Analysis of Findings at the Buckeye Knoll Site (41VT98), Victoria County, Texas
Quarterly Report No. 4 (through October 4, 2004)

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The following tasks related to site analysis have been carried out during the past quarterly period:

1. Dr. Ricklis delivered the following human tooth (M3) samples to Dr. Thomas W. Stafford, Stafford Laboratories, Boulder, Colorado, for collagen purification for AMS dating:

   Burial 73
   Burial 13
   Burial 50A
   Burial 67B
   Burial 74
   Burial 34
   Burial 57
   Bural 47
   Burial 75

   Based on their stratigraphic context and in some cases associated mortuary artifacts, all of these are believed to pertain to the Early Archaic cemetery component.

2. In the same trip, Dr. Ricklis delivered a selection of artifacts to Dr. Linda Scott Cummings, Paleo Research Insititute, Golden Colorado, for residue analyses (protein, starch and/or phytolith):

   ? Quartzite grooved stones ("Waco sinkers") from Burials 61 (N=3), 65 (N=1), 6 (N=1)
   ? Lanceolate dart points from Burials 61, 8 (N=2), 43, 49 (N=2), 26
   ? Large fluted stemmed biface from Burial 74

   ? Milling stone fragments (N=2), one from Zone 2 (midden stratum) on the Knoll Top, and one from Zone 3 on the West Slope

   ? Chert chopper from from Zone 2, the Knoll Top excavation.

   ? Burned clay nodules and/or sandstone fragments from the following hearth features:

Feature 16
Feature 8
Feature 12
Feature 15

Chemical washes were performed on all of the above-listed specimens on the day of delivery. The specimens were then immediately repackaged and returned with Dr. Ricklis to the CEI lab in Corpus Christi

3. Also delivered to Dr. Cummings were a total of 46 flotation samples from various midden excavation levels and feature matrices in both the Knoll Top and West Slope excavations. These samples were left with Dr. Cummings for taxa identification of preserved (charred) macrobotanical remains.

4. Several days after receiving the human tooth samples, Dr. Stafford reported that Seven or eight of the nine samples were too small for reliable collagen extraction using the specialized technique he has developed. Because of the importance of this analytical procedure in obtaining confidence in the age of the early cemetery, it was decided to replace these samples with human bone. Thus, small (approx. 2-3 cm) samples of cortical bone were selected from Burials 13, 47B, 5OA, 57, 67B, 73, 74 and 75. These were hand delivered by Michele Markovicz, an associated of Dr. Glen Doran. At the same time Ms. Markovicz took the original samples from Dr. Stafford and returned them to the Florida State University facility where they have been put back with the burial remains from which they came.

5. Stable isotope data from human bones from 41VT98 were obtained from Dr. Noreen Tuross for Burials 5, 6, 8, 27, 74 (Early Archaic) and 23 (Late Archaic, AMS-dated to 2100 b.p.). The results on the C13 and N15 isotopes have been plotted against comparable data published by Dr. Robert Hard et al. (2002) on numerous bone samples from various cemetery sites on the Texas coastal plain (primarily Ernest Witte and Crestmont on the lower Brazos-Colorado Rivers, 41BX1 at San Antonio, and 41NU2, the Callo del Oso site near Corpus Christi). The results of this comparison are highly significant. The Early Archaic samples from 41VT98 have elevated N and C values that are in contrast to values from inland sites such as Ernest Witte, Crestmont and 41BX1, but intermediate between these results and those from the coastal cemetery, 41NU2. Thus, the Buckeye Knoll Early Archaic population appears to have subsisted on a mix of terrestrial/riverine food resources and coastal (marine) resources. Additional isotope data are pending from Buckeye Knoll; if the presently exhibited pattern is sustained by further analyses, this will have major implications for tracking the early use of a wide-ranging subsistence economy that included a significant input of marine foods in addition to the expectable prairie-riverine resources for this population. By contrast, the single Late Archaic sample (Burial 23) thus far analyzed fits squarely in the C/N cluster exhibited at the Ernest Witte and Crestmont cemeteries, suggesting a similar economic pattern for the later

population at Buckeye Knoll (as might be expected given the attributes this burial, and nearby Burial 25, share with mortuary patterns at those other sites). These findings combine to suggest that during the Early Archaic, inland populations made some use of the shoreline resources, and this may be represented by thin shell midden strata documented for that time period on Nueces Bay and the Lavaca River estuary (Ricklis 1993, 1995; Weinstein 1994). The research of Hard et al. (2002) suggests that the inland-coastal cultural boundary documented for the Early Historic period (Ricklis 1996) was in place by the Late Archaic, and this fits with the isotope data for the Late Archaic Burial 23 at Buckeye Knoll as well as the isotope data for that period and the initial Late Prehistoric from the nearby Blue Bayou site (41VT94; Huebner and Comuzzie 1992). These findings suggest that with additional data from Buckeye Knoll, it will be possible to identify a shift during the Holocene from exploitation of coastal resources as a significant supplement to an inland-based subsistence to an intensive occupation/exploitation of the shoreline zone and the corresponding emergence of a clear coastal-interior cultural-ecological and territorial dichotomy. This will represent a probably unique contribution to understanding the emergence and evolution of coastal adaptation during the Holocene. These suggestions must be considered tentative and preliminary at this time, due to the small number of analyzed samples from Buckeye Knoll.

6. An analysis of prismatic blades from 41VT98 is presently underway. Blades were recovered from Zones 2 and 3 in the Knoll Top excavation, as well as in various strata in the West Slope excavation. The analysis is designed to identify changes in blade size and technological variables during the several millennia represented by these strata.

7. Seasonality analysis has been carried out on the fish otoliths from the site. The relevant species are black drum (*Pogonias cromis*), redfish (*Sciaenops ocellata*), speckled sea trout (*Cynoscion nebulosis*), Atlantic croaker (*Micropogonias undulatus*) and catfish (*Aureus felis* and possibly others). Out of the 99 otoliths recovered in the excavations, 55 were sufficiently well preserved and of adequate size (a factor of the age of the fish and completion of multiple growth-year annuli to permit assessment of season of death) for reliable seasonality estimates. The results on the total sample are:

Winter-Early Spring 5 (9.1%)
Spring 6 (10.9%)
Summer 9 (16.40%)
Late Summer-E. Fall 5 (9.1%)
Fall 11 (20.0%)
Late Fall-Winter 1 (1.8%)
Winter 18 (32.7%)

These results indicate a multi-season use of shoreline resources by he occupants of the Buckeye Knoll site, in contrast to the unimodal Fall-Winter-Early Spring

pattern that tends to characterize Late Archaic and Late Prehistoric shoreline occupation along the mddle Texas coast.

8. Zooarchaeological aalysis of faunal bone samples from various areas of the site continues. Susan Scott Jackson reports that 23,000 bone elements have been speciated and those data have been entered into a computer data base. An additional 15,000 specimens are identified but not yet entered into the data base, and 17,000 specimens have been rough sorted and await final species identification. Ms. Jackson has made the preliminary observation that marine species appear to be more abundant in the lower levels of the site deposits, which is congruent with the human-bone stable isotope data presently available from the site.

9. Dr. Glen Doran reports the following for the bioarchaeological analysis that is ongoing at FSU:

   Our effort is to complete the analysis of the materials during the fall and very early part of next year so data collection and documentation continues. We are continuing to work with the burials and are almost finished with a miscellaneous collection of unassociated skeletal material - largely fragments and small bones of the hands and feet. This miscellaneous collection of material includes preliminarily 15 carpals, 8 metacarpals and 8 metatarsals, multiple long bone fragments and over 100 hand and foot phalanges (proximal, medial and distal). The miscellaneous series has provided roughly 100 metrics (mainly length and width). This material is a mix of adult and subadult material but is mainly from adults.

   The continuing analysis of the identified burials has provided a number of interesting and problematic observations. Field observations indicated 75 distinct burials of which 5 contained multiple individuals. Our analysis indicates this was a gross under-enumeration, but one that would only become apparent with complete matrix removal and detailed skeletal inventory of every burial. This is an ongoing process but at the moment it appears 25 burials have at least two individuals represented, and three burials have three individuals represented and four burials have a minimum of four individuals represented. Multiple individual representation is generally is indicated by duplicated elements, particularly teeth and skeletal elements clearly from individuals of grossly different ages. Initial field observations indicated there were eight (8) subadults. Our preliminary and continuing assessment indicates the actual number of subadults represented is closer to 33, nearly a four fold increase in subadult representation.

   The Final Treatment Plan indicated that cranial and postcranial metrics would be limited given the condition of the bone in many burials and this holds true. The cranial/post-cranial data set includes roughly 132 specific cranial and post-cranial dimensions (excluding dental observations). Rarely is a single dimension represented by more than five different individuals with a total of

nearly 300 total dimensions. As was indicated the dental data set is much more robust and includes standard dimensions and a suite of nonmetric observations on nearly 1000 teeth (about half providing metrics) and a similar number providing multiple nonmetric observations.

We have extracted, photographed and transferred samples to Stafford Labs for AMS analysis and samples are also ready to be delivered (by hand) to Harvard for analysis by Tuross (AMS, DNA and isotopic analysis).

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