

IMAGINING SIXTEENTH- AND SEVENTEENTH-CENTURY NATIVE AMERICAN AND HISPANIC TRANSFORMATIONS OF THE GEORGIA BIGHT LANDSCAPES

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Various subfields of archaeology, including archaeobotany, zooarchaeology, archaeopedology, and bioarchaeology, are interrelated in this essay to provide a provisional look at the interactions between humans, both Native American and European, and the environment that impacted the landscape and land use reconstruction. Focusing on the archaeobotany of both precontact sites and sixteenth- and seventeenth-century mission-period sites along coastal *La Florida*, Native American and Spanish use of and impact on the plants and land of the Georgia Bight reveal many transformations. Areas of the landscape were altered in part by Hispanic introductions, including architecture and agrarian practices that invoked not only a difference in degree, but, in some cases, in kind that persist to the present. These changes, however, had far less impact than subsequent European introductions would bring to this region of the Georgia Bight and its adjacent area.

Key words: archaeobotany, Georgia Bight, landscape archaeology, Native American settlement, Spanish settlement

Reconstructing landscapes from the archaeological record is complex because landscape transformations minimally entail intentional constructs of buildings and land use (gardens, fields, roads, pathways, tree plantings, and the like), incidental and accidental human manipulation, and such natural phenomena as floods, droughts, and high winds (Ashton 1985; Beaudry 1986; Crumley 1994; Deetz 1990; Kelso and Most 1990; Schmidt 1997). Whether they are the result of natural or cultural events, changes to the landscape are inevitable and, as such, are dynamic works in progress. In this essay, I will review what we know about Native American and Spanish use of and impact on the plants and land of the Georgia Bight from a few centuries before contact to a few centuries afterward to attempt a provisional decoding of the vegetation history of this region. While it is only one aspect of environmental archaeological research, macrobotanical analyses of pre-colonial and colonial contexts can help identify land clearings and managed landscapes while charting their transformations and the consequences of human action. Bridging the disparate, often isolated, data sets of the subfields (Reitz et al. 1996: 3-14) of environmental archaeology is difficult, but synthesizing these may strengthen any one used alone. To help "imagine" the landscape transformations, as well as the unique contributions that

the emergent field of environmental archaeology can offer, I selected the lower Atlantic coast for two reasons. First, much zooarchaeological research has been generated in Elizabeth S. Wing's laboratory from this region. Second, for more than a decade archaeobotanical research has been encouraged by and has benefited from Dr. Wing's environmental archaeology perspective and influence. It is with great pleasure that these data, originally sampled and collected to evaluate foodways and subsistence strategies, was reevaluated. At best, we glean a diffuse perspective on what the landscape of the Georgia Bight once looked like and how it was manipulated, first by Native Americans, then by the earliest Europeans. Consequently, while it has been important to use some of these data in an attempt to envision landscape transformations embedded in horticultural/agricultural economies, these insights are still emerging and must be viewed provisionally.

Monastic gardens, medicinal herbal gardens, vineyards, walled gardens, and planted meadows were among the many well established trademarks of Old World landscapes long before their introduction in the Americas (Cooks 1676; Crisp 1924; MacDougall 1986; Meyvaert 1986; Miller 1986; Opsomer-Halleux 1986; Wright 1934). The term landscape, from the sixteenth-century Dutch word *landschap*, referred to painted scenes (Gleason 1994: 1; Stilgoe 1982: 24-25). As such, one might argue that the construct of landscape is something that was brought by Europeans, along with

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the Old World plants, animals, and lifeways they introduced. The concept of landscape is suggested here to have existed for centuries, if not millennia, as a mental construct by both Old and New World peoples. Although landscape can be a non-specific term, it is used here to refer to both natural (landform) and culturally modified aspects while using an archaeological perspective to define landscape as the material (natural or cultural) manifestations of the relations between humans and the environment (Crumley and Marquardt 1987). The emphasis for this short history of the Georgia Bight is the attempt to chart changes in the archaeobotanical manifestations over time.

Of the three dimensions of archaeology, Deetz (1990: 1) noted that the spatial dimensions of archaeology are studied less than its time and form components. Equally, until recently, reconstructing landscapes using environmental archaeology was comparably limited. Thus it seemed warranted to begin this essay by describing some of the primary plant communities and ecosystems of the Georgia Bight. Looking at an historic account of the landscape at the time of contact provides insights that can then be correlated with modern ecosystem data. Next, using the archaeobotanical record, we step back into prehistory and see what types of evidence we have for past plant use along the Georgia Bight. Finally, we return to what we may glean about changes to the landscape based primarily upon the archaeobotanical remains recovered from sixteenth- and seventeenth-century Spanish mission sites of coastal *La Florida*.

THE GEORGIA BIGHT

Flat, with many marshes fed by powerful rivers was how Oviedo (1853), the sixteenth-century chronicler, described the terrain Spanish explorers had located along the Atlantic seaboard. Occurring well over four centuries ago, this reconnaissance mission took place along what is today called the Georgia Bight, part of a large embayment of the Atlantic coastal plain (Fig. 1). As Oviedo noted, it is a low-lying region of well drained, gently rolling hills and poorly drained flatwoods (Reitz 1988: 141; Shelford 1974: 76; Wharton 1977). The bight extends from approximately Cape Hatteras, North Carolina, to Cape Canaveral, Florida (Frey and Howard 1986; Hubbard et al. 1979), and incorporates a chain of barrier, or sea and marsh, islands.

Because of tidal activity, the sea islands extending from Little Talbot in Florida to Hilton Head in South Carolina are broad (1-5 km) and short (5-15 km)

compared to more northerly barrier islands (Hubbard et al. 1979; Hoyt and Hails 1967; Johnson and Barbour 1991: 433). Active modern (Holocene) beaches are often attached to such older Pleistocene barrier islands as Little Talbot and Big Talbot in Florida (Frey and Howard 1986; Hayden and Dolan 1979; Hoyt 1967, 1969; Hoyt and Hails 1967; Johnson et al. 1974: 11; Johnson and Barbour 1991: 433; Wenner et al. 1979). Marsh islands, intermittent along the mainland, are separated from the sea islands by tidal creeks, sounds, and salt marshes.

Low, sandy beach fronts on the barrier islands can be as wide as 6 km. A higher (2 m) tidal range, deeper inlets, and larger marshes in the Georgia Bight are interrelated because stronger currents are created that "can maintain the inlets open against the tendency of longshore drift to occlude them" (Johnson and Barbour 1991: 433). This action also is what is thought to cause the short "drumstick" shape of these sea islands (Hayes 1979; Johnson and Barbour 1991: 433). Pine forests (often on drier stretches and along the seaward sides) and maritime oak forests are the dominant plant communities on the barrier islands, which were inhabited by various Native Americans in prehistoric times and subsequently by Hispanic, French, British, and others. The dominant hardwoods include live oak, laurel oak, water oak, southern red oak, and sweet gum, while magnolias, red bay, southern red cedar, and black gum are among the subdominants. Other understory vegetation include staggerbush, wild olive, wax myrtle, sparkleberry, and an array of grass (Gramineae) and sedge (Cyperaceae) species. Slash pine is the dominant pine, while co-dominant pines are loblolly and longleaf (Bozeman 1975; Wharton 1977).

South and Hartley (1985: 263-264) suggest that high ground and deep water were two primary factors for European site location along the eastern shores of North America. In part, this was a defense strategy, as well as to ensure access to shipping routes. These two variables undoubtedly played significant roles in European settlement patterns, but Hispanic strategies also included fertile soils and the presence of Native Americans whom they wished to evangelize and whose labor they wished to employ, if not exploit. For example, Paul Hoffman (1990) has noted the concerns of Ayllon's scouting party as they searched for a site for the new colony:

Scouting parties sent inland returned to say that they had found no land suitable for settlement. . . . Only a few pockets of clay loams or sandy loams exist in the river valleys. They are often poorly drained today, and may have been at that time too. . . .

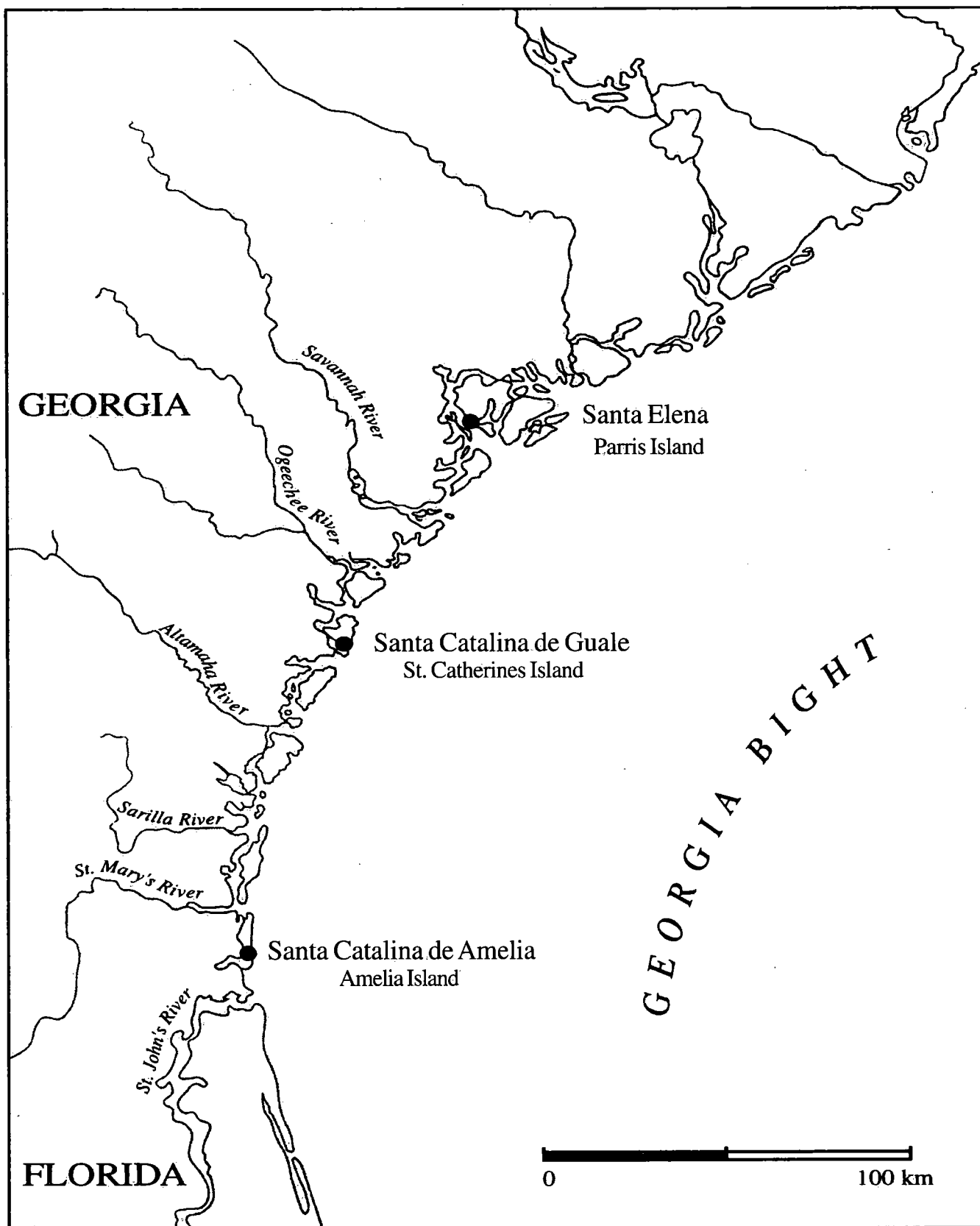


Figure 1. Map of the area known as the Georgia Bight. Original Spanish settlement names in larger type; contemporary names in smaller type.

Whatever Spanish-style farming Ayllon intended for his colony, the absence of Indians in numbers meant that it could not succeed at such a location. Moreover, missions and trade with the Indians were as important as Spanish farming, perhaps more important. (pp. 67-68)

From the earliest endeavors to settle the eastern shores of *La Florida*, these and other variables were taken into consideration. Once colonists landed, they began to look for fertile soils and areas that were populated. This was not an easy task in the Georgia Bight, where edaphic conditions were often highly acidic and not conducive to cultivation and where few Native Americans were encountered.

In the sixteenth century, Oviedo described a typical southern mixed-hardwood complex (Table 1) that, because of the many broadleaf trees, suggests a subtropical complex. Most of the plant descriptions were based on what the Spaniards knew from their experiences in the Old World and the Caribbean island locales they had settled. The service tree (*Sorbus domestica*) is a good example of something they thought they recognized. This, however, is an Old World tree of medium size with large flowers and edible fruits with simple, broad-ovate, and usually somewhat cordate leaves. It is uncertain which broadleaf tree they were mistaking for *Sorbus*, but possibilities include serviceberry, holly, or bay. The mention of *nogales*, possibly black walnut (*Juglans nigra*), rather than the various hickory species (*Carya* spp.), would indicate a more northern evergreen forest.

Oftentimes information concerning provisions are present in ships' manifests, inventories of supplies, and other documents (e.g., Bushnell 1981, 1994; Connor 1925, 1930; Hoffman 1990). Months of planning and purchasing of goods took place before an expedition set sail. Subsistence commodities were procured from both continents; domesticated Old World plants and animals were a major import from Spain and elsewhere in Europe. New World supplies came mostly from the Caribbean and Mexico to *La Florida* (Bushnell 1981, 1994; Connor 1925, 1930; Crosby 1972; Hoffman 1990; Sauer 1966, 1980).

Throughout the early years of exploration and colonization ships were loaded with plant and animal supplies for developing the New World, feeding the voyagers and the numerous animals (cattle, sheep, pigs, horses, chickens) aboard. Sufficient fodder also was stored for these sojourns. This fodder was likely the basis for a number of Old World commensal (weed-like,

growing in disturbed places) plants that would compete successfully with some of the indigenous New World commensals. *Eleusine indica* (goosegrass), *Echinochloa* sp. (barnyardgrass), and other genera of grasses are among the Old World introductions found at contact period sites and which precipitated permanent incidental and intentional changes of native habitats.

According to sixteenth-century documents and the archaeobotanical record, most Old World plants were domesticated species, including cultivated grains (e.g., wheat, barley, rye), fruits (e.g., peach, watermelon, fig, cantaloupe, wine grapes, pomegranate, quince, citrus, olive), and vegetables (e.g., lettuce, onion, peas, garbanzos), along with Old World nuts (hazelnut), and herbs and spices (e.g., cumin, sorrel, rosemary, sweet basil, clover, garlic). All these crops were to impact the original landscape. Some of these plant remains have been recovered from Spanish colonial period sites in St. Augustine, Florida (e.g., Government House well, Fountain of Youth site); Parris Island, South Carolina (Santa Elena); St. Catherines Island, Georgia (Santa Catalina de Guale); Amelia Island, Florida (Santa María and Santa Catalina de Amelia); and elsewhere in *La Florida* (Reitz and Scarry 1985; Ruhl 1990a, 1992, 1993). However, many were far too fragile and comestible for preservation and recovery.

In general, those plants that have been incidentally deposited rather than intentionally discarded and those that lack a non-edible plant part, such as a peach stone, nut hull, or corn cob, rarely survive in the archaeological record. In the Southeast where mesic habitats prevail, archaeobotanical remains are preserved best either when they are carbonized (a caramelization and conversion by thermal alteration of the plant's organic components to elemental carbon, which is a more durable substance) or the plant parts have been deposited in an anaerobic setting, such as underwater in a well without oxygen (Dimbleby 1978; Ford 1979). Consequently, submerged sites in ponds and lakes, sites offshore, and historic-period wells (Deagan 1983; Reitz and Scarry 1985; Ruhl 1990a, 1990b, 1993; Scarry 1983; Scarry and Reitz 1990; South 1983, 1985) have yielded well preserved seeds, nuts, and other related structures useful to understanding the vegetation history of the area.

Various rebellions took place throughout the Georgia Bight settlements during the colonization period (e.g., Guale rebellions of 1580, 1582, 1597 and British attacks led by Colonel Moore, 1680; see Gannon 1965; Lanning 1935; Solís de Merás 1923; Thomas 1986; Worth 1995). The conflagrations that resulted from many of these

Table 1: Vegetation listed in Oviedo's account of the Ayllon explorations. (After Oviedo, *Historia General y Natural de las Indias*, book 2, part 2, 1853, and Hoffman, *A New Andalusia and a Way to the Orient*, 1990).

English name	Spanish term	Suggested scientific taxa*
<u>Trees</u>		
Pine	Pinos	<i>Pinus</i> spp.
Live oak with galls	Robles de los que dan agullas	<i>Quercus virginiana</i>
Oak with acorns	Encinas de bellotas	<i>Quercus</i> spp.
Chestnut/dwarf chinkapin with little nuts	Castanos pero la fructa es pequena	<i>Castanea dentata</i> /C. <i>pumila</i>
Mulberry	Morales	<i>Morus rubra</i>
Willow	Mimbres	<i>Salix</i> spp., <i>Justicia</i> spp.
Walnut	Nogales	<i>Juglans nigra</i>
Serviceberry	Servos (Serbales)	<i>Amelanchier</i> spp.; <i>Ilex</i> spp.
Laurel	Laureles	Lauraceae, e.g., <i>Persea</i> spp.
<u>Shrubs, vines, herbaceous plants</u>		
Wild grape	Parras de uvas montesinas	<i>Vitis</i> spp.
Blackberry	Carcamoras (Zarzamoras)	<i>Rubus</i> spp.
Palmetto	Palmitos de los baxos	<i>Serenoa repens</i> /Sabal spp.
Raisin	Passas fechas	numerous small fruits could have been dried—grapes, berries
Sumac	Cumaque (Sumague)	<i>Rhus</i> spp.
Sow thistle	Cerrajas	<i>Cirsium carolinianum</i>
Sorrel	Quales?	<i>Hibiscus</i> spp.
Reeds	Canas	<i>Arundinaria gigantea</i>

*Possible taxa that may have been observed in areas along the Atlantic coast.

confrontations actually enhanced plant preservation and our chances for recovering such archaeobotanical remains as wood, wattle and daub, and other building materials along with plant remains used for subsistence and other purposes. In order to better understand changes to this early historic landscape we also need to consider briefly what occurred before contact.

PREHISTORIC ARCHAEOBOTANICAL DATA FROM THE GEORGIA BIGHT

Prehistoric archaeobotanical evidence for horticultural activity is limited at best, and particularly scant for agricultural endeavors along the Georgia Bight (cf.

DesJean et al. 1985: 147, 150, 194; Larson 1978, 1980; Ruhl 1990a, 1993; Saunders et al. 1985: 121-122, 164-165, 254). Presently, the dominant plant remains recovered from prehistoric sites in the coastal sector include hickorynut and acorn, with an occasional mention of cabbage palm (*Sabal palmetto*), persimmon (*Diospyros virginiana*), grape (*Vitis* sp.), pokeberry (*Phytolacca* sp.), chenopod (*Chenopodium* sp.), blackberry (*Rubus* sp.), and wild cherry and plum (*Prunus* spp.). In general, these remains are sparse. Data were generated from a number of sites using differing excavation methods. This information, however, coupled with the more substantial zooarchaeological

inventory, has been used to suggest that the prehistoric people living in this area maintained a subsistence strategy of hunting-fishing-gathering from the early Archaic through the Woodland periods. While plant evidence is meager, the zooarchaeological database provides evidence for sedentary populations in these rich estuarine habitats of the coast (e.g., Reitz 1982, 1988). Like the highly visible aspects of durable shell middens that mask the numerous quantities and varieties of small fish remains, well preserved plant remains, such as nutshells and corncobs, may mask the less conspicuous and more perishable resources that effect economic change and thereby overemphasize the more conspicuous remains' utilization beyond their actual importance. Archaeobotanically, the direct evidence of horticultural practices on the mainland or along the South Carolina and Georgia coast and adjacent barrier islands is limited and late (Ruhl 2000; Wagner 1995).

Interestingly, Oviedo (1853: 630-631) commented on drying certain berries to be stored for eating in the winter, although he made no similar comment concerning maize or other domesticated crops being processed and stored. In the late 1560s, some forty years after Ayllon's travels, Pardo explored the interior southeast from Parris Island to the Tennessee region. During this time he found little evidence of maize being grown in the lower Savannah River basin, but noted arable land and many regions where nuts, chestnuts, grapes, persimmons, and, occasionally, sweet tubers (*batatas*) were observed or given to him and his army of about 100 men (Hudson 1990). In most instances, it was only when they were in the central and upper reaches of the Savannah, Broad, and Wateree rivers, away from the coast, that they came across tall storage structures filled with maize.

It is not until the Irene phase in the late Mississippian Period that we have more than an occasional or equivocal suggestion of domesticated crops appearing in the archaeobotanical record. This may be due in part to limitations in sampling and methodological strategies. However, it also may be due to the limited initial adoption and, possibly, gradual onset of horticultural activities. Evidence of microbotanical remains, such as maize pollen, have been equally scant in the poor, sandy soils.

Interestingly, some of our strongest, albeit still controversial, evidence for domesticated plants comes from the bioanthropological research of prehistoric and historic period skeletal populations. Data from sites dated at ca. A.D. 1150 during the Savannah period and continuing into the Irene phase ca. A.D. 1300 and further evidenced

by the Mission Period populations ca. A.D. 1550-1680 (Hutchinson et al. 1998; Larsen 1982, 1990; Larsen et al. 1992) indicate increased use of domesticated plants. This evidence includes increased dental caries, periosteal reactions (nonspecific bone infections, suggesting that population increases leading to crowding and poor health conditions have increased the incidence of infection), and increases in arthritis and osteoporosis. Changes in the shape of humeri and femora suggest that different levels and types of activities were performed by pre- and post-horticultural groups (Larsen 1982: 200-210, 1990; Ruff et al. 1984). In spite of the limited and somewhat equivocal archaeobotanical data on the emergence of maize and other domesticates during the late Woodland and early Mississippian periods throughout the Georgia Bight, the anatomical and pathogenic responses in human dental and skeletal remains indicate the presence in the twelfth century coastal dwellers' diet of either maize or some other heretofore unrecognized C-4 plant or plants or even other plants causing similar wear and caries. These data suggest a shift from plant procurement to plant production. At present, the stable isotope data from carbon and nitrogen signatures suggest an increase of maize consumption and marine resource use for both island and mainland Savannah Period compared to earlier periods. Irene phase data, although limited, show a decreased or equal value of carbon, suggesting little if any intensification of maize production (Hutchinson et al. 1998; Larsen et al. 1992).

Two controversial hypotheses concerning the contact-period Native American (Guale) peoples' settlement patterns and horticultural practices, and their significance have been deduced from the available archaeological data and historical materials (c.f. Jones 1978; Larsen 1982; Larson 1980; Ruhl 1990a, n.d.; Thomas 1986; 1990). In both scenarios, it is not the presence of maize that is questioned; rather it is the dietary importance of this and other cultigens. The role of maize changed from being an incidental, supplemental, or purely religious item that may have been traded or locally grown in small quantities to an integral, reliable, and conserved dietary staple, grown as a monocrop in large fields. Changes in ceremonial or economic value or both are important for understanding modified mobility (sedentism/seasonal) factors and their subsequent impact upon subsistence and settlement adaptations and landscape transformations. Contact period accounts appear to differ; one may extol the abundance of crops for storage, trade, and exchange, another may report

scanty supplies guarded and hoarded (cf. Hudson 1990; Jones 1978; Larson 1978, 1980; Laudonniere 1975 [1586]). Just how long this period of transition to monocropping lasted and the toll it took on humans may be inferred in part from Larsen's bioanthropological research that suggests more problematic changes to human bones during the incipient stages of horticulture (ca. A.D. 1150-1550) than changes after European contact.

Saunders (2000) has pointed out recently that the varying models of transhumance versus year-round settlements depicted in the documents (e.g., Laudonniere 1975 [1586]) and used by historians and archaeologists (cf. Crook 1986; Larson 1978, 1980; Jones 1978; Pearson 1978, 1984; Ruhl 1990a, 1993; Saunders 2002) may be the result of a decade-long drought in the 1560s (Saunders 2000: 36-37). Anderson (1994: 326) suggested that a similar mid-fifteenth century drought impacted abandonment of the Savannah River Basin chiefdoms. The research on tree rings conducted by Stahle and his colleagues over the past two decades (e.g. Stahle et al. 1985a, 1985b, 1998; Stahle and Cleaveland 1994) indicated climatic extremes in North Carolina that empirically supported Anderson's and Saunderson's claims. Saunders (2000) uses this evidence for her conjectures on the vacillating climate in the region of the Georgia Bight. Collaborative efforts (Anderson et al. 1995), designed to integrate paleoclimatic data with archaeological data from the middle and lower Savannah River, have shed light on settlement and subsistence changes in the protohistoric period. In addition, current research on abundance changes of charred wood remains of pine, oak, and hickory from archaeological sites in South Carolina suggests climate-induced forest make-up and the likelihood of human fire maintenance during the late prehistoric and protohistoric periods (Wagner 2001). Collection of vegetation-history data through dendrochronology, zooarchaeology, bioarchaeology, and archaeobotany indicates agrarian efforts throughout this period that created new vistas and ongoing changes on and to the landscape. Clearing and trenching of forested areas by Native Americans was impacting soil fertility, the rate of soil erosion, and habitat change.

From the earliest data generated from the tidewater zone to the introduction of European domestic mammals in the 1500s, we have strong zooarchaeological evidence that the rich maritime/estuarine resources were the dominant resources exploited on the sea and marsh islands along the South Carolina, Georgia, and northeastern

Florida coasts (Adams et al. 1985; Dukes 1993; Reitz 1982, 1988, 1992, 1993; Reitz and Scarry 1985; Smith et al. 1981). Marine invertebrates included shrimp, crabs, oysters, clams, and whelks, while marine vertebrates included sharks, rays, and an array of bony fishes, with catfish and drumfish the primary taxa. Remains of many of these species indicate multi-seasonal uses of these habitats during prehistoric times with possible year-round occupation along the richest ecotones (Reitz 1988). Deer, small mammals, and turtles were consumed in lesser amounts by prehistoric people on the sea and marsh islands. Marine transformations may have resulted in land form changes as cane and other plants were used for fishing and other estuarine resource exploitation (e.g., fish weirs, traps, nets). Invertebrate remains scattered along the coastal landscapes range from small linear deposits to large middens and mounds.

Unfortunately, the botanical data from the Georgia Bight are not as clear-cut concerning use of estuarine habitats. In the past, samples were small and processing methods were highly variable (cf. Adams et al. 1985; Brooks and Canouts 1984; Smith et al. 1981; Trinkley 1984). Those few plants thus far identified can be obtained not only from marsh and sea island habitats, but elsewhere. In general, plant exploitation indicates they procured wild plant foods throughout each period even after the onset of horticultural practices, which at present appear to be gradual and late, likely because the highly acidic and, consequently, infertile soils that comprise most of the coastal islands and coastal plain produced poor yields.

Larson (1980) has suggested that limited fertility forced groups to be mobile, practicing a swidden-type horticulture where trees would be felled and burned to clear for and fertilize gardens. Most available direct archaeobotanical remains indicate the use of wild fruits, nuts, and leafy vegetables, but, until late in prehistoric times, there is no direct evidence for maize or bean cultivation. Although the impact on the landscape from hunters-fishers-gatherers to horticulturists or agriculturists is not definitive, it suggests cleared lands for small and possibly large plots, household gardens, and silvicultural practices. Without more archaeobotanical evidence, our understanding of agrarian activities, diversity of plant utilization, and the impact of humans on plant communities will remain incomplete.

HISTORIC EVIDENCE OF IMPACT ON THE LAND
As European exploration and colonization efforts continued, more and more trees were felled for

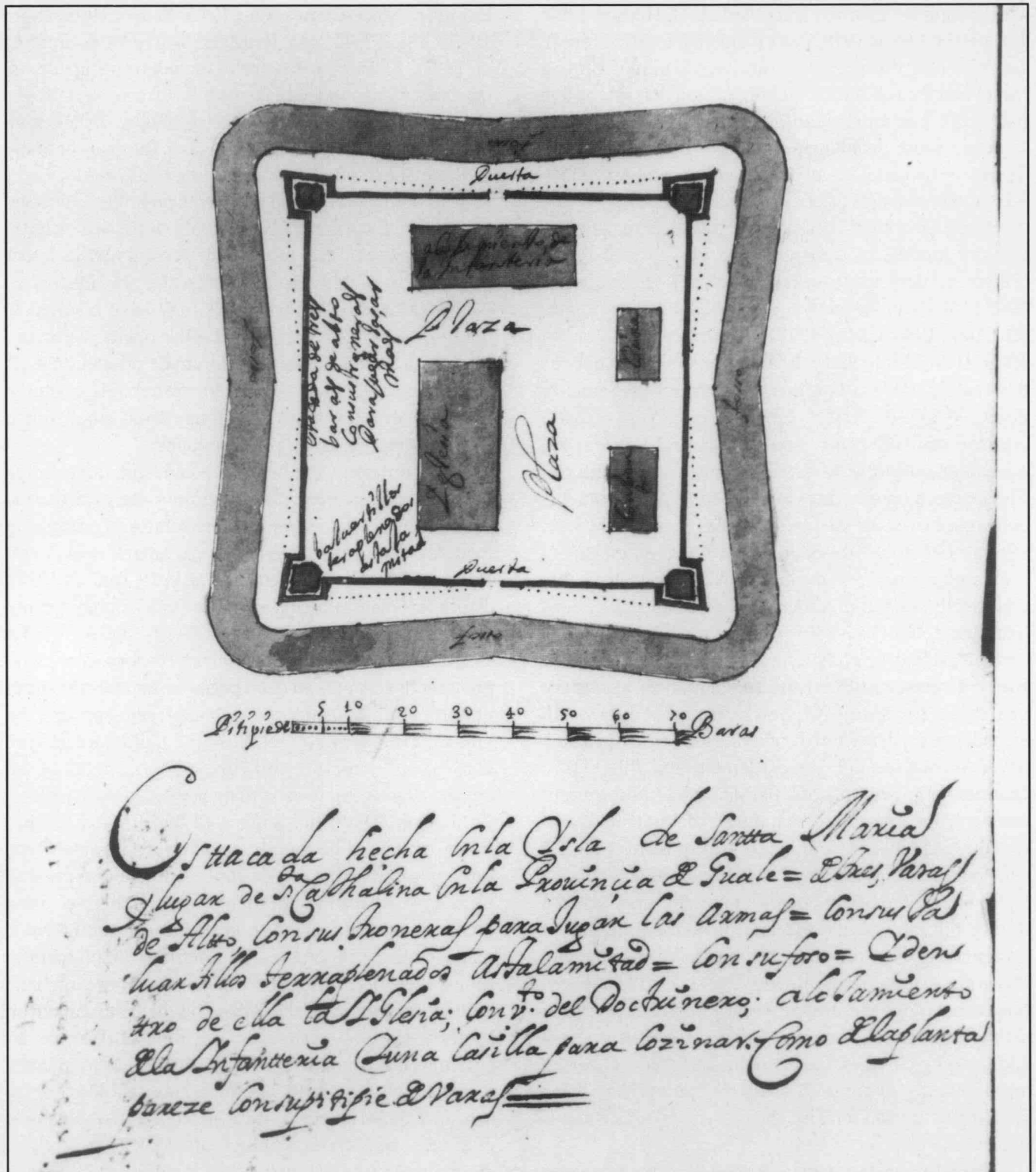


Figure 2. Photostat of a ca. 1691 illustration (PKY1136) entitled *Estacada hecha en la Ysla de Santa Maria y lugar de S^a Cathalina en la Provincia de Guale*. . . . From the Archivo General de Indias, Santo Domingo 228 (1691) in *Mapas y Planos de la Florida y la Luisiana*, #23. (Courtesy of the P.K. Yonge Library of Florida History.)

commercial use (shipbuilding, lumber), new communities were founded, and land was further cleared for crops, gardens, and livestock grazing. Much archaeobotanical data for the Georgia Bight comes from the mission of Santa Catalina de Guale on St. Catherines Island, Georgia (Ruhl 1990a, 1990b, 1993, n.d.; Thomas 1986), the town settlements at Santa Elena in South Carolina (Reitz and Scarry 1985; Scarry 1983; South 1983, 1985) and St. Augustine, Florida (Reitz and Scarry 1985), and the mission at Amelia Island, Florida (Santa María, Santa Catalina de Amelia, Plantation Point) (Ruhl 1990a, 1992, 1993; Ruhl and Bond 1996). The majority of the data thus far generated has been recovered primarily from the Hispanic structures (Figure 2, for example) and not the associated Native American structures. Survey work in the pueblo area associated with the Mission at Santa Catalina de Guale has been undertaken and further research is slated for the future (Thomas and Jimenez 1992).

We have evidence of Old World cultigens, introduced New World cultigens, wild fruits and nuts, commensals, and wetlands plants. It is possible that these were procured by the Guale and other Native Americans working and living side-by-side with the friars, soldiers, and other European colonists in these frontier settlements.

The St. Catherines Island data suggest that, even if Native Americans were already practicing agriculture, the Spanish brought new techniques applicable to gardens, orchards, and large fields, as well as new tools for felling trees (e.g., hatchets) and tilling the land (e.g., metal hoes) and new concepts of monocropping, arboriculture, and possibly irrigation, fertilizing, and hybrid cultivation. Historic documents dating to the time of occupation and to a few years after the abandonment of Mission Santa Catalina de Guale in the late 1600s indicate that this region had been regarded as a breadbasket, supplying St. Augustine with crops (Bushnell 1986).

The accounts of both Captain Dunlop and Jonathan Dickinson noted the abandoned fields (Dunlop 1926). Dickinson, who passed along the coast in the late seventeenth century, stated, "We got to the place called St. Catalina, where hath been a great settlement of Indians, for the land hath been cleared for planting, for some miles distant" (Andrews and Andrews 1985: 70).

From this site we have recovered evidence from representative fields, as well as gardens and what is thought to have been orchards and vineyards. Literally thousands of wheat grains have been recovered from the mission church contexts, which may have been grown

locally by the seventeenth century (Ruhl 1997, n.d.). From elsewhere at these mission and Spanish settlement sites indigenous New World cultigens (local and exotic) such as squash (seeds and rind of *Cucurbita pepo* and *C. moschata*), chile pepper (*Capsicum* sp.), bottle gourds (*Lagenaria siceraria*), bean (*Phaseolus* sp.), and maize (*Zea mays*) have been found in association with such Old World cultigens as wheat (*Triticum* sp.) and possibly rye (*Avena* sp.), as well as cantaloupe (*Cucumis* sp.), watermelon (*Citrullus* sp.), peach (*Prunus persica*), fig (*Ficus carica*), hazelnut (*Corylus* sp.), wine grape (*Vitis vinifera*), common pea (*Pisum sativum*), and possibly lentil (*Lens* sp.) (Reitz and Scarry 1985; Ruhl 1990a, 1992, 1993). Prolific and adaptable, the nature of some plants would mislead later eighteenth- and nineteenth-century naturalists, such as Lawson, into thinking they were indigenous species. Some adapted so well (e.g., peach, watermelon) they were found growing inland long before the arrival of European explorers to the region (Blake 1981; Hoffman 1990; Ruhl 1993; Sheldon 1978). As Axtel (1997: 22) points out, "It is not difficult to imagine the proliferation and hybridization of species throughout Spanish and native Florida of the 600 chickens, 550 pigs, 492 pumpkin squashes, 505 loads of casava, and 854 *fanegas* of maize that Menendez imported from Havanna in 1566."

Not all introduced plant or animal species, however, were successes, but their impact on the land was ever-present. Documents reveal that attempts to grow wheat along the lower Atlantic coast initially failed, and similar attempts to grow olive trees and wine grapes also were unsuccessful (Connor 1925: 146-149). In many areas along the lower Atlantic coast, from South Carolina to northern Florida, the sandy soils were infertile, being nutrient poor and not well drained (Scarry and Reitz 1990: 344). South (1985) has suggested that some trenches at Santa Elena may have been intended for trials at viticulture. At Mission Santa Catalina de Guale, where similar, parallel, narrow, trench-like features were uncovered between the well and the cocina area, these arbor-like subterranean features also may have been for viticulture. However, because we have only a few seeds present in the archaeobotanical inventories, it seems unlikely this site had had anything like the success of Spanish Peruvian attempts at viticulture (e.g., Cushner 1980; Rice and Ruhl 1989) where numerous pips and bodegas were found (Smith 1997).

Remains of a few European domestic animals, including cattle, pigs, and chickens, are found in the

mission deposits from the lower Atlantic coast. As such, one might envision fences, corrals, pens, and coops, as well as free-ranging animals in the scrub and settlements. One difference between Spanish and, on occasion, Native American landscapes after contact is the quantity of shell middens and deposits, in particular their location, distribution, and function across sites. At Hispanic settlements, shells (old midden or recent collections) were likely to be used as fill for postholes or intentionally distributed around structures or in courtyards (Milanich and Saunders 1986; Saunders 1993; Thomas 1986, 1993; Thomas and Jimenez 1992). At Native American settlements, such as Meeting House Field (Saunders and Russo n.d.), shells, although scattered, dominate the deposits. The overall zooarchaeological evidence from Irene phase populations (precontact period) compared to Guale populations (contact period) indicate that "there was an increased reliance on terrestrial resources and a decreased reliance on invertebrates" (Dukes 1993: 57). Similar finds of invertebrate species declining and terrestrial mammals (e.g., deer and raccoon) and introduced European domesticates (e.g., pig, chicken) increasing was also found at such Timucuan villages as Baptizing Springs (cf. Dukes 1993:60; Loucks 1979, 1993; Reitz 1992, 1993). No doubt deer was more pervasive in the zooarchaeological record not only as a food item but also because of its multiple economic uses (e.g., skins, food, bone utensils) in the mission system (Loucks 1979, 1993). This would have impacted the landscape as deer populations became over exploited (Dukes 1993).

The few soil analyses that have been performed from Spanish colonial sites come from interior, not coastal, settlements. Although not easy to uncover archaeopedologically, samples selected to assess from their chemical constituents whether certain features were corrals could only hint at more phosphorous (the most sensitive chemical indicator of anthropogenic contexts) in deposits thought to be corrals (Scudder n.d.: 21). Sheep, the preferred Iberian meat source, did not flourish in semitropical *La Florida*; instead, cattle would prevail (Reitz 1993: 388-390; Scarry and Reitz 1990: 344).

Remains of commensal and wetland plants increase in quantity and variety as smaller-gauge screens are used. These plant remains include species from such families as grass (Gramineae), legume (Fabaceae), euphorb (Euphorbiaceae), mint (Lamiaceae), composite (Compositae), amaranth (Amaranthaceae), chenopod (Chenopodiaceae), rose (Rosaceae), nightshade

(Solanaceae), and others. (For the possible uses and interpretations of these plant remains see Reitz and Scarry 1985; Ruhl 1990a, 1990b, 1993, n.d.; Scarry 1993; Scarry and Reitz 1990.) Some of the weed-like grains became naturalized, forever changing the mix of vegetation on the islands, as did accidental fauna (e.g., rats, insects, and microorganisms) that crossed the Atlantic (Axtel 1997; Crosby 1972) and domestic pigs gone feral.

From the sister site of Santa Catalina de Guale on Amelia Island, Florida, where the Guale Indians relocated in 1683, we have a better picture of possible wild plant resources that may have been exploited by both Native Americans and Europeans. Excavations at Plantation Point, which is thought to be the northern boundary of the mission site on Amelia Island, uncovered the remains of a dwelling believed to be either a Native American house or the dwelling of a Spanish lieutenant who was documented to have been living with a Native American woman (Bushnell 1986; Hann 1986a, 1986b, 1987; Robert Johnson personal communication; Ruhl 1992). Much of this plant assemblage resembles the composite sixteenth- and seventeenth-century indigenous plant remains, including wild fruits, acorns from four species of oak (*Quercus* spp.), some hickorynuts (*Carya* spp.), maypop (*Passiflora incarnata*), creeping cucumber (*Melothria pendula*, a possible medicinal), blueberry/sparkleberry (*Vaccinium* spp.), wild plum and cherry (*Prunus* spp.), palm berries (*Serenoa* sp.), blackberry (*Rubus* sp.), persimmon (*Diopyros virginiana*), green briar (*Smilax* sp.), and muscadine grape (*Vitis* sp.).

These plant remains reveal that, while the Spanish adapted, adopted, and depended upon New World resources and Native American produce, their plan was to create an Iberian microcosm in the New World (Crosby 1972) with large fields of wheat, in contrast to the possible multicropped fields of the Native Americans (e.g., Lorant 1965: 264). Interestingly, mention of large fields in the Georgia Bight were few in the accounts of Ayllon, Pardo, Menendez, and others, unlike in the chronicles of the Narvaez and de Soto expeditions in the bountiful western Apalachee provinces in Florida's more fertile panhandle (Hann 1988a: 71, 137-139, 1988b: 12, 1988c; Scarry 1993). Despite this, occasional references to structures for grain storage and remains of other plant and non-plant items have been reported for various places on the lower Atlantic coast (e.g., Hoffman 1990; Hudson 1990; Laudonniere 1975; Lorant 1965:79; Swanton 1922: 360-361).

Archaeobotanical evidence of relatively large

numbers of peach stones from the mission at Fig Springs suggests the possibility of orchards (Ruhl 1990a, b). These fruits have been found at almost every Spanish mission site studied (e.g., Reitz and Scarry 1985; Ruhl 1990, 1993, 1999, 2003; Scarry 1983, 1993; Scarry and Reitz 1990). Because these trees take three to five years from planting to bearing fruit, they may have been brought as potted plants, as was done in Spain in the Medieval period (Crisp 1924; MacDougall 1986). The presence of some wood, tentatively identified as peach, from the well and *convento* (friary) at Mission Santa Catalina de Guale (St. Catherines Island) supports the idea of arboricultural practices at this mission, possibly some of Georgia's first peach and orange orchards (Ruhl 1997).

The design of Medieval and Renaissance monastic gardens varied throughout Europe, from numerous gardens around abbey grounds to small but carefully tended gardens located adjacent to buildings and around garden fountains (e.g., Colvin 1986; Crisp 1924; MacDougall 1986; Miller 1986). Most often these gardens contained herbs and spices that were used for medicinal and culinary purposes alike (e.g., Meyvaert 1986; Opsomer-Halleux 1986). Plant assemblages recovered from wells, in particular the well at Mission Santa Catalina de Guale, suggest kitchen gardens. At St. Catherines Island this may have been in the area between the well and *cocina* (kitchen) because many small, typically commensal, plants were recovered. A number of so-called commensal species have uses as dyes, medicines, herbs, or spices, or may have been grown for aesthetics.

The impact on the landscape is also revealed by not only what was contained within the well but by the subsurface remains of the construction pit fills, posts, and other subsurface constructs that enabled a simple or elaborate above-ground well casing or structure. The construction pit at Mission Santa Catalina de Guale measured 6 m across for the squared-off cypress well shaft that was approximately 1 m x 1 m, indicating the likelihood that this mission well was important because it was an imposing above-ground structure on the landscape. As Thomas (1986) and others (e.g., Ruhl and Bond 1996) have noted, wells and water reservoirs were important to the friars' daily lives, if not to all the residents of the site, especially during times of British encroachment in the last decade of the seventeenth century. Public or private, sacred or secular, wells were key features in and on the landscape. Wells imply a reliable water

source for use minimally on gardens, fields, orchards, and vineyards during their active life until their potential subsequent function as trash containers. [It should be pointed out that most other architectural features have been intentionally left out of this discussion, as they already serve as foundations of much archaeological and ethnohistorical discussion and research (see e.g., Saunders 1993; Thomas 1986, 1993; Thomas and Jimenez 1992; Worth 1995)]. Here the objective was to reconstruct the landscape from less typical artifacts and remains, although they include wooden posts, almost without exception of native pine, revealing once again the impact by humans on the indigenous forests.

SUMMARY

By using a perspective drawn primarily from the archaeobotanical and historic records, this paper presents evidence of the transformation of sixteenth- and seventeenth-century landscapes of the Georgia Bight. Bioarchaeological and archaeobotanical data complement zooarchaeological data and suggest a non-agrarian economy along the Georgia coast until sometime between ca. A.D. 1150 and 1550 when maize cultivation begins to develop in the relatively infertile soils. The local subsistence economy was bolstered by the bountiful animal and fish life associated with the estuarine and palustrine environments supplemented by small swidden plots and gardens that dotted the landscape.

Spaniards tried to recreate familiar landscapes, but climatic, edaphic, biological, and socio-political conditions were often limiting. Terraced fields, plowed by ox or horse in Spain, were cleared and terraced on the islands and mainland of the lower Atlantic coast by human, not animal, labor before and after contact. The arrivals of ships with supplies and seedstock led to further agrarian endeavors throughout the missions and settlements of *La Florida* (e.g., Bushnell 1981, 1994). By the seventeenth century, historical, archaeobotanical, and zooarchaeological evidence indicate that hacienda-like establishments existed at some settlements with Old and New World taxa intermingled, which suggest various agrarian practices, including large fields of maize and wheat, orchards of peach, fig, and other fruits, and small gardens with a variety of medicinal and other plants. Along with these transformations came European cattle, pigs, chickens, and other domesticated species. These impacted maritime habitats and settlements as areas were set aside or carefully designed for their use. An

array of wild fruits, nuts, vegetables, small grains, oil seeds, and "commensals" may have been tended in small Native American and European gardens. Incidental inclusions of both plants and animals altered the landscape and invasive alien species took over native habitats. The diversity of cropping and gathering techniques reveals not only a changing plant husbandry but many landscape transformations, from failed attempts to successful endeavors to grow introduced species. Original spaces were impacted, altered, or otherwise reused utilizing new species and ideas. Areas were converted from forests to fields, pastures, gardens, corrals, and such structures as council houses, residences, barns, plazas, wells, *iglesias*, *conventos*, and *cocinas*. The scale and environmental impact are still not fully understood and in these altered landscapes plant diversity varied at different periods marked by the impact of climate, population size, disease, and economic strategies.

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