Stable isotope analysis provides an innovative and detailed approach with which to study dietary patterns and the local environment of residence, permitting clearer understandings of the biological effects of status. This study characterizes enamel carbonate $\delta^{13}C$ and $\delta^{18}O$ from three burial mounds in North Florida to relate diet and residence during early life to archaeologically determined status.

Stable isotope analyses have become an integral part of bioarchaeology and provide a powerful set of analytical tools for reconstructing the diets (Katzenberg and Harrison 1997; Schwarcz and Schoeninger 1991; Ambrose 1993) and migratory histories (Price, Burton, and Bentley 2002; White et al. 1998) of ancient populations. As direct measures of macronutrient intake and local environment, stable isotopes often complement other archaeological lines of evidence and yield novel and key insights into ancient populations. The assumption underlying these analyses is that ratios of isotopes such as carbon, nitrogen, and oxygen reflect the ratios in consumed animals, plants and water; in essence, that one is what one eats and drinks. Because of their utility and salience to bioarchaeological research, stable isotope analyses have been applied to skeletal populations in many different regions of the world. Moreover, because social status can often result in differential dietary patterns related to high- and low-status foods, stable isotope analysis permits assessments of differential status (Ubelaker, Katzenberg, and Doyon 1995) or lack thereof (White, Longstaffe, and Law 1999) when analyzed in combination with archaeological data.

This study seeks to relate longitudinal dietary and migratory trends to archaeologically defined social status in two poorly preserved skeletal populations in North Florida, one associated with the early Weeden Island culture and one with the succeeding Suwannee Valley culture, which is contemporaneous with late Weeden Island cultures elsewhere in northern Florida. The Early Weeden Island period I (Late Middle Woodland) in North Florida (A.D. 145–785) is characterized by villages, often with ceremonial mounds and plazas, distinctive ceramic and lithic styles, a broad-spectrum hunter-gatherer subsistence pattern, and some status differentiation. The early portion of the Suwannee Valley culture (Late Woodland; A.D. 785–ca. 1200) is characterized by settlements which are less dense, more numerous, and smaller than the earlier Weeden Island settlement system. After A.D. 1200, Suwannee Valley settlements are more nucleated and larger and are believed to be associated with maize agriculture and a chiefdom level of sociopolitical organization (Milanich 1994:348–353). Corn cob–impressed pottery is found at late Suwannee Valley village sites. It is thought that the early portion of the Suwannee Valley culture, as well as the contemporaneous, post–Early Weeden Island Wa-kulla culture in Northwest Florida, “may correlate with increased reliance on agriculture” though direct evidence in the form of plant remains is lacking from North Florida sites (Milanich 1994:350). It is only after A.D. 1200 that maize appears to become an important agricultural crop, as evidenced by corn cob impressions on ceramic vessels.

There is no evidence for widespread maize agriculture in the early Weeden Island period in North Florida, and indeed little evidence for a heavy reliance on maize in much of Florida until the late pre-contact period (Larsen et al. 2001:72). If maize were being cultivated and eaten during that time, it has been surmised that it was used ceremonially rather than as a staple crop. Archaeological evidence of differential status may therefore have been related to biological evidence of differential diet, with evidence of some maize consumption likely indicative of higher status.

This study explores biological aspects of status through the reconstruction of weaning trends and childhood dietary and migratory patterns at the McKeithen site, an early Weeden Island village in North Florida, using stable carbon and oxygen isotopes in enamel carbonate. Multiple teeth are analyzed, and since teeth do not remodel following their formation during childhood, they preserve an isotopic record of the individual’s diet and local environment during the period in which each tooth developed. This analysis therefore permits the longitudinal characterization of childhood isotopic trends in adults.

Isotopic carbon signatures are used as indicators of childhood diet since they reflect the isotopic composition of consumed fats, protein and carbohydrates, while isotopic oxygen signatures are used as indicators of the local environment since they reflect the isotopic...
composition of imbibed meteoric water. Isotopic variation is measured among individuals at the site who exhibit similar burial locations and patterns and is compared to those from a single individual displaying a markedly different archaeological context suggestive of elevated status. The degree of isotopic difference is characterized between individuals from the McKeithen site and a small, later-in-time sample from Leslie Mound, an early Suwanee Valley culture mound also located in North Florida. Because Leslie Mound dates to a period of increasing agricultural importance, it is hypothesized that shifts in subsistence, such as maize consumption, may be reflected in enriched isotopic carbon signatures relative to the McKeithen sample. Further, given that the two sites are located in very similar environments (they are only 5 km apart), heterogeneity in isotopic oxygen signatures are used to assess the range of variation expected in similar latitudinal and longitudinal contexts and thereby identify any nonlocal individuals from either site. This will permit assessments of whether dietary variation in early life is related to immigration from elsewhere or to status, or possibly both.

Background

The region of North Florida where the Weeden Island and Suwanee Valley cultures were located is defined as the stretch of land bordered to the south by the Santa Fe River, to the west by the Aucilla River, to the north by Valdosta, Georgia, and to the east by the area between Lake City, Florida, and the St. John’s River (Figure 1). North Florida is characterized by several environmental contexts that form a subsistence mosaic of terrestrial and aquatic ecological niches. This ecological mosaic is primarily characterized by mixed deciduous and pine forests and a network of wetlands, creeks, rivers, and estuaries that undergo periodic flooding. The climate of North Florida is temperate, with wide seasonal and even daily temperature fluctuations, high levels of rainfall with periodic droughts, and long growing seasons. The three prevalent vegetative communities noted in the region are pine flatwoods, mesic hammock, and sand hills, while the prevalent aquatic habitats include marshes and wet prairies, permanently watered lakes and ponds, streams, creeks, wooded swamps, and poorly drained flatwood forests. The North Florida highlands are well suited to year-round occupation (Milanich et al. 1997:25–31).

The McKeithen site itself is situated next to Orange Creek, a small but active creek that itself forms the northern boundary of the site. Wetland faunal remains at McKeithen include mudfish, catfish, bass, mud turtles, chicken turtles, soft-shelled turtles, and alligator (Milanich et al. 1997:75), while terrestrial plant species important to subsistence include oaks, palmettos, pines, wire grasses, wild plum, wild cherry, wild grape, persimmon, blueberry, and huckleberry (Milanich et al. 1997:33). No cultigens have been found at any early Weeden Island site, though squash and gourd ceramic effigies have been recovered from early sites, suggesting some cultivation (Milanich et al. 1997:35). Indigenous terrestrial animal species most likely important to subsistence include rabbit, squirrel, opossum, raccoon, and black bear (Milanich et al. 1997:33). However, the most commonly found faunal remains at the McKeithen site were of white-tailed deer (Milanich et al. 1997:33). The McKeithen population, therefore, likely practiced a broad and seasonally variable hunting and gathering mode of subsistence that utilized a wide variety of wetland and terrestrial resources.

The McKeithen Site

The McKeithen site is located near permanent water sources and mesic hammocks that are abundant in nuts and fruits from oak, hickory, wild plum, and wild cherry trees as well as aquatic resources. The layout of the site does not suggest political centralization but, rather, the presence of ceremonially based hierarchy perhaps centered on mortuary specialization (Milanich et al. 1997). Political organization was likely somewhere between egalitarian and stratified, and differential status was likely ceremonial. The McKeithen site is considered one of the largest and most complex of Weeden Island villages and, therefore, would be expected to have some degree of ceremonially based social stratification.

The McKeithen village is one of three known functioning chiefdom sites in northern Florida characterized
by triangular mound complexes (Figure 2), structures on mounds as precursors to temple mounds, and horseshoe-shaped villages oriented around a main plaza. Radiocarbon dates suggest that the site was inhabited between A.D. 145 and 785. The McKeithen site is characterized by temporary periods of increased complexity, with mounds and specialized ritual activity (Milanich et al. 1997:91). The site may have been home to one or more elite lineages or it may have been a burial site for local elites, with one individual serving as a burial specialist or “Big Man” leader at the site (Milanich et al. 1997:91).

At McKeithen there are three synchronous, functionally related mounds erected and used sometime during the period (calendar years), ca. A.D. 480–615, as suggested by 16 radiocarbon dates obtained from 12 charred wood samples, including three wall posts from the structure on Mound B, a post associated with the Mound B tomb, four posts and a fire pit from the Mound A platform mound, a fire pit under that platform mound, and two posts from the Mound C charnel house (Table 1, and see Milanich et al. 1997:91–109). Mound A contained purely utilitarian and locally made pottery, while Mounds B and C contained interments and nonlocal, elite ceramic assemblages. The remains of a structure were found on a platform mound within Mound C, likely the remains of a charnel house used to process human remains (Milanich et al. 1997:93). A minimum of 36 individuals were recovered from Mound C, including 26 adults and 10 children, with a 10:9 male : female sex ratio and very poor preservation (Milanich et al. 1997:117). The burials at Mound C were bundles, comprised primarily of fragmented crania, some vertebrae, and long limb bones, with some bundles containing the remains of more than one individual (Figure 3). The poor preservation of these remains precludes accurate sex and age determination. When use of the Mound C charnel house ceased, it was burned. Roughly 40 large sandstone and limestone rocks were placed on the platform and a layer of clean sand was used to cover the burned debris. Burials, presumably previously stored in the charnel house and removed before it was burned, were placed atop the clean sand and the platform mound and burials were then capped with a stratum of sand (Milanich et al. 1997:91).

Of the three mounds at the McKeithen site, Mound B appears to have held special significance, based on its location and orientation to the other two mounds, its associated features and artifacts, and the unique characteristics of its sole interment. First, the three mounds at the site form an isosceles triangle, which faces the rising sun of the summer solstice and has Mound B at its apex (Figure 2). Second, the remains of a rectangular structure were built on top of the Mound B platform with the long axis oriented to 62.5 degrees east of magnetic north, with the entrance on the opposite wall from that facing the plaza to the west. The orientation of this feature, with an entrance seemingly hidden from the central plaza suggests that the structure served a ceremonial or ritual function. The mound also contained unique types of elite ceramics not found elsewhere at the site. The period of greatest social heterogeneity, inequality, and population density was likely the middle phase of the site’s occupation, when all three mounds were in use (A.D. 300–350). However, a wider distribution of elite ceramics during the middle phase suggests that many people at McKeithen had access to high-status goods, further supporting the notion that the McKeithen site served as a burial site for local elites.

Finally, the body of a single individual, most likely a female who died in her mid- to late thirties, was interred in a tomb constructed on the Mound B platform. The individual was buried on her back, extended in an orientation that perpendicularly bisected the 62.5 degree axis of the platform, lying along the solstice plane (Figure 4). A Pinellas-style projectile point, a style found elsewhere at the site, was found embedded in the innominate bone of the pelvis with almost 3 cm of penetration and evidence of healing. Ochre was found on the skull of this individual, and an occipital fragment from another human was found underneath the head, as was a lower-leg bone from an anhinga bird; the ochre may have used to color the person’s hair, while the occipital and bird bones could have been amulets tied in the hair or associated with a headress of some type. Stylized bird effigies were common to the unique ceramic assemblages found in the mound layers (Milanich et al. 1997:110).

Among the three mounds at the site, it appears that Mound B held a great deal of significance. Also, while
the ceramic and lithic assemblages in Mounds B and C suggest the presence of multiple elites, the burial style and ceremonial artifacts associated with the Mound B burial (assigned Florida Museum of Natural History catalogue number S426) point to a unique, ceremonial role played by this individual at the site. Milanich et al. (1997:91) suggest that burial S426 from Mound B was a religious specialist or “big man” (or “big woman”), and that the McKeithen site functioned as a religious center during its occupation. At least some of the burials at the McKeithen site may have therefore individuals brought to the site for burial.

Isotopic characterizations of in vivo dietary and migratory patterns for burial S426 and the interments from Mound C could be instrumental in reconstructing the ways in which differences in elite status relate to fundamental characteristics of everyday life such as subsistence and regional mobility. Longitudinal characterization of these isotopic patterns during different periods of development would further permit a discussion of the role that these status differences played during early life, and whether the unique characteristics of S426 reflect a lifelong status distinction.

### The Leslie Mound Site

Leslie Mound, located adjacent to a small creek with a village midden nearby, is an almost perfectly circular sand burial mound (Milanich et al. 1997:202–203). When excavated, it was 26 m in diameter and 2.1 m high. The soil used to form the mound was scraped up from the village area, resulting in potsherds and other midden debris being contained in the mound fill. The excavation by the Florida Museum of Natural History consisted of a 6-×-6-m block in the east side of the mound which extended down below the original ground surface on which the mound was constructed.

The sequence of mound construction and use was as follows. First, the humus was scraped away and a 10-cm-thick layer of clean sand containing some clay was laid down. Atop that stratum, a low platform mound 30 cm thick and approximated at 9 m across was deposited. Humic deposits, perhaps associated with a charnel structure, accumulated atop that platform. Bundles of human bones, perhaps previously stored in a charnel house, were placed on that surface and then covered with a cap of sand scraped up from nearby, forming a mound .8 m high. A second humic stratum formed on that surface (possibly a second charnel house) upon which bundled burials also were placed. Those burials were again covered with a second mound cap to form the present mound.

### Longitudinal Isotopic Analysis

Stable isotope analyses rest on the assumption that the isotopic composition of human tissues reflects that of consumed food or imbibed water. Stable carbon isotopes

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**Table 1. Radiocarbon Dates from the McKeithen Mounds.**

<table>
<thead>
<tr>
<th>Lab No.</th>
<th>Provenience</th>
<th>RCYPB</th>
<th>Calender Date Range (2σ) and Relative Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>UM-1435</td>
<td>Bottom of in situ large charred wooden post (Pinus sp.) extending down from surface of platform mound; FS 1094-A*</td>
<td>1720 ± 80</td>
<td>AD 130–465; 95%</td>
</tr>
<tr>
<td>UM-1642</td>
<td>Bottom of in situ large charred wooden post (Pinus sp.) extending down from surface of platform mound; FS 1147</td>
<td>1770 ± 70</td>
<td>AD 115–415; 97%</td>
</tr>
<tr>
<td>UM-1643</td>
<td>Large horizontal lying charred post (Pinus sp.) from screen on platform mound; FS 1191</td>
<td>1455 ± 90</td>
<td>AD 415–725; 97%</td>
</tr>
<tr>
<td>UM-1645</td>
<td>Wood charcoal from small fire pit on surface of platform mound; FS 1271</td>
<td>1530 ± 80</td>
<td>AD 335–665; 100%</td>
</tr>
<tr>
<td>UM-1646</td>
<td>Bottom of in situ large charred wooden post (Pinus sp.) extending down from surface of platform mound; FS 1312</td>
<td>1515 ± 70</td>
<td>AD 415–650; 100%</td>
</tr>
<tr>
<td>UM-1644</td>
<td>Wood charcoal from fire pit under platform mound and on top prepared strata; FS 1267</td>
<td>1690 ± 90</td>
<td>AD 130–550; 100%</td>
</tr>
<tr>
<td>UM-1233</td>
<td>Charred in situ wooden post (Pinus sp.) associated with burial tomb on platform mound; closest to burial; FS 782</td>
<td>1980 ± 70</td>
<td>170 BC–AD 145; 97%</td>
</tr>
<tr>
<td>UM-1564</td>
<td>Same as UM-1233 (split sample); same laboratory pretreatment as UM-1233</td>
<td>1660 ± 80</td>
<td>AD 210–575; 99%</td>
</tr>
<tr>
<td>I-10,455</td>
<td>Same as UM-1233 (split sample)</td>
<td>1340 ± 75</td>
<td>AD 545–825; 98%</td>
</tr>
<tr>
<td>UM-1563</td>
<td>Charred in situ wooden wall post (Pinus sp.) associated with structure on platform mound; FS 777</td>
<td>1350 ± 70</td>
<td>AD 656–825; 98%</td>
</tr>
<tr>
<td>UM-1234</td>
<td>Charred in situ wooden wall post (Pinus sp.) associated with structure on platform mound; FS 777</td>
<td>1590 ± 70</td>
<td>AD 325–615; 98%</td>
</tr>
<tr>
<td>I-10,453</td>
<td>Same as UM-1234 above (split sample)</td>
<td>1345 ± 75</td>
<td>AD 570–870; 100%</td>
</tr>
<tr>
<td>UM-1235</td>
<td>Charred in situ wooden wall post (Pinus sp.) associated with structure on platform mound; FS 779</td>
<td>1550 ± 75</td>
<td>AD 380–645; 98%</td>
</tr>
<tr>
<td>I-10,454</td>
<td>Charred in situ wooden post (Pinus sp.) associated with structure on platform mound</td>
<td>1325 ± 75</td>
<td>AD 595–885; 100%</td>
</tr>
<tr>
<td>UM-1434</td>
<td>Charred bottom of in situ wooden post (Pinus sp.) associated with charnel house on platform mound; FS 956</td>
<td>1455 ± 70</td>
<td>AD 430–675; 100%</td>
</tr>
<tr>
<td>UM-1436</td>
<td>Charred wooden timber associated with charnel house on platform mound; FS 1022</td>
<td>1470 ± 70</td>
<td>AD 430–665; 100%</td>
</tr>
</tbody>
</table>

* FS is field specimen number.

**Note:** Calendar date range and relative area (both rounded) calibrations based on Stuiver, Reimer, and Reimer 2005. The laboratory radiocarbon analyses were completed in 1977, 1978, and 1979. All field notes, including field specimen catalogues, are curated at the Florida Museum of Natural History.
in bone and enamel apatite reflect the relative amounts of C₃ and C₄ plants in the diet, based on divergent photosynthetic pathways that differentially discriminate against ¹³C and result in different ¹³C/¹²C ratios (δ¹³C) in plants and later in animal and human tissues. The result is that C₃ plants exhibit δ¹³C values that generally range between −22 and −35‰, while C₄ plants generally range between −10 and −15‰ (O’Leary 1981). Animals, including humans, in turn incorporate fractionated carbon isotopic values from consumed plant tissues or from the tissues and products of other animal consumers, into their own tissues with consistent fractionation. While carbon that is incorporated into bone and dentine collagen is preferentially drawn from sources of dietary protein, carbon in bone and enamel apatite is incorporated from fats, carbohydrates, and protein and thus

Figure 3. (a) Schematic of Mound C and (b) typical Mound C bundle-burial style. Milanich et al. 1997:114.
Figure 4. (a) Schematic of Mound B and (b) Burial S426. Milanich et al. 1997:107, 111.
reflects the isotopic composition of an organism’s overall diet (Ambrose and Norr 1993). Stable carbon isotopes in preserved tissues substrates are thus useful measures of broad variation in dietary composition in humans and provide powerful information used to reconstruct culturally mediated subsistence and feeding practices (Schwarm and Schoeninger 1991).

Stable oxygen isotopes in bone and enamel apatite, on the other hand, reflect the isotopic composition of body water, which equilibrates the $^{16}\text{O}/^{18}\text{O}$ ($\delta^{18}\text{O}$) of bone at a constant temperature of 37°C. Body water $\delta^{18}\text{O}$ is influenced by the oxygen isotopic composition of imbibed meteoric drinking water and, to a lesser extent, water in air and food sources. The isotopic composition of meteoric water is in turn affected by latitude, altitude, aridity, distance from the sea, and temperature through the variable loss of $^{16}\text{O}$ through evaporation and enrichment of $^{18}\text{O}$ in local water sources (Dansgaard 1964). These ecological and physiological processes make $\delta^{18}\text{O}$ a useful measure of local climatic variables such as overall climate, seasonal temperature change, and fluctuating rainfall (White et al. 1998), as well as of an individual’s movement to geographical areas characterized by $\delta^{18}\text{O}$ ranges distinct from those from which he/she originated (White et al. 2002; White et al. 2000).

Most stable isotope studies in anthropological literature utilize components of bone such as collagen or apatite to reconstruct dietary composition. However, these substrates undergo elemental turnover as part of normal bone remodeling throughout life, resulting in an isotopic signal that represents the averaged diet during the last 10 or so years of life (Mangolagas 2000). Recently, several anthropological studies have analyzed tissues that preserve isotopic signatures from different periods of development in order to reconstruct longitudinal, intra-individual isotopic trends, following White’s (1990) study of multiple preserved tissues in reconstructing diet among the Wadi Halfa population from Sudanese Nubia and Schwarcz, Gibbs, and Knyff’s (1991) study of American soldiers interred in Canada. White (1993) further identified a seasonally variable pattern of C$_3$ and C$_4$ consumption at Wadi Halfa population through incremental analyses of preserved hair but found no such trend in a similar study from the Kharga Oasis (White, Longstaffe, and Law 1999). Balasse and colleagues successfully traced dietary trends associated with weaning and fattening in modern steers through analyses of intra-bone (Balasse, Bocherens, and Mariotti 1999) and dentine (Balasse et al. 2001) isotopic variability, illustrating the potential of such analyses for reconstructing dietary changes in vivo. Kohn, Schoeninger, and Valley (1998) further demonstrate the utility of intra-individual isotopic analysis for reconstructing dietary and climatic trends by effectively discounting physiological processes as confounders in determining the isotopic composition of preserved tissues.

The rarity of preserved hair in most archaeological contexts, however, and the susceptibility of bone and dentine to diagenetic alteration makes tooth enamel the most useful tissue for intra-individual isotopic analysis. Tooth enamel is composed of tightly packed mineral crystals with almost no organic content, making it more likely to withstand taphonomic breakdown and diagenetic alteration. Moreover, tooth enamel forms at stable, incremental rates and does not remodel once formed, thereby “fossilizing” the biochemical composition and other features such as surface defects (Goodman and Rose 1990). Studying isotopic ratios of carbon and oxygen in tooth enamel is thus similar to studying enamel defects in that the parameters of interest form during specific periods during development and can be used to map trends during infancy, childhood and early adolescence regardless of the age at which the individual died. Perhaps best known among stable oxygen isotopic studies is that by Müller et al. (2003) in estimating the region in Italy from which Otzi the Iceman originated relative to where he died. Gadbury, Jahren, and Amundson (2000) analyzed isotopic signatures in microsampled bison enamel to track seasonal fluctuations in the $\delta^{18}\text{O}$ of consumed drinking water, positing a progressive decline in enamel $\delta^{18}\text{O}$ as indicative of a Holocene drying trend that caused catastrophic mortality among the population. Frick, O’Neil, and Lynnerup (1995) examined variation in enamel $\delta^{18}\text{O}$ from seven heterochronic Greenlandic populations and found both an overall decline in isotopic values suggestive of climatic cooling and within-population variation suggestive of immigration and mobility. White et al. (2000) estimated only a weak Teotihuacan colonizing presence at the site of Kaminaljuyu using enamel phosphate $\delta^{18}\text{O}$ to identify Teotihuacano immigrants, uncovering a previously unknown degree of migration involving individuals from multiple regions. White et al. (2002) further identified a substantial number of immigrants, including among sacrificial victims, in a population from at the Feathered Serpent Pyramid through analyses of enamel phosphate $\delta^{18}\text{O}$, differentiating local residents, recent arrivals, and more long-term immigrants through varying scales of isotopic equilibration.

Recently, several studies have successfully reconstructed weaning trends and early childhood diets among adult remains. Wright and Schwarcz (1998, 1999) estimated the timing and nature of the weaning process among a small population from Kaminaljuyu, Guatemala, using analyses of $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$ in tooth enamel carbonate. Their study illustrates the utility of isotope analysis in uncovering rich biological patterns in poorly preserved remains. These analyses not only permit an elucidation of in vivo changes in diet but also overcome the possible confounding effect of selective mortality bias in interpretation (Wood et al. 1992).
through the exclusive analysis of those who survived infancy and childhood (Wright and Schwarcz 1999).

Similar carbon and oxygen isotopic analyses were performed on the McKeithen and Leslie Mound populations in order to reconstruct dietary trends during infancy, childhood, and adolescence and to relate variation in early life experience to social status at the time of death. Variation in oxygen isotopic signatures of residence and mobility were also examined to assess the relationship among dietary variability, status, and immigration. While the preservation of the skeletal material from McKeithen and Leslie Mounds is poor and limits the extent to which these trends can be generalized, the marked difference in burial style between the two McKeithen mounds and cultural divergence between the McKeithen and Leslie Mound sites permits some discussion of these factors as they relate to diet and residence. Since the consumption of maize in Florida during the early Weeden Island period is thought to have been largely ceremonial in nature, if present at all, it is hypothesized that if there was any maize present at the McKeithen site, its consumption would be most pronounced in the tissues of burial S426, the sole occupant of Mound B and the most skeletally complete and archaeologically complex burial at the site. Indeed, preliminary carbon isotopic data from a study of bone collagen suggests that S426 did consume a diet that included C4 foods, while those interred at Mound C did not (Bruce Smith, personal communication 2004). However, the possibility of contamination with organic preservatives prompted a reanalysis of the material with a more rigorous preparation technique and yielded collagen δ13C data indicative of dietary protein from C3 sources (Bruce Smith, personal communication 2004). These new findings are intriguing and would be complemented by independent test using a different substrate that is unaffected by organic contamination, that is, enamel apatite. Further, while bone collagen represents the average of the isotopic values from approximately 10 years before death, the use of enamel apatite in this study permits a longitudinal isotopic reconstruction that addresses not only if but also when and for how long S426 consumed any C4 foods during childhood and adolescence, and whether this dietary pattern is correlated to immigration from another region.

Further, a small sample of remains from the nearby Leslie Mound was analyzed. Because maize was more likely to have some presence at the later Leslie Mound site, these remains were analyzed in order to test the hypothesis that the S426, the lone burial in McKeithen Mound B would have enamel carbonate δ13C that was more similar to those at Leslie Mound than to those from McKeithen Mound C, who are assumed based on burial style to be of lower status relative to burial S426, even if they are in fact elites. It is also suggested that burial S426 could be an immigrant to the McKeithen site from elsewhere, and that any variation in diet observed in this individual could be due to a residence in different ecological contexts during life.

Methods

The poor preservation and fragmentary nature of the McKeithen and Leslie Mound populations precluded a sampling design based on standardized tooth types or specific quadrants of the arcade and reduced the available sample size. Only one individual at the McKeithen site was distinct in burial style, location, and accompaniments, however, while the remainder of the skeletal population was confined to one mound and with uniform burial styles. This means that a large sample size is not necessary to test the hypotheses that differential dietary composition involving ceremonial foods such as maize was linked to social status, and isotopic indicators of maize consumption are more similar between the McKeithen Mound B interment and the interments from Leslie Mound than either are to the interments from McKeithen Mound C.

Teeth were opportunistically selected from those individuals from the overall population (N = 37) with one or more identifiable tooth types, yielding seven individuals from McKeithen Mound C, the single individual from McKeithen Mound B, and three individuals from Leslie Mound. Teeth were grouped into three broad developmental periods: first and second incisors and first molars comprised the “infancy/early childhood” (IEC) period, while canines, second premolars, and second molars comprised “middle childhood” (MC), and third molars comprised “adolescence” (AD) (summarized in Table 2). Each tooth was catalogued and cleaned with acetone, and surface contaminants were ground off with a Dremel tool when necessary. Twenty to 60 milligrams of enamel was taken from each tooth using a hand-held Dremel tool and diamond cutter saw attachments, spanning the CEJ to the occlusal margin, or the area of maximum height in the case of worn teeth. Residual dentine was ground away when necessary.

Enamel carbonate apatite was isolated for δ13C and δ18O characterization using methods adapted from van der Merwe, Tykot, and Hammond (1995), Ambrose (1993), and Schoeninger et al. (1989). Enamel samples were crushed to a fine powder using an agate mortar and pestle and soaked for 24–48 hours in a 3:1 solution of ddH2O and NaOCl (double-distilled water and sodium hypochlorite) in 15-ml falcon tubes until all organic material was removed. The samples were then centrifuged and rinsed to neutral with distilled water, then soaked for 18 hours in a .2 percent acetic acid solution at 4°C to remove exogenous carbonates and diagenetic contaminants while avoiding recrystallization of the
Table 2. Categorization of Tooth Type by Developmental Period.

<table>
<thead>
<tr>
<th>Tooth Type</th>
<th>Years of Development</th>
<th>Assigned Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>I1</td>
<td>0.0–5.0</td>
<td>Infancy/Early Childhood (IEC)</td>
</tr>
<tr>
<td>I2</td>
<td>0.8–5.5</td>
<td>Infancy/Early Childhood (IEC)</td>
</tr>
<tr>
<td>C1</td>
<td>0.3–7.0</td>
<td>Middle Childhood (MC)</td>
</tr>
<tr>
<td>PM1</td>
<td>1.0–7.5</td>
<td>N/A (none present)</td>
</tr>
<tr>
<td>PM2</td>
<td>2.0–8.5</td>
<td>Middle Childhood (MC)</td>
</tr>
<tr>
<td>M1</td>
<td>0.0–3.5</td>
<td>Infancy/Early Childhood (IEC)</td>
</tr>
<tr>
<td>M2</td>
<td>2.5–8.0</td>
<td>Middle Childhood (MC)</td>
</tr>
<tr>
<td>M3</td>
<td>8.0–15.0</td>
<td>Adolescence (AD)</td>
</tr>
</tbody>
</table>

Note: Years of development from Hillson 1996 and White and Folkens 2000.

enamel apatite (Garvie-Lok, Varney, and Katzenberg 2004). The isolated carbonate apatite samples were then centrifuged and rinsed to neutral pH with distilled water, freeze-dried, and digested on an automated prep system at 50°C in a VG prism mass spectrometer at the Center for Isotope Geoscience at University of Florida, Gainesville. Isotopic values are expressed as per mil (‰) relative to the international PDB standard for carbon and standard marine ocean water (SMOW) for oxygen. The analytical precision of the mass spectrometer used is ±.05‰ for δ13C and ±.11‰ for δ18O.

The integrity of skeletal tissue samples and the potential confounding effects of diagenetic alteration in the burial environment are of concern when interpreting isotopic data. To avoid the possibility of analyzing diagenetically altered samples, bone is not analyzed in this study due to its greater susceptibility to taphonomically induced isotopic exchange. Tooth enamel, on the other hand, is composed almost exclusively of a tightly compacted mineral matrix that is highly impermeable to exchange in the burial environment. Moreover, empirical data and theoretical models indicate that enamel apatite retains in vivo biogenic signals despite fossilization processes (Wang and Cerling 1994; Sponheimer and Lee-Thorp 1999; Lee-Thorp 2000; Kohn, Schoeninger, and Barker 1999). Also, while White, Longstaffe, and Law (2004) suggest that enamel phosphate is less susceptible to diagenetic alteration than enamel carbonate, the two inorganic components appear to be comparable in their resistance to alteration and the integrity of biogenic signals. Finally, while the possibility of diagenesis cannot be completely ruled out, the intra-individual consistency of the δ13C and δ18O data across the McKeithen and Leslie Mounds study samples suggests the retention of biogenetic isotopic characteristics.

Results

Diet

As summarized in Table 3 and shown in Figure 5, the majority of the individuals from McKeithen Mound C had fairly consistent, closely clustered δ13C values that did not substantially vary across tooth types. The mean δ13C value for the Mound C cohort was −14.2 ± 4.6‰, while the mean value for the Leslie Mound cohort was −13.4 ± 6.0‰. Contrary to expectation, these mean δ13C values varied by less than 1‰ and the individual values overlapped substantially; while the sample size from each mound is too small for statistical tests, the data suggest no meaningful difference in δ13C between the two mound samples. Contrasting with these data, and with collagen data from an earlier study (Bruce Smith, personal communication), are those from S426 interred in McKeithen Mound B (referred to hereafter simply as S426), whose mean individual δ13C value for the four teeth sampled is −3.3 ± 4.7‰, a respective enrichment of 10.9 and 10.16‰ compared to the Mound C and Leslie Mound samples.

Because enamel sampling was necessarily opportunistic, it was impossible to standardize tooth types or arcade quadrants across the sample, so teeth were grouped into early childhood, middle childhood, and adolescent developmental periods based on the timing of crown completion (Table 2). To measure within-individual changes in diet or residence during growth, paired differences between the absolute values of δ13C and δ18O in IEC, MC and AD tooth types were calculated using a modified version of that employed by Wright and Schwarcz (1998). When multiple teeth were
Among the individuals from Mound C, $\delta^{13}$C values in the infancy/early childhood period ranged between $-14.8$ and $-14.2\%$, while they ranged from $-14.7$ to $-13.3\%$ and between $-14.1$ and $-13.4\%$ during adolescence. These ranges are small, less than $1.4\%$, and suggest a similar dietary range among the Mound C sample. Following Prouse et al. (2004), a fractionation effect between dietary sources and enamel carbonate of $+13\%$ is assumed, as an intermediate between those established for rodents (Ambrose and Norr 1993) and for large ruminants (Cerling and Harris 1999). Using this $+13\%$ fractionation effect, the overall diet consumed by the Mound C sample had estimated isotopic values ranging from $27.8$ and $26.3\%$, consistent with those found in C3 plants and C3-consumers. Between infancy/early childhood and middle childhood, the mean $\delta^{13}$C value at Mound C increased by .3 to .6, and between infancy and adolescence the mean value increased by .1 to .4. Only one value is present for the difference in $\delta^{13}$C between middle childhood and adolescence, showing a .9% increase. These differences are also less than $1\%$, suggesting a relatively stable C3-based diet throughout early life among these individuals. However, Wright and Schwarcz (1998) postulate that isotopic differences exceeding .5% between teeth from the same individual may indicate enrichment or depletion associated with dietary changes such as weaning. While the mean within-individual isotopic differences at Mound C could represent normal individual variation or the influence of analytical precision, the fact that M1 and I1 are formed from birth until 3.5–4 years means that enamel $\delta^{13}$C is possibly enriched in these teeth due to the consumption of fractionated carbon in maternal milk.

The three individuals from Leslie Mounds display similar $\delta^{13}$C trends, showing values between $-14.5$ and $-12.8\%$ during infancy/early childhood and single values of $-13.1$ and $-13.2\%$ during middle childhood and adolescence, respectively. The infancy/early childhood range is $1.6\%$ and is slightly larger at Leslie Mound than at Mound C, though the small sample size limits interpretations of dietary variation during this period. Between infancy and middle childhood, $\delta^{13}$C increased by .3% (based on one paired observation) and between infancy and adolescence $\delta^{13}$C increased by .1% (one paired observation), while during middle childhood and adolescence $\delta^{13}$C increased by .1% (one paired observation). These differences are also small, suggesting that each of the three individuals at Leslie Mound consumed relatively stable diets during life, though some variation in diet existed during infancy and early childhood.

The $\delta^{13}$C values for S426 also show a low level of variability between developmental periods. The mean $\delta^{13}$C value during infancy/early childhood of $-3.5 \pm 2\%$ (M1, I1) is $4\%$ lower than the mean middle childhood value of $-3.1 \pm .5\%$ (C1, PM2), while the adolescent (M3) value of $-1.1\%$ is $2.3$ and $1.9\%$ greater than those from infancy/early childhood and middle childhood, respectively. These moderate within-individual differences between developmental periods are similar to those observed at Mound C.
suggest that S426, like the individuals from Mound C and Leslie Mound, consumed a fairly consistent diet during early life; the isotopic values that reflect this diet, however, were markedly distinct from those of the other two mound samples. If one again assumes a +13‰ diet-tissue fractionation effect, this means the overall diet consumed by S426 was between −16.6 and −15.7‰ consistent with a diet that includes C4 plants, terrestrial C4-grazers and/or marine animal protein in increasing amounts over time. The discrepancy between enamel apatite and bone collagen δ13C data for S426, however, suggests that the C4 component of the diet was not the primary source of dietary protein, based on established models of collagen-apatite spacing (Ambrose and Norr 1993), and was from a carbohydrate source such as maize. S426’s diet nonetheless markedly contrasts with a consistently C3-based diet among those interred at Mound C and Leslie Mound.

Because enamel was sampled from multiple teeth representing different stages of individual development, some discussion of early diet as it pertains to the process of supplementation and weaning is possible. As described above, Wright and Schwarz (1998) argue that while changes within teeth below .2‰ are not biologically meaningful, those that exceed .5‰ represent dietary change; specifically, decreases in δ13C between first molars and later-developing teeth may reflect reduced reliance on 18O-enriched breast milk. Indeed, several individuals show an increase in δ18O exceeding .5‰, between these teeth and later-developing teeth suggestive of supplementation following breastfeeding. S426, for example, exhibits a premolar δ13C value that is .6‰ greater than those from M1, I1 and C1, suggesting the introduction of C4 supplementary foods during mineralization of PM2 after approximately 2 years of age. A corresponding decline in δ18O of over .6‰ between M1, I1 and C1, PM2 suggests that supplementation corresponded with a decline in breastfeeding. A similar increase in δ13C and decline in δ18O can be seen in some (S444, S454, S460, L96.22.24), but not all, of the individuals from Mound C and Leslie Mound. Moreover, the magnitude of isotopic change and the tooth types in which such changes occur are not uniform in those exhibiting these trends. The small number of individuals for whom data are available mandates conservative interpretation, but it is tentatively suggested that some variation in the timing and nature of supplementation and weaning existed within the McKeithen site and between the McKeithen and Leslie Mound sites.

Residence

The δ18O values for the Mound C sample also show substantial overlap with those of the three individuals from Leslie Mound, and with comparable variability within and between individuals (Table 3). As seen in Figure 6, the mean δ18O value at Mound C is 28.7 ± .5‰ while for Leslie Mound the mean value is 29.1 ± .3‰. These means are similar and suggest low variation in sources of imbibed water, which is not surprising given that the two sites are located within the same highland hammock region of North Florida (Milanich et al. 1997:38). S426 has a mean individual δ18O value of 28.2 ± .4‰ based on five teeth, at first glance similar to those from the Mound C and Leslie Mound samples. As is visible in the raw distribution in Figure 6, however, the five values for S426 appear to fall below the Mound C and Leslie Mound distributions, especially in teeth formed during middle childhood and adolescence. The dissimilarity in δ18O values between S426 and the other two mounds, given the substantial divergence in corresponding δ13C, suggests that the difference in diet during early life seen in this individual may due to residence in nonlocal region prior to residence and interment at the McKeithen site.

Mound C δ18O values ranged between 28.3 and 29.8‰ during the infant/early childhood period, between 28.3 and 29.4‰ during the middle childhood period, and between 27.9 and 28.6‰ during adolescence. The middle childhood period is the only period in which the range in δ18O values exceeds 1‰ suggesting little...
variation between individuals interred in Mound C. This low level of variation is consistent within individuals at Mound C as well. Between the infant/early childhood and middle childhood periods, mean $\delta^{18}O$ values decreased by $0.3 \pm 0.2\%$, while between the infant/early childhood and adolescent periods, mean $\delta^{18}O$ decreased by $0.6 \pm 0.5\%$. Based on one paired observation, $\delta^{18}O$ decreased at Mound C by $0.1\%$ between childhood and adolescence. These are small decreases, suggesting a low level of extraregional migration during early life, especially if some enrichment in earlier-developing teeth due to breastfeeding is assumed (Wright and Schwarcz 1998; White et al. 2002). However, there is more variability in the magnitude of within-individual decline, with one individual (S469) exhibiting a $1.2\%$ depletion in $\delta^{18}O$ between infancy/early childhood and adolescence. This same individual exhibits a depleted M3 $\delta^{18}O$ value comparable to S426, as does another individual (S460), though in I1, an earlier-forming tooth.

The three individuals from Leslie Mound also showed low within-individual variation in $\delta^{18}O$. Between infancy/early childhood and middle childhood, $\delta^{18}O$ decreased by $0.3\%$, based on one paired observation (L96.22.24), while $\delta^{18}O$ decreased by $0.9\%$ between infancy/early childhood and adolescence, also based on one paired observation (L96.22.9). These values are small, and though the decrease in $\delta^{18}O$ between infancy/early childhood approaches $1\%$, this difference may again be attributable, at least in part, to enrichment in teeth reflecting the infant/early childhood period due to breastfeeding. There are unfortunately no paired observations from which to measure changes in $\delta^{18}O$ between childhood and adolescence, due to the paucity of teeth in the Leslie Mound remains.

Inversely corresponding to the trends observed in $\delta^{13}C$ data, S426 exhibits $\delta^{18}O$ values that slightly but consistently deviate from the Mound C and Leslie Mound interments, with the exception of I1 from S460 and M3 from S469 (both individuals from Mound C). The mean $\delta^{18}O$ value during infancy/early adulthood (M1, I1) is $28.5 \pm 1\%$, while the mean $\delta^{18}O$ value during middle childhood (C1, PM2) is $27.9 \pm 1\%$, likely due in part to enrichment in M1 and I1 associated with breastfeeding. Mean $\delta^{18}O$ further decreases by $0.6\%$ from middle childhood to adolescence (M3), from $27.9 \pm 1\%$ to $27.3\%$. The consistency of these lower $\delta^{18}O$ values relative to the individuals from Mound C and Leslie Mound suggests that S426 was originally from an isotopically lighter region, likely to the south and/or closer to the coast.

**Discussion**

Several general trends emerge from the carbon and oxygen isotopic data. First, S426 displays depleted $\delta^{18}O$ values across all five teeth and especially in later developing teeth that fall below the distribution of values from the rest of the site. These isotopic differences indicate habitation during life in regions characterized...
by isotopically different meteoric water (precipitation), in essence that S426 grew up somewhere else. A 2.0‰ range of variation exists among the individuals buried in Mounds B and C from the McKeithen site. Numerous studies from Mesoamerica have suggested that differences in δ18O that are less than 2‰ are within the natural range of variation expected for local archaeological populations (White et al. 1998; White et al. 2002; White, Longstaffe, and Law 2004; Wright and Schwarcz 1999), and others have suggested such differences are within the range of individual variation in highly seasonal environments (Kohn, Schoeninger, and Valley 1998). However, the oxygen isotopic variation for southeastern North America is much smaller than Mesoamerica and other parts of the world (Bowen and Wilkinson 2002), meaning that a 2‰ difference between S426 and the individuals from Mound C could be a significant marker of immigration from outside of this region of North Florida. Because δ18O values tend to increase with increasing distance from the ocean, the depletion in these values displayed by S426 suggests residence in a coastal region of southeastern North America. It is also interesting to note that two other individuals at the McKeithen site (S460, S469) each display depleted δ18O values, though only in one tooth each, suggesting they experienced some degree of mobility as well, discussed below. This suggests that the burial population from the two McKeithen mounds was comprised of local individuals as well as at least one nonlocal individual.

The second and more obvious interpretation suggested by the isotopic data is that S426 appears to have consumed a diet with a substantial inclusion of C4 resources. Milanich et al. (1997) cite a near-total absence of cultigen remains in Weeden Island I sites, including the McKeithen site, as evidence that agriculture did not play a substantial role in Weeden Island I culture, with evidence of maize only appearing in later Suwannee Valley sites. A maize-based diet for anyone at the McKeithen site, while possible, is unlikely based on available archaeological evidence. Moreover, the McKeithen site is not located along the Gulf Coast, so the majority of aquatic resources available to the population were from freshwater sources. As freshwater fish and shellfish are generally lower in δ13C than marine and terrestrial resources (Schurr and Powell 2005; Muldner and Richards 2004), however, it is not likely that C4-based animal protein was gathered from ponds, creeks, or rivers.

This C4-based diet suggested for S426 could be drawn from several possible sets of subsistence resources. First, the enrichment in δ13C could be due to a substantial incorporation of maize. The consumption of this cultigen was still uncommon during the Weeden Island I (Middle Woodland) period in Florida, but given the obvious ceremonial significance of Mound B, and the fact that S426 was the mound’s sole interment, S426 could have consumed a maize-based diet indicating high status in a region where it was grown. S426 is also the only individual at the site who displays multiple enamel hypoplasia on upper incisors, premolars, and molars, suggesting multiple stress episodes during her development perhaps associated with a starchy, cereal-based diet. There is also low wear on the occlusal surfaces of her teeth, suggesting a diet low in grit or hard foods. The poor preservation of the overall skeletal population from Mound C makes a comparative dental pathology study impossible and so limits any comparative interpretations of diet and stress episodes based on these data alone, but the presence of dental and isotopic indicators of maize consumption is noteworthy.

Another possibility is that S426 incorporated a substantial amount of protein from a 13C-enriched animal source into her overall diet, given that she may have grown up in a coastal region. Due to increased complexity of oceanic food webs and therefore increased carbon fractionation through various trophic levels, animal protein from marine contexts (fish, shellfish) displays δ13C values in a range similar to C4 terrestrial plants. Marine foods are also a common source of parasites, which could have caused considerable metabolic stress and contributed to the frequency of enamel hypoplasias seen in S426. Alternatively, this individual may have consumed the flesh or products of terrestrial C4 grazing animals, which could also result in some isotopic carbon enrichment.

However, both terrestrial and marine animals are substantial sources of protein, which would have resulted in correspondingly enriched bone collagen δ15N, which is not the case (Bruce Smith, personal communication). This suggests that the C4 component of the diet was not from a source rich in protein and may instead have been from a carbohydrate such as maize. An independent test of these two possibilities, maize versus animal protein, as the key contributors to the diet was attempted via the characterization of carbon and nitrogen (15N;14N, or δ15N) isotopes in organic bone collagen, using similar methods as this earlier unpublished data. The carbon in bone collagen is drawn primarily from that found in dietary protein sources, while the carbon in bone and enamel apatite is drawn from all sources in the overall diet (Ambrose and Norr 1993). Therefore, comparing apatite and collagen δ13C permits some estimation of the amount and type of protein in the overall diet. δ15N ratios in bone collagen also reflect that of consumed dietary protein, permitting assessments of how much of the diet included 15N-enriched marine protein versus 15N-depleted plants. Unfortunately, all of the bones analyzed from the McKeithen site were almost invariably inundated with small rootlet fragments that were impossible to remove from isolated collagen ismorphs, potentially skewing collagen δ13C data and precluding characterization of organic δ13C and δ15N and
an estimation of dietary protein sources in this study. Therefore, while the C₄ source is distinct in burial S426 and corroborates earlier, unpublished collagen data, it is unclear as to what part of the overall diet was the primary contributor, though data from an earlier study suggests that it may have been maize.

Three aspects of this C₄ signal are noteworthy despite these limitations. The first is that whether the isotopic signal reflects the consumption of maize or of a distinct form of marine or terrestrial protein, it still suggests a diet composed of distinct food types that held some significance by virtue of their uniqueness to S426. Second, in all five teeth analyzed, S426 displays distinct, consistent δ¹³C-enriched isotopic and similarly consistent, depleted δ¹⁸O values relative to the range of the Mound C and Leslie Mound samples. These findings suggest that the difference in dietary composition may be due to residence in a region with isotopically lighter meteoric water (precipitation) further south and/or closer to the ocean. In short, the data suggest that S426 consumed a different diet than the other individuals at the McKeithen and Leslie mound sites because she lived in a different region of the Southeast before migrating to the McKeithen site following adolescence. Third, this C₄ signal is constant in all five teeth sampled from S426, two of which form during the first few months of life, when an individual would likely be exclusively breastfeeding. Even if one adjusts for a trophic-level enrichment during breastfeeding (Katzenberg 1992), this still implies a maternal isotopic value of approximately −5.5 to −6.0‰, and therefore a maternal diet averaging −18.5 to −19.0‰ one that included significant amounts of C₄ foods. None of the individuals at Mound C display comparable δ¹³C values, suggesting that the dietary distinction displayed by S426 was present from very early in life and may have been shared by S426’s mother. This further supports the notion that S426 was an immigrant to the McKeithen site and grew up among a population that consumed a diet similar to hers, possibly one that incorporated a substantial amount of maize. Also, it highlights marked differentiation in indicators of residence as well as mobility within a mound assumed to be an interment site that included local elites (Milanich et al. 1997). The fact that two individuals (S460 and S469) from Mound C exhibited depleted δ¹⁸O values, each in a single tooth, suggests that those individuals may also have migrated between different regions during life: S460 may have also been born elsewhere due to δ¹⁸O depletion in I1, an early forming tooth, while S469 may have lived in a different region during adolescence due to depletion in the M3.

Archaeological interpretations that the McKeithen site was a burial center for regional elites should therefore not be discounted, as the highland hammock region of Northern Florida in which both sites are located displays a low variability in δ¹⁸O values (Bowen and Wilkinson 2002). This is supported by the fact that the three individuals from Leslie Mound share similar δ¹⁸O values to those from McKeithen Mound C. Moreover, the fact that Leslie Mound dates from the later Suwannee Valley (Late Woodland) period points to dietary continuity between Weeden Island and Suwannee Valley periods and suggests that maize consumption at Leslie Mound was similarly low to that at the McKeithen site.

Based on these findings, it could be argued that the dietary distinction between S426 is not related to her markedly different status at the site but rather to her nonlocal origins. Indeed, no strong claims can be put forth explicitly linking S426’s dietary divergence to her burial style and adornments in light of the fact that she appears to have grown up elsewhere. Her status at the site, then, may have had little to no effect on her diet. Among the individuals from Mound C and Leslie Mound, however, there is no dietary variation comparable to that displayed by burial S426 even among S460 and S469, the two other individuals with depleted δ¹⁸O values. This implies consistently C₃-based diets among locals and nonlocals alike at McKeithen and Leslie Mounds, with S426 as the exception. While it is not possible to assess whether the status enjoyed by S426 was lifelong or conferred following immigration to McKeithen, the fact that S426 is the only individual with both nonlocal and divergent dietary isotopic values supports a tentative interpretation that the three phenomena—nonlocal origin, markedly different diet, and elevated burial status—may be related. It is also interesting to consider that the only individual at the McKeithen site who was given dramatically different burial status was also the only individual who does not appear to be local to the site. Milanich et al. (1997:91) postulate that S426 was a religious specialist and possibly a “big man,” which could mean that the McKeithen site, its inhabitants, and perhaps those brought to the site for burial were subject to the religious and political power of someone from another region. The fact that all five of S426’s teeth display these depleted, arguably nonlocal δ¹⁸O values means that S426 likely immigrated to the McKeithen site following adolescence and likely during young adulthood, given that she died in her mid- to late thirties. What is also clear from these findings is that however few and poorly preserved the remains from the McKeithen and Leslie sites may be, this study has uncovered a hidden complexity among the background of those at the site that could have significant implications for reconstructing the lifeways and culture of Weeden Island and Suwannee Valley peoples.

Conclusion

This study utilized multi-tissue isotopic analysis to reconstruct longitudinal profiles of dietary composition and residence during early life in order to relate them to
differential status in burial samples from two mound sites in North Florida. Despite poor preservation and a small sample size, several key trends were identified, including variable infant feeding practices and low subsistence variation among most individuals at the sites, pointing to regional and temporal dietary continuity.

Most interesting, however, was the dramatically different dietary pattern characterized by the individual with archaeological evidence of elevated status. Because this individual appears to be a nonlocal immigrant to the site, it is argued that her divergence in diet is due to residence in a different region. This does not, however, preclude a relationship with her status at death, and it is noteworthy that the only individual who appears to have immigrated to the site following adolescence is also the only individual at the site who enjoyed a markedly different status. Since isotopic carbon values remain enriched and indicative of a unique diet even after adjusting for enrichment expected during breastfeeding, it is tentatively suggested that the breastmilk consumed by this individual, and therefore the maternal diet, was also distinctly enriched, suggesting that S426’s diet was not unique in the region in which she was born. While it is impossible to definitively determine if this enrichment in apatite δ13C is due to the consumption of maize or a distinct form of marine protein, and where exactly S426 originated, these findings nonetheless point to an unrecognized complexity among Weeden Island and Suwanee Period populations and culture.

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