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## The Ethnohistorical Context of Bioarchaeology in Spanish Florida

John E. Worth

As a topic for directed research, the biological consequences of “first contact” between Native Americans and Europeans in the southeastern United States present a remarkable opportunity to explore the relationship between the documentary and archaeological records, between historical texts and “hard” biological data. Authors of the rest of this volume explore and interpret a wide range of archaeological and biological data, most of it completely new, regarding the biological impact of Spanish exploration, colonization, and missionization on Native Americans living in and around the colony of Florida. In this connection, my intent in this first chapter is to provide an overview of the broader ethnohistorical context regarding these same Native American populations.

Even though the Florida colony during its first incarnation (1565–1763) never effectively expanded far beyond its 16th-century roots in the port city of St. Augustine, the establishment of this isolated outpost of less than 3,000 Spaniards living on the northern fringes of the broader Spanish empire ultimately resulted in massive and dramatic transformations among indigenous populations living within and beyond the Spanish colonial frontier. Although long-range exploratory expeditions were undertaken in the decades before and after the establishment of St. Augustine in 1565, the most significant and the longest-lived mechanism for direct contact and interaction between Spaniards and Indians in the Southeast was undoubtedly the Franciscan mission system, which operated between roughly 1587 and 1706, before the final retreat of the missions and the virtual depopulation of interior Florida by English-backed slave raiders.

During these decades, Franciscan missions acted as the primary mechanism for societal assimilation in the colonial system of Spanish Florida. As

is explored later, mission populations formed what was in effect the local economic base of the Florida colony during the 17th century. If not producing economic expansion, they at least permitted a degree of stability and continuity otherwise not always possible given the unreliability of external supply lines. For Native Americans affected directly or indirectly by this system, however, the biological consequences were increasingly severe, both for individuals and for groups.

I address the biological consequences of missionization in a four-part discussion that draws heavily on ethnohistorical data, much of which has been either discovered or reevaluated only very recently. I begin with a brief review of the sociopolitical and economic systems of late prehistoric populations within the study area of Spanish Florida, providing a benchmark against which transformations of the mission period may be compared. Second, I review the timing and nature of pre-mission era contacts between Europeans and Native Americans in the region that would become Florida. Next, I examine the primary mission era (1587–1706), when aboriginal chiefdoms were assimilated into the developing colonial system of Spanish Florida, focusing on the pivotal role that mission populations played in that system. Finally, setting the stage for the contributions that follow, I provide a specific overview of the anticipated biological consequences of assimilation and participation in the Florida colonial system.

Because much of this material is explored in greater depth in my recent two-volume *The Timucuan Chiefdoms of Spanish Florida* (Worth 1998a, 1998b)—including a wide range of supporting primary documentation as well as secondary literature—many of the citations in this chapter direct readers to specific sections of these volumes, where there are more extensive citations of supporting materials. Nevertheless, I also include citations to major published references where readers can also explore specific topics.

### Chiefdoms of the Late Prehistoric Southeast

Although a detailed description of the many and diverse Native American societies of the late prehistoric Southeast is far beyond my scope, it is possible to summarize both commonalities and variations present within the broader area that became Spanish Florida (fig. 1.1). Most of the indigenous societies directly or indirectly affected by the Florida colony during the 16th, 17th, and 18th centuries may be described broadly as agricultural chiefdoms. Each comprised at least a handful of distinct communities under centralized, hereditary leadership, and that the economic infrastructure

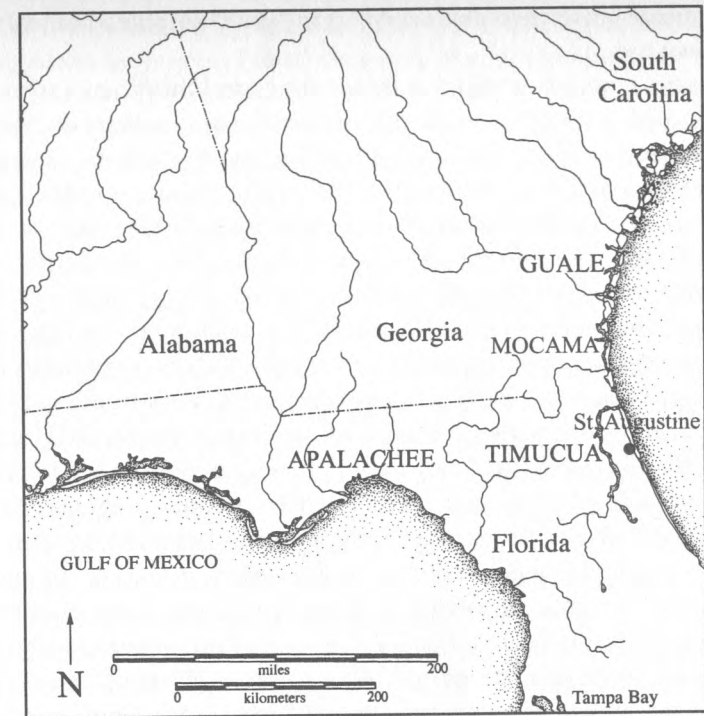


Fig. 1.1. Map of Spanish Florida.

of these societies was based in part on the appropriation of surplus labor and agricultural products (especially maize) for the use of the chiefly matrilineage (Worth 1998a:1–18, 81–102, 162–68; and see Anderson 1994; Widmer 1994).

While this is of course a gross oversimplification of an immensely complex and diverse range of socioeconomic systems, I would argue that the term *agricultural chiefdom* is useful not only as a generalization but also in calling attention to the fundamental characteristics of these societies that made them more easily assimilated into the colonial system of Spanish Florida. Specifically, most of the chiefdoms that were eventually assimilated as subordinate elements within a hierarchical system based on tributary labor and foodstuffs had been practicing some variation of this theme for centuries prior to European contact. In effect, the agricultural chiefdoms of the late prehistoric Southeast were ideally suited to serve both as breadbasket and as labor pool for the St. Augustine garrison, since each political unit was already organized for the managed, hierarchical allocation of labor and foodstuffs. All that was required was the imposition of a

superordinate jurisdiction that would act to “skim” surplus labor and food for its own use.

This said, it must be noted that these agricultural chiefdoms varied considerably with regard to overall population size and settlement distribution, their degree of sociopolitical integration and centralized administration, and the relative contribution of agricultural products to the annual diet. There is considerable scholarly debate, for example, regarding the degree to which coastal chiefdoms such as the Guale and Mocama originally relied upon corn and other cultivated crops, as opposed to the rich abundance of estuarine and marine foodstuffs available in these productive environments (Larson 1980; Worth 1999; Larsen, this volume). Although documentary evidence clearly indicates substantial agricultural production in these areas by the earliest years of missionization during the late 16th century, there is only limited data to push these interpretations back to the very moment of European contact. Bioarchaeology may provide considerable assistance in this regard, especially regarding pre-contact differences and post-contact homogenization of Native American dietary regimes.

While a substantial number of aboriginal chiefdoms across the interior Southeast were exposed either directly or indirectly to brief European contact during one or more of several 16th-century exploratory expeditions, the geographic area encompassed by the long-lived mission system of Spanish Florida was somewhat more restricted. The mission system eventually included most of the present-day coast of Georgia and northern Florida, extending westward across the interior of southeastern Georgia and virtually the entire northern half of the state of Florida to its western extreme along the Apalachicola River basin. Major politico-linguistic groups eventually assimilated into the mission system included virtually all the Timucuan-speaking chiefdoms inhabiting the coastal, riverine, and lacustrine habitats of central, north-central, northern, and northeastern Florida as well as southeastern Georgia. The Muskogee-speaking chiefdoms of Guale and Orista-Escamaçu along the Georgia and South Carolina coast were impacted heavily by early coastal colonization around the city of Santa Elena (1566–87) as well as the later mission system. The populous Muskogee-speaking Apalachee chiefdom of northwest Florida was assimilated, as were elements of other chiefdoms to the west and north, including the Apalachicola chiefdom of southwest Georgia, which ultimately formed the core of the 18th-century Lower Creeks. Other groups along the southernmost frontier of Spanish Florida, including the Mayaca and Jororo of east-central Florida, were also impacted by the mission system (see Hann 1993).

Within this broad geographic area, Native American populations numbering in the many tens of thousands were directly assimilated or substantially affected by the mission system of colonial Spanish Florida. Here, the primary mission era may be divided into roughly three broad periods: an initial period of geographic expansion from 1587 until the 1630s; a period of relative stasis (if not stability) from the 1640s through the 1650s; and a period of contraction, aggregation, and retreat from the 1660s through 1706. These periods should not be considered mutually exclusive, however, especially since most of the overall elements of the mission system, including the appropriation of surplus labor and food for Spanish use, were in operation on a local and regional scale throughout most of the mission era. Nevertheless, it must be emphasized that not all populations were assimilated at once, and that not all served precisely the same function in the overall colonial system. For this reason, the biological analysis of archaeological human remains from any site or region must take into account the specific historical context and details of their involvement in the mission system.

Finally, it should be noted that although missions were not established beyond these geographic boundaries, significant numbers of refugees from more distant regions ultimately settled within the mission system during the final decades of the 17th century (Worth 1995, 1998b). Even though some of these immigrants remained only a short time within Spanish Florida, their presence within and adjacent to established mission communities undoubtedly resulted in at least some biological impact on local populations, particularly with regard to physical characteristics linked to ethnic origin. In this regard, populations comprising the late 17th-century mission system of Spanish Florida originated from a geographic area much larger than that which might be indicated by the distribution of mission convents alone.

### Exploration, Colonization, and Early Mission Efforts

The establishment of St. Augustine in 1565 represented the last and most successful colonial effort undertaken by Europeans in the 16th century. It followed more than half a century of initial exploration and failed attempts at permanent colonization in this same region (see, e.g., Milanich 1995: 99–163, 1999:56–81; Hudson and Tesser 1994:36–122). All previous attempts involved some direct contact between indigenous Indians and immigrant Europeans, although the degree of biological impact resulting from each is debatable. Nevertheless, since all these expeditions might be

argued to have posed at least some risk for localized epidemics, or even widespread pandemics, among Native American populations living in areas later missionized within the Florida colony, they must be mentioned here.

Following the 1513 discovery and naming of the Florida peninsula by Juan Ponce de León, there was a second failed attempt in 1521, resulting in his death from an arrow wound. That same year there was a Caribbean slaving expedition to the South Carolina and Georgia coast, followed by yet another failed colonial attempt there in 1526 under the direction of Lucas Vázquez de Ayllón, who also perished in the attempt. Pánfilo de Narváez also died in Florida during his failed expedition of 1528, as did Hernando de Soto, whose 1539–43 expedition succeeded primarily in establishing direct contact with a multiplicity of indigenous chiefdoms across the deep interior Southeast. Dominican friar Luís Cáncer de Barbastro died on Florida's Gulf coast in a follow-up missionary expedition dating to 1549, and during the 1559–61 colonial attempt of Tristán de Luna, soldiers once again penetrated deep into the southeastern interior. The French garrison left in 1562 by Jean Ribaut along the South Carolina coast was also a complete failure, though the subsequent 1564 French colony at Fort Caroline near Jacksonville might well have survived had its Protestant inhabitants not been killed by Spaniard Pedro Menéndez de Avilés shortly after establishing St. Augustine just to the south. Before the French were extirpated, however, they did manage to send at least one small expedition to the deep interior Timucuan region of northern Florida.

This sort of limited contact continued even after 1565, including the two substantial expeditions of Juan Pardo launched from Santa Elena between 1566 and 1568, retracing much of de Soto's earlier route across the Appalachian summit. Later exploration into the interior was far more limited, but even these contacts between 1597 and 1628 might have had some biological consequences for Native Americans beyond the mission system.

While none of these early expeditions and colonial attempts resulted in the kind of long-term and in-depth contact and interaction that were ultimately established through the mission system, together they represent a prolonged period of episodic and repetitive, if limited, face-to-face contact between Europeans and Native Americans in the broader region that fell within or not far beyond the eventual colonial jurisdiction of Spanish Florida. In this sense, they form a sort of baseline for "first contact" that prefaced the era of missionization under primary consideration in this volume. Researchers are blessed with a relative wealth of documentation regarding the Native American groups encountered during many of these expedi-

tions, but it is difficult to judge their subsequent biological impact, even as a sum total of all these contacts combined. Given that such contacts were normally brief and only rarely violent, and were followed by years or decades without further contact, the most likely source of biological impact is of course European pathogens, unwittingly introduced by passing explorers or colonists. Attempts to examine this question from an archaeological standpoint have generally relied upon indirect evidence for substantial regional population decline—(i.e., the cessation of public architecture after the 16th century, simultaneous reduction in site numbers and size, and abandonment of entire chiefdoms)—in the absence of clear and convincing direct skeletal evidence for European pathogens (Smith 1987). Nevertheless, there seems to be sufficient evidence to conclude that the sum total effect of early European exploration in many areas was regional population loss, in some cases severe. While there is only limited evidence to this effect for areas later directly assimilated into the mission system, the possibility nonetheless exists that missionized populations had already been exposed to earlier population loss due to the biological impact of 16th-century exploration. For my purposes here, however, I focus on biological changes that occurred in surviving populations during the primary colonial era of Spanish Florida (1565–1763) and more precisely during the primary Franciscan mission period (1587–1706).

It must be remembered that there was an intermediate period of Spanish colonial and missionary activity along the Atlantic coast between 1565 and 1587 and that the increased level of interaction during this period between Spaniards and Native Americans undoubtedly had biological consequences for the indigenous coastal populations. Points of direct contact were in operation at St. Augustine after 1565; at Fort San Mateo at the mouth of the St. Johns River between 1565 and 1568; at Santa Elena on Parris Island, South Carolina, between 1566 and 1587; and at Fort San Pedro on Cumberland Island between 1569 and the early 1570s. In addition, a handful of Jesuit missionaries were dispatched to work in coastal Orista and Guale between 1568 and 1570, followed by Franciscans in 1574–75. Although Franciscans remained as chaplains in both Santa Elena and St. Augustine through the 1580s, it was not until 1587 that formal mission convents were established directly within aboriginal villages (Lyon 1976, 1992; Hann 1996:50–72; Milanich 1999:82–103).

Interaction between Native Americans and Spaniards during this early colonial phase varied in its character and extent and, in any case, was markedly different from that which was established after 1587 with the onset of the primary mission era, especially with regard to labor, food

production, settlement aggregation, and ethnic mixing. While relations between Spanish colonists and neighboring chiefdoms were often friendly or at least neutral, this early period was frequently characterized by hostility and outright warfare between Spaniards and Indians or between Indian allies of rival Spanish and French interests. To the south, in the district just west and north of St. Augustine, coastal Timucians later known as the Mocama remained fierce allies of the French even through the 1570s, while St. Johns River Timucians under chief Outina allied themselves with the Spanish, simultaneously making the Spanish enemies of the deep interior Potano, who were assaulted by Spanish forces in 1567 and 1585, supplementing earlier raids supported by the French in 1564 and 1565. Many of these antagonistic relationships manifested themselves in open warfare, undoubtedly resulting in numerous casualties and, in many cases, in the wholesale abandonment of villages and traditional territories.

To the north, in the vicinity of Santa Elena, the Orista-Escamaçu and Guale chiefdoms maintained amicable relations with Spanish colonists through this same period, ending abruptly in 1576 with a widespread revolt that resulted in the temporary abandonment of Santa Elena and its destruction by fire at the hands of Indian attackers. In the winter of 1579–80—following fierce reprisals by Spanish authorities, including the destruction of all major coastal villages—the rebels once again rendered obedience to the Spanish crown, paving the way for renewed interaction until Santa Elena was dismantled and abandoned in 1587.

Apart from the wounds and deaths resulting from conflicts during this period, the biological consequences of warfare might be anticipated to have been far more wide-reaching. Specifically, Spanish reprisals commonly resulted in the repeated burning of major Indian villages and the intentional destruction of their agricultural crops and stores of food. Thus there is good reason to suspect that both settlement and dietary patterns may have been significantly altered among Native American groups opposed to the Spanish during this period. This would certainly be the case for the Orista-Escamaçu and the Guale between 1576 and 1579 and probably for many of the coastal and interior Timucians between 1565 and 1580.

In the absence of warfare, amicable relations between Spaniards and Native Americans during this period undoubtedly included reciprocal visits between chiefs or their representatives and Spanish officials, presumably including the exchange of gifts and food. Account records from the 1580s make it clear that Indians around Santa Elena, including parties from Orista-Escamaçu and Guale, did provide manual labor to the Spanish

garrison in exchange for rations of wheat flour and occasional gifts of iron tools. Nevertheless, it seems clear that such tasks were normally limited to episodic construction projects associated with the fort and did not include the kind of farming activities that would characterize the later mission period. Spaniards did barter or appropriate Indian food on occasion but relied principally on their own external supply lines during this early period, in contrast to later decades when mission-based production flourished.

Missionary efforts during this early period were generally so short-lived and limited as to be virtually incomparable to the permanent convents established by Franciscans during the primary mission era. On account of hostilities, no early missionaries were sent among the Timucua, but the brief presence among the Guale and Orista-Escamaçu of a handful of Jesuits for less than two years and a few Franciscans for less than a year can hardly be given undue weight in comparison to the far lengthier interaction between the Santa Elena garrison and its Indian neighbors. Apart from the possible introduction of more epidemic diseases, the biological impact of these early missionary efforts must have been only minimal.

### Missions and the Assimilation of Chiefdoms

The arrival of nine new Franciscan friars in 1587, resulting in the establishment of the first permanent Timucuan missions north of St. Augustine that same year, launched a missionary effort that would alter the destiny of the Florida colony. Missionization ultimately came to be the primary mechanism for the integration and assimilation of aboriginal societies on Florida's colonial frontier (Worth 1998a:35–76; Milanich 1999:104–29). The key to understanding the process by which Florida's Native American chiefdoms were assimilated, as well as the ultimate impact on the societies involved, lies in the structure and function of the broader colonial system of Spanish Florida. Viewed within the context of the vast colonial empire ruled by Spain during the 16th–18th centuries, Spanish Florida was a strategic military outpost on the northern periphery of a complex web of productive colonies centered on the Caribbean basin and mainland Central and South America. Lacking the economic productivity demonstrated by densely populated New World provinces bearing gold, silver, and other valuable commodities, Florida's primary function for the Spanish crown was strategic, guarding the shipping routes of the Bahama Channel, through which all the riches from the Americas traveled on their way to Spain. As a consequence, direct royal support for the Florida garrison town

of St. Augustine was normally only barely sufficient for most of the garrison, and was occasionally lacking altogether, for which reason St. Augustine ultimately developed a reputation as a wretched frontier town to which few soldiers and colonists would relocate willingly. During the 17th century, external support became less and less reliable due to delays in the shipment of wheat, corn, and other products from New Spain and Havana and in the delivery of cash from the *situado*—the royal dole of silver coins from the coffers of Mexico. The inhabitants of St. Augustine were eventually left in the precarious position of having too many poor military families and not enough colonial farmers.

The ultimate survival of this garrison town was, therefore, based on an extensive support system, including not only periodic infusions of cash, armaments, provisions, and other supplies from other Spanish colonies external to Florida but also a vast pool of human and natural resources comprising greater Spanish Florida (see Worth 1998a:126–34, 210–14; Bushnell 1994). Without readily available internal sources of real wealth with which to supplement purchasing power based on cash derived from royal support, St. Augustine's Spanish population was in many ways almost wholly dependent upon Indian labor, both directly and indirectly, to make up for substantial shortfalls in vital foodstuffs (principally maize) and other supplies. As a consequence, the colonial system of 17th-century Spanish Florida was fundamentally based on the structural assimilation of largely self-sufficient centers of Native American population distributed across an unevenly productive landscape. In this sense, Florida's mission provinces served a pivotal function for the residents of St. Augustine: the maintenance of a vast Indian labor pool comprising an interconnected web of population centers subordinated beneath the Spanish crown and church. In effect, then, Florida eventually became not so much an independent Spanish outpost interacting with neighboring and autonomous Indian societies (as was the trend during the colony's first two decades) but was instead a broader community of interdependent Spanish and Indian populations woven into a functioning colonial system with its hub at the Atlantic port of St. Augustine.

At its core, the internal economic structure of the colonial system in 17th-century Florida revolved around the production and distribution of staple food crops, particularly maize. While this is of course a simplification of a much more complex economic system, local maize production does seem to have played a determining role in the overall structure of Florida's economic system, especially in the role of the mission provinces in that system. It was the production and distribution of Florida's yearly

maize crop that constituted the primary economic relationship between St. Augustine and its mission provinces. Together, the mission provinces provided both surplus maize and surplus labor for producing more maize, all of which was subsidized at least in part using funds derived from Florida's yearly royal subsidy, the *situado*. While local officials often skimmed personal profits from all such transactions, the end result of this colonial system was the yearly production of substantial supplementary food reserves for the city of St. Augustine. Given existing limitations both in available Spanish agricultural labor in St. Augustine (including not only soldiers and their families but also royal slaves and prisoners) and in subsidy funds that could have been used to purchase staple foods from other Spanish colonies, Spanish officials ultimately came to rely on the food and labor provided by the mission provinces as a relatively inexpensive local solution to food supply problems in St. Augustine. In times of crisis, St. Augustine's maize reserves were the primary buffer against privation for the Florida colony.

One perpetual dilemma in the overall colonial food production system that developed in Florida was the fact that St. Augustine was situated in a comparatively unproductive region of Florida and had few resident Indians remaining by the first decades of the 17th century—presumably a consequence of demographic collapse due to early and prolonged exposure to European pathogens introduced at the port. The most productive areas in colonial Spanish Florida (in terms of both soil fertility and human population, since neither was useful alone) were located far to the west and north of St. Augustine, in the mission provinces of Apalachee and Guale. While surplus maize and other foodstuffs were regularly bartered with trade goods and transported by ship from coastal ports in these provinces, the initiation of the Spanish *repartimiento* draft labor system in Florida provided hundreds of Indian laborers who traveled to St. Augustine on foot across the less productive Timucuan mission provinces of Timucua and Mocama. A yearly draft of some 300 unmarried males from the mission provinces spent between four and seven months in the environs of St. Augustine to provide the labor force needed to produce the city's yearly maize crop. This important crop amounted to perhaps a million pounds of maize each year during the mid-17th century, providing something on the order of eight times the amount of surplus corn available annually from Apalachee and Guale (Worth 1998a:126–34, 176–97).

Neither local agricultural productivity nor the available labor pool was distributed evenly across all the mission provinces during the mission period. While Apalachee provided abundant maize and numerous laborers, Guale and Mocama seem to have provided comparatively fewer laborers,

focusing instead on local maize production for barter by ship. The interior Timucuan missions, on the other hand, generally produced few laborers and little surplus maize, serving instead as a transportation corridor across the peninsula. These missions, for example, particularly those along the trans-peninsular road known as the Camino Real, nevertheless played a crucial role in the maintenance of the travel, transport, and communication network that effectively linked the population centers of Apalachee and St. Augustine into a functioning economic unit. As way stations along the primary east-west land transportation corridor in Spanish Florida, the Timucuan missions were links in the western mission chain, without which the colonial system would have been unable to function efficiently. Just as Apalachee was a major agricultural production center in the Florida colony, Timucua served as a major transportation corridor. Larger surpluses in Apalachee were purchased for the royal warehouses, whereas minimal surpluses in Timucua presumably served to ration travelers of all sorts, including Spanish soldiers and officers, Franciscan friars, repartimiento laborers, burden bearers, and couriers. Each province thus had a unique role in Florida's colonial system, making both Apalachee and Timucua interdependent parts of a broader society. A similar relationship existed between Guale and Mocama along the northern mission chain.

The driving force behind the entire economic system was aboriginal labor. Without resident aboriginal labor, the fertile soils of Apalachee and Guale could yield neither the agricultural surpluses regularly purchased by Spanish agents nor the subsistence base of resident Indian and Spanish populations, including friars and garrisoned soldiers. Without aboriginal labor, the missions of Timucua and Mocama could not produce the staple foods that supported resident and transient populations along the Camino Real, nor could they provide ferry services across the rivers and estuaries of northern Florida and coastal Georgia. Furthermore, without aboriginal labor from all these regions (particularly Apalachee), the yearly maize crop in St. Augustine would effectively vanish, leaving the Spanish residents of St. Augustine without any important local source of staple foods as a backup in case of the failure of external supply lines. Finally, without aboriginal labor on a local level, the Florida mission chiefs would have little real basis to their hereditary positions of leadership, undermining not only traditional aboriginal sociopolitical systems but also the overlying Spanish administrative structure on which the entire colonial system was based. In these fundamental ways, aboriginal labor was perhaps the most important commodity in 17th-century Spanish Florida. This interpretation, of course,

has considerable bearing on the overall biological impact of the mission system.

Ironically, it was precisely this commodity that entered a free-fall decline during the 17th-century mission era. The fatal flaw in the colonial system of Spanish Florida was its substantial dependence upon stable aboriginal population reserves as a source of labor. Even as Native American chiefdoms were incorporated into the expanding colonial system through the process of missionization, they were simultaneously exposed to a variety of European plague diseases to which they possessed little resistance. As we shall see, epidemic population decline was soon supplemented by other forces leading to increased mortality, decreased fertility, and simple flight from the mission provinces. The 17th-century colonial system of Spanish Florida was thus characterized by an almost continual process of adaptation and change, driven by rampant demographic collapse in the mission provinces. This tragic phenomenon ultimately transformed the colonial system, setting up internal stresses that, at least in the case of the interior Timucuan missions, led to open rebellion and the subsequent wholesale transformation of the interior missions under Spanish guidance (Worth 1998b:38–116).

Internal change and adaptation served only as a preface to external forces that would eventually result in the rapid destruction of the mission system and its contraction to the area around St. Augustine by 1706. Beginning in 1659, immigrant northern Indians variously known as Chichimecos, Rickahockans, or Westos arrived along the frontiers of broader Spanish Florida, wielding English-supplied firearms in a campaign of terror that would ultimately transform the entire social geography of the Southeast (Milanich 1999:168–88; Worth 1995, 1997, 1998b:140–46). In 1661, they assaulted and destroyed Guale mission Santo Domingo de Talaje on the Georgia mainland, and subsequent raids forced the retreat and relocation of all mainland Guale missions to the barrier islands by the 1670s, including the aggregation and fusion of villages from a variety of locations. Simultaneously, a new confederacy of refugees from the deep interior called the Yamasees relocated first to the old Escamaçu province on the mission frontier, and by the late 1660s into the mission system itself, forming new island towns in Guale and Mocama and later in Apalachee and on the upper St. Johns River in central Florida. While the coastal Yamasees contributed substantially to the repartimiento labor draft, their involvement in the Franciscan conversion effort was minimal during their brief tenure among the mission Indians. Pirate assaults against these relo-

cated coastal missions in 1683 and 1684 finally forced the retreat of all Guale and Mocama missions to Amelia Island and southward, while the Yamasees fled west and north, ultimately relocating back to Escamaçu as new slave raiders for the Scottish and English traders in Carolina.

With the destruction of the Westo after 1680 by Carolina settlers, the creation of a new alliance with the mission Yamasees in late 1684, and the establishment of trade relations among the nascent Lower Creek and the Cherokee between 1685 and 1690, the missions were subjected to yet another wave of slave raids in the western interior after 1685, beginning with Timucuan mission of Santa Catalina de Afuyca that year. The annihilation of all remaining Guale missions in 1702 and the rout of Apalachee in 1704 prefaced final raids in Timucua that forced the abandonment of all remaining missions by 1706. The mission era was effectively over, as the few hundred survivors huddled together as refugees in a handful of newly established mission towns within sight of St. Augustine (Hann 1996:296–325; Worth 1998b:147–58; Milanich 1999:188–95).

### Anticipated Biological Consequences

Within the 119 years that constituted the primary mission period between 1587 and 1706, the mission system of Spanish Florida resulted in significant and widespread transformations among assimilated chiefdoms, many of which would be anticipated to result in biological consequences for Native American populations living in and around these mission communities. A considerable amount of scholarly research has already been directed at this question (Larsen et al. 1990, 1996; Larsen 1990, 1993; Hoshower and Milanich 1993), and this volume represents the most current data and thinking in this regard. Based at least in part on the results of previous bioarchaeological research, in combination with the comparative wealth of ethnohistorical data already discussed, the following discussion addresses the anticipated biological consequences of missionization, some of which can be and have already been examined and some of which remain to be explored or demonstrated. I intend this discussion more as an overall framework for understanding the broader scope of biological change among mission populations than as a precise list of predictions or hypotheses for scientific testing.

What precisely were the broader sociopolitical and economic consequences of missionization for aboriginal populations, and how might these changes have been reflected in the biological realm? Given the overall

ethnohistorical context discussed, changes in the following areas might be expected to be evidenced within skeletal samples taken from mission-era populations. On an individual level, these morphological and compositional changes would be related principally to alterations in activity, diet, and biological stress (related to nutrition or disease); on a group or community level, changes might occur in demography (i.e., increased mortality and decreased birthrate), overall community health, and ethnic composition. Ultimately, the sum total of such biological changes would be expected to be reflected to greater or lesser degrees in mission-era skeletal samples from the various provinces or regions within the Florida mission system, particularly when compared with pre-mission-era samples from the late prehistoric or contact periods in these same areas.

Documentary evidence makes it abundantly clear that the most significant biological consequence of missionization in Spanish Florida was rapid and traumatic depopulation of all areas directly affected by the mission system, eventually resulting quite literally in extinction for all missionized populations. Although the causes, timing, and rate of depopulation undoubtedly varied from province to province, and even from village to village, global census data from Spanish Florida confirm unambiguously that indigenous population levels within the geographic area eventually encompassed by the mission system dropped effectively 100 percent between the early 16th and late 18th centuries. Using a rough estimate of perhaps 200,000 prehistoric Native Americans living in what would later become the Florida mission system, subsequent data suggest that these same populations eventually plummeted to less than 5 percent of their original level by the end of the primary mission period in the early 18th century. They declined to less than 0.1 percent by the time of their removal from Florida in the 1760s, when only 89 mission Indians (including many immigrant refugees from beyond the original mission system) boarded ships bound for Cuba with the Spaniards, not counting some 40 families of remnant Apalachee, Yamasee, and Creek Indians living around Pensacola who were shipped to Veracruz, Mexico, that same year. Later records demonstrate that the total surviving number of Florida Indians in Cuba and Mexico was just over 100, of whom many certainly died within a few years of their immigration (Worth 1998b:156–57; Hann 1988:314–16).

Despite this ultimate result, the extinction of the mission Indians was actually a comparatively gradual process, lasting many generations, during which surviving populations were subjected to a variety of biological transformations. In this sense, the detailed examination of skeletal populations



from Florida missions represents a remarkable opportunity to explore the precise nature and timing of specific changes resulting from many different aspects of daily life in the assimilated mission chiefdoms.

The reasons for radical depopulation in the Florida mission provinces were undoubtedly numerous, and elsewhere I have outlined five principal categories that contributed to the observed demographic collapse among missionized Native Americans (Worth 1998b:8–26). These included death and declining health resulting from or influenced by (1) epidemic diseases, (2) exhaustion and exposure, in the context of the colonial labor system, (3) declining nutrition, and (4) frontier raiding, all of which resulted in an increased rate of mortality among mission populations. These factors were presumably supplemented by (5) reduced population growth influenced by an overall decrease in community health as well as by demographic transformations and also (6) intentional out-migration, in which individuals and families simply left the mission system to live beyond the reach of Spanish authorities.

For our purposes here, however, the simple death or absence of individuals or families from mission communities represents only one of many biological consequences evidenced for the mission period. In some ways, the overall depopulation of the missions represents the least intriguing of all biological transformations experienced, since it was actually the living, surviving populations that were forced to adapt and change during the courses of their lives, providing a far greater possibility that such life changes would be reflected in skeletal populations.

Such changes would be expected in several areas within the primary mission period, including transformations in diet and nutrition, activity and workload, community health, and (later) in the ethnic composition of local populations. Easily the most important dimension of the mission system in this regard was the colonial economy of broader Spanish Florida, already addressed. Two principal factors—the intensification of agricultural production in mission communities and the colonial wage-labor system—would be expected to have resulted in significant biological transformations among mission Indians. Given that the staple crop of Spanish Florida was maize, and that the local production and barter of mission maize eventually became one of the primary functions of the mission economy, it would seem likely that mission diets across Spanish Florida became far more uniform in their reliance upon agricultural products such as maize. In this sense, missionization probably served to minimize or even erase previous disparities in the relative contribution of maize and other agricultural crops to Native American diets in the various regions assimilated

into the mission system. Inasmuch as maize served as the primary currency of the mission frontier, at least with regard to the garrison of St. Augustine, missionized chiefdoms and villages undoubtedly increased their maize crops substantially during the 17th century, in many cases probably growing far more than could ever be eaten by local residents. This agricultural intensification was enhanced by the introduction of iron tools such as axes for felling trees and hoes for cultivating fields, but it was the increased demand for maize in St. Augustine that prompted their widespread use toward this end. In the absence of the colonial barter economy, such iron tools held principally social value as visible symbols of chiefly alliances, but during the mission period their value was far higher in the realm of economic productivity (see Worth 1998a:38).

In the biological realm, the agricultural intensification spurred by the colonial economy served not only to render mission diets more homogeneous across Spanish Florida but presumably also to alter the nutritional composition of mission diets, resulting in specific changes generally associated with an increased reliance on starchy carbohydrates. In addition, dental health would obviously have declined, particularly given the sugars present in maize. All of these transformations would be expected to be reflected in skeletal populations and might be especially pronounced among Native American groups that had had little previous experience with a substantially agricultural diet.

Agricultural intensification in the missions also resulted in transformations in local aboriginal work patterns, which were of course supplemented by the simultaneous increase in wage labor associated with the annual repartimiento labor drafts. Not only were resident mission populations expected to provide the additional labor associated with increased local maize production, but they also served as the labor pool for the colonial labor system, which generally enlisted young, unmarried males for seasonal labor in the privately owned fields and ranches around St. Augustine and San Luis, for courier and burden-bearing services, and for canoe and ferry transportation in specific locations. In overall perspective, the colonial labor system would be expected to have resulted in substantial transformations in Native American labor patterns, reflected in the biological realm by alterations in the intensity, type, and frequency of activities associated with various tasks associated with manual labor. In this regard, several subpopulations can be identified within mission communities, distinguished in part by gender, age, and marital status. Specific tasks were generally associated with specific groups; young adult males would be expected to bear the imprint of increased upper-body activity associated with

lengthy periods of digging and hoeing in agricultural fields and also increased lower-body activity associated with episodic long-distance travel on foot. Other groups not directly affected by the annual repartimiento draft—women, children, and older, married males—presumably took up the slack in the missions, providing manual labor in mission fields to make up for other laborers absent in St. Augustine during the growing season. All these transformations in labor patterns, while complex, should be reflected in the bioarchaeological record.

The colonial labor system had additional effects in the biological realm, particularly the seasonal and annual demographic profile of specific mission communities. Mission chiefs occasionally complained that most of the young males eligible for marriage lived or spent long periods of time in St. Augustine as wage laborers, leaving mission villages with a surfeit of unmarried young women (Worth 1998b:21–22). This, in turn, resulted in a decreased overall birthrate, leaving the mission Indians literally without any means to combat epidemic depopulation with a normal or increased birthrate.

Global depopulation in the Florida missions also produced secondary consequences that provided further fuel for biological change in surviving mission populations. Even as mission populations declined rapidly, Indian and Spanish authorities endeavored to counter this trend with a variety of strategies designed to maintain mission villages with sufficient population levels to survive as viable communities (Worth 1998b:27–37). One of these strategies was *congregación*, or the intentional contraction and aggregation of outlying satellite communities into central villages and administrative centers. Apart from resulting in the outright abandonment of many smaller subordinate villages and hamlets, this strategy, employed most commonly during the early and mid-17th century, ultimately resulted in the fusion of originally dispersed population centers into larger communities, all on a localized scale. In some cases, entire villages were voluntarily or forcibly relocated tremendous distances in order to repopulate strategic nodes in the travel and transport network of Spanish Florida. In the end, *congregación* and directed resettlement resulted in a significant transformation from a relatively dispersed settlement pattern to a far more centralized one, reducing the overall number of communities within the mission system from hundreds to only a few dozen, all within the space of just a few decades. This phenomenon, combined with the effects of agricultural intensification and the colonial labor system described, undoubtedly resulted in a degree of crowding and sedentism that may not have been present prior

to the mission period, potentially compromising elements of overall community health.

Finally, beginning in the 1660s and continuing through the end of the primary mission period in 1706, Florida's mission communities were transformed by the advancing juggernaut of English-sponsored aggression and the technological advantages afforded these slave raiders by their flintlock muskets. Land-based aggression had several effects, including the further contraction of all remaining satellite communities and farmsteads into more compact and defensible mission villages and the further relocation and aggregation of exposed communities. In the Guale province, for example, no fewer than four formerly distinct mission villages lived together on the northern end of Sapelo Island between 1680 and 1684, including mainland Tupiqui and Satuache and the island towns of Guale and Sapala, originally located many miles apart from one another in the old Guale chiefdom (Worth 1995:34, 101).

Even more important, English-sponsored slave raiding also resulted in the immigration of significant numbers of Native Americans from more distant regions as refugees from the raiding. Without question the largest group of such refugees was the Yamasee confederacy, which coalesced along the northern mission frontier in the 1660s and which relocated en masse into the mission system by the 1670s (Worth 1995:18–30). Their brief tenure on the Georgia coast, and an even more ephemeral stay along the upper St. Johns River in central Florida, nonetheless resulted in the physical proximity of Native American populations from widely disparate geographic, ethnic, and even linguistic origins during the 1660s, 1670s, and early 1680s. Many of the converted Christian Yamasee even remained in the Tama mission in the Apalachee province, and while most of the Atlantic coast Yamasee evidently remained unconverted and unattached to their Guale and Mocama neighbors, demographic data from 1675 and 1681 population reports suggest that at least some intermarriage did occur, presumably introducing an element of biological diversity to local mission populations during this period (Worth 1995:34).

In conclusion, while the details of the initial biological consequences of missionization remain a fruitful subject for scientific research, as demonstrated in this volume, it must be remembered that the ultimate biological impact of the missions was extinction. All major regional provinces or districts assimilated into the mission system, including principally the Guale, Mocama, Timucua, Yustaga, Apalachee, and various “Freshwater” Timucuan chiefdoms of the upper St. Johns River drainage had been se-

verely depopulated by the last decades of the 17th century; the few survivors who remained after the retreat of the missions in the face of English slave raiding by 1706 were gradually reduced to near total extinction by the 1760s, when the removal of only a handful of surviving mission Indians to Cuba and Mexico effectively marked the biological end of these populations in the southeastern United States. Nevertheless, the story of biological adaptation and change experienced by surviving generations of mission Indians during the 17th and early 18th century is one that is well worth studying, even if the end result was ultimately a tragic one.

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