastline and in the initial development of the Galveston Bay estuary. Stream hydrology changed from conditions of high discharge and lateral erosion to that of low discharge and stream incision from ca. 12,000 B.P. to 5000 B.P., and by ca. 3500 B.P., it had changed to moderate discharge and floodplain aggradation. The part of the Beaumont Formation within the general study area was probably deposited by the Beaumont-age (late Pleistocene epoch) Brazos River. Sediments resembling Beaumont Formation deposits, which have a predominantly silt loam surface horizon overlying reddish brown and yellowish brown clays, silty clays, and clay loams, are present in Harris County at depths of 3.05 m to 4.57 m. Elevations in Harris County range from sea level to 38.1 m. Within the study area elevations range from 0 m to 6.1 m above mean sea level (Bernard et al. 1970:Fig. 44; Fisher et al. 1972:Fig. 4; Bureau of Economic Geology 1982; Day 1982; Aronow 1982, citing Bernard and LeBlanc 1965:Fig. 5, and Van Siclen and Harlan 1965:Plate 1; Aten 1983a:104-139; Aronow 1984:2; Fields and Jackson 1984:1).

The Galveston and Houston vicinity is currently affected by subsidence and erosion, and these conditions are clearly evident at De Zavala Point. Local residents have estimated that from 2.7 m to 3.0 m of subsidence has occurred within the general project area during the last 20 years (Day 1982). Results of a study by Gabryish and Bonnet (1977), however, indicate that a lesser amount of subsidence--approximately 1.98 m--has occurred during the previous 75 years, with most of it occurring during the last 40 years. Day (1982) notes that comparison of a 1982 topographic map of the study area prepared by Espey, Huston & Associates with a 1967 USGS 7.5' topographic map shows that an estimated 100 m of land surface along the shoreline of De Zavala Point has become submerged within the last 15 years (*ibid.*). At the San Jacinto Battlefield south of the project area, the land was found to have subsided a total of 1.8 m from 1898 to 1967. One probable cause of the area subsidence and also of the shoreline erosion is the withdrawal of oil field fluids and groundwater, which is centered around the community of Baytown, east of De Zavala Point. Wave erosion has also increased due to traffic on the waterways of the area (Cartier and Hole 1972:90; McGuff and Ford 1974:23; Aronow 1982, 1984:1; Fields and Jackson 1984:3).

Dredging operations in the Houston Ship Channel in the vicinity of De Zavala Point have also affected the rate of subsidence and erosion. The Buffalo Bayou Ship Channel Company was formed in 1869 to develop what became known as the Houston-Galveston Ship Channel for use by deep draft ships. Since that time the depth of dredging in the Houston Ship Channel has increased from 2.7 m in 1874, to 12.2 m in 1957 (Day 1982; Alperin 1983), an increase in depth of 452%. As a result of the enlargement of the channel the number and size of ships using the channel have increased, with an accompanying increase in wave action and erosion. At least 0.6 m of dredged material has been spread on portions of De Zavala Point as a result of dredging activities (Aronow 1982, citing Fisher et al. 1972; Voellinger 1982). Aronow (1982) examined the soils at De Zavala Point, however, and concluded that the identification of the soils at De Zavala Point as disturbed materials was largely erroneous.

Figure 4. General Views of Site 41 HR 39.

- a, view facing north-northwest from the top of the Falcon Cement Inc., storage towers, toward the north and east shorelines of the project area. A backhoe (backhoe trench 5) is visible in the central part of the photograph, and the pile of dredged material is to the right of the bulkhead along the north shore in the upper left part of the photograph;
- b, view of eroded shell in the southwestern part of the project area, looking toward the east shoreline.



a



b

**a****b**

Figure 5. Views of the North Bluff and Shoreline of the Site. a, view facing south of the eroding north bluff and shoreline at low tide, near the bulkhead; b, view facing west of the north shoreline at low tide, and the nearby bulkhead and tugboat area.

SOILS

Soils in the project area are of the Aldine series, and are dark gray brown, acidic, fine sandy loams which overlie a stratum of gray clay. These soils are typical of the dark-colored, crumbly, limelike clays of the Gulf Coast Prairie, within which the study area is located. Aldine soils parallel and flank the floodplain of the San Jacinto River and several other streams of Harris County. The profile of soils within the Aldine series is generalized as having a sandy, light-colored horizon that varies in thickness from roughly 10.8 cm to 15.24 cm. The B and A horizon has fingers or "tongues" of a horizon material which moved down along cracks, and a B horizon of clay, clay loam, or silty clay which extends to depths of over 1.52 m (Pool 1975:6-8; USDA 1976; Aronow 1982, citing Wheeler 1976).

As noted by Aronow (1982), the general profile descriptions do not mention any calcareous materials or reddish yellow or reddish brown colors, though both were found in several test pits in Aldine-like profiles in the southern part of De Zavala Point investigated by Day (1982), adjoining the present study area. In the excavation areas opened by Day (1982), and as interpreted by Aronow (1982), there was what appeared to be a preserved part of a natural surface. Exposed along the north bank of De Zavala Point, at site 41 HR 39, were sediments overlain by what appeared to be an undisturbed shell midden (cf. Fig. 4, a, b). Along the southern shore of the Point, recent shell fill varying from 20.32 cm to 61 cm in thickness covered well-defined soil profiles which overlaid abundantly calcareous materials. In adjacent areas there was a transition from reddish clay, which probably originated from a flood basin or backswamp, to fairly clean reddish very fine to fine fluvial sand, which seemed to be consistent with the fluvial origin of the Pleistocene material. Aronow (1982), a regional expert on soil deposition, concluded that although the surface of De Zavala Point has been considerably modified, the bulk of the materials appear to be natural and in place, rather than being dredged material.

Aronow (1982) suggested some possible origins for the soils found along the San Jacinto River, particularly at De Zavala Point. Much of the sandy A horizon soils may be windblown material derived from sandy stream terraces of Deweyville age which are now submerged. Alternatively, part of the region, especially at the site, may be a Deweyville-age San Jacinto erosional terrace which was cut into the surface of the local Beaumont-age Brazos River sediments, thus reducing the vertical distance to calcareous materials and reddish sediments. In this instance the sandy surface of the Aldine soils would be the thin fluvial residuum which is now wind modified and left on the surface of the strath. "The scarp between the upper and lower levels then would be an erosional feature left during this episode of terrace formation" (*ibid.*). Yet another possibility was that the surface may have been cut by exceptional prehistoric hurricane storm surges which occurred during a period distant enough to allow the development of the mature Aldine-like profile (Aronow 1982).

CLIMATE

The average annual rainfall in Harris County is 122 cm. This county is within the Upper Coast Division of the region of summer maximum rainfall. The modern climate is mild with an annual mean temperature of 21.1°C (70°F; Carr 1967:4; Webb Vol. 1 1952:777). According to Aten (1983a:104-139), however, before 8500 B.P. (years Before Present), the climate was cool and moist but with less variation, or seasonality, than occurs currently. From 8500 B.P. to 5000 B.P., the regional climate was warmer and drier than it is today. Since 4000 B.P. or 3000 B.P., the climate has been predominantly modern.

FLORA AND FAUNA

The natural region within which site 41 HR 39 is located is the Coastal Prairie and Marsh zone, a part of the West Gulf Coastal Plains bordering the tidewater. The northern part of Harris County, however, is in the Pine Woods region (Fenneman 1938; Arbingast et al. 1973; Pool 1975:4-6).

Three main vegetation habitats are within the general study area: second growth woodland, grassland, and new growth in recently disturbed areas. The dominant species within the second growth woodland, which included De Zavala Point prior to recent development, are Texas sugarberry (*Celtis laevagata*), American elm (*Ulmus americana*), black willow (*Salix nigra*), a stand of loblolly pines (*Pinus taeda*), river birch (*Betula nigra*), and yaupon (*Ilex vomitoria*). The woodlands understory includes predominantly Japanese honeysuckle (*Lonicera japonica*), with a limited amount of poison ivy (*Rhus toxicodendron*) and Virginia creeper (*Parthenocissus quinquefolia*). Within the grasslands the major species are Bermuda grass (*Cynodon dactylon*), tick-tree foil (*Desmondium* sp.), threeawn (*Aristida* sp.), ragweed (*Ambrosia* sp.), and a few McCarthy rose bushes (*Rosa bracteata*). In the recently disturbed areas, which includes all of the project area, the dominant species are pokeweed (*Phytolacca americana*), poison ivy (*Rhus toxicodendron*), Texas sugarberry seedlings (*Celtis laevagata*), blackberry (*Oxalis priceae*), ironweed (*Vernonia* sp.), and yellowwood sorrel (*Oxalis priceae*) (Voellinger 1982:1).

Archaeological sites in the region have yielded faunal assemblages which show a major reliance upon aquatic and fluvial woodland species. The major faunal types are the brackish water clam (*Rangia cuneata* and *R. flexuosa*), oyster (*Crassostrea virginica*), catfish (*Ictalurus* spp.), black drum (*Pogonias cromis*), freshwater drum (*Aplodinotus grunniens*), gar (*Lepisosteus* spp.), sheepshead (*Archosargus cephalophobatus*), alligator (*Alligator mississippiensis*), various turtles, various waterfowl, bison (*Bison bison*), white-tailed deer (*Odocoileus virginianus*), black bear (*Ursus americanus*), rabbits (*Sylvilagus floridanus* and *S. aquaticus*), opossum (*Didelphis marsupialis*), raccoon (*Procyon lotor*), muskrat (*Ondatra zibethica*), mink (*Mustela vison*), and skunk (*Mephitis mephitis*) (Fields and Jackson 1984:3, citing Gilmore 1974:22, 28-29, Dillehay 1975:166-178, and Mercado-Allinger et al. 1984:42-48).

ARCHAEOLOGICAL BACKGROUND

PREHISTORIC PERIOD

The prehistoric cultural sequence of the Galveston Bay area was most recently investigated and described by Aten (1979, 1983a). The sequence proposed by Aten (*ibid.*) is divided into two major parts, the Preceramic period and the Ceramic period.

Little is known about the Preceramic period (ca. 12,000 to 2000 B.P.) due to a scarcity of sites which date to that period. Many Preceramic sites were destroyed by early Holocene valley scouring, or are buried beneath stream floodplains or beneath the Gulf of Mexico. It is hypothesized that social organization remained much the same throughout the period, with individuals, family groups, task groups, and small bands serving as the primary social units. The technology remained generalized, being suited to the utilization of a wide array of resources. Recorded site densities and environmental reconstructions suggest that during the early Holocene the population size increased, then it dramatically decreased in the middle Holocene, and then during the late Holocene it again increased. Settlement strategies possibly changed from a pattern of infrequently occupied and scattered sites to sites which occur predominantly on inland stream floodplains and estuaries (Aten 1983a:160-162).

The Ceramic period (ca. 2000 to 200 B.P.) is subdivided into six subperiods: Clear Lake (A.D. 100 to 425), Mayes Island (A.D. 425 to 650), Turtle Bay (A.D. 650 to 1000), Round Lake (A.D. 1000 to 1350), Old River (A.D. 1350 to 1725), and Orcoquisac (A.D. 1725 to 1810; Aten 1983a:285). The sequence, and descriptions, of ceramics which occur during these subperiods are described in detail by Aten (1983a). The general order of appearance of the various types of ceramics is as briefly follows. Sandy paste **Goose Creek** wares and various **Tchefuncte** types first appear at ca. A.D. 100 during the Clear Lake subperiod. **Goose Creek** ceramics continued to occur during the Mayes Island and Turtle Bay subperiods. During the last of the Round Lake subperiod, **Goose Creek** ceramics and also grog-tempered **Baytown** and **San Jacinto** wares occur. There is an increased occurrence of **Goose Creek** wares and the consistent appearance of bone-tempered ceramics during the Old River subperiod. During the Orcoquisac subperiod, there are **Goose Creek** wares with small percentages of grog-tempered and bone-tempered ceramics (*ibid.*).

Aten's (1983a) classification of prehistoric ceramics from the upper Texas coast is largely based upon paste categories: sandy paste, sand-tempered paste, and grog-tempered paste. The term temper indicates the presence of an aplastic material which was added to the pottery clay. Grog designates the use of fired clay or finely crushed sherds as a pottery temper. Temper, decoration, and paste texture are also major factors in the classification of coastal ceramics (*ibid.*:209-221, also see footnote on pages 212-213, citing Shepard 1963:25).

Along the upper Texas coast, chert, quartzite, and silicified wood pebbles and cobbles were utilized from the inland Willis Formation or from the terraces along the Trinity or San Jacinto Rivers. Bipolar flaking and hand-held direct percussion techniques of lithic reduction were both used. Dart

points occur into the Mayes Island subperiod, when the bow and arrow was introduced. During the Mayes Island period, the amount of flakes recovered from sites decreases; the density of flakes slowly increases during the Old River period, and then rapidly decreases during the Orcoquisac period. The use of silicified wood and quartzite increases with the introduction of arrow points, though it declines by the Historic period. Other lithic tools include expanded base perforators, small expanded base drills, bipointed drills, flat base drills, microflints, general ovoid bifaces, ovoid end scrapers, elongate end scrapers, uniface side scrapers, end scrapers, ovoid end scrapers, round uniface and/or biface tools, and general utilized flakes. Sandstone fragments used for grinding or abrading, and also pumice and mudstone abraders are found on coastal sites, as are unworked fragments of imported slate, quartz cobbles, ocher, and asphalt (Aten 1983a:246-262, 266-267, 300-304).

Bone tools found on upper coastal sites are items such as gorges, projectile points, and socketed blunt points (which occur from the late Preceramic through the early Turtle Bay period), spatulas, incised fragments, antler tine flaking tools, and ulna tools. Artifacts made of shell are oyster shell cutting implements, *Busycon* fragments, and a perforated *Rangia* valve. A fragment of a pointed wooden stake, and impressions of cordage and netting have also been recovered (Aten 1983a:262-266, 302).

HISTORIC PERIOD

Before European involvement around Galveston Bay, the area was occupied by the Akokisa (Aten 1983a:29-37). Prior to 1821, European involvement in the Galveston Bay area consisted of early explorations, beginning with the Alonso Alvarez de Pineda expedition of 1519, and including the travels of Alvar Nuñez Cabeza de Vaca, a member of the failed Panfilo de Narvaez expedition of 1527-1528; trading by the French; efforts by the Spanish to prevent French activities in the area; and smuggling and privateering by individuals such as Jean and Pierre Lafitte and Luis Michel Aury from ca. 1816 to 1820. In 1821, Stephen F. Austin received a grant of land from Mexico, and then Anglo-Americans began to settle in the general Galveston Bay vicinity (Bolton 1962; Webb Vol. 1 1952:78-79, 81-84, 261-263; Webb Vol. 2 1952:5-6; Fields and Jackson 1984:7).

In 1822, approximately 15 or 20 families of European descent moved to an area along the San Jacinto River, two or three miles above the present community of Highlands. This group was soon joined by others who came from the United States, and one, a Mrs. Jane Long, from Bolivar Point in eastern Galveston County. Thirty-two people received land along the San Jacinto River, Buffalo Bayou, and Cedar Bayou from the government of Mexico in 1824. Boats were operated regularly on Buffalo Bayou by 1824. Harrisburg, the first town in the area, was established on the south bank of Buffalo Bayou before 1825. Harrisburg served as the seat of government for the Republic of Texas during March and April of 1836, but it was burned by the Mexican army prior to the Battle of San Jacinto, which occurred on April 21, 1836. The seat of the Texas government was then moved to Houston where it remained until Austin was made the state capital in 1839 (Looscan 1914:201; Webb Vol. 1 1952:777-778, 848; Webb Vol. 2 1952:554).

Manuel Lorenzo Justiano de Zavala was issued a bond on August 12, 1835, for a labor (approximately 176 acres or 71 hectares) of land on De Zavala Point, and moved his family to a house (site 41 HR 32) on or near De Zavala Point in 1835. This property was part of a league of land granted to William Harris and David Carpenter on August 6, 1824. The house had been built by Philip Singleton in 1828 or 1829. De Zavala was born in Yucatan, Mexico, in 1789. He was elected governor of the State of Mexico in 1827 and again in 1832, and also served in various other political offices, and was a proponent of democratic reform in Mexico. He moved to Texas when he decided that Santa Anna, the president of Mexico, was not going to observe the Constitution of 1824. De Zavala then became active in Texas politics. In 1836, he was a signer of the Declaration of Independence at Washington-on-the-Brazos, and was also elected **ad interim** vice president of Texas. De Zavala resigned from office in October 1836, and died less than one month later (Looscan 1914:198; Webb Vol. 1 1952:498; Brandimarte 1982; Voellinger 1982:3; **Harris County Deed Records** Vol. E:159-160). He was buried in the De Zavala family cemetery, roughly 300 m southwest of the project area (Fox 1982).

In the late 1800s or early 1900s, Tom Copings built a house at or near the De Zavala homestead location, on the south end of De Zavala Point, facing the confluence of Buffalo Bayou and a meander of the San Jacinto River (which is now known as the Old River). By 1915, there were at least 10 structures located on De Zavala Point. During the 1920s, a ferry was built across Buffalo Bayou from De Zavala Point, which was then known as Copings Point, to San Jacinto. It was during the 1920s that De Zavala Point also became known as Muggers Point after a bootlegging operation was established there. Brick used to construct structures on De Zavala Point from 1870-1920s may have been obtained from nearby Cedar Bayou, which had from six to eleven brickyards in operation to supply the general Galveston Bay area during this period (Cartier and Hole 1972:61; Voellinger 1982:4, citing Fossen 1982, Sumpter 1982, and Williams 1982). The last private citizen to own and utilize De Zavala Point was Mr. Askew. He cleared the property of existing vegetation and structures and built a two-story, six-room ranch house and stables (Voellinger 1982:4, citing Fossen 1982, Sumpter 1982, and Williams 1982).

The United States Government bought De Zavala Point and adjoining property in 1937 to build the San Jacinto Naval Ordnance Depot. With the exception of the Askew home, which was used for officer housing, all existing structures were removed. Six rectangular structures, possibly barracks, were built along the center of De Zavala Point. A possible pumphouse and laundry were built west of the barracks; one structure was along the bank of the Old River northwest of the laundry; and another structure, which may have been the officers quarters or Askew house, was on the southern shore of the Point. Along the bank of the Old River, a course of shell roads was laid which also encircled the six barracks and led to each of the other structures. The San Jacinto Ordnance Depot (41 HR 423) was abandoned and the buildings dismantled soon after World War II ended, and the property was sold to the Millray Corporation of Houston in 1964. Second growth vegetation was then allowed to grow on the site, and the area was used as a dump by local residents (Voellinger 1982:4-5, citing U.S. Air Force aerial photograph, flight date 5 May 1953, **Harris County Deed Records** Vol. 5735:605, Vol. 998:298, and Steere 1982).

PREVIOUS SITE INVESTIGATIONS

Site 41 HR 39 was originally recorded in 1956 during an extensive survey of an approximately five-mile radius of Lynchburg, Texas, by W. B. Neyland and R. B. Worthington, avocational archaeologists. During an archaeological survey of the Lost Lake Disposal Area in 1973 by the Texas Archeological Survey (McGuff and Ford 1974:16, Fig. 4,A; Balcones Research Center, Texas Archeological Research Laboratory site files), site 41 HR 39 was observed from a distance and reported to be well preserved by professional archaeologists.

Fox (1982) did a survey and archival research of the Lorenzo de Zavala family cemetery, which is roughly 300 m southwest of the present project area, and the immediate area on the south slope of De Zavala Point. This study was done for a feasibility report for the TERA Corporation of Dallas, Texas, who were planning the construction of a docking facility in this area. The De Zavala family cemetery was found to be partially submerged, and no additional sites were found in the project area. The decision was made to not develop the cemetery area, but rather to fence off and protect the cemetery, and work around it.

During 1982, historic research and archaeological survey and testing were conducted on the southern part of De Zavala Point by personnel of Espey, Huston & Associates (Voellinger 1982; Brandimarte 1982; Day 1982). This work was done in conjunction with the Department of the Army Permit Application No. 16000 for the construction of a cement terminal and access road by Falcon Cement, Inc. Brandimarte (1982) conducted archival research as part of these investigations, attempting to find the probable location of the original Lorenzo de Zavala homesite (41 HR 32), and of structures relating to the subsequent historic occupation of De Zavala Point.

Three **Rangia** shell middens in addition to the study site (41 HR 39) have been located on De Zavala Point (41 HR 32, 41 HR 40, and 41 HR 41). These shell middens are the earliest evidence of occupation at De Zavala Point. Collected materials indicate that these sites may date to the Ceramic period, though this assessment is tentative. Additionally, five prehistoric shell middens (41 HR 37, 41 HR 38, 41 HR 42, 41 HR 43, and 41 HR 44) were recorded by Neyland and Worthington along the banks of the Old River in the vicinity of the study site. Shell middens within the project area are densely packed lenses of **Rangia cuneata** shell in a matrix of dark organic-stained soil, and are the remains of seasonal campsites where brackish water clams were collected and processed. Such exploitation of shell food resources appears to have been most intense in shallow brackish water lakes and bays within the estuarine environment (McGuff and Ford 1974:19-20, 22).

Although only the southern tip of site 41 HR 39 extended into the 1982 project area, eroded shells from the site were scattered throughout the vicinity. The **Rangia** shell midden deposits at site 41 HR 39 were reported to be 65 cm thick along approximately 200 m of the rapidly eroding northern bluff of De Zavala Point. Aboriginal ceramics and lithic materials were observed in the midden deposits. Uncontrolled surface collections recovered early historic artifacts in addition to prehistoric materials, including a **Perdiz** arrow point and a **San Jacinto Plain** (or, **Baytown Plain**, variety **San**

Jacinto; Aten 1983a:239-241) ceramic sherd in the vicinity of site 41 HR 39. A dirt road which crossed the site did not appear to have disturbed the midden deposits (Aronow 1982; Brandimarte 1982; Day 1982; Voellinger 1982). Site 41 HR 423, a late 19th-century homesite, located on the southern end of site 41 HR 39, exhibited small shell lenses, and had both prehistoric and historic materials, including an undecorated gray sherd and two chert chips, an intact course of handmade bricks, a purple glass bottle stopper, and metal fragments suggestive of a late 19th-century/early 20th-century site (Voellinger 1982:12).

Site 41 HR 32 is described as a severely eroded prehistoric shell midden and the location of the Lorenzo de Zavala homesite (Brandimarte 1982; Day 1982; Fox 1982:1-2; Voellinger 1982:3). Artifacts recovered from the site, however, generally date to the late 1800s and later (Voellinger 1982:10, citing Black 1982 and Fullen 1982; Fox 1982). The investigations by Voellinger (1982), Brandimarte (1982), and Day (1982), could not determine the precise location of the De Zavala homesite, but the available evidence did suggest that it was located on high land on the south side of De Zavala Point, adjacent to Buffalo Bayou. The house was small and served as a hospital after the Battle of San Jacinto. The structure burned down sometime between 1860 and 1870. Severe erosion and subsidence of this area may have destroyed the archaeological remains of the original homesite. The remains of the homesite are probably not currently located in the project area on the north side of De Zavala Point, but it is possible that the archaeological remains of homesites and other structures associated with occupation and utilization of De Zavala Point may have once been present in the project area (Brandimarte 1982; Fox 1982; Voellinger 1982:3, citing *Houston Post* n.d., and De Zavala 1934; Department of the Army, Galveston District, Corps of Engineers 1984).

Another historical site recorded during the 1982 archaeological investigations was the San Jacinto Ordnance Depot (41 HR 424), established in 1939 by the United States Navy, which has features such as cement sidewalks and steps, brick piers, and shell-topped roads. Piles of recent trash found throughout the project area along the existing shell roads evidenced the use of the Point as a dump (Day 1982).

In 1984, staff archaeologists for the Department of the Army, Galveston District, Corps of Engineers conducted an inspection of site 41 HR 39 (Stokes 1984) in conjunction with the processing of Department of the Army Permit Application No. 17151, Old River Fleet and Shipyard, applicant, to dispose of dredged materials on the northern shore of De Zavala Point where site 41 HR 39 is located. Eight auger tests dug by the archaeologists showed that the shell midden stratum was beneath up to 65 cm of recently deposited fill in the northeastern part of the site study area. The shell midden stratum was exposed at the surface and eroding in the southwest part of the permit area. The test results indicated that portions of the site remained intact. On the basis of this investigation, it was recommended that the site be tested to determine its eligibility for the National Register of Historic Places.

RESEARCH GOALS AND METHODS

The primary goal of this project was to test site 41 HR 39 to obtain sufficient information to determine its eligibility for the National Register of Historic Places. The site is to be impacted by the disposal of dredged material during industrial development by the Old River Fleet and Shipyard, the current owners of the site property.

Investigations conducted during this project were intended to provide the following information, if possible: the site limits, cultural stratigraphy, chronology, and potential to yield additional significant information. Cultural features and special use areas within the site were to be identified. Information gained from the analysis of tools and faunal materials recovered from the site would be used to identify subsistence strategies, including a seasonality study of *Rangia cuneata* shell. Finally, the relationship between site 41 HR 39 and other such sites in the project area was to be established (Department of the Army, Galveston District, Corps of Engineers 1984).

The first task performed for the project was the survey and mapping of the project area. A transit and stadia rod were used to make a contour map of the site which included the excavation areas, and to set a metric horizontal grid system aligned with magnetic north across the site to provide horizontal control. All elevations were calculated relative to a site datum set at a concrete base for the fence which marks the property line of the adjoining Falcon Cement, Inc., operation (Figs. 2; 3). Elevations shown on the site map (Fig. 2) were calculated using the current shoreline level as 0.0 m elevation. The beach face and the site area were examined to determine the extent of all exposed shell deposits within the project area. These exposures were used to roughly define the site limits and to help determine the placement of excavation pits, units, and trenches.

The testing strategy included backhoe trenching to initially define the site boundaries and to locate areas which had potentially intact remains. Five backhoe trenches were excavated during the project. The color of the soil exposed in the backhoe trenches was determined in the laboratory using **Munsell Soil Color Charts** (1975) from soil samples collected from the trench profiles during field operations. In addition, five backhoe test pits and nine shovel tests were dug to further determine the site limits (Fig. 2). Since the purpose of the shovel tests was to determine the extent of the subsurface shell midden, they were dug in single levels and were excavated to sterile clay subsoil, or through dredged clay to a depth considered sufficient to determine that the shell midden deposit was not present. The soil from the shovel tests was hand sorted using trowels and shovels, rather than being screened, due to the clayey nature of the soil. Cultural materials from what appeared to be recently dredged soil were not collected, considering the recent introduction of such items.

Cultural deposits exposed by the backhoe operations, which appeared to be **in situ**, were investigated with hand-excavated units. Only two 1-m² units, N40/W36 and N48/W33, were dug because of the evidence of disturbance in the shell midden deposits at the site. The two units were located in areas which appeared to have the most intact and abundant shell midden deposits, near

backhoe trenches 4 and 5 (Fig. 3) in the northeastern part of the project area. The test units were dug in natural levels which were subdivided in arbitrary levels. Each level was recorded on a printed CAR-UTSA unit-level record. The levels in the two units were recorded differently. The dredged clay in unit N40/W36 was designated as level 1, and the underlying levels in the shell midden were designated as levels 2 and 3. In unit N48/W33, the dredged clay was not designated as a level, and the two levels in the shell midden deposit were recorded as levels 1 and 2. The dredged clay overlying the shell midden stratum was shoveled out and not screened due to the disturbed nature of the deposit. Materials recovered from the hand-excavated test units were water screened using 1/4-inch mesh hardware cloth overlying 1/8-inch fine mesh. The water was pumped from the Old River. In addition to cultural materials, all the shell and bone from the test units was collected. Because there was an admixture of numerous pieces of recent wood and charcoal, and other recent historic materials into the shell midden stratum, no samples were collected of charcoal for radiocarbon dating. Both test units were excavated to the sterile clay subsoil. In unit N40/W36 (or unit 1), the excavation levels were as follows: level 1, dredged clay, existing ground surface to 12 cm below ground surface; level 2, shell midden deposit, 12-27 cm below ground surface; level 3, shell midden deposit, 27-37 cm below modern ground surface. The excavation levels in unit N48/W33 were as follows: (no level) dredged clay, existing ground surface to 13 cm below ground surface; level 1, shell midden deposit, 13-28 cm below ground surface; level 2, 28-36 cm below ground surface.

All excavated areas were backfilled at the completion of the project using a backhoe. Modern markers such as aluminum cans were placed in the bottom of the excavations prior to backfilling with stockpiled backdirt.

Prehistoric artifacts, mainly sherds, and historic artifacts were collected from the site surface and from the beach and slumping shell midden deposits along the banks of the site. This was done to add to the artifact sample and thereby aid in determining the chronology of shell midden deposits at the site.

Daily field journals were kept by all members of the CAR-UTSA field crew, including the field director. Records were kept of backhoe and hand-dug excavations, including stratigraphic profiles, and photographs were taken of the general site and of the excavations.

After the completion of the field work all the collected materials were taken to the CAR-UTSA for laboratory processing and analysis. All these materials, in addition to all the notes, records, and photographs generated during the project are curated at the CAR-UTSA.

SITE DESCRIPTION

During the 1982 investigations, 41 HR 39 was described as an extensive shell midden which extended for several hundred meters along the north and east shores of De Zavala Point (Voellinger 1982; Day 1982). Since 1982, however, industrial development of the Point has severely modified the vicinity.

Since 1982, a large concrete storage silo was constructed on the southern half of the Point by Falcon Cement, Inc. (Permit Application No. 16000). At approximately that same time, the Old River Fleet and Shipyard acquired the northern half of the Point and constructed a brick office building and a corrugated metal utility structure and dug trash pits on the northern side of the utility structure. One of the trash pits measured roughly 2.8 m x 3 m, and the other measured 3 m x 3.5 m in diameter. Nearly all the thick forest overgrowth which formerly covered the Point was removed, and much of the land surface appears to have been bladed or covered with fill (Stokes 1984). A large pile of dredged material is on the northwestern part of the project area, and covers part of the site (Figs. 2; 3; 4,a,b). Jack Lillard, an employee of the Old River Fleet and Shipyard, told the archaeologists that the pile of dredged material dated to 1983, and consisted of materials which had slumped from the north bank of the Point, and that the trash pits were dug at that same time. Large pieces of concrete, metal, plastic, crushed gravels, and other industrial debris are situated on the southern part of the project area. Most of the eroding shell midden stratum of 41 HR 39, which occurred along the north bluff, was destroyed during the installation of a 1-m high bulkhead in this area. James Bradley, an employee of the Old River Fleet and Shipyard, told the archaeologists that the "best part" of the site (41 HR 39) was removed for the construction of the metal bulkhead and post pier on the northwest side of the site. The small isolated segments that were preserved of this midden stratum along the north bluff are slumping rapidly down slope (Figs. 4,a; 5,a,b). A dense surface scatter of *Rangia* shells, oyster shells, and prehistoric and historic artifacts marked the erosion of the southeastern part of site 41 HR 39 (Figs. 4,a,b); these eroding materials extended into the area investigated by Voellinger (1982) and Day (1982). An investigation by Jan Stokes and Carolyn Good (Stokes 1984), staff archaeologists for the Department of the Army, Galveston District, Corps of Engineers, which is reviewed earlier in this report, indicated that intact deposits were preserved at site 41 HR 39.

James Bradley of Channelview (personal communication 1984) reported finding several projectile points from the sandy trash pit area, west of the Old River Fleet and Shipyard metal utility building. He said that the sand in this area accumulated from sand blasting. Bradley also stated that artifacts relating to the World War II military occupation of De Zavala Point had been recovered from the area between the metal utility building and the brick office building. Bradley's information concerning the site would have been gained recently during his employment at the Old River Fleet and Shipyard.

Jack Lillard of Channelview (personal communication 1984) told the archaeologists that brick firing had been done in the area, which might explain the crumbling, over-fired bricks and brick fragments found on the site. These brick fragments, however, may have been from demolished structures, and probably were manufactured at nearby Cedar Bayou, as discussed further in this report. Like Bradley, Lillard has been present at De Zavala Point for only one or two years, since his employment at the Old River Fleet and Shipyard.

Disturbance at the site has been caused by various activities associated with the repeated nonaboriginal occupation, utilization, and abandonment of the Point since the 1820s or 1830s. These activities include the recent

deposition of a pile of dredged material in the northwest part of the project area; a layer of dredged clay in the north and northeastern parts of the project area; trash dumping, especially visible in the south and west parts of the project area; erosion, particularly evident along the shorelines and in the southeast part of the project area; and subsidence of the Point. The depositional sequence at the site was further complicated by the presence of a shell-topped road, now partially covered with dredged material, which followed the banks of De Zavala Point including the site (41 HR 39) area, and possibly extended inland. Lenses of crushed shell observed in the shell midden stratum of backhoe trench 5 (Fig. 3) appeared to be part of that road.

De Zavala Point gently slopes from south to north, and an eroding compound slope goes from west to east on the southeastern part of the project area. The **Rangia** shells exposed on the surface in the southeastern part of the site (Fig. 2) appear to have eroded from the intact deposits in the northern part of the site since no subsurface shell midden deposits were found in the tests dug in this area.

THE EXCAVATIONS

Shovel tests 1-6 (Table 1), predominantly located in the southern part of the project area (Fig. 3), revealed eroding, disturbed deposits in the vicinity of the Old River Fleet and Shipyard metal utility building. Shovel test 9 showed clayey dredged material in the southeastern part of the project area, near the east beach face. Shovel tests 5 and 6, along the north bank in the northwestern part of the project area, showed clayey, dredged material.

The stratigraphy of the northwestern part of the project area where backhoe trenches 1-3 (Figs. 6-8) were excavated is variable. In backhoe trench 1 (Fig. 6), the stratigraphy is composed of an upper deposit of sandy clay (recently dredged material), from 5 cm to 20 cm thick, overlying a 5 cm to 10 cm thick deposit of sandy clay loam with **Rangia** shells, prehistoric ceramics, and historic materials. The sandy clay loam stratum overlies another deposit of sandy clay loam with a higher sand content, which is from 17 cm to 125 cm thick, and includes a few pieces of shell. The lower strata, which contain no cultural materials, are deposits of sandy clay which become more clayey with increased depth.

In backhoe trench 2 (Fig. 7), the stratigraphy includes a 5 cm to 30 cm thick upper deposit of sandy clay loam with a high clay content and a few **Rangia** shells, prehistoric ceramics, and historic materials. The underlying, 5 cm to 25 cm thick stratum is a sandy clay loam with a high sand content, more **Rangia** shells than the overlying level, prehistoric sherds, and historic materials. The underlying, 22 cm to 50 cm thick stratum is a clay loam with no cultural materials. The deeper strata are sterile clay.

The upper stratum in backhoe trench 3 (Fig. 8) is a sandy clay loam with a high clay content, which varies from 5 cm to 100 cm in thickness. The underlying stratum in the east and west ends of the trench (Fig. 8,a,c) is a sandy clay with no cultural materials, which becomes more clayey with increased depth; this stratum was not visible in the central part of the trench, though it may occur at a depth below where this part of the trench

TABLE 1. SHOVEL TEST DESCRIPTIONS

Shovel Test	Depth	Description
1	0-6 cm	eroded, sandy clay loam, Rangia shells, and glass
	6+ cm	clay
2	0-41 cm	sandy clay loam with brick, Rangia shells, and glass
	41+ cm	clay
3	0-10 cm	sandy loam
	10-29 cm	sandy clay loam
	29+ cm	clay
4	0-46+ cm	clay
5	0-45+ cm	sandy clay with petroleum smell
6	0-10 cm	sandy clay with Rangia shells and glass
	10-46+ cm	sandy clay with petroleum smell, clay content increases with depth
7	0-15 cm	clay loam, crushed and burned Rangia shell fragments, mineralized bone fragments--highly disturbed
	15-18 cm	clay loam grading into clay
	18-34+ cm	clay
8	0-10 cm	sandy clay loam, Rangia shells
	10-33 cm	sandy clay loam
	33-70+ cm	sandy clay, clay content increases with depth, chert flake at ca. 40 cm
9	0-40+ cm	clay

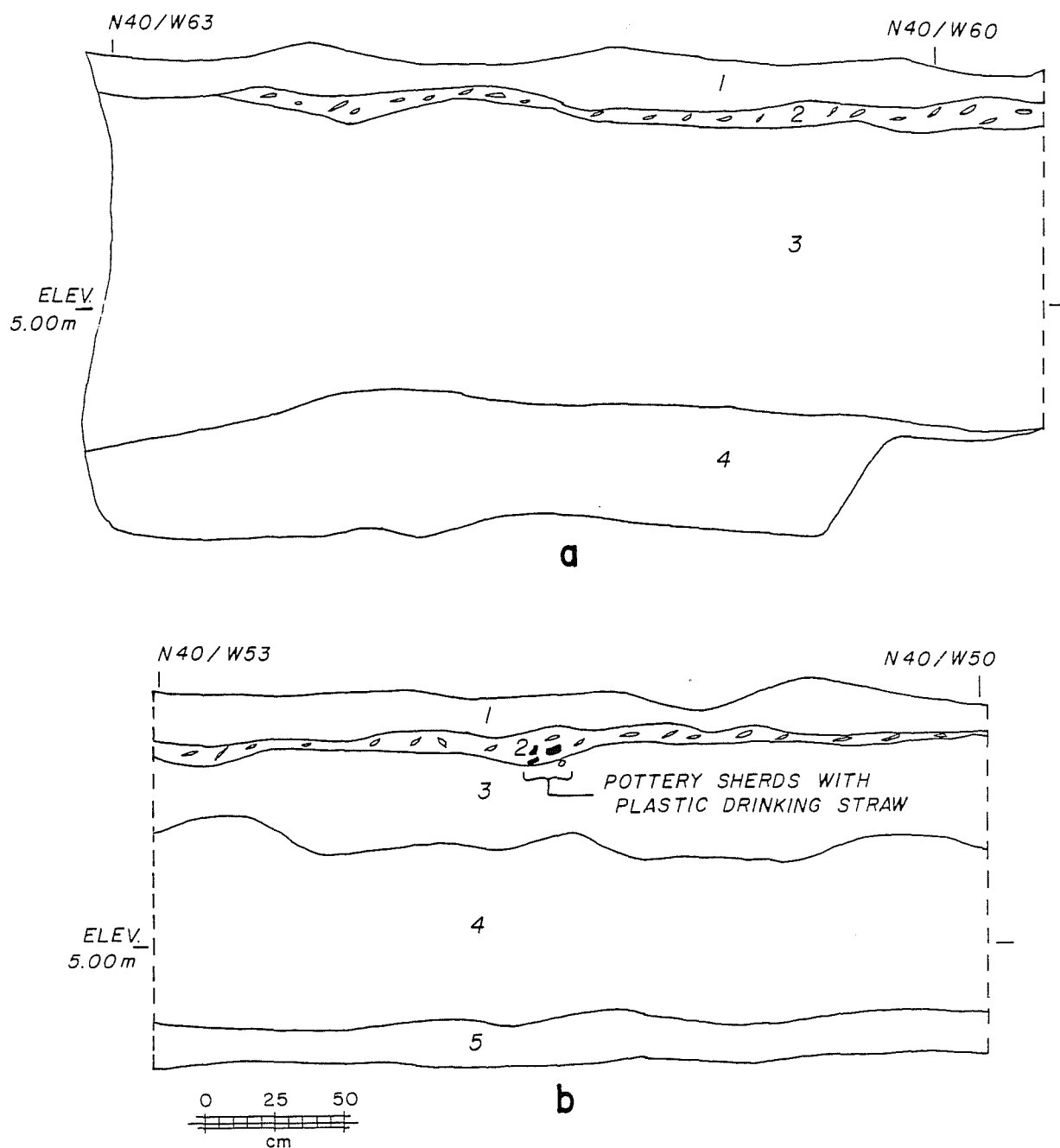


Figure 6. Backhoe Trench 1, North Profile. a, N40/W60-63, west end of trench; b, N40/W50-53, east part of trench. The strata are as follows: (1) Dark yellowish brown (10 YR 3/4) sandy clay with red (10 YR 4/8) mottling. (2) Dark brown (10 YR 3/3) sandy clay loam with *Rangia* shells, and prehistoric and historic materials. This stratum is the shell midden deposit. (3) Dark brown (10 YR 3/3) to dark yellowish brown (10 YR 3/4) sandy clay loam with a high sand content, and a small amount of shell. (4) Dark yellowish brown (10 YR 4/4) sandy clay with a high sand content, and historic materials and shell. (5) Pale brown (10 YR 6/3) sandy clay with dark red (2/5 YR 3/6) and yellowish brown (10 YR 5/8) mottling.

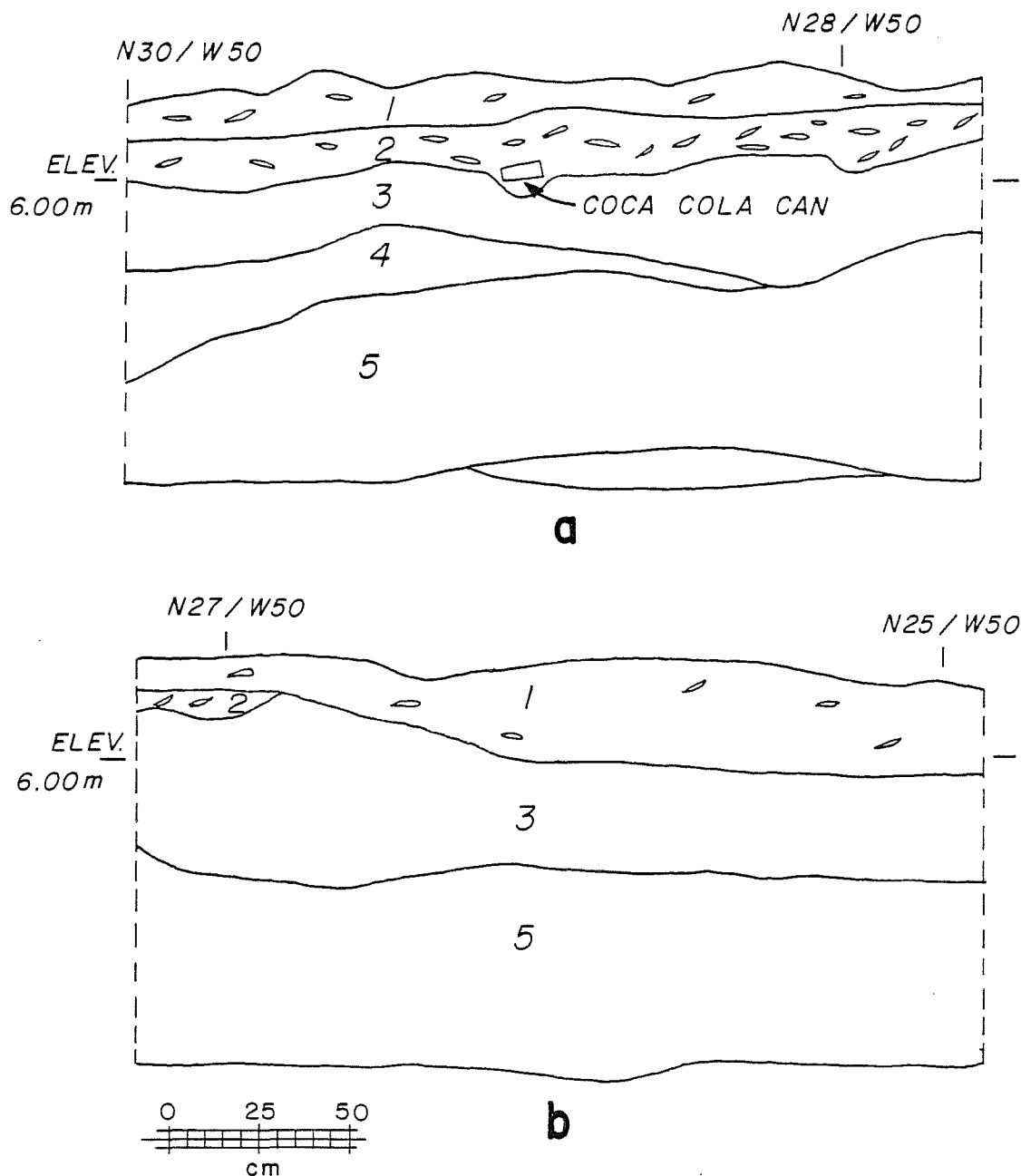


Figure 7. Backhoe Trench 2, East Profile. a, N28-30/W50, north end of trench; b, N25-27/W50, central part of trench. The strata are as follows: (1) Dark yellowish brown (10 YR 3/4) sandy clay loam with a low sand content and a few *Rangia* shells. (2) Dark yellowish brown (10 YR 3/4) sandy clay loam with a high sand content, and a higher count of *Rangia* shells than stratum 1. Prehistoric and historic materials occur in this stratum. This stratum is the shell midden deposit. (3) Dark brown (10 YR 3/3) clay loam. (4) Dark yellowish brown (10 YR 4/4) clay. (5) Pale brown (10 YR 6/3) clay with dark red (2.5 YR 3/6) and yellowish brown (10 YR 5/8) mottling, and a few small pebbles. (6) Grayish blue clay. (No sample was taken of this stratum for a Munsell soil color reading.)

was excavated. Beneath the upper stratum in the central part of the trench (Fig. 7,b) is a 2 cm to 10 cm thick stratum of sandy clay loam with a few **Rangia** shells; this stratum appeared to have been compacted. Underlying this stratum is another deposit of sandy clay loam that is lighter in color, has more shell, and includes flecks of charcoal; this lower deposit appeared to be part of the shell midden deposit, and did not appear to be compacted, unlike the stratum which overlies it. Beneath this stratum, in the central part of the trench (Fig. 8,b), is a stratum of sandy clay loam with a high clay content which overlies sandy clay deposits; no cultural materials were found in these deposits.

In backhoe trenches 4 and 5 (Figs. 9; 10), the northeastern part of the project area, the shell midden deposits were best preserved. In backhoe trench 4 (Fig. 9) the upper stratum consists of a 5 cm to 25 cm thick layer of dense, mottled clay which was dredged material; a layer of grass and other organic materials was visible at the base of this deposit marking the former ground surface. The next stratum is a loose sandy clay, from 2 cm to 55 cm thick, which overlies a 2 cm to 20 cm thick, sandy clay loam deposit with **Rangia** shells, prehistoric ceramics, and historic materials. In some parts of the trenches the shell is sandwiched between layers of dark sandy clay loam, while in other parts the shell and the sandy clay loam are intermixed. The underlying stratum is a 5 cm to 75 cm thick deposit of sandy clay with fragments of crushed, weathered shell, but no cultural materials. Beneath this stratum is a strata of sand and a strata of dense clay, neither of which contain cultural materials.

In the northern and southern parts of backhoe trench 5 (Fig. 10,a,c) the upper stratum is a 15 cm to 55 cm thick deposit of clay with a few **Rangia** shells (recently dredged material). In the central part of the trench (Fig. 10,b), however, this clayey, dredged deposit is overlain by a 40 cm to 45 cm thick layer of sandy clay loam which has a high clay content, smells of diesel oil, and contains a few **Rangia** shells and decaying organic materials; the location of this layer above dredged material indicates that its deposition occurred recently. Underlying these deposits is a 5 cm to 45 cm thick stratum of sandy clay loam with a high clay content, containing many **Rangia** shells, and also prehistoric and historic materials; this stratum is the shell midden deposit. The shell midden deposit was not visible in the central part of the trench (Fig. 10,b), however. Within the shell midden layer is a lens of crushed shell (Fig. 10,a) with a maximum thickness of 15 cm, which may have formerly been part of a shell-topped road. There is what appeared to be a tree root disturbance through the shell and loamy deposit in the northern part of backhoe trench 5 (Fig. 10,d). In the northern part of the trench (Fig. 10,c,d), the shell midden deposit is overlain by a 2 cm to 15 cm thick deposit of sandy clay loam which is similar to the underlying shell midden deposit, but which has thin lenses of sand and a lesser amount of **Rangia** shells; this layer may represent part of the shell midden which has eroded. Underlying the shell midden deposit in the southern and central parts of the trench (Fig. 10,a,b) is a 5 cm to more than 60 cm thick stratum of sterile clay; this clay layer does not extend to the northern end of the trench (Fig. 10,c,d). A stratum of sandy clay with fragments of crushed, weathered shell underlies the sterile clay stratum in the southern part of the trench (Fig. 10,a). This layer of sandy clay underlies the shell midden deposit in the northern end of the trench

Figure 8. **Backhoe Trench 3, North Profile.** a, N15/W52.25.-55, east part of trench; b, N15/W60-63, central part of trench; c, N15/W70-73, west part of trench. The strata are as follows:

- (1) Light brownish gray (10 YR 6/2) sandy clay loam with a high sand content.
- (2) Light gray (10 YR 7/2) sandy clay with yellowish brown (10 YR 5/8) mottling. The clay content increases with depth.
- (3) Very dark grayish brown (10 YR 3/2) sandy clay loam with a few **Rangia** shells. This stratum is layered and compacted.
- (4) Lighter grayish brown sandy clay loam (in comparison to stratum 2) with a moderate amount of **Rangia** shells and charcoal flakes. This stratum is the shell midden deposit. (No sample was taken of this stratum for a Munsell soil color reading.)
- (5) Light brownish gray (10 YR 6/2) sandy clay loam with a high sand content.
- (6) Light gray (10 YR 7/2) sandy clay with a moderate sand content and with yellowish brown (10 YR 5/8) mottling.
- (7) Light gray (10 YR 7/2) sandy clay with red (2.5 YR 4/6) mottling.

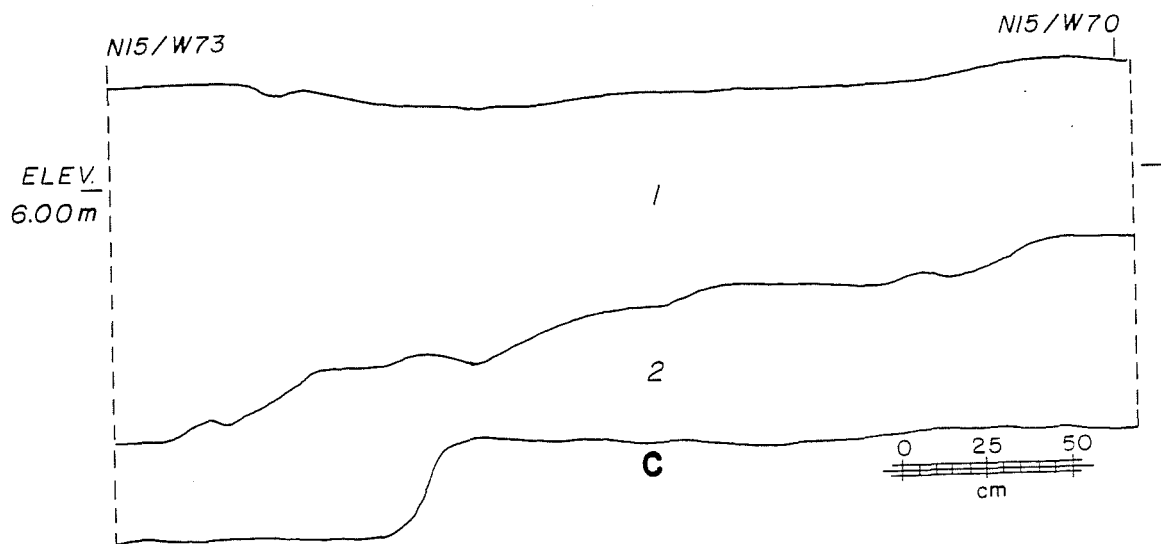
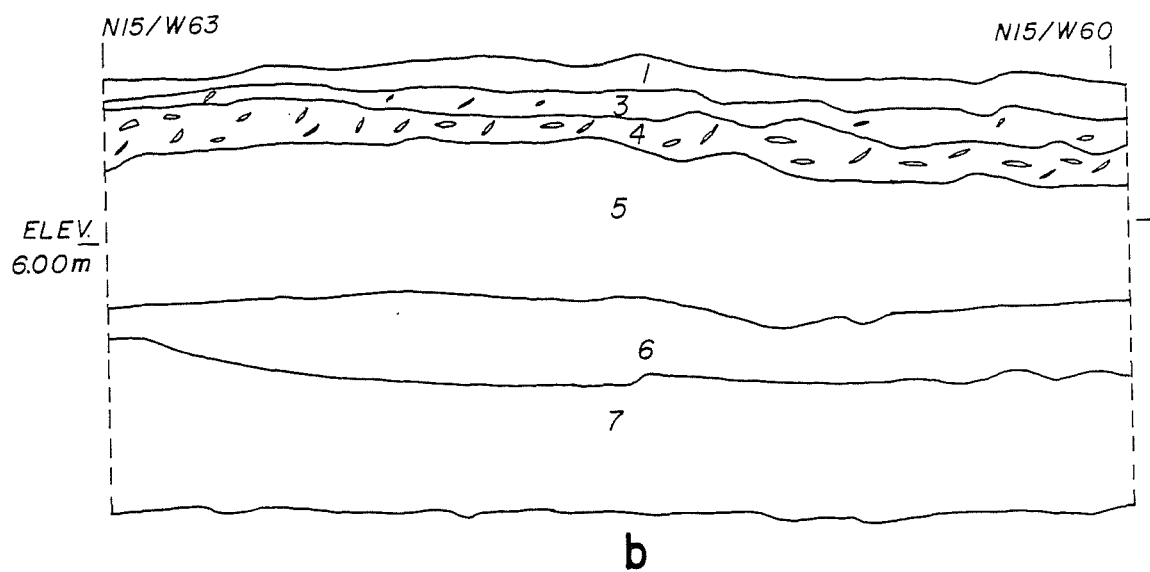
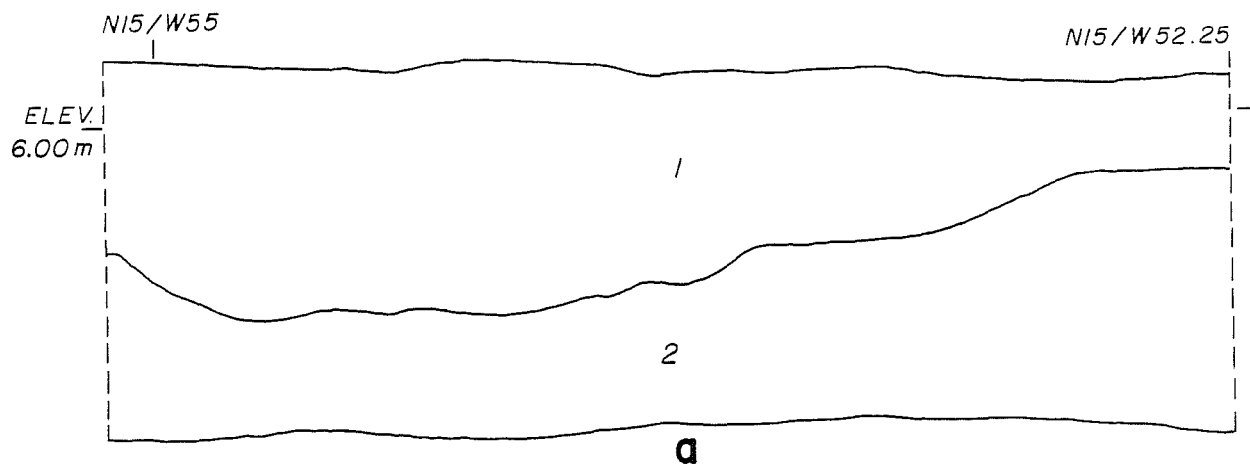


Figure 9. **Backhoe Trench 4, South Profile.** a, N40/W26-29, east end of trench; b, N40/W35-37, central part of trench; c, N40/W40-43, west of end of trench. The strata are as follows:

- (1) Dense red (2.5 YR 4/8), brown (10 YR 5/3), and very dark grayish brown (10 YR 3/2) mottled clay with a few **Rangia** shells. This stratum is recently dredged clay.
- (2) Very dark grayish brown (10 YR 3/2) sandy clay loam with a high clay content, roots, decaying wood, and a very few **Rangia** shells.
- (3) Very dark gray (10 YR 3/1) sandy clay loam with a high clay content, with many **Rangia** shells, and prehistoric and historic materials. This stratum is the shell midden deposit.
- (4) Light yellowish brown (2.5 YR 6/4) sandy clay with crushed, weathered shell fragments.
- (5) Very pale brown (10 YR 7/4) sandy clay with yellowish red (5 YR 5/8) mottling.
- (6) Tan sand. (No sample was taken of this stratum for a Munsell soil color reading.)
- (7) Dark greenish gold dense clay. (No sample was taken of this stratum for a Munsell soil color reading.)

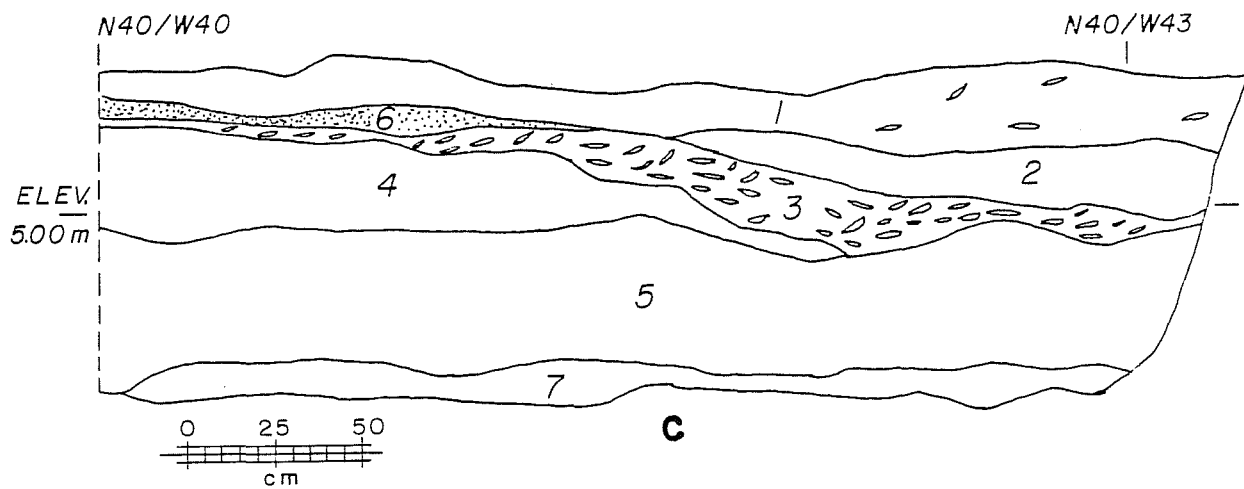
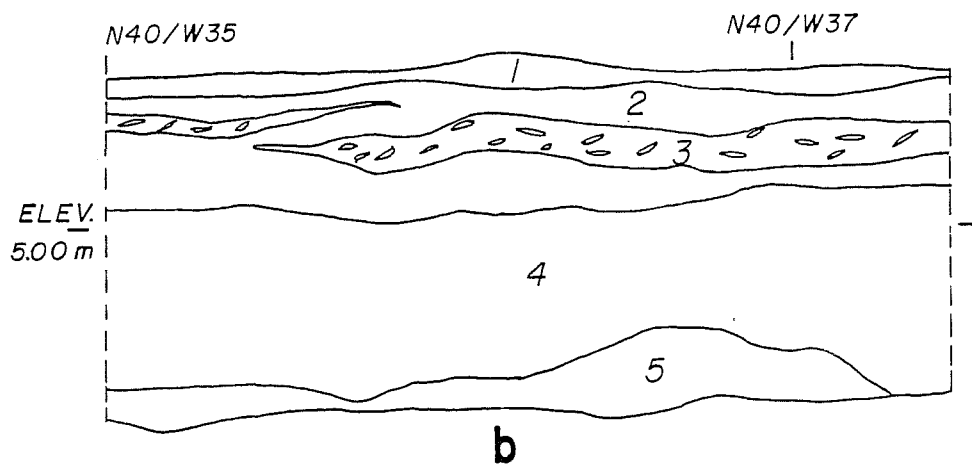
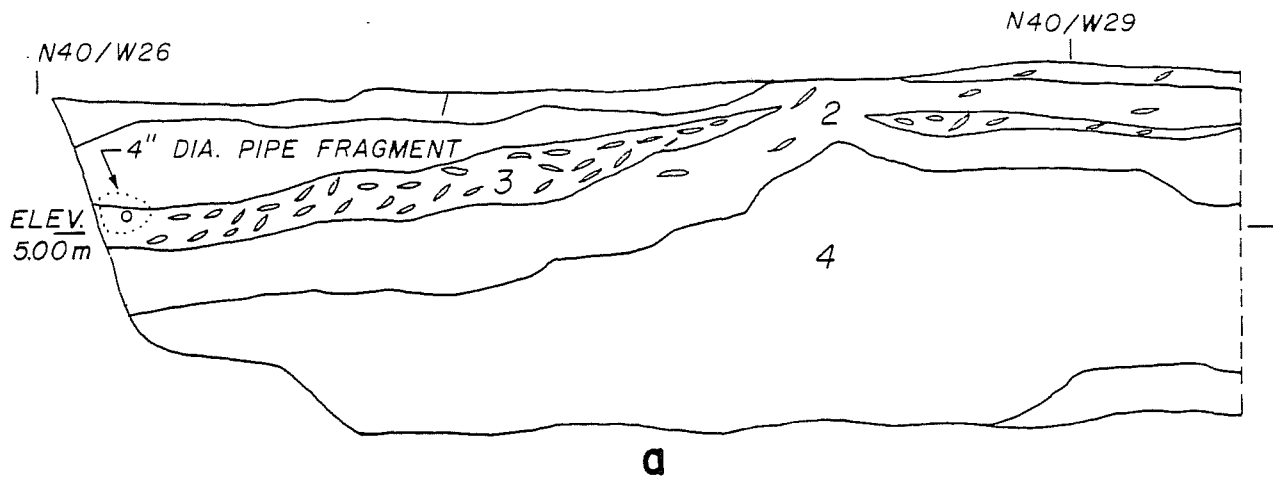
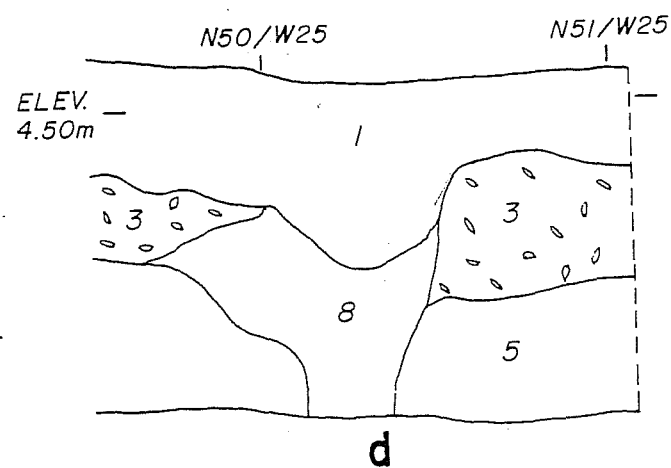
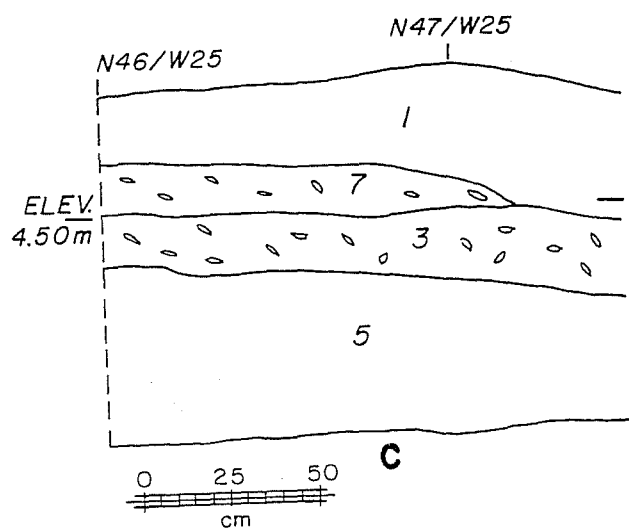
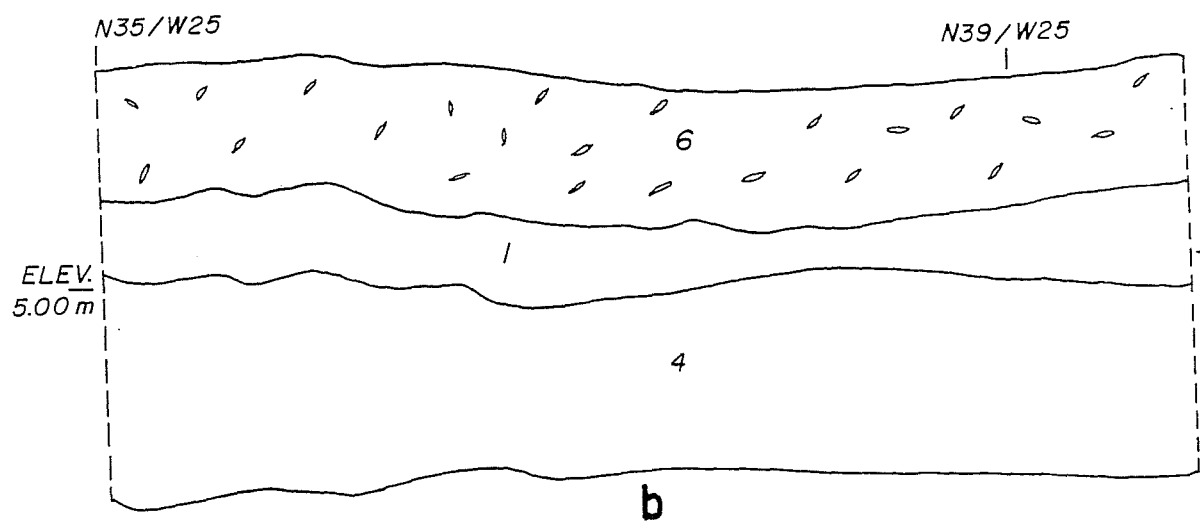
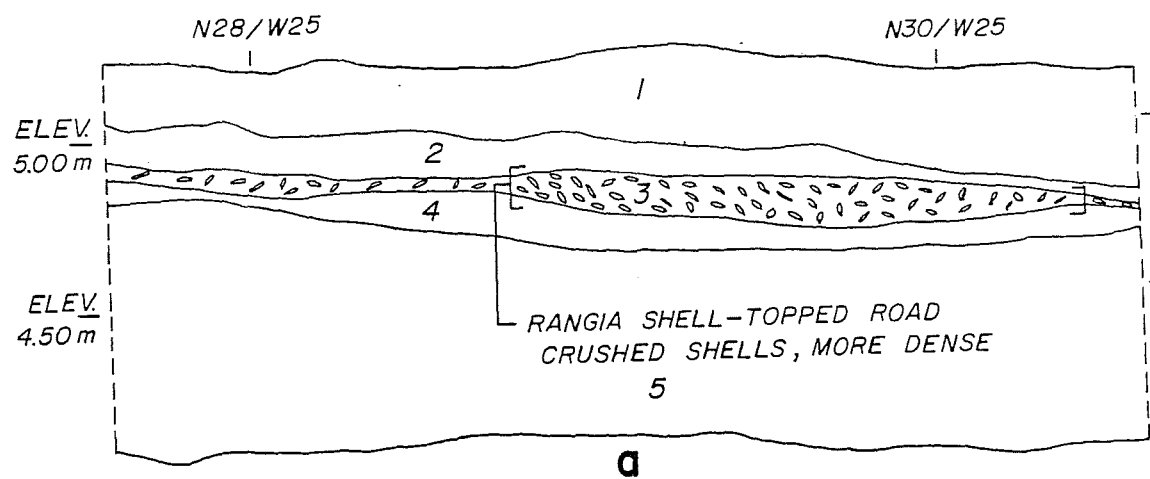


Figure 10. **Backhoe Trench 5, West Profile.** a, N28-30/W25, south part of trench; b, N35-39/W25, south-central part of trench; c, N46-47/W25, north-central part of trench; d, N50-51/W25, north part of trench. The strata are as follows:

- (1) Dense red (2.5 YR 4/8), brown (10 YR 5/3), and very dark grayish brown (10 YR 3/2) mottled clay with a few **Rangia** shells. This stratum is recently dredged clay.
- (2) Very dark grayish brown (10 YR 3/2) sandy clay loam with a high clay content, roots, decaying wood, and very few **Rangia** shells.
- (3) Very dark gray (10 YR 3/1) sandy clay loam with a high clay content, with many **Rangia** shells, and prehistoric and historic materials. This stratum is the shell midden deposit.
- (4) Light olive brown (2.5 YR 5/4) clay with red (2.5 YR 4/8) mottling.
- (5) Light yellowish brown (2.5 YR 6/4) sandy clay with crushed, weathered shell fragments.
- (6) Very dark gray (10 YR 3/1) layered sandy clay loam with historic materials. This stratum smelled strongly of diesel oil.
- (7) The same soil as stratum 3, but with thin lenses of tan sand, and only a few **Rangia** shells.
- (8) The same soil as stratum 3, but with thin lenses of tan sand, and only a few very small **Rangia** shell fragments. This deposit appeared to have resulted from tree root disturbance.



(Fig. 10,d), but was not observed in the central part of the trench (Fig. 10,b).

Judging from the excavation results, the intact shell midden deposits of 41 HR 39 are predominantly in the northeastern part of De Zavala Point, in the vicinity of backhoe trenches 4 and 5 of excavation units N40/W33 and N48/W36. The portion of the site which is preserved within the study area appears to measure roughly 30 m x 40 m. Though relatively thick shell midden deposits occur along the northern bank of De Zavala Point, west of backhoe trenches 4 and 5 and the excavation units, the additional backhoe trenches (1-3), backhoe test pits, and shovel tests show that these deposits do not extend southward from the bank into the Point. An additional remnant of the site was located by Day (1982), in the southern part of De Zavala Point, in backhoe trenches 9 and 10. This southern remnant of the site was covered by as much as 60 cm to 125 cm of recent overburden, however, in comparison to 35 cm of overburden found in backhoe trenches 4 and 5 within the present project area.

MATERIALS RECOVERED

The materials recovered from the site are divided into prehistoric and historic categories. The prehistoric materials are ceramics, lithics, all faunal materials, and all the fine screen materials; some of the faunal materials and fine screen materials included in the prehistoric section date to the historic component, however. The historic materials are ceramics, glass, metal, and miscellaneous materials such as stone and plastic.

The provenience of the material is as follows. The surface collection category includes all materials collected from the surface of the southern part of the site, and from other parts of the site but for which specific provenience was not recorded. The northwest (NW) quad category is materials collected from the surface of the northwestern part of the site and also from the eroding deposits exposed along the north bluff and the sea wall or pier on the northern side of the site; materials collected from the north shore of the site along the Old River were also included in this category. Materials collected from the pile of dredged material on the north side of the site are designated as such. Specific collection stations or areas from the backdirt of the northern part of backhoe trench 5 (collection stations 5-1 and 5-2) are also designated; the backdirt was consistently placed near the area from which it was excavated, so collections from these trench stations (which were mapped during the project) are from known areas of backhoe trench 5. ST 1 designates shovel test 1. Materials from the controlled excavation units, N40/W36 and N48/W33, are assigned to specific levels.

PREHISTORIC MATERIALS

The prehistoric cultural materials recovered during this project are 613 sherds, 40 lithics, and two pieces of worked bone.

Ceramics

The prehistoric ceramics are categorized and discussed in terms of paste, temper, decoration, and vessel part (Table 2; Figs. 11-13). Aten's (1983a) ceramic classifications for the Galveston Bay area were assigned to sherds for which distinct types could be distinguished. The surface and interior (as shown in a fresh break) of all the sherds were examined using 10X and 16X magnification. There were 592 sandy paste sherds, six sherds which may be shell-tempered, and 15 grog-tempered sherds. Overall, thinner sherds were approximately 0.4 cm thick, and generally had a finer paste. Thicker sherds were roughly 0.65 cm thick, and generally had a more coarse paste. A brief examination of body sherd thickness indicated that the sandy paste body sherds generally average 0.65 cm, shell-tempered 0.61 cm, and grog-tempered 0.71 cm. Sandy paste rim sherds vary from 0.5 cm to 0.8 cm in thickness, averaging roughly 0.65 cm. There were no shell-tempered rim sherds. The single grog-tempered rim sherd recovered was 0.70 cm thick. Some sherds have blackened interiors, possibly from deliberate sooting or smudging.

Sandy Paste Ceramics

The upper Texas coast sandy paste plainwares are generally classified as one type, **Goose Creek Plain**, because of the similarity of such ceramics throughout southeast Texas and southwestern Louisiana. Local varieties of sandy paste ceramics are defined as a division of **Goose Creek Plain** (Aten 1983a:217). **Goose Creek Plain** vessel lip types which were distinguished in the study collection were thinned, flattened, and rounded. Lip notching occurred on flattened rims in all cases for **Goose Creek Plain** rim sherds (Fig. 11,b,c). Suhm, Krieger, and Jelks (1954:378) state that most rim sherds have a thinned, or sharp, edge (or lip). Some rim sherds are turned outward, and some exhibit lip notching, which is fairly common. The lip notching on **Goose Creek Plain** rim sherds in the study sample extended across the vessel lip at a right angle. Lip notching on **Goose Creek Incised** rim sherds was present only along the interior lip edge and always appeared in combination with horizontal, parallel lines which were on the exterior of the rim (Fig. 12,a,c). Vessel bases were conical and were characterized by a thick knob. Although whole vessels from this area are rare, three forms are known to be present: deep hemispherical bowls which are up to 45 cm in diameter, cylindrical vessels which are 25 cm or more in height, and generally cylindrical vessels which curve slightly inward between the middle and the mouth (*ibid.*, citing Wheat 1953:Plate 31). Drill holes may occur immediately below the lip, or in pairs, on either side of a crack and were probably used for vessel repair (Suhm, Krieger, and Jelks 1954:378).

The sand in the sandy paste sherds from site 41 HR 39 grades from very fine with a homogeneous texture and fine, thin layers or lenses of sand, to a coarse, large grain paste. Most sherds have a coarse paste, a very few have a uniform fine paste, and more sherds have a medium grain size paste than have a fine paste. The medium paste sherds appear to have a contorted, poorly wedged paste texture. Since there was a gradation of sherd pastes rather than a distinct division, all the sandy paste sherds were placed in one category rather than into grain texture divisions and are referred to as **Goose Creek Plain**.

TABLE 2. PROVENIENCE OF ABORIGINAL CERAMICS

Provenience	Plain Sandy Paste	Incised Sandy Paste	Red-Filmed Sandy Paste	Plain Shell-Tempered	Incised Shell-Tempered	Plain Grog-Tempered
Surface Collection	161	4	1	-	1	2
NW Quad	285	2	-	-	-	13
Dredged Material	30	1	-	-	-	-
Trench 5-1	10	-	-	-	-	-
Trench 5-2	15	-	-	-	-	-
ST 1	3	-	-	-	-	-
ST 2	2	1	-	5	-	-
N40/W36 Level 2	10	-	-	-	-	-
N40/W36 Level 3	2	1	1	-	-	-
N48/W33 Level 1	56	2	-	-	-	-
N48/W33 Level 2	5	-	-	-	-	-
TOTAL	579	11	2	5	1	15

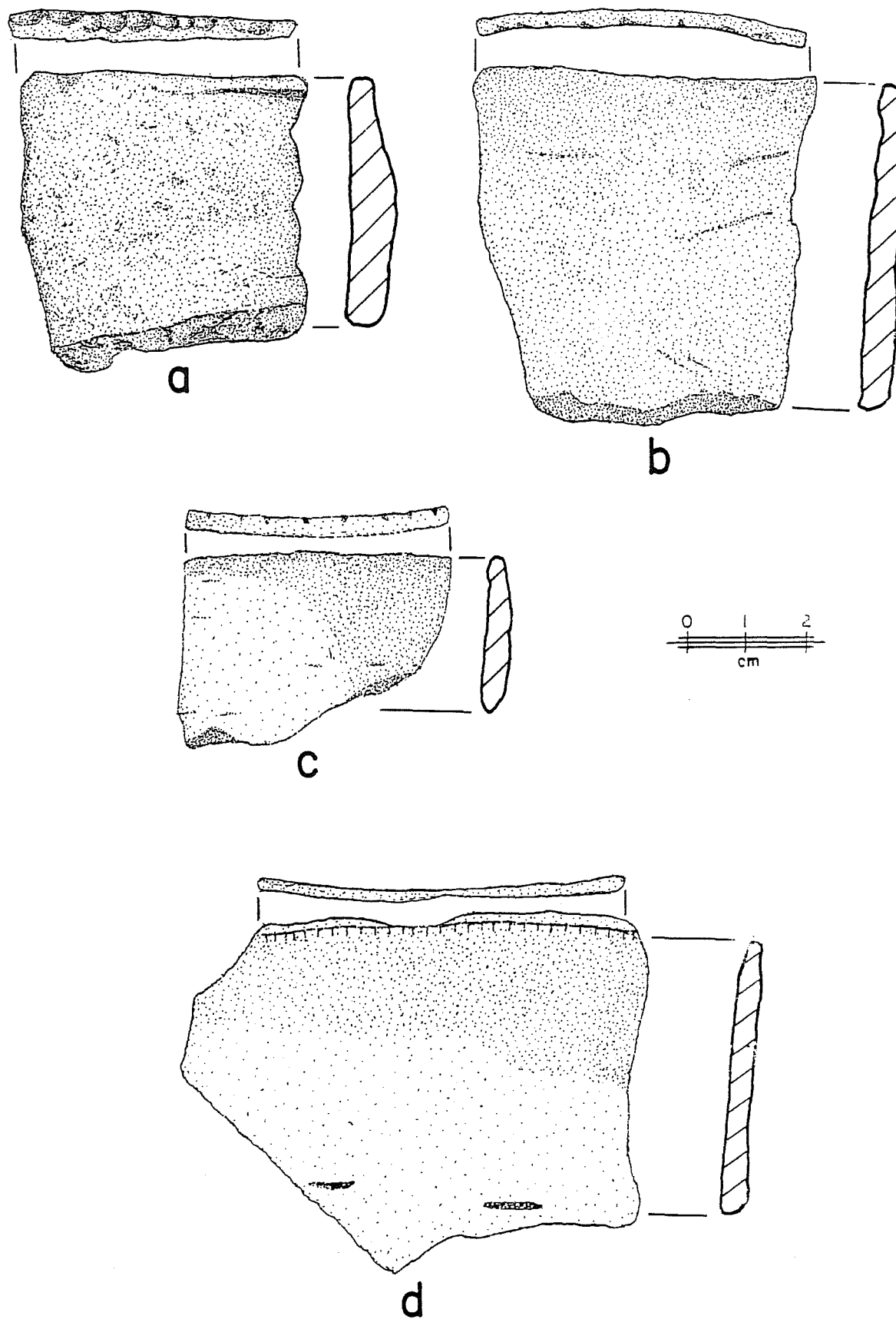


Figure 11. Aboriginal Ceramics from Site 41 HR 39. a, Goose Creek Plain rim sherd with worked lip; b, Goose Creek Plain rim sherd with flattened lip and interior lip notching; c, Goose Creek Plain rim sherd with flattened lip and interior lip notching; d, Goose Creek Incised rim sherd with tick marks below the thinned lip.

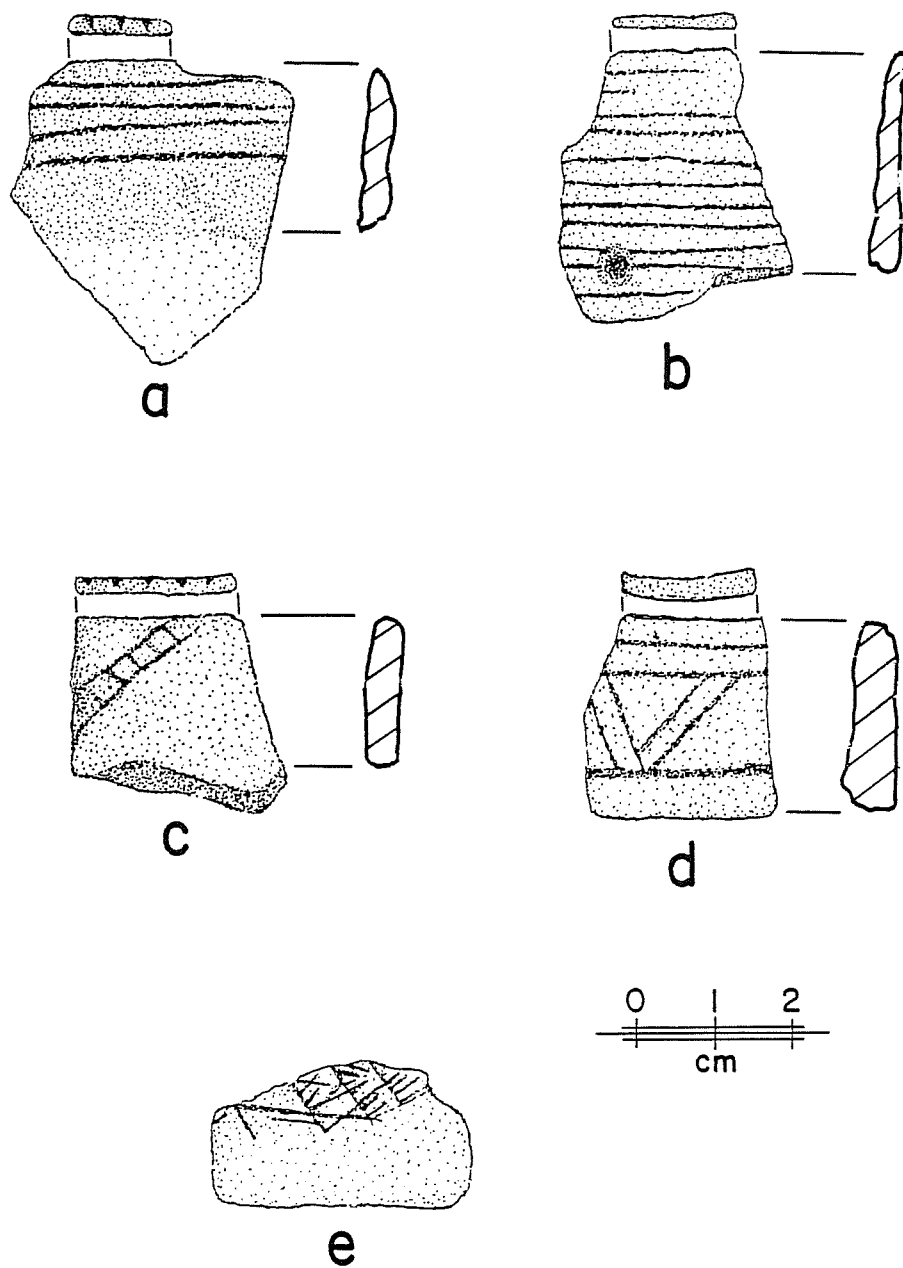


Figure 12. **Aboriginal Ceramics from Site 41 HR 39.** a, **Goose Creek Incised** rim sherd with flattened lip and interior lip notching, and horizontal lines beneath the lip; b, **Goose Creek Plain** rim sherd with thinned lip, horizontal lines beneath the lip, and a biconical drill hole; c, **Goose Creek Incised** rim sherd with flattened lip and interior lip notching, and diagonal hatched lines extending to the lip; d, **Goose Creek Incised** rim sherd with flattened lip, and horizontal and diagonal lines beneath the lip; e, **Goose Creek Incised** neck sherd.

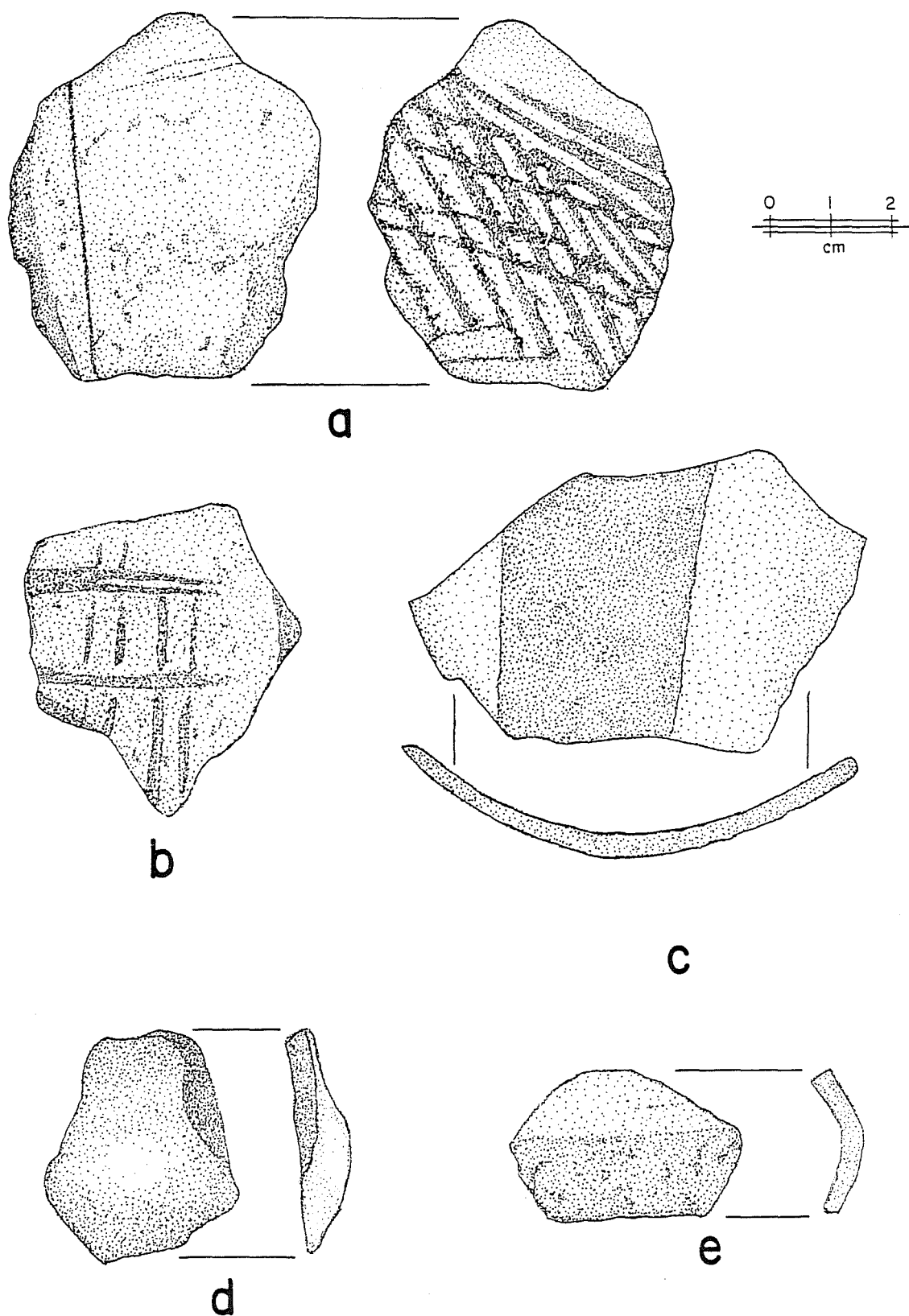


Figure 13. **Aboriginal Ceramics from Site 41 HR 39.** a, shell-tempered incised body sherd with vertical and horizontal lines and a smoothed, irregular grid on the sherd interior; b, badly eroded Goose Creek Incised body sherd with horizontal and vertical lines; c, banded Goose Creek Red-Filmed body sherd; d, Goose Creek Plain body sherd with knob; e, grog-tempered sherd from vessel shoulder.

Plain, sandy paste ceramics, of which there are 579, compose 94.45% of the sherds recovered from the site. There were 28 rim, 549 body, and two base sherds. Of the rim sherds, 24 had thinned lips, four had flattened lips, and one had a rounded lip. Most of the sherds were recovered from surface collections from the site, particularly in the northwest quadrant along the northern bluff. In the controlled excavation units, the most sherds came from N48/W33, level 1. A lesser amount of sherds was recovered from the lower level in both excavation units. **Goose Creek Plain** ceramics are not particularly time diagnostic since they occur throughout the Ceramic period, from A.D. 100 to A.D. 1800 (Aten 1983a:Fig. 14.1).

Eleven incised, sandy paste ceramics, known as **Goose Creek Incised**, were recovered from the site, which composed 1.8% of the study collection. There were 11 rim sherds of this type, of which two had thinned lips (Figs. 11,d; 12,b), and three had flattened lips (Fig. 12,a,c,d). The lip was broken from six of the sherds. Decoration on these sherds included punctations and incisions, and generally included the following designs: (1) from one to six horizontal parallel lines underneath which was a single row of punctated dots; (2) lower pendant triangles filled with lines or punctates; (3) diagonal ladders; (4) ticking along border lines; (5) crossed diagonals; (6) ticked diagonals between border lines; (7) diamonds or squares filled with crosshatching; and (8) wavy lines. Since the body and base of these vessels were not decorated, those parts of the incised vessels are necessarily included with the **Goose Creek Plain** ceramics. The incised rim sherds were predominantly recovered during surface collections, though they were also found in shovel test 1, in level 3 of unit N40/W36, and in level 1 of unit N48/W33. **Goose Creek Incised** ceramics occur sporadically throughout much of the Ceramic period.

Plain, red-filmed sandy paste sherds, of which there were only two recorded during the analysis, formed 0.3% of the collection. It is possible that the red film on some sherds was removed during the water screening or during processing in the laboratory since a greater number of these sherds had been collected during field investigations. Recorded were one red-filmed body sherd (Fig. 13,c) and one base sherd. The base sherd was well fired and was banded with a vertical zone which is unslipped, and sided by two red-filmed vertical zones. The decoration zones are further delineated by shallow grooves along the zone edges. Like the other **Goose Creek** ceramics, **Goose Creek Red-Filmed** ceramics occur sporadically throughout the Ceramic period.

Shell-Tempered Ceramics

No bone-tempered ceramics were recognized in the sherd sample, though there were six sherds (1.0% of the collection) which appear to be shell tempered (Fig. 13,a). The temper in these sherds appear to have a pearly luster, which would not be expected to be present in bone. There were six body sherds, one of which was incised. Most of the shell-tempered sherds came from shovel test 2, and one (which was incised) was from the general surface collection. The interior of the incised shell-tempered sherd had a "grid of crossed lines," which may have been produced by smoothing the vessel interior with coarse grass (Suhm, Krieger, and Jelks 1954:378, Plate 71,H), or perhaps with a "ribbed marine shell tool" (Calhoun 1961:325). The interior of the

sherds in the remainder of the study collection had smoother surfaces. Aten (1983a:244-245, Fig. 14.1) did not assign this kind of sherd to any category and states that most shell tempering is probably fragmented **Rangia** or small gastropod shells which are probably fortuitous inclusions. Shell-tempered ceramics are therefore not used as a basis for analysis on the upper Texas coast.

Grog-Tempered Ceramics

Grog-tempered ceramic types which occur in the Galveston Bay area are **Baytown Plain** and **San Jacinto Incised** (Aten 1983a:239-242, Fig. 14.1). **San Jacinto** grog-tempered ceramics are thin-walled with moderate amounts of grog fragments in a sandy clay paste. The 15 plain, grog-tempered (one rim sherd and 14 body sherds) sherds compose only 2.45% of the study sample, but were the second most common ceramic type recovered from the site (Fig. 13,e). The rim sherd had a thinned lip. All the grog-tempered sherds were collected from the site surface, predominantly from the northern bluff and beach. Grog-tempered ceramics occur from ca. A.D. 1000 to 1800 (Aten 1983a: Fig. 14.1). Day (1982) reported finding a **San Jacinto Plain** ceramic sherd at site 41 HR 39, on the northern beach along the Old River.

Lithics

The 40 pieces of lithic materials recovered from the site during this project (Table 3; Figs. 14; 15) were predominantly made of a opaque, fine-grained, golden tan, banded chert; a few pieces, however, were of a coarser opaque gray chert, or a translucent brown chert. There were also three small pieces from petrified wood. The appearance of the cortex (the natural surface of flintlike materials; Crabtree 1972:56) remaining on the debitage and worked lithics indicates the utilization of stream cobbles as a lithic source. Six pieces of chert debitage (residual lithic material resulting from tool manufacture; *ibid.*:58) showed signs of thermal alteration as evidenced by reddening and/or crazing and potlids (plano-convex flakes which leave a concave scar, and result from differential expansion and contraction of the material; Crabtree 1972:84). At least two flakes had blue paint on them, and one lithic tool, a unifacial scraper, had concrete attached to it (Fig. 14,d). Surface scatters of gravels and cobbles, which may have been brought in for construction work, were observed predominantly in the central part of the project area. The **Perdiz** point recovered and reported by Day (1982) from the northern part of the site along the Old River was included in Table 3, making a total of 41 reported lithic items from the site.

The debitage was classified into categories which roughly follow the lithic reduction sequence for the hand-held hard-hammer percussion technique (cf. Shafer 1973:63-64). Primary flakes have cortex across the entire dorsal surface. Secondary flakes have cortex on a part of the dorsal surface. Interior flakes have no cortex, except possibly on the striking platform. Thinning flakes have a lipped platform, which indicates they were removed from the edge of a biface. Fragments are broken flakes that could not be confidently assigned to any other category. Shatter includes debitage which is blocky in shape, and may have been produced by the bipolar (anvil)

TABLE 3. PROVENIENCE OF LITHIC MATERIALS

Provenience	Primary Flakes	Secondary Flakes	Interior Flakes	Thinning Flakes	Fragments	Shatter	Other	Crusher
Surface Collection	-	-	1	1	-	2	Ensor point Mano fragment	2
NW Quad	-	1	3	-	-	-	Perdiz point* Unifacial scraper Thin biface fragment	2
Dredged Material	-	-	-	1	1	2	Type A-1 point	1
Trench 5-1	-	2	-	-	2	-	Thin biface fragment	1
Trench 5-2	-	-	-	1	-	-	Unifacial scraper	-
Shovel Test 1	-	-	1	-	-	-	-	-
N40/W36 Level 2	-	-	-	-	-	-	-	-
N40/W36 Level 3	-	2	1	1	1	-	-	-
N48/W33 Level 1	-	2	2	-	3	-	-	-
N48/W33 Level 2	-	-	-	-	-	-	-	-
TOTAL	0	7	8	4	7	4	8	6

*Day 1982

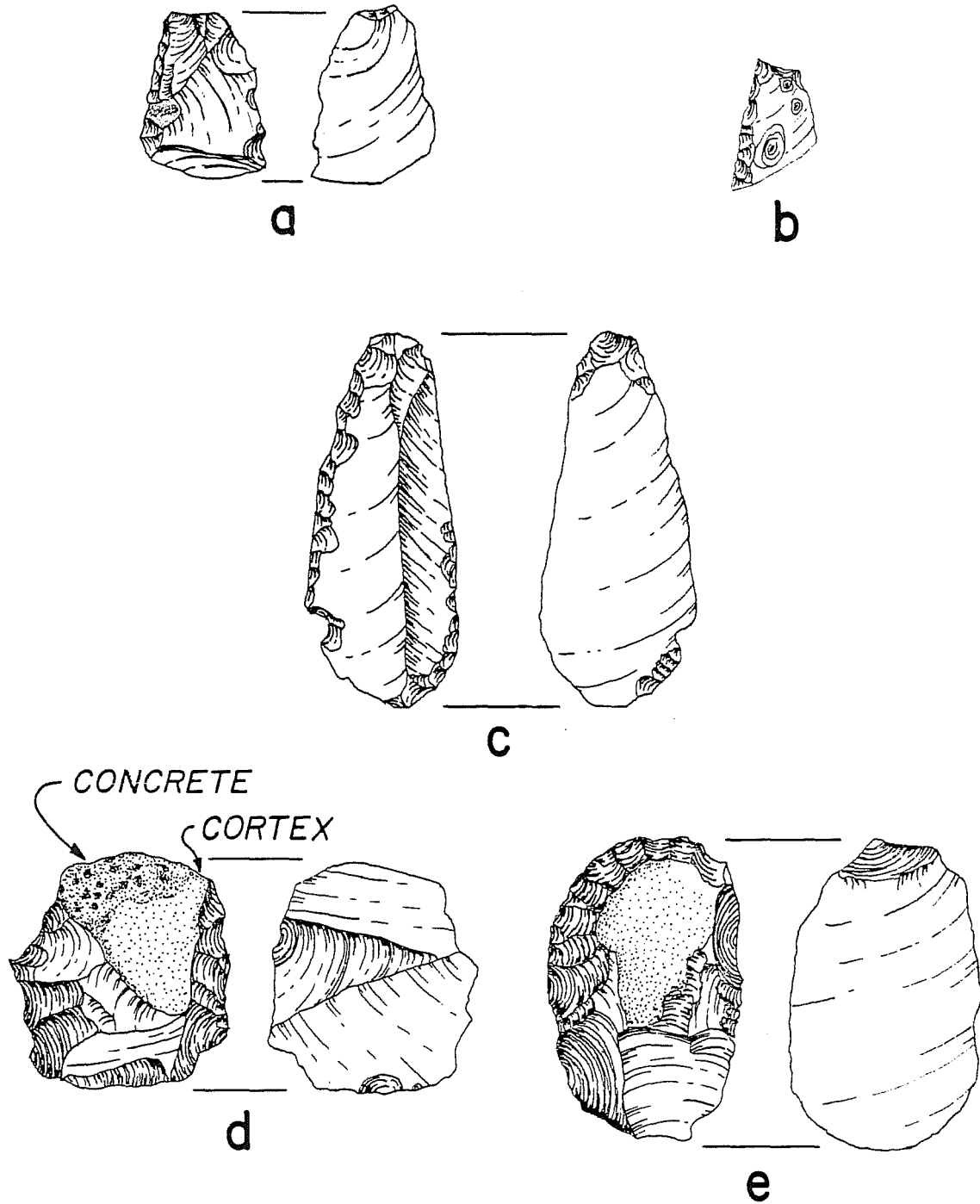


Figure 14. Lithic Artifacts from Site 41 HR 39. a, retouched secondary chert flake with lipped platform; b, thermally altered, very thin chert biface fragment; c, utilized, retouched interior chert blade; d, uniface, chert ovoid end scraper with concrete attached; e, uniface, chert ovoid end scraper.

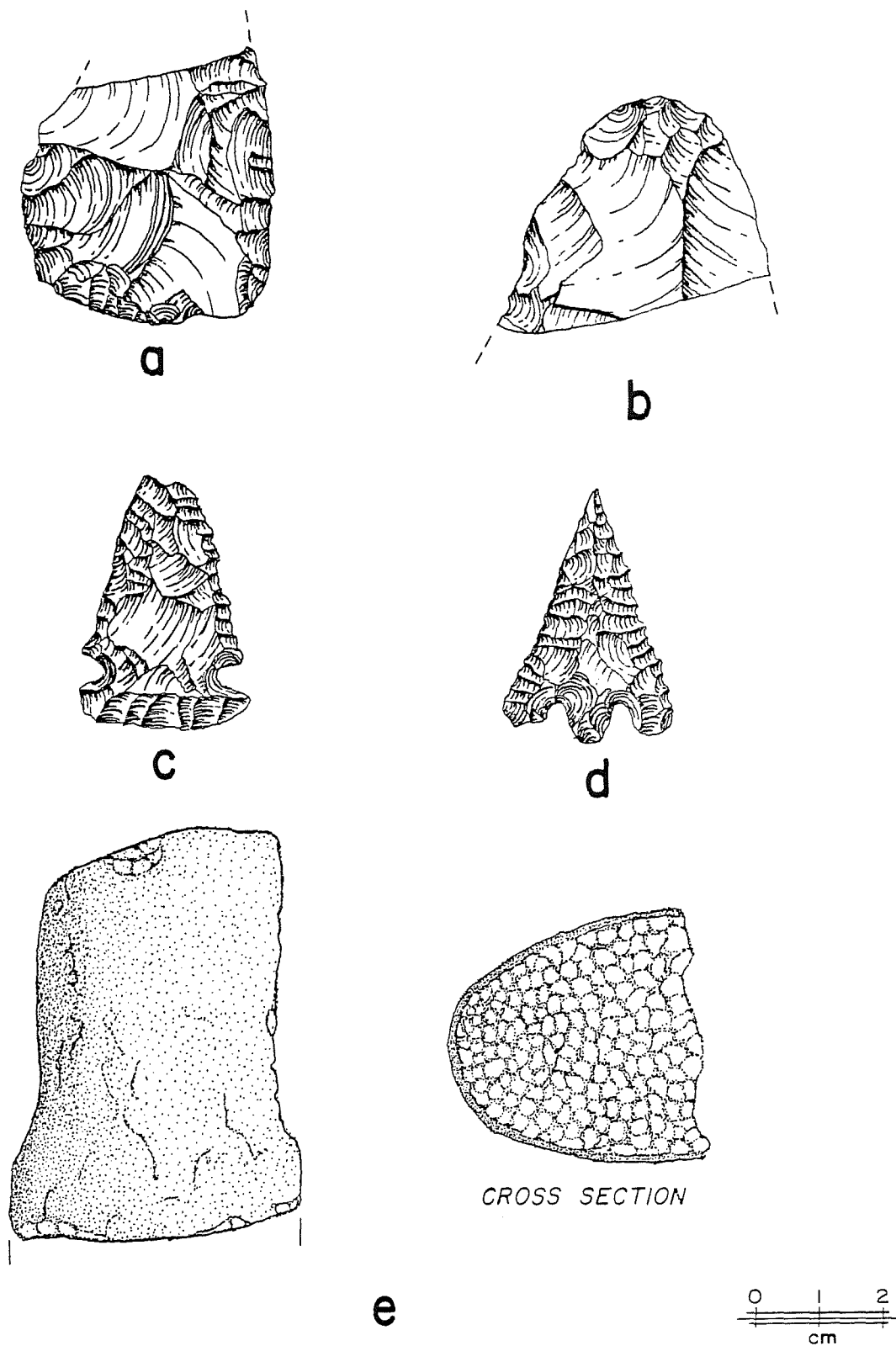


Figure 15. Lithic Artifacts from Site 41 HR 39. a, thin, chert biface fragment; b, chert biface fragment; c, chert Ensor point; d, chert Type A-1 point; e, quartzite mano fragment.

percussion technique (cf. Shafer 1973:64-65). The lithic artifacts included retouched flakes (cf. Crabtree 1972:89) and unifacial and bifacial tools. With the possible exception of the lithic shatter, the debitage and tools from the site generally appear to have been produced by, or resulted from, the hand-held hard-hammer percussion technique rather than from bipolar percussion. An additional category of lithics from the site, however, includes cobbles and flakes which appear to have been through a gravel crusher.

No primary flakes were recovered from the site. Seven secondary flakes (one of petrified wood) and seven interior flakes were recovered. Also recovered were four thinning flakes, seven lithic fragments, and four pieces of shatter (two of petrified wood). The lack of primary flakes suggests that the initial reduction of lithic materials, such as cobbles, was not done at the site. The secondary and interior flakes indicate that lithic production may have been conducted at the site, and the presence of thinning flakes indicates that tools may have been finished or sharpened there. The lithic shatter consists of small pieces, and may have resulted from bipolar reduction, or possibly from modern activities at the site.

The lithic artifacts consist of a retouched secondary flake (Fig. 14,a) with a lipped platform which terminates in a hinge fracture. An inclusion is on the dorsal side of the flake. The flake is retouched on the dorsal side along both edges, and also along approximately half of the distal end. There is a small notch on one side near the distal end of the flake. A thermally altered very thin biface or flake fragment (Fig. 14,b) with a potlid, has bifacial flaking along one edge. One utilized interior blade (Fig. 14,c; cf. Crabtree 1972:42) was retouched along the distal end and one edge on the dorsal side; the retouched side has a notch in it near the distal end of the blade. The two unifaces, ovoid end scrapers (Fig. 14,d,e; cf. Aten 1983a:255, Fig. 13.2), both have cortex on the distal side, and one (Fig. 14,d) has concrete attached to it. There is also a thin biface fragment (Fig. 15,a), and another less finely worked biface fragment (Fig. 15,b) which has a quartz inclusion along the break. The **Perdiz** point from the site (reported by Day [1982]) is a contracting stem form (Aten 1983a:250, Fig. 13.1, u-aa, citing Suhm and Jelks 1962:269; cf. Turner and Hester 1985:168). The **Ensor** point (Fig. 15,c; Turner and Hester 1985:94) is side notched, has a broken tip, and the straight base is beveled on one side; the point is 3.8+ cm long, 2.3 cm wide, and 0.5 cm thick. The Type A-1 point (Fig. 15,d; Aten 1967; cf. Turner and Hester 1985:168) has a small contracting stem, slightly concave serrated edges, and prominent rounded barbs; it is 3.85 cm long, 2.55 cm wide, and 0.4 cm thick. A fragment of a quartzite mano (a small, oval handstone used to grind foods) is rounded and unworked on one side, and is flattened with evidence of grinding on the other side (Fig. 15,e; cf. Turner and Hester 1985:248-249).

All but one of the retouched flakes and tools were recovered from the site surface, from the eroding northern bluff of the site along the Old River, and from the backdirt of backhoe trench 5 (collection stations 5-1 and 5-2). One interior flake was found in shovel test 1. In unit N40/W36, no lithics were recovered from level 2, but level 3 yielded two secondary flakes, a thermally altered interior flake, a thinning flake, and a flake fragment. In level 1 of unit N48/W33, one chert and one petrified wood secondary flake, one

thermally altered interior flake with a bifacially worked edge, and three flake fragments were recovered; no lithics were found in level 2 of this unit.

Faunal Remains

Most of the faunal remains from site 41 HR 39 were **Rangia cuneata** shells and shell fragments (Tables 4, 5). A few vertebrate faunal remains were collected (Table 6), although some date to the historic occupation of the site. The presence of shell roads in the site area and the degree of intermixing of prehistoric and historic materials in the shell midden stratum may suggest that at least part of the shells at the site were deposited or introduced during the later historic utilization of De Zavala Point. All the invertebrate and vertebrate faunal remains recovered from the 1/4-inch mesh screens are quantified and discussed here. A sample collected from the 1/8-inch mesh screens are discussed in the section on the fine screen sample.

With the exception of a few fragments of oyster (**Crassostrea virginica**), all the identified collected shells are from the brackish water clam, **Rangia cuneata** (Tables 4, 5). The relative amount (by weight) of **Rangia** shells to oyster shells in the controlled excavation units ranges from 99.3% to 99.9%, with oyster shells constituting only from 0.1% to 0.7% of the sample.

The **Rangia cuneata** shell samples from midden context collected during the 1/4-inch mesh screening (Table 4) consist mainly of valves with umbos (58% by weight). **Rangia** shell fragments without umbos (42%) form less of the shell midden sample. Although none of the **Rangia** shells or shell fragments recovered from the 1/4-inch screen appear to have been burned, burned shell fragments were present in the fine screen sample. No evidence of butchering or human alteration of the shell sample was observed. No evidence was found of barnacles or oyster spats on the shells, which could yield information on environmental changes in the area. Most of the whole and partial **Rangia** valves appear weathered.

A seasonality study, or shell growth stage analysis, was done of **Rangia cuneata** shells from both levels of the two controlled excavation units at the site (Tables 6, 7). This study, in consultation with Dr. David Carlson of Texas A&M University, was conducted to determine the season of collection for the shell midden deposits, as was specified in the project contract. The technique employed for such a study was modeled after that described by Aten (1981) and, to a limited extent, after Carlson (1983).

The **Rangia cuneata** shells used in the seasonality study came from unit N40/W36, levels 2-3, and also from unit N48/W36, levels 1-2. Shells from both levels in the two controlled excavation units were used to obtain a sufficient sample (50 specimens) of intact specimens of right valves which were large enough (in the third or fourth year of growth, with shell lengths from 35 to 49 mm) to study. Right valves rather than left valves were selected because there were more right valves than left valves in the sample, and the larger sample was considered desirable for this study. The surface of all the shells are weathered to some extent; most shells are moderately weathered. The archaeologists were advised (David Carlson, personal

TABLE 4. QUANTIFICATION OF *RANGIA CUNEATA* SHELLS*

Provenience	Total Weight	Weight of Valves with Umbos	Number of Valves with Umbos	Weight of Whole Valves	Number of Whole Valves**	Minimum Number of Individuals	Weight of Fragments without Umbos
N40/W36 Level 2	4842.00	3139.00	408	595.00	43 (L20/R23)	225	1703
N40/W36 Level 3	12291.00	7463.00	1017	965.00	69 (L33/R36)	521	4828
N48/W33 Level 1	8058.00	4108.00	674	941.00	68 (L34/R34)	337	3950
N48/W33 Level 2	1857.25	1073.25	162	476.75	39 (L14/R25)	87	784
TOTAL	27048.25	15783.25	2261	2977.75	219 (L101/R118)	1170	11265

Note: All weights are in grams.

*Only the *Rangia cuneata* shells recovered from the 1/4-inch mesh screening are included in this table. The *Rangia cuneata* shell fragments recovered from the 1/8-inch mesh water screening are not included.

**The number of whole valves was reduced by shell breakage during excavation.

The number of left and right whole *Rangia cuneata* valves is given in parentheses beneath the total number of whole valves.

TABLE 5. QUANTIFICATION OF NON-RANGIA CUNEATA SHELLS
(CRASSOSTREA VIRGINICA)

Provenience	Total Weight (g)
N40/W36 Level 2	6
N40/W36 Level 3	37
N48/W33 Level 1	33
N48/W33 Level 2	14
TOTAL	90

communication 1985) that it would be best if the more weathered shells were eliminated from the sample, but doing so would result in too small a sample. The weathered shells are therefore included in the sample. Carlson (personal communication 1985) explained that the indeterminate category used by Aten (1981) includes valves which have numerous growth interruption rings, and for which no definite annual growth rings could be determined rather than including shells for which growth rings could not be distinguished due to weathering. Aten discarded eroded shells from his study sample. Annual growth increments were recorded for each selected specimen. The growth stages of specimens (interrupted, early, middle, and late), or a category of indeterminate or uncertain specimens, were also identified.

The results of the shell sorting are shown in Table 6. Carlson (1983) analyzed the results using a computer program, and the sample results were found to match reasonably well with the expected proportions for a late May collection (Table 7). Carlson's (1983:22) analysis of 59 reported samples of **Rangia** shells from aboriginal sites indicated that over half the samples had been collected from late April through late May.

Vertebrate faunal remains from the site (Table 8) were analyzed by Robert F. Scott IV. Fish types represented in the site collection are unidentified fish, gar (**Lepisosteus** sp.), and croaker or black drum (family Sciaenidae). Reptiles in the collection are unidentified turtle and alligator (**Alligator mississippiensis**). Only one bird bone was identified in the collection. Mammals represented in the collection are unidentified large mammal, canid--possibly dog (family Canidae), white-tailed deer (**Odocoileus virginianus**), domestic cow (**Bos** sp.), and possibly buffalo (**Bison bison**).

TABLE 6. *RANGIA CUNEATA* GROWTH STAGE EVALUATIONS

Provenience	Interrupted	Early	Middle	Late	Uncertain/ Indeterminate
N40/W36 Level 2	2	5	3	-	-
N40/W36 Level 3	2	5	7	1	-
N48/W33 Level 1	-	4	8	2	1
N48/W33 Level 2	-	3	7	-	-
TOTAL	4	17	25	3	1

Note: Only right valves were used for this study.

TABLE 7. COMPARISON OF OBSERVED AND EXPECTED *RANGIA CUNEATA* GROWTH STAGE PROPORTIONS

Provenience	Interrupted	Early	Middle	Late	Uncertain/ Indeterminate
Observed Proportions	0.080	0.340	0.500	0.060	0.020
Expected Late May Proportions*	0.0451	0.3012	0.4378	0.1236	0.0923

The mean squared error for the sample is 0.365676 with a variance of 0.049377.

The error sum of squares for the sample is 0.010637.

*From Carlson (1983:10)

TABLE 8. QUANTIFICATION OF VERTEBRATE FAUNAL REMAINS

Provenience	Element	Age	Animal	Comments
Surface Collection	long bone fragment	-	large mammal	water-rolled; some trace of a green snap fracture; not a tool
	right medial calcaneus	mature	white-tailed deer	fragment
	distal metapodial	?	white-tailed deer	2 articular facets; badly eroded
	right astragalus fragment	?	Bos/Bison	
	medial metapodial	?	white-tailed deer	fragment
	long bone fragment	-	mammal	
NW Quad	long bone fragment	-	no identification possible	
	long bone fragment	-	no identification possible	burned
	long bone fragment	mature	no identification possible	
	left proximal radius	mature	B. bison	numerous cut marks on the proximal anterior; possible marrow fractures
	lower limb fragment	mature	large mammal	water-worn and mineralized
Dredged Material	large rib facet	mature	large mammal	2 fragments fit
Trench 4-3	5 long bone fragments	-	large mammal	
	right centroquartal	mature	white-tailed deer	fragment
	3 plastron fragments	-	turtle	
	1 fragment	-	no identification possible	

TABLE 8. (continued)

Provenience	Element	Age	Animal	Comments
Trench 5-1	right distal tibia	mature/ immature	white-tailed deer	incomplete epiphyseal union
	(?)distal metapodial	immature	white-tailed deer	immature articular facets
	long bone fragment	-	large mammal	
	dentary	-	fish	garlike; too little to identify
	7 fragments	-	no identification possible	1 burned brown
Trench 5-2	21 fragments	-	no identification possible	
	1 fragment	-	no identification possible	gnaw marks
	1 fragment	-	no identification possible	snap fracture
	5 long bone fragments	-	no identification possible	1 with cut marks
	3 flat long bone fragments	-	no identification possible	
	long bone fragment	-	large mammal	burned brown
	long bone fragment	-	mammal	snap fracture; made into an awl
	proximal femur	mature	white-tailed deer(?)	fragment
	left astragalus	mature	white-tailed deer	
	left scapula fragment	mature	white-tailed deer	glenoid portion
	pelvis/left acetabulum	mature	Bos	saw cut through ischium; blunt fracture near socket
	vertebra centrum	small	alligator	burned brown

TABLE 8. (continued)

Provenience	Element	Age	Animal	Comments
Trench 5-2 (continued)	dorsal spine	-	family Sciaenidae	either black drum or Atlantic croaker
	neural spine	-	fish	incised; bead blank(?)
	6 scales	-	gar (fish)	
	skull element	-	fish; no identification possible	
	5 fragments	-	fish; no identification possible	
	premaxilla	-	fish; no identification possible	not gar or drum
	2 vertebrae	large-size	family Sciaenidae	
	1 plastron fragment	-	turtle	
N40/W36 Level 2	3 long bone fragments	-	large mammal	badly eroded; snap fractured
	1 long bone fragment	?	white-tailed deer	metapodial fragment(?)
	1 metapodial fragment (?)	mature	white-tailed deer(?)	
	34 fragments	-	no identification possible	
	1 fragment	-	fish; no identification possible	
N40/W36 Level 3	2 long bone fragments	-	large mammal	negative impacts; green snap fractures
	9 long bone fragments	-	no identification possible	
	42 fragments	-	no identification possible	
	1 long bone fragment	-	large mammal	

TABLE 8. (continued)

Provenience	Element	Age	Animal	Comments
N48/W33 Level 1	premolar	mature/ immature	family Canidae	upper right fourth premolar fragment; probably domestic dog
	2 scales	-	gar	
	complete dentary	medium-size	gar	2 fragments
	4 neural spines	-	family Sciaenidae	
	vertebra	-	fish	badly eroded
	pectoral spine	-	fish	fragment
	3 fragments	-	fish; no identification possible	
	vertebra	medium-size	turtle	badly eroded
	11 long bone fragments	-	large mammal	
	19 fragments	-	no identifi- cation possible	1 burned
N48/W33 Level 2	right astragalus(?) fragment	mature	white-tailed deer	badly eroded
	long bone	-	bird	
	1 fragment	-	large mammal	very thick fragment
	1 fragment	-	no identifi- cation possible	
	1 fragment	-	no identifi- cation possible	burned black

The faunal material recovered during excavations at 41 HR 39 generally resembles a prehistoric assemblage. Many of the bones show evidence of water-rolling or prolonged surface exposure. Several fragments appear to be mineralized. The only definitely historic bone, from a cow (*Bos*), is a pelvis fragment with a clear saw mark recovered from backhoe trench 5-2. No other collection unit could definitely be said to contain historic remains. Finally, enough indications of prehistoric butchering (blunt impact fractures and green snap fractures) exist to confidently group most of the bone as being derived from prehistoric deposits.

Material from the surface collection bags contained mostly white-tailed deer remains, some of which shows evidence of having been marrow fractured. Though this trait does not guarantee a prehistoric origin for the bone, it would be unusual to find similar marks on a bone butchered with historic tools. One astragalus fragment in this collection could represent a domestic cow (*Bos*). However, a large part of a radius exhibiting clear cut marks on its anterior surface is tentatively determined to be *Bison bison* based on the similarity of cut marks to those made by stone tools. It was recovered in the northwest quadrant (from the shell midden deposits along the northern bluff of the site) along with a large, thick, unidentified bone fragment that was partially mineralized. Generally, it can be said that the surface collection, including the northwest quadrant, had bone derived from a prehistoric context with the possibility of some historic mixing.

Collections from backhoe trench 4, collection area 3 (trench 4-3) yielded evidence of white-tailed deer and an unidentified turtle. Most of the bone fragments in trench 4-3 are long bone fragments, probably a deer or similar-sized mammal. Backhoe trench 5-1 was similar, except the white-tailed deer fragments are of an immature animal less than 12 months old (Gilbert 1980:102). One fragment of fish bone found in trench 5-1 could not be accurately identified.

Backhoe trench 5-2 yielded the largest amount of bone. Alligator, white-tailed deer, turtle, gar, and Atlantic croaker (or a similar fish of the family Sciaenidae) were all represented in the total backhoe trench 5-2 collection. Gar is represented by scales, the most durable of their skeletal elements, and portions of their dentaries. Neural vertebrae spines and some skull elements representing a marine Sciaenid fish strongly resemble Atlantic croaker (*Micropogon undulatus*) or black drum (*Pogonias cromis*). Both are common in estuaries in all but cold weather and can exceed 50 cm in size. The alligator, represented by a small, immature vertebral centrum, was once common in coastal marshes and estuaries. The centrum had been burned. The only two pieces of worked bone observed in the collection were both from trench 5-2. One is a long bone fragment from a mammal, with a snap fracture and made into a small awl; the other is an incised neural spine of a fish which may have been a bead blank.

Collections from the controlled excavation units were generally small except for N48/W33, level 1. Fragments of bones represent a canid, gar, Sciaenid fish, turtle, and an unidentified large mammal from level 1 of N48/W33. The canid, probably a dog, is represented by a part of the fourth premolar which indicates an age of less than 12 months. Several fish bones which could not

be identified further were also present. White-tailed deer was definitely identified in N48/W33, level 2; the only bird bone from the site came from this level, but could not be identified any further. Several fragments from the excavation units showed evidence of exposure to deteriorating elements, either water-rolling or drying and cracking.

In general, the collection is unremarkable for a prehistoric site in Texas. However, the occurrence of bison, white-tailed deer, alligator, gar, and a Sciaenid fish together is somewhat unusual. Such a collection indicates exploitation of habitats ranging from grassland for the bison, mixed woodland and grassland for the browsing white-tailed deer, marshes for the alligator, fresh and brackish water for the gar, and brackish and marine water for the Sciaenids. Obviously the inhabitants of 41 HR 39 were not highly specialized in their foraging strategies, but were skilled in a number of methods of procuring food animals. A similar assemblage of animals was identified at a series of shell middens near Clear Lake in Galveston and Harris Counties (Scott 1984:185-202). Similar sites may indicate that shell middens were not nearly as specialized, but were actually a part of a very broad subsistence base.

Fine Screen Sample

All the materials recovered from the 1/8-inch hardware mesh screen were kept since subsistence and technological data can be recovered from such samples (Aten 1983a:170; Fields and Jackson 1984:20). One fine screen sample, the lower level (3) of the shell midden deposit in unit N40/W36, was separated and briefly examined (Table 9) to investigate the potential of the remainder of the fine screen materials. This particular sample was chosen because it appeared to contain less modern organic material, such as bark and rootlets, than the other samples and therefore might be somewhat less disturbed. Also, as the sample was from the lower stratum of the unit, it might be less disturbed from recent activities than the upper stratum which was in contact with dredged material.

Referring to Table 9, the analysis of the fine-screened sample consists predominantly of fractured unburned *Rangia cuneata* shells (77% of the total weight). A smaller percentage (11%) of the fractured *Rangia* shells appears to have been burned. These burned shell fragments have streaks of gray and are generally rounded, unlike the unburned shells which are usually more angular and white in color. The rounded, weathered appearance of these fragments is thought by Aten (1983b:86) to result "from their extreme softness once subjected to heat either in the process of being opened to extract the clam, or when used as a refractive base for a later hearth." Non-*Rangia* shell fragments, which were unidentified as to type, compose only a small percentage of the sample (1%).

In the fine screen sample there were numerous iron-manganese concretions, small gravels, small hard clay pieces, and modern organic material such as bark, rootlets, and hackberry seeds. Bone fragments were unidentifiable as to type, and no fish vertebrae or scales were observed. Weathered bits of prehistoric sherds were also identified. Additionally, there was historic material such as weathered fired brick fragments, glass fragments, plastic

TABLE 9. QUANTIFICATION OF FINE SCREEN SAMPLES BY WEIGHT

Sample	Provenience			
	N40/W36 Level 2	N40/W36 Level 3	N48/W33 Level 1	N48/W33 Level 2
Total Weight*	524	1581.0 (1508.2)**	1044	784
Unburned Rangia Shell Fragments	-	1157.8	-	-
Burned Rangia Shell Fragments	-	161.5	-	-
Unburned Non- Rangia Shell Fragments	-	7.0	-	-
Bone Fragments	-	12.5	-	-
Unburned Organic Matter	-	15.3	-	-
Charcoal	-	1.2	-	-
Iron-Manganese Concretions	-	128.5	-	-
Chert Chips	-	1.5	-	-
Prehistoric Sherds	-	5.5	-	-
Historic Artifacts	-	17.4	-	-
Plastic Pellets	-	0.3	-	-
Metal Fragments	-	12.7	-	-
Glass Fragments	-	4.4	-	-

Note: All weights are in grams.

*Total weight for all fine screen samples = 3933 g.

**The weight of the fine screen sample after sorting is given in parentheses; the difference in weight (72.8 g) is due to additional soil loss during sorting.

pellets, styrofoam, and rusted metal fragments. Charcoal from the sample may be from either the prehistoric or historic component.

HISTORIC MATERIALS

The historic materials within the general surface collection include several artifacts collected from the site by James Bradley, an employee of the Old River Fleet and Shipyard, a few materials collected by the staff of the Texas Historical Commission, and numerous items collected from the site during the currently reported project. The historic materials are ceramics, glass, brick, metal, plastic, concrete, coal, plaster, unburned organic material, burned clay, bone, and sandstone fragments (Table 10). Many of these materials were deposited at the site during construction activities since 1980, also previously, when De Zavala Point was used as a local trash dump, and as an Ordnance Depot.

The amount of historic materials recovered from the shell midden deposits in the two controlled excavation units (Table 10) is thought to be indicative of the degree of disturbance present at the site. Bone fragments, which could be either prehistoric or historic, were found in both levels of the two units. Glass, metal, concrete, coal, and plaster were also found in the two levels of both units. Historic ceramics occurred in small amounts, but were present in the lower levels of both units; one historic sherd was found at the contact zone between the shell midden deposit and the underlying clay subsoil in unit N48/W33, level 2. Several pieces of glass were found in the units at both levels. Brick was recovered from level 3 in unit N40/W36, and from level 1 in unit N48/W33. Unburned organic material such as tree roots and rootlets, hackberry seeds, and fragments of lumber, were found in levels 2 and 3 of unit N40/W36, and level 1 of unit N48/W33. Judging from the count of historic materials in the unit levels, level 1 of unit N48/W33 appears to be the most severely disturbed. Level 3 in unit N40/W36 also had several historic items and the least disturbed levels appear to be level 2 of unit N40/W36, and level 2 of unit N48/W33. The high level of disturbance in unit N48/W33, level 1, might be explained by its proximity to the surface, which would have been more exposed to dredged materials and modern activities at the site; the lesser amount of historic materials in level 2 of unit N40/W36 and the greater amount in the underlying level 3 of that same unit, however, cannot be explained in the same manner. It is possible that the presence of the greater amount of historic materials in the lower part of the shell midden deposit indicates that the aboriginal site deposits have been thoroughly disturbed during historic times, either through natural bioturbation, plowing, dredging, and/or construction activities.

Ceramics

Eighty-three historic ceramic sherds were collected from the site, of which 45 are earthenware, 25 are stoneware, and 13 are porcelain. The historic ceramics and glass from the site were identified by Anne Fox of the CAR-UTSA.

TABLE 10. PROVENIENCE OF HISTORIC MATERIALS: GENERAL CATEGORIES

Provenience	Ceramics	Glass	Brick	Metal	Plastic	Concrete, Coal, and Plaster	Unburned Organic Material	Bone Fragments	Sandstone Fragments	Burned Clay
Surface Collection	52	32	3	1	-	4	-	X	7	-
NW Quad	7	3	7	1	-	10	-	X	-	11
Dredged Material	9	-	1	-	2	-	-	X	-	-
Trench 5-1	1	13	3	11	-	-	-	X	-	5
Trench 5-2	8	5	3	8(1)*	-	119	-	X	-	-
N40/W36 Level 2	-	10	-	21	8	28	X	X	-	-
N40/W36 Level 3	1	35	1	31	2	71	X	X	-	-
N48/W33 Level 1	3	79	3	128(1)*	20	204	X	X	-	-
N48/W33 Level 2	2	17	-	6	-	5	-	X	-	-
Shovel Test 1	-	2	-	-	-	-	-	-	-	-
TOTAL	83	196	21	207(2)*	32	441	-	-	7	16

*The figure in parentheses denotes the presence of aluminum foil fragments--the exact count of these fragments was not taken.

X = presence of material

Earthenware

The earthenware ceramics recovered from the site (Table 11) include one sherd of blue feather-edged earthenware from a plate (Fig. 16,a). These feather-edged, or shell-edged, earthenwares could date to as early as 1795--they were made from 1780 to ca. 1830 (Fox, Bass, and Hester 1976:58; Noël Hume 1970:131)--but in Texas they are generally considered to date prior to 1850 (Mallouf, Fox, and Briggs 1973:170), which would be during the De Zavala family occupation of the Point. Other sherds dating to the same general period are four blue transfer plate sherds (Fig. 16,b), two sherds of a hand-painted plate (Fig. 16,c), and three flow blue plate sherds (Fig. 16,d). Blue transfer earthenware probably dates from 1820 to 1830, but it may date from 1795 up to the present. With the exception of one flow blue sherd from backhoe trench 5-1, all these early earthenware sherds were collected from the general surface of the project area.

The 27 plain white sherds, which are from plates and cups (Fig. 16,e) and from the lid of a circular container, probably date from the post-Civil War period through the 1920s or 1930s. The container lid has a black transfer label on it (Fig. 16,f). Four of these sherds were recovered from the shell midden deposits in backhoe trench 5-2, and one was from unit N40/W36, level 3.

The six sherds from a blue glazed bowl (Fig. 16,g) date to the post-1900s, and were recovered from the shell midden deposits in backhoe trench 5-2, and in unit N48/W33, levels 1 and 2. Two sherds from a contemporary painted flowerpot, possibly from Mexico, were found in the dredged material.

Stoneware

Stoneware ceramics collected from 41 HR 39 (Table 12) include four sherds with an Albany slip, one sherd with a Rockingham glaze, and five sherds with a salt glaze, all of which date to the late 1800s. Also dating to the same period were five sherds which have an exterior salt glaze and an interior Albany slip. All these early stoneware ceramics were collected from the surface of various areas of the site except one sherd from backhoe trench 5-2 that has a salt glaze and an Albany slip. One sherd from a striped yellow ware bowl was also found on the site surface, and may date to the late 1800s or early 1900s (Raycraft and Raycraft 1975:Plate 16).

Two sherds with a Bristol glaze, one sherd with a Bristol glaze and an Albany slip, and a blue glazed stoneware sherd date to post-1900. These ceramics are all from surface collections.

The large basal sherd of a charcoal brazier found on the site surface may date from the 1800s through the 1930s. One square of recent, brown ceramic tile, which probably dates to the 1920s or later, was also collected from the surface of the site.

The two sherds recovered from the surface with the blue sponged design (Fig. 16,h) may date to the turn of the century, although vessels of this sort were made well into this century (Raycraft and Raycraft 1975:Plate 14).

TABLE 11. PROVENIENCE OF HISTORIC CERAMICS: EARTHENWARE

Provenience	Plain Whiteware	Blue Feathered Edge	Blue Transfer	Hand Painted	Flow Blue	Blue Glazed	Flowerpot
Surface Collection	20	1	4	1	2	-	-
NW Quad.	-	-	-	1	-	-	-
Dredged Material	2	-	-	-	-	-	2
Trench 5-1	-	-	-	-	1	-	-
Trench 5-2	4	-	-	-	-	3	-
N40/W36 Level 2	-	-	-	-	-	-	-
N40/W36 Level 3	1	-	-	-	-	-	-
N48/W33 Level 1	-	-	-	-	-	1	-
N48/W33 Level 2	-	-	-	-	-	2	-
TOTAL	27	1	4	2	3	6	2

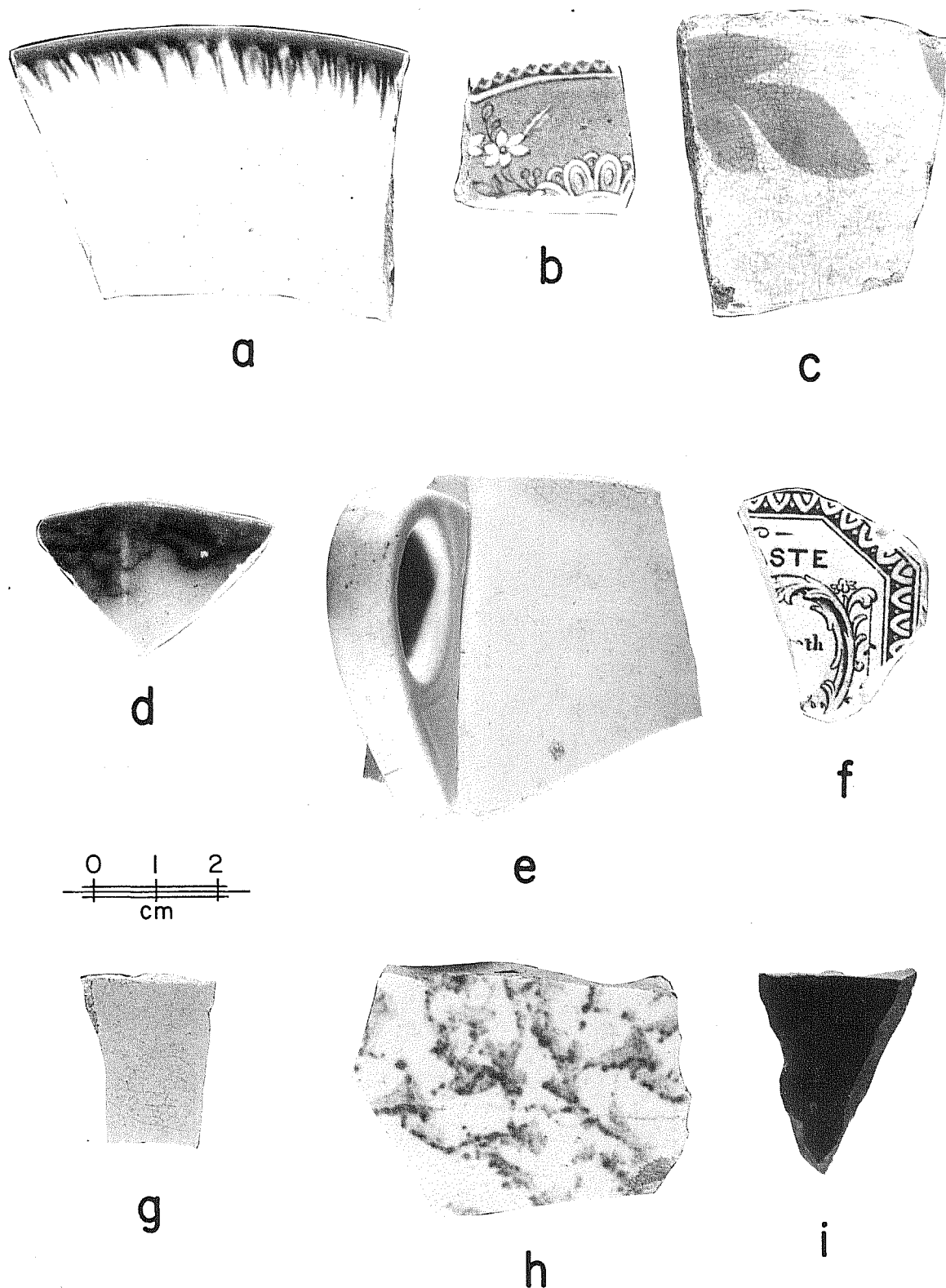


Figure 16. Historic Ceramics from Site 41 HR 39. a, blue feather-edged earthenware plate rim sherd; b, blue transfer earthenware plate rim sherd; c, hand-painted earthenware plate body sherd; d, flow blue earthenware plate rim sherd; e, plain white earthenware cup sherd with handle; f, plain white earthenware container lid sherd with a transfer label; g, blue glazed earthenware bowl sherd; h, blue sponged stoneware bowl(?) sherd; i, redware bowl sherd.

TABLE 12. PROVENIENCE OF HISTORIC CERAMICS: STONEWARE

Provenience	Albany Slip	Salt Glaze	Salt Glaze/ Albany Slip	Bristol Glaze	Bristol Glaze/ Albany Slip	Rockingham Glaze	Blue Sponged	Blue Glaze	Yellow Ware	Redware	Charcoal Brazier	Tile
Surface Collection	1	4	2	1	-	1	1	1	1	1	1	1
NW Quad	1	1	-	1	-	-	1	-	-	-	-	-
Dredged Material	2	-	2	-	1	-	-	-	-	-	-	-
Trench 5-1	-	-	-	-	-	-	-	-	-	-	-	-
Trench 5-2	-	-	1	-	-	-	-	-	-	-	-	-
N40/W36 Level 2	-	-	-	-	-	-	-	-	-	-	-	-
N40/W36 Level 3	-	-	-	-	-	-	-	-	-	-	-	-
N48/W33 Level 1	-	-	-	-	-	-	-	-	-	-	-	-
N48/W33 Level 2	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	4	5	5	2	1	1	2	1	1	1	1	1

The one sherd of redware (Fig. 16,i), found on the site surface, has a dark brown glaze and has not been assigned to any particular period.

Porcelain

Seven plain white porcelain sherds were recovered from the site (Table 13). Five sherds were from the site surface, and two were from level 1 of unit N48/W33. Sherds of this sort, however, have been manufactured for a long period and therefore cannot be assigned to a particular period.

There were three pieces of contemporary blue and white porcelain tile collected. Two pieces of a recently made porcelain plumbing fixture were also found. These recent porcelain pieces were all from surface areas of the site.

Glass

The majority of the 196 glass fragments collected from the project area (Table 14) were clear glass from recent soda bottles. Of the total of 123 clear glass fragments recovered, 101 were from the controlled excavation units. Clear glass fragments may date from 1880 or earlier to the present (Newman 1970:Fig. 3). One fragment collected from the site surface, however, was from a goblet, and may date to 1910-1920. Another fragment, also from the site surface, was from the chimney rim of an oil or kerosene lamp; it probably dates prior to 1900. Five or more clear fragments which were melted from burning were from the general site surface and from backhoe trench 5-2. Nine clear glass fragments from window panes were recovered from backhoe trench 5-1, and from unit N40/W36, levels 2 and 3. One clear fragment from backhoe trench 5-1 was pressed glass and had a late 1800s design on it (Fig. 17,a).

Eighteen fragments of brown glass were recovered; the majority were from unit N40/W36, level 3, and unit N48/W33, levels 1 and 2. These fragments were from beer or whiskey bottles and may date from the 1880s up to the present. An employee at the Old River Fleet and Shipyard stated that many bottles and bottle fragments were found at the site, and thought that they dated to the 1920s when a bootlegging operation was operating on De Zavala Point. The archaeologists did not see any of the reported bottles, however.

Four fragments of olive glass were found on the site surface and also in unit N48/W33, level 1, but they can only be dated to a wide time range. The two fragments of green glass from the shell midden deposit in backhoe trench 5-1 are from contemporary bottles.

The purple, or amethyst, coloring in the eight fragments of purple bottle glass is caused by manganese which was added during manufacture. One of the purple sherds was from backhoe trench 5-1, and three were from levels 1 and 2 of unit N48/W33. One purple glass fragment from the surface collection was from the rim of an oil or kerosene lamp chimney (Fig. 17,b), which would probably date prior to 1900. There was one fragment of purple pressed glass from the surface collection in the northwestern quadrant of the site.

TABLE 13. PROVENIENCE OF HISTORIC CERAMICS: PORCELAIN

Provenience	Undecorated	Undecorated with Transfer Printed Label	Tile	Plumbing Fixture
Surface Collection	4	1	3	1
NW Quad	1	-	-	1
Dredged Material	-	-	-	-
Trench 5-1	-	-	-	-
Trench 5-2	-	-	-	-
N40/W36 Level 2	-	-	-	-
N40/W36 Level 3	-	-	-	-
N48/W33 Level 1	2	-	-	-
N48/W33 Level 2	-	-	-	-
TOTAL	7	1	3	2

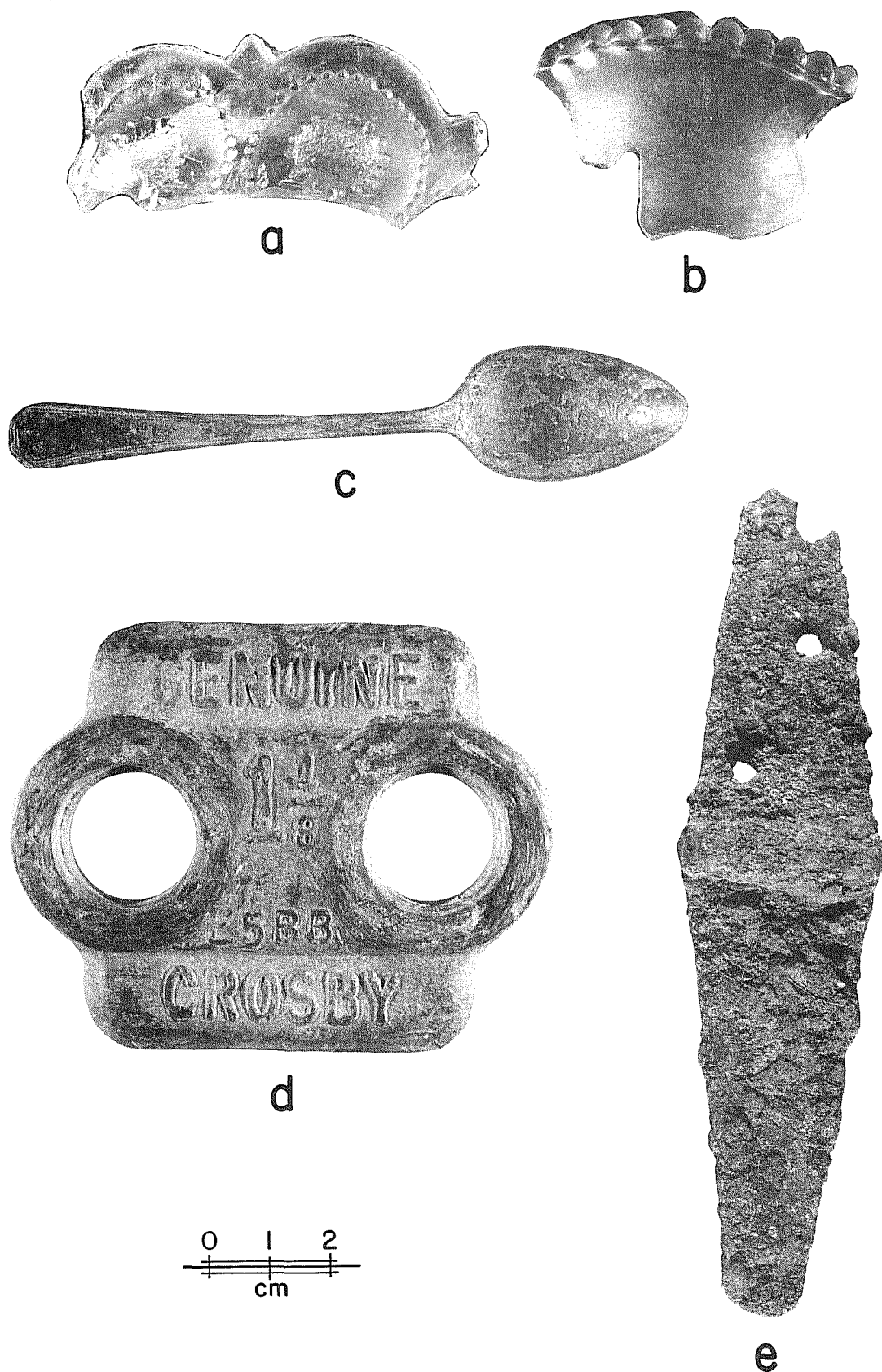


Figure 17. Glass and Metal Artifacts from Site 41 HR 39. a, clear pressed glass vessel lid rim fragment; b, purple lamp chimney rim glass fragment; c, small child's(?) spoon; d, steel cable tie-down; e, iron hinge.

TABLE 14. PROVENIENCE OF GLASS

Provenience	Clear Glass	Clear Window Glass	Clear Pressed Glass	Brown Glass	Olive Glass	Green Glass	Purple Glass	Purple Pressed Glass	Aqua Glass	Cobalt Glass	Milk Glass
Surface Collection	14	1	-	3	2	-	4	-	5	2	1
NW Quad	1	-	-	-	1	-	-	1	-	-	-
Dredged Material	-	-	-	-	-	-	-	-	-	-	-
Trench 5-1	2	2	1	3	-	2	1	-	2	-	-
Trench 5-2	3	-	-	-	-	-	-	-	2	-	-
N40/W36 Level 2	9	1	-	-	-	-	-	-	-	-	-
N40/W36 Level 3	22	5	-	4	-	-	-	-	4	-	-
N48/W33 Level 1	57	-	-	7	1	-	2	-	12	-	-
N48/W33 Level 2	13	-	-	1	-	-	1	-	2	-	-
Shovel Test 1	2	-	-	-	-	-	-	-	-	-	-
TOTAL	123	9	1	18	4	2	8	1	27	2	1

Pressed glass vessels of this color date from 1880 to 1925 (Newman 1970:Fig. 3). Voellinger (1982:12) reported finding a purple bottle stopper at site 41 HR 423, a southern extension of site 41 HR 39.

Of the 27 aqua glass fragments found, most are from contemporary bottles. Eighteen of these fragments are from unit N40/W36, level 3 and unit N48/W33, levels 1 and 2. Three bottle neck fragments from the surface collection are from a bottle manufactured at the turn of the century.

Two cobalt glass fragments from a cup were recovered from the site surface. They may date from the late 1800s to the present.

The one milk glass fragment recovered could not be assigned to any particular period because of its long period of manufacture. It is from the surface collection.

Metal

The metal materials recovered from the site (Table 15) were predominantly badly corroded and appeared to be recent. A small spoon which was formerly silver plated and possibly made for a child (Fig. 17,c), was found on the surface of the northwest quadrant of the site. A steel cable tie-down from a ship, with the inscription "GENUINE, 1 1/8, E5BB, CROSBY" (Fig. 17,d), came from unit N40/W36, level 2.

An iron square spike was collected from the site surface. An iron square nail, which may date prior to 1890, came from unit N48/W33, level 1. The 25 cut or wire nails, which occur in Texas around 1890 up to recent times, were from backhoe trenches 5-1 and 5-2, levels 2 and 3 of unit N40/W36, and level 1 of unit N48/W33. A large iron bolt and washer was from backhoe trench 5-1. One galvanized roofing nail was found in level 1 of unit N48/W33.

An iron hinge (Fig. 17,e) was collected from backhoe trench 5-2. Fourteen pieces of iron wire were recovered from unit N40/W36, levels 2 and 3 and unit N48/W33, level 1. Four pieces of an iron can base were also collected in unit N48/W33, level 1. Roughly 152 rusted iron fragments were collected, nine from backhoe trenches 5-1 and 5-2, and 143 from the excavation units, with the most coming from unit N48/W33, level 1. Voellinger (1982:12) reported finding metal fragments at site 41 HR 423, which is actually the southern end of site 41 HR 39. One piece of bronze alloy wire, pointed on the end, came from backhoe trench 5-1. A brass grommet came from unit N40/W36, level 3, and a brass ferrule came from unit N48/W33, level 1.

A live .30-06 caliber Springfield round, which probably dates to the World War II military utilization of De Zavala Point, was excavated from level 2 of unit N48/W33 (the live round was disposed of). A .22-caliber cartridge which appears to be recent, came from unit N48/W33, level 1.

There were brittle fragments of aluminum foil found in backhoe trench 5-2 and in unit N48/W33, level 1. These pieces of foil continued to fragment after

TABLE 15. PROVENIENCE OF METAL ARTIFACTS

Sample	Surface Collection	NW Quad	Dredged Material	Trench 5-1	Trench 5-2	N40/W36 Level 2	N40/W36 Level 3	N48/W33 Level 1	N48/W33 Level 2	TOTAL
Small Spoon	-	1	-	-	-	-	-	-	-	1
Steel Cable Tie-Down	-	-	-	-	-	1	-	-	-	1
Iron Square Spike	1	-	-	-	-	-	-	-	-	1
Iron Square Nail	-	-	-	-	-	-	-	1	-	1
Iron Cut Nails	-	-	-	5	1	4	1	14	-	25
Iron Bolt with Washer	-	-	-	1	-	-	-	-	-	1
Galvanized Roofing Nail	-	-	-	-	-	-	-	1	-	1
Iron Hinge	-	-	-	-	1	-	-	-	-	1
Iron Wire	-	-	-	-	-	1	5	8	-	14
Iron Can Base	-	-	-	-	-	-	-	4	-	4
Miscellaneous Iron Fragments	-	-	-	3	6	15	24	98	6	152
Bronze Alloy Wire	-	-	-	1	-	-	-	-	-	1
Brass Grommet	-	-	-	-	-	-	1	-	-	1
Brass Ferrule	-	-	-	-	-	-	-	1	-	1
Cartridge-.22 Caliber	-	-	-	-	-	-	-	1	-	1
Springfield Cartridge-.30-06 Caliber (live)	-	-	-	-	-	-	-	-	1	1
Aluminum Foil	-	-	-	-	X	-	-	X	-	(2)
Aluminum Can	-	-	-	1	-	-	-	-	-	1

they were collected, so the presence or absence of the foil rather than a count is given in Table 15.

Other Historic Materials

Chert gravels, including flakes which appear to have been processed through a rock crusher, were found on the surface of the site; these materials are discussed previously in the section on prehistoric lithics (Table 3). Fragments of sandstone, found only on the surface of the site, showed no signs of alteration and could possibly have been brought into the area as historic construction material. Pieces of concrete, coal, asphalt, and plaster were also collected. A fragment of a stone disc, made of an identified type of orthoquartzite and which was originally 21 cm in diameter and 1.9 cm thick, was found along the northern bluff exposure in the northwestern quadrant of the site. The function of the stone disc is unknown though it is speculated that it may have served as a crock cover.

Eroded fragments of handmade, chocolate-colored burned brick were found across the surface of the site, in backhoe trenches 5-1 and 5-2, level 3 of unit N40/W36, and level 1 of unit N48/W33 (Table 10). These pieces of brick may be from construction at the site, or may have been dumped there. It is also possible that they resulted from brick firing at De Zavala Point, discussed previously in the site description section of this report, though there are no records of this. Most probably, though, the brick was made at the Cedar Bayou brickyards and was transported to the site. Voellinger (1982:12) reported finding an intact course of handmade bricks on the southern side of De Zavala Point. Cartier and Hole (1972:32) note that the brick used to construct numerous buildings, especially foundations and chimneys in San Jacinto, Texas, during the 1840s was obtained from the Cedar Bayou brickyards. These brickyards, which had up to 11 kilns, also supplied brick to Houston and Galveston from 1850 to 1900. Bricks produced at Cedar Bayou were recovered from the San Jacinto Battlefield (*ibid.*), and the burned, chocolate-brown brick fragments found at site 41 HR 39 also appear to have been produced there (Anne Fox, personal communication). The badly burned appearance of the brick may indicate that these pieces were "wasters," brick which was overfired in the kiln during manufacture (Anne Fox, personal communication). Handmade brick was produced at Cedar Bayou from ca. 1850 or 1865 through the early 1900s (Martin 1968). Burned clay was collected from the northwestern quadrant of the project area by the northern bluff of De Zavala Point (Table 10). It was also found in backhoe trench 5-1, an area which was obviously highly disturbed. The unweathered appearance of the burned clay suggests that it dates to the historic component at the site, rather than to the aboriginal occupation.

A mottled dark brown, mineral doorknob collected from the surface of the site probably dates to the turn of the century. Doorknobs of this type are described in the 1897 Sears Roebuck catalog (Israel 1968:90), and are the least expensive kind listed.

Tiny, dull white to amber-colored polyethylene pellets, ranging from 3.5 mm to 1 mm in diameter, were found in the fill from the excavation units; only a small amount of the pellets found were collected. These pellets, which

commonly occur in beach drift, came from chemical plants located at Texas ports such as Houston (Andrews 1971:269). Small fragments of styrofoam and sheet plastic were also recovered from the dredged material and from the excavation units.

DISCUSSION

Overall, the presence of numerous historic materials within the shell midden deposit indicates that the historic materials were intermixed with the aboriginal cultural remains. The method by which these materials were combined is not certain, but the highly disturbed state of the site is evident. Almost all of the early historic materials were from surface collections at the site.

SUMMARY AND RECOMMENDATIONS

Personnel from the CAR-UTSA conducted archaeological investigations on De Zavala Point in Channelview, Harris County, Texas (Fig. 1), for the Department of the Army, Galveston District, Corps of Engineers. The project involved test excavations at site 41 HR 39, a prehistoric shell midden with a historic component, to assess the eligibility of that site for the National Register of Historic Places.

Site 41 HR 39 is on the northwestern part of De Zavala Point, on top of a 6.1-m-high bluff overlooking the confluence of the Old River and Buffalo Bayou (Fig. 2). The shell midden deposits are visible along the northern and northeastern banks of the Point, and eroding shell and artifacts are visible on the surface in the southeastern part of the project area (Figs. 4-5).

The field work was intended principally to determine the extent, cultural stratigraphy and features, chronology, and potential of the site for yielding additional significant information. To achieve these goals the project area was mapped; nine shovel tests (ST 1-9), two 1-m² controlled test units (N40/W36, N48/W33), five backhoe test pits (BHTP A-E), and five backhoe trenches (BHT 1-5) were excavated (cf. Fig. 3). Artifacts were collected from the site surface and from the shorelines of the project area. The excavations showed a high degree of disturbance of the shell midden deposit in the eastern (ST 1; BHTP D), southern (ST 1-3, 7, 8; BHTP B,C,E), and western areas (ST 4-6; BHTP A; BHT 1-3) of the project area (Figs. 6-10, Table 1). The best-preserved shell midden deposits, represented by a 2 cm to 45 cm thick stratum of *Rangia* shells in a sandy clay loam matrix with faunal materials and prehistoric ceramics, occurred in the north-central part (units N40/W36, N48/W33; BHT 4, 5) of the project area. Historic materials, such as glass, ceramics, and metal, which were recovered from the prehistoric shell midden deposits, and a portion of a former shell-topped road which intruded into the shell midden deposits (Figs. 16-17, Tables 10-15), evidenced the effects of bioturbation and also the long term occupation and usage of De Zavala Point during the Historic period.

The 613 prehistoric sherds collected from the surface and from controlled excavations within the project area consist of 579 plain sandy paste sherds,

11 incised sandy paste sherds, two red-filmed sandy paste sherds, five plain shell-tempered sherds, one incised shell-tempered sherd, and 15 plain grog-tempered sherds. A total of 44 lithics recovered from surface collections and from controlled excavations includes seven secondary flakes, eight interior flakes, four thinning flakes, seven flake fragments, four pieces of shatter, six pieces which had been altered by a mechanical crusher, and also two unifacial scrapers, two thin biface fragments, a mano fragment, an **Ensor** point, a **Perdiz** point, and a Type A-1 point. These ceramics and lithics indicate that the shell midden deposits date to the Ceramic period (ca. A.D. 100-1810), and perhaps prior to this date as well. Other prehistoric materials excavated from the two controlled test units at the site include 27048.3 g of **Rangia cuneata** shells, 90 g of predominantly **Crassostrea virginica** shells, and a small amount of vertebrate faunal remains. A shell growth stage analysis, or seasonality study, of a sample of the excavated **Rangia cuneata** shells indicates that the shell was gathered during late May. The vertebrate faunal remains recovered from the backhoe trenches and from the controlled excavation units are similar to the faunal materials from other prehistoric shell midden sites in Galveston and Harris Counties. The faunal remains recovered represent gar, croaker, turtle, alligator, an unidentified bird, possibly dog, white-tailed deer, domestic cow, and also possibly buffalo. The types of fauna represented in the assemblage were obtained from a variety of habitats. The two pieces of worked bone recovered from the backhoe trench collection areas are an awl and a possible bead blank.

Historic materials recovered from the surface of the project area and also from excavations in the shell midden deposits consist of 83 sherds, 196 glass fragments, 21 handmade brick fragments, 16 pieces of burned clay, 207 pieces of metal, 32 pieces of plastic, and 441 pieces of concrete, coal, and plaster. These historic materials date from the 1820s or 1830s through recent times, a time span which would include, and possibly predate, the occupation of De Zavala Point by the Lorenzo de Zavala family in 1835.

Based upon the data gathered during this project and presented in this report, site 41 HR 39 is judged to have a low research potential and to be not eligible for the National Register of Historic Places. The major factor upon which this assessment is based is the intermixture of prehistoric and historic materials throughout the shell midden deposits. It is doubtful, therefore, that additional archaeological investigations at the site would yield important data beyond that which is presented in this report.

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