

# Sambaqui (Shell Mound) Societies of Coastal Brazil

MARIA DULCE GASPAR, PAULO DEBLASIS,  
SUZANNE K. FISH, AND PAUL R. FISH

## INTRODUCTION

Sambaquis (the Brazilian term for shell mounds, derived from the Tupi language) are widely distributed along the shoreline of Brazil and were noted in European accounts as early as the sixteenth century. They typically occur in highly productive bay and lagoon ecotones where the mingling of salt and fresh waters supports mangrove vegetation and abundant shellfish, fish, and aquatic birds. More than one thousand sambaqui locations are recorded in Brazil's national register of archaeological sites [Note 1], but represent a fraction of the original number because colonial through modern settlements coincide with these favorable environments. Although sambaquis are of variable scale overall, massive shell mounds are characteristic of Brazil's southern coast (Figure 18.1).

The term "sambaqui" is applied to cultural deposits of varying size and stratigraphy in which shell is a major constituent, undoubtedly encompassing accumulations with a range of functions and origins. Proportions of soil, sand, shell [Note 2], and the kinds of cultural inclusions and features in sambaquis also are variable. Small sambaquis often consist of shell layers over sandy substrates or sequences of shell and sand layers, with or without signs of burning or significant numbers of artifacts. Larger shell mounds typically have horizontally and vertically complex stratigraphy, including alternating sequences of shell deposits, narrower and darker layers of charcoal and burned bone that mark occupation surfaces, and clusters of burials, hearths, and postholes descending from these surfaces.

Food refuse is present in sambaquis, along with a set of several feature types that are commonplace in residential occupations. Recognizable dwellings have not been encountered, however, nor do arrangements of features and distributions of artifacts indicate sustained domestic activity, with very few exceptions (e.g., around lakes in the state of Rio de Janeiro: Barbosa et al. 1994; L. Kneip 1992). In some cases, small sambaquis with

*Handbook of South American Archaeology*, edited by Helaine Silverman and William H. Isbell.  
Springer, New York, 2008



Figure 18.1. Sambaqui da Figuerinha, Santa Catarina. (Maria Dulce Gaspar)

less complex stratigraphy and minimal features or artifacts may represent campsites or processing stations. Most others serve mortuary functions, particularly the massive ones with complex stratigraphy. These rise tens of meters (maximum height today, after historic mining of shell, is approximately 50m) and cover hundreds of square meters. They are monumental in their scale and visual obtrusiveness in flat coastal settings and are noteworthy for pervasive burials. It is clear that sambaquis do not represent ordinary habitation, but rather are specialized elements of settlement systems in which very little is known about the other kinds of sites. The lack of a well defined settlement context that includes habitation sites reflects the very limited amount of survey in damp and heavily vegetated coastal zones, combined with the difficulty of finding and identifying contemporary site types that are not similarly marked by heaped shell, have no ceramics, little diagnostic chipped or ground stone, non-durable shell and bone tools, and perishable structures.

## SAMBAQUIS IN SPACE AND TIME

The earliest dates of 9200 BP for sambaquis are inland along the Ribeira de Iguape where small mounds of edible land snails (*Megalobulimus* sp.), rather than bivalves, have stratigraphic sequences resembling those of coastal locations (Figuti et al. 2004) and already held burials (Neves et al. 2005). These initial riverine instances yield evidence for coastal contact, probably with populations at coexisting coastal sambaquis now lost to sea level changes and other geological processes; a sambaqui at the coastal end of the same river

basin dates to 8000 BP (Calippo 2004). Although intervening ages are well documented, the bulk of radiocarbon determinations on shell mounds are concentrated between approximately 4000 BP and 2000 BP.

Sambaquis frequently terminate in capping deposits of dark soil that are structurally similar to previous shell strata and also contain burials, but contrast in having only minor shell inclusions. Ceramics often occur in uppermost levels, prior to a generally synchronous cessation of sambaqui use everywhere. About the same time, villages and camp sites of Tupi-Guarani and Taquara/Itararé ceramic traditions appeared, sometimes exhibiting bone and lithic technologies suggestive of continuities or interactions. When European settlers arrived, Tupi and Guarani coastal groups possessed a very efficient fishing technology that likely incorporated a heritage from sambaqui predecessors.

Because shells of mostly edible species, fish bone, and other faunal remains are prominent constituents, sambaquis have been strongly associated with hunting and gathering economies dependent on mollusk collection and fishing. The absence of pottery in most cases, or its restriction to uppermost layers, strengthens the impression that sambaquis are not components of primarily agricultural settlement systems. Grinding stones are seldom formally shaped. Other common items in artifact assemblages are consistent with a marine and lagoon orientation. Largely expedient chipped stone, ground stone objects ranging from informal pebble and cobble forms to well-shaped and polished axes, and shell and bone implements (such as hooks, points, and needles) are typical (e.g., Bryan 1993). Sculpted and polished stone items that are technologically sophisticated include decorated plates, vessels, and ornaments (Prous 1977, 1992). The most distinctive of these polished stone items, however, are fish, bird, and mammal effigies termed zooliths, and geometric shapes. These are always rare, but occur throughout much of the area containing sambaquis.

Sambaquis have been most intensively studied along the coast from the states of Rio de Janeiro to Santa Catarina, including Paraná and São Paulo (e.g., Schmitz 1987; Prous 1992; Gaspar 1998, 2000; Lima and Mazz 2000). Shell mounds further north, although numerous and occasionally described (e.g., Calderón 1964; Simões and Correa 1971; Roosevelt et al. 1991), are more poorly known. To the south, in the state of Rio Grande do Sul and into Uruguay where it is too cold for mangrove vegetation, shell mounds become smaller and infrequent, and are then replaced by earthen mounds (or *cerritos*) that exhibit significant parallels. The huge sambaquis of Santa Catarina are among the best preserved and reported (e.g., Beck 1972; Prous and Piazza 1977; Rohr 1984; Wiener 1876). Researchers have also concentrated work in the state of Rio de Janeiro. These two areas have produced the majority of detailed archaeological information. Because the authors have collaborated in a long-term project in Santa Catarina, findings from this region and this work are frequently cited in the following discussion.

## TRENDS IN SAMBAQUI RESEARCH

Sambaquis have been the subject of archaeological inquiry since the late nineteenth century. Only much later did archaeologists begin to address the cultural and organizational characteristics of the associated societies. A strongly empirical orientation focused early attention on aspects such as artifact technology, composition of faunal assemblages, and the physical traits of skeletal populations. Nevertheless, important reports appeared regarding distribution, composition, subsistence, human remains, and even relationships to Quaternary coastal evolution (e.g., Loefgren 1893; Krone 1905, 1914). Until the late

1940s, a central question was whether the sambaquis were natural shell deposits (which also occur in Brazilian coastal areas) or cultural phenomena.

Advocates of the “natural” position initiated a legacy of geological approaches that examine the positioning and chronology of sambaquis as references for the study of coastal landscape processes. Such studies have generated models that explore the distribution and positioning of sambaquis in relation to geological phenomena and sea level fluctuations (e.g., Caruso 1995; Giannini 1993; Martin et al. 1986). Advocates of the cultural origin of sambaquis predominantly assumed them to be the unplanned accumulations of shellfish collectors during successive camp episodes. A small number of researchers, considering the repeated presence and frequent abundance of burials, suggested shell mounds were cemeteries, or even that they were built as monuments (e.g., Duarte 1968; Wiener 1876).

Systematic excavations and radiocarbon dating began in the 1950s with French and North American archaeologists (e.g., Bryan 1993; Emperaire 1955; Emperaire and Laming 1955; Hurt 1974; Hurt and Blasi 1960) and pioneering investigators from Brazil’s developing archaeological institutions (e.g., Castro Faria 1955; Fernandes 1955; Duarte 1968). Deeply impressed by the rapid destruction of sambaquis due to mining of shell for modern uses and urban expansion, these scholars promoted laws for the protection of the archaeological heritage, enacted in 1961.

In the early 1960s, a group of Brazilian archaeologists, with support from Betty Meggers and Clifford Evans of the Smithsonian Institution, launched the five-year Programa Nacional de Pesquisas Arqueológicas, a reconnaissance, mapping, and dating project throughout Brazil. This program generated models for regional archaeological interpretation and, with the French “paleoethnographic” approach (e.g., L. Kneip 1977), established mainstream methodological paradigms that are still influential today. A methodology that privileged surface collections and test pits on a regional scale was better suited to provide preliminary insights on inland Archaic and ceramic traditions than on the deeply stratified sambaquis of coastal zones. Despite recognition of a sambaqui tradition, cultural parameters remained poorly understood.

For many years, relatively early dates, scarcity of ceramics, and repetitive deposits dominated by shells prompted most archaeologists to describe sambaquis as a sequence of campsites. Nomadic shellfish gatherers, fishers, and hunters were thought to have occupied the same location over time because it offered a dry, secure setting with immediate access to aquatic resources. Grinding stones suggestive of plant processing, and the variety of bone tools pointing to an intensive fishing technology, were seldom taken into account, although the increase of bone tools in the upper layers of many sambaquis was interpreted as a late economic shift from shellfish collection towards intensified fishing strategies (e.g., Dias 1972; Mendonça de Souza 1981; Lima 1991, 1995).

Archaeologists now acknowledge the full ecological potential available to coastal societies that could allow them to intensify subsistence, experience population growth, and achieve higher levels of social complexity (e.g., Arnold 1996; Price and Brown 1985). In fact, the emergence of “complex hunter-gatherers” is often associated with these rich environments, such as on the Northwest Coast and in southeastern portions of the United States (e.g., Sassaman 2004). Recent zooarchaeological studies (Bandeira 1992; Figuti 1992, 1993; Figuti and Klökler 1996; Klökler 2001) reveal that from at least 5000 BP, sambaqui economies were based on intensive fishing rather than collection of low calorie shellfish, especially net fishing in bay and lagoon ecotones, complemented by gathering from mangrove areas. An oxygen isotopes analysis of skeletons from a Santa Catarina sambaqui indicates a diet based mainly on fish but without evidence for seasonality, reinforcing an

interpretation of substantial year-round catches (DeMasi 1999). Observations of traditional fishing communities that still occupy lagoon settings today point incisively to the intensive practice of communal net fishing in all seasons, in which families work together and share the yield<sup>3</sup>.

In the state of Rio de Janeiro, Scheel-Ybert (1998, 2000, 2001) has reported the presence of plant resources, most notably cará (*Dioscorea* sp.), an edible root. Together with wood charcoal identifications of tree species, these findings suggest the management of forests and preferred plants, and perhaps even garden horticulture (Tenório 1991). Significantly, in the earthen cerritos of Uruguay, Iriarte (2004) has documented cultivated plants as early as 4,000 years ago.

Bioanthropological studies on sambaqui skeletal populations beginning in the nineteenth century (Ladislao Netto 1882; Lacerda 1885) described a strong, robust biotype of short stature. Teeth show almost no caries, indicating a low carbohydrate intake, and arms show intense muscular stress, taken as evidence for rowing and canoeing. A recent paleopathological study (Storto et al. 1999) found signs of endemic diseases, indicative of sedentism and relatively dense populations.

Consideration of sambaquis within regional approaches of settlement analysis and efforts to understand their societal significance (e.g., Barreto 1988; Gaspar 1991) focused attention on the contemporaneity of mounds in the same region and the implications for interaction. Linkages among the social groups associated with massive sambaquis are revealed by patterns of intervisibility within regional landscapes and their status as landmarks from vantages on land, sea, and lagoon (Gaspar 1989). As issues of social complexity have come to the fore and excavations have amassed new data, perspectives on sambaqui cultures have changed from a singular emphasis on nomadic, highly mobile shell fish collectors (who eventually intensified fishing) to a recognition of denser, sedentary societies that evolved toward more complex patterns of social organization (DeBlasis et al. 1998; Lima and Mazz 2000; Gaspar 2000). The massive sambaquis, now frequently regarded as monuments impregnated with symbolic meaning, are viewed as the result of socially articulated effort involving mortuary ritual and a cult of ancestors (Fish et al. 2000; Gaspar 2000). Investigators discuss evidence for social inequality and territorial configurations (Storto et al. 1999; Lima and Mazz 2000; Gaspar 2000; Fish et al. 2000) as well as trans-regional ideological systems (DeBlasis 2005).

The prolonged and widespread sharing of fundamental cultural patterns exhibited in sambaquis indicates intense, sustained interaction among the corresponding communities. Major shifts in cultural trajectories are not apparent, and there is no appreciable evidence for interaction and exchange with inland hunters and gatherers of other cultural traditions (for rare exceptions, see Miller 1969 and Figuti et al. 2004), or with subsequent ceramic people, until after 2000 BP. Regional differences, to the extent that they exist, have not been systematically defined. In view of this notable economic and social stability and the absence of competing developments in coastal environments, Gaspar (1994) has proposed that sambaquis are the product of homogenous societies, probably with a shared ethnic identity, that were differentiated from other hunter-gatherer traditions of the adjoining highlands from middle to late Holocene times.

Both pervasive burials and extensive food remains characterize almost all investigated sambaquis throughout Brazil's central and southern coast (Gaspar 1998). Even if some were not domains reserved exclusively for the dead, the importance of shell mounds as burial places persisted for millennia. The study of sambaquis as mortuary structures is recent and has opened new avenues for archaeological inquiry. Just prior to

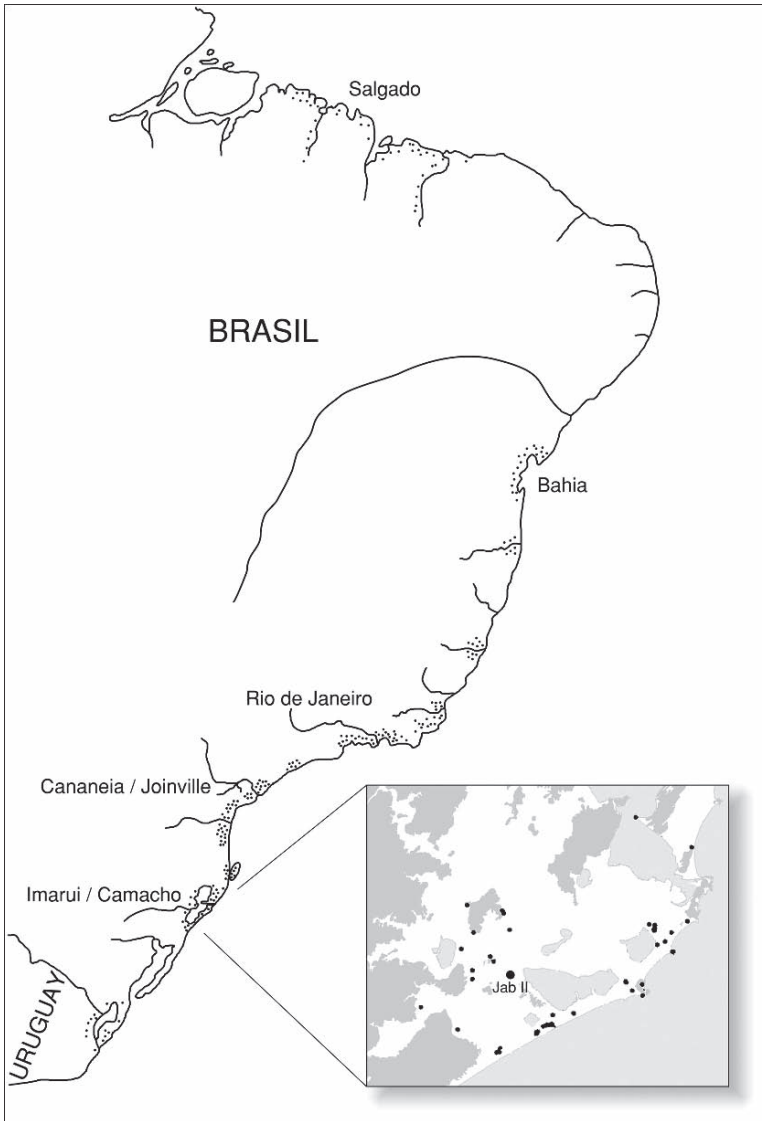
the implementation of this perspective, investigators demonstrated that some sambaquis were intentionally built, overturning the traditional assumption that even the massive ones originated with successive camping, but not yet addressing the decisive role of mortuary ritual in building processes (Afonso and DeBlasis 1994; DeBlasis and Afonso 1999; DeBlasis and Gaspar 1992). The towering sambaquis of the southern coasts now have been identified and examined as mortuary monuments within regional settlement systems in the course of a long-term research project in southern Santa Catarina (DeBlasis et al. 1998, 2001; Fish et al. 2000).

## MORTUARY MONUMENTS, TERRITORIES, AND DEMOGRAPHY

In a regional sector bounded by the modern towns of Laguna, Tubarão, and Jaguaruna, early reconnaissance by Rohr (1984) and more recent systematic inventory have outlined a settlement system encompassing 420 km<sup>2</sup>, over 60 sambaquis, and 96 radiocarbon dates between 4500 and 1500 BP (DeBlasis et al. 2004; Eastoe et al. 2002; Fish et al. 2000) (Figure 18.2). An innovative related study by A. Kneip (2004) shows that sambaqui locations as much as 10 km inland today formerly had access to open bays, before the slow, regular lowering of sea level by about 2 m over the last five thousand years. The previous bay and barrier island ecosystems would have been even more favorable than the still very productive but now more fully enclosed lagoons. Clusters of massive shell mounds are associated with current principal lagoons. Initial mounds had appeared in most of these locales by approximately 5000 BP; dates from later mounds end a few centuries after 2000 BP. An intensively dated mound (Jaboticabeira II) in one cluster was built continuously for almost eight hundred years (Fish et al. 2000). Another (Carnaça I) has dates suggesting relatively continuous construction for one thousand years or more (Hurt 1974). In several other cases, a few, more isolated dates from the same mound suggest an even longer time-span, but it is unclear whether the building process was continuous or episodic. In any case, huge sambaquis containing burials persisted in the same locales for more than 3,500 years. The ongoing construction of monumental mounds implies a social system that not only was relatively sedentary but that also continued to imprint its enduring cultural perspective on coastal landscapes.

Excavations at Jaboticabeira II in the vicinity of the Camacho lagoon (Figure 18.3) clarify and add critical details to the results of previous research on monumental sambaquis and their mortuary contents in this region and elsewhere (Fish et al. 2000; DeBlasis 2005). A mid-sized mound among its neighbors, Jaboticabeira II is over 8 m high, covers 90,000 m<sup>2</sup>, and has a volume of approximately 320,000 m<sup>3</sup>. As with most sambaquis of such size, it was heavily mined for modern construction materials prior to legal protection, leaving behind cavities with near-vertical walls throughout the mound. Long profiles documenting about 250 m<sup>2</sup> of these cuts reveal the repetition of many smaller, internally mounded sequences beginning about 2500 BP. Thicker shell layers are interspersed with thin, dark layers rich in charcoal, burned fish bone, and other organic materials. Careful sampling to test the entire mound attests that the formation processes involved in these sequences are cumulatively responsible for the construction of the mound as a whole.

With few exceptions, burials are grouped into discrete funerary areas that recur throughout the height and breadth of Jaboticabeira II, originating on the thin, dark layers. These funerary areas are interpreted as the designated burial locations for specific affinity groups, whose membership was based on kinship, territorial affiliation, or other social



**Figure 18.2.** Location of sambaquis along the coast of Brazil. Enlargement of the Camacho Study Area in Santa Catarina. Note the association of sambaquis with lagoons. (Maria Dulce Gaspar)

principles. A horizontal excavation of 36m<sup>2</sup> within a funerary area confirmed that the corresponding dark layers are successive occupation surfaces, sometimes with localized shell pavements and always with numerous postholes in the vicinity of the burials. Posts encircled some burial pits and similarly demarcated whole funerary areas. Additional posts may have supported miniature structures over graves (as in ethnographic practices), suspended offerings, marked the graves, or served still other purposes.

Bodies usually were interred in shallow pits closely accommodating the tightly flexed remains and offerings, but there are rare instances of extended burials. Multiple burials,



**Figure 18.3.** Excavations at Jaboticabeira II, Santa Catarina. The horizontal exposure is 36 m<sup>2</sup>. (Maria Dulce Gaspar)

frequently a combination of adult and child, were common. Secondary burials were the rule, with bodies apparently prepared by desiccation and wrapping elsewhere before transport to the site. Because of this prior preparation, all those who died over some interval may have been transported at a prescribed time and interred by the affinity group with coordinated and communal ceremony. Treatments of the bodies were not consistently performed but included covering with red pigment, removal of few specific bones, and the addition of a few bones from other individuals. Typical artifact offerings, when present, were utilitarian items of shell, bone, and stone; shell and bone jewelry; small sets of rounded pebbles; and sometimes, large stone objects placed near the head.

During the interment ceremonies, and also during later visits to the grave, hearths surrounding and overlying the burial pits were lit and large quantities of food were consumed. The debris of fires and feasting is responsible for the dark color and organic composition of the occupation layers in funerary areas. Fish species are predominant among food refuse, but land and sea mammals and birds (for example, armadillo, tapir, monkey, whale, dolphin, penguin, duck) also occur, often as intentional placements. Complete fish and other intact faunal remains on occupation surfaces around graves and in graves suggest food offerings (Klökler 2001). Although fish bone is abundant across the surfaces and in grave fill, the highest concentrations usually occur immediately above the burials, conforming to expectations for mortuary feasts.

After some specified period, an affinity group ceased to add burials to its funerary area and it was then “closed” and covered by heaped shell. The appreciable quantities of shell mounded over occupation surfaces required procurement elsewhere and transport to the site. Ensuing funerary areas were established on subsequent surfaces atop previous shell



deposits in an extended process of both horizontal and vertical accretion. The ritual program of burial, feasting, and mounding of shell over a former funerary area was re-enacted over centuries, incrementally giving rise to the ultimate huge volume and monumental appearance of the sambaqui (Fish et al. 2000).

The western part of Jaboticabeira II is capped by up to 2.5 m of “black earth” deposits that cover many other sambaquis in the same manner. In this dark earthen cap, the same general stratigraphic structure as before was maintained, but shell is a minor and localized component; burned fish bone and charcoal are abundant. Both lithic and bone artifacts appear to be more common than in the lower shell layers, although they do not occur in configurations denoting activity areas. Burials continued and are even more concentrated. This final dark earthen phase dates approximately between 2000 and 1700 BP, both here and at another sambaqui in a neighboring cluster. Because of the continuity in mortuary function, researchers consider the whole of Jaboticabeira II to be a long-standing (about 800 years, from 2500 to 1700 BP) communal funerary structure or cemetery (Fish et al. 2000).

The monumental sambaquis enclose impressive numbers of bodies. Preliminary estimates extrapolated from the large profile sample at Jaboticabeira II conservatively indicate around 0.137 burials per m<sup>3</sup>, for a total of nearly 43,000 people interred in this mound over 800 years (Fish et al. 2000). Burial rate estimates per m<sup>3</sup> from three previously excavated sites with sufficient quantified information (Beck 1972; Castro Faria 1952; Mendonça de Souza 1995; Hurt 1974; Bryan 1993; see Fish et al. 2000 for this comparison) produce equally high or even higher burial totals. These demographic figures, even if rough estimates, are indicative of relatively sizable and stable populations in a delimited surrounding area rather than the traditionally presumed “bands of nomadic shellfish collectors.” As most of the huge sambaquis in the region appear to have served funerary purposes, a substantial overall population density is indicated. During the interval of active burial, each of these monumental sambaquis would have represented the cemetery for a prescribed hinterland territory (perhaps analogous to the named fishing communities today). The presence of multiple contemporary sambaquis in the same regional sector suggests territorial circumscription and related economic intensification, based on rich lagoon resources and some possible cultivation in later times.

The towering sambaquis built around the productive Camacho lagoon for almost 3,500 years bespeak conditions conducive to sedentism and population growth. GIS analysis of visibility among mounds based on height and positioning shows the lagoon as the center and probable focus of intense boat interactions, as well as a common space and collective provisioning territory (A. Kneip 2004). Net fishing techniques point to strong social interchanges among communities around the lagoon [Note 3].

## THE END OF THE SAMBAQUI ERA

In the best-studied areas in Santa Catarina and Rio de Janeiro, mound building tended to intensify towards the end of pre-ceramic times, apparently due to population growth. By about 2000 BP, there was a noticeable decrease in the use of shell and a switch to dark earth in final building stages. Cultural transitions correspond to this change in construction material. After the seventeenth century BP, monumental mound building processes ceased. Cemetery sites appeared with low earthen mounds over the graves. Both in the final earthen layers of sambaquis and these sites with small earthen mounds, ceramics are frequently present, usually in very small amounts (Rohr 1984; Schmitz et al. 1993, 1996; Fish et al. 2000;

for an exceptional site that extends significantly later in time and has abundant pottery in upper layers, see Bryan 1993).

Ecological transitions likewise are evident at the end of the sambaqui era. According to the curve for sea level changes in southern Santa Catarina (A. Kneip 2004; Angulo et al. 2005), the enclosure of open bays proceeded, involving the reduction of mangrove vegetation, and shellfish, and marine fish and mammals in the later lagoons. An increase in typical lagoon fish species in the upper layers of Jaboticabeira II (Klökler 2001) is a likely correlation. In combination with cultural change, the decreased use of shells for mound building may be related to decreased availability, particularly of berbigão. Also about 2,000 years ago, cultural change accelerated across central and eastern South America. Archaeological evidence throughout Brazil points to the expansion of agricultural societies and the emergence of complex systems of social organization, usually termed chiefdoms, especially along the Amazon River axis and its peripheries. Agriculturalists had arrived in central Brazil and on the southern coast by that time, and were undoubtedly involved in the disappearance of sambaqui traditions, although contact and assimilation varied across this very large area; in fact, northern sambaqui societies of the Salgado coast experienced this contact and transition by the fifth millennium BP (Simões and Correa 1971).

In the state of Rio de Janeiro, a long contact period with Ge-speaking and other external groups (archaeologically indicated by Una ceramics) appears to have generated transitional sites (Cordeiro 2004). On the southern coast, the newly established cemetery sites with low earthen mounds have Itararé/Taquara ceramics attributed to southern Ge-speaking groups (Rohr 1984; Bryan 1993). Inhabitants of these transitional sites no longer constructed monuments and followed different funerary rituals, but the technological and typological characteristics of their lithic and bone artifacts remained mostly unchanged from sambaqui predecessors, as did their intensive exploitation of aquatic resources. Although evidence is not yet strong for cultivation during the sambaqui era, dental evidence and the presence of ceramics convince most authors that these transitional sites were fully agricultural.

Tupi-speaking tribes also challenged long-lived sambaqui cultural domains on the southern coast at this time. Historical linguistics indicates that a Tupi diaspora (archaeologically indicated by diagnostic polychrome pottery) originated in Amazonia, although Brochado's (1984) comprehensive archaeological model for such a diaspora has not yet been confirmed by consistent evidence. It is likely that Tupian newcomers forcefully absorbed former sambaqui territories, as their villages and campsites never co-occur with the terminal construction phases of shell mounds or culturally transitional sites. Ritually sanctioned aggression, including warfare and ceremonial cannibalism, was the basis of Tupi political power (Silva et al. 2004: 11) among widespread post-contact groups. Apparently at a very fast pace, they achieved technological and demographic superiority, becoming the dominant occupants of the coastal zones (see Chapter 33 in this volume). Ethnographically described as superb fishers, it is very likely that they incorporated the remarkable fishing technology that had supported sambaqui societies.

## CONCLUSION: FROM SAMBAQUIS TO SAMBAQUI SOCIETIES

What we know about the people who constructed sambaquis is almost wholly derived from these specialized sites linked with burial. The shell mounds provide direct information on technology and subsistence but also offer bases for reconstructing the builders' societies.

The mortuary program that resulted in mound building must have played a decisive role in societal structure and dynamics. The nature of feasting has great potential for disclosing cultural characteristics and social relationships (Dietler and Hayden 2001). Furthermore, mortuary observances are privileged arenas for displaying political or prestige power and negotiating or reinforcing solidarity and cooperation. The prolific consumption and discard of food around individual burials and throughout a funerary area suggests that the affinity group interring their dead invited the participation of a larger social network in mortuary ceremonies. They expended surpluses to maintain and expand connections or to negotiate and regulate power and prestige, thus promoting interactions and integration of a broader regional scope.

Formalized systems of social inequality are not apparent in mortuary treatments. Funerary areas are collective and isolated burials are few. Distinctions that might relate to social categories or status are infrequent rather than regularly encountered, but include a painted clay covering placed over a body, shell deposited over an occasional individual grave as well as over whole funerary areas, and much greater than usual volumes of shell mounded over particular funerary areas. A few recorded instances of rare stone effigies as burial accompaniments are potentially a potent form of differentiation. The probable religious connotation of zooliths and their restriction to individual burials in a few sambaquis likely signifies the emergence of ritual power, exercised within the framework of ideology and territoriality underlying mortuary ritual and funerary landmarks.

Broadly shared similarities in sambaqui bone, shell, and lithic industries, as well as building processes have been interpreted as the outcome of interactions all along Brazil's coast, probably based on common linguistic and social grounds (Gaspar 1991, 1998). Evidence for another aspect of such a pan-regional network comes from the stylistic and ideological implications of zooliths and related stone objects. They are made in an elegant, schematic, and homogeneous style over a distance of around 2,000 km from the Cananéia/Iguape region southwards to Uruguay, always in association with coastal sambaquis or cerritos (Prous 1977).

The frequent precision in depicting recognizable species morphology (Figures 18.4, 18.5) could be described as "hyper-realistic," and is evocative of iconographic and symbolic meaning. Zooliths include effigies of land and sea species such as whales, dolphins, sharks, penguins, turtles, bats, felines, armadillos, eagles, other varied birds and fish and, very occasionally, humans. As representations of entities belonging simultaneously to the material and spiritual worlds, zooliths may represent ancestors, founders, mythical culture heroes, or even deities of a shared cosmology. In the context of other broadly shared sambaqui patterns, their standardized style is commensurate with the emergence of a pan-regional ideology and adds to the impression of a unique and unified cultural expression along the entire southern coast.

Ideological principles appear to have permeated sambaqui culture. Constantly reenacted in funerary rituals involving the offering and consumption of abundant food, these precepts would have been decisive in structuring sambaqui societies and in the development of economic and social complexity without the emergence of explicit mechanisms for rank and hierarchy. Where shell mound distributions have been mapped and initially dated, it is possible to detect territorial configurations among contemporary sambaquis. Spatial and demographic parameters not only would have promoted sedentism but also, given the long duration of regional occupations, the emergence of increasingly complex systems of communal production and social relationships.

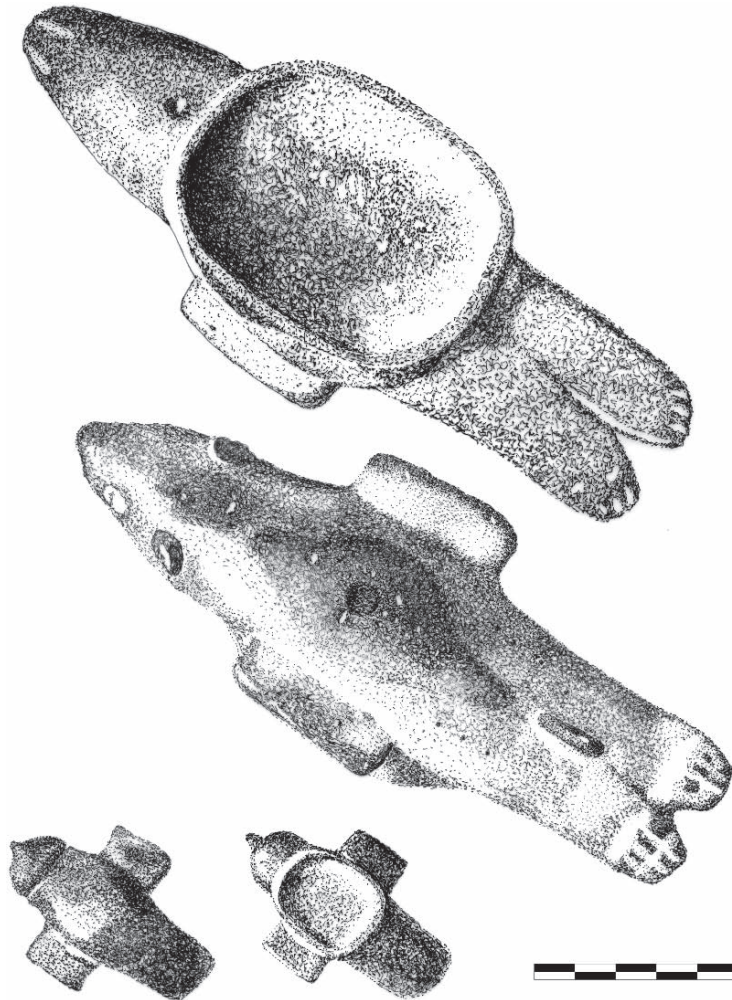


Figure 18.4. Zooliths from Santa Catarina. (Maria Dulce Gaspar)

Ceremonialism in funerary areas, involving the larger networks of affinity groups, also fits this interpretation.

Huge shell mounds were unequivocal landmarks, visible over long distances from land or water. The imposing mass of sambaquis imparted a similar obtrusive quality to the enclosed ancestors or founders, making them a constant presence in surrounding communities and reaffirming territorial rights grounded in these predecessors. Funerary monuments encoded a symbolic lexicon shared by fishing communities all along the Brazilian coast. Their construction embodied the ideological foundations of sambaqui societies that endured for millennia until the arrival of agriculturalists.



Figure 18.5. Zooliths from Santa Catarina. (Maria Dulce Gaspar)

## NOTES

1. In Brazil archaeological sites and collections, even in cases of private land, are considered federal property, regulated and supervised by the National Historical and Artistic Heritage Institute (IPHAN), a federal agency for the management of archaeological and historical sites and museums.
2. By far the most common species in the sambaquis is berbigão (*Anomalocardia brasiliana*, Gmelin 1791), and also *Ostrea* sp., *Lucina pectinata* (Gmelin 1791), *Brachinodontes* sp., *Thais haemastoma* (Linnaeus 1767), among others.
3. Gaspar conducted ethnoarchaeological studies of traditional fishing communities around the Camacho lagoon today. The lagoon is still very productive, readily providing residents with resources for subsistence and sale at the market. Fishing technologies and strategies also likely parallel those of the sambaqui era, involving small boats, cooperative groups, and distribution among participants. Another important finding of this study is the role of shellfish in the diet: although almost always available (and used), shellfish never constitute a staple but are usually consumed as a side dish or in a sauce accompaniment. Significantly, shells, particularly berbigão, are still valued as building material, especially for paving to enhance drainage and stability.

## REFERENCES

- Afonso, Marisa C. and Paulo DeBlasis, 1994, Aspectos da formação de um grande sambaqui: alguns indicadores em Espinheiros II, Joinville, SC. *Revista do Museu de Arqueologia e Etnologia* 4: 21–30. Museu de Arqueologia e Etnologia da Universidade de São Paulo.
- Angulo, Rodolfo, Guilherme C. Lessa and Maria Cristina de Souza, in press, A critical review of mid- to late-Holocene sea level fluctuations on the eastern Brazilian coastline. *Quaternary Science Reviews*. Elsevier.
- Arnold, Jeanne E., 1996, The archaeology of complex hunter-gatherers. *Journal of Archaeological Method and Theory* 3 (2): 77–126.
- Bandeira, Dione da Rocha, 1992, Mudança de estratégia de subsistência. O sambaqui Enseada II – um estudo de caso. Dissertação de Mestrado. Universidade Federal de Santa Catarina, Florianópolis.
- Barbosa, Márcia, Maria Dulce Gaspar and Débora R. Barbosa, 1994, A organização espacial das estruturas habitacionais e distribuição dos artefatos no sítio Ilha da Boa Vista I, Cabo Frio, RJ. *Revista do Museu de Arqueologia e Etnologia* 4: 31–38. Museu de Arqueologia e Etnologia da Universidade de São Paulo.
- Beck, Anamaria, 1972, A variação do conteúdo cultural dos sambaquis, litoral de Santa Catarina. Tese de Doutorado. FFLCH da Universidade de São Paulo.
- Barreto, Christiana Nunes Galvão de Barros, 1988, A ocupação pré-colonial do vale do Ribeira do Iguape, SP: os sítios concheiros do médio curso. Dissertação de Mestrado. Faculdade de Filosofia, Letras e Ciências Humanas da Universidade de São Paulo.
- Brochado, Jose J., 1984, An Ecological Model of the Spread of Pottery and Agriculture into Eastern South America. Ph.D. dissertation. University of Illinois, Urbana.
- Bryan, Alan, 1993, The Sambaqui at Forte Marechal Luz, State of Santa Catarina, Brazil. In *Brazilian Studies*, edited by Alan L. Bryan and Ruth Gruhn. Center for the Study of the First Americans, Oregon State University, Corvallis.
- Calderón, Valentín, 1964, O Sambaqui de Pedra Oca. Instituto de Ciências Sociais, 2. Universidade da Bahia, Salvador.
- Calippo, Flávio R., 2004, Os sambaquis submersos de Cananéia: um estudo de caso de arqueologia subaquática. Dissertação de Mestrado. Museu de Arqueologia e Etnologia.
- Castro Faria, Luiz de, 1952, Le problème des sambaquis du Brésil: récentes excavations du gisement de Cabeçuda (Laguna, Santa Catarina). *XXX Congresso Internacional de Americanistas*, pp. 86–91. London.
- \_\_\_\_\_, 1955, A formulação do problema dos sambaquis. In *Atas do XXXI Congresso Internacional de Americanistas*, edited by H. Baldus, pp. 569–577. Ed. Anhembi, São Paulo.
- Cordeiro de Oliveira, Jeanne, 2004, A Primeira Face da Tradição - os Goitacá - da História e Identidade dos que não deitaram letras. Tese de Mestrado. Programa de Pós-Graduação e História Social Universidade Severino Sombra.
- DeBlasis, Paulo, 2005, Os sambaquis vistos através de um sambaqui. Tese de Livre-Docência. Faculdade de Filosofia, Letras e Ciências Humanas da Universidade de São Paulo.
- \_\_\_\_\_, and Marisa C. Afonso, 2000, Indicadores de complexidade nos grandes sambaquis do litoral sul do Brasil: o caso de Espinheiros II, Joinville. In *Arqueologia de las Tierras Bajas*, edited by A. D. Coirolo and R. B. Boksar, pp. 341–352. Comisión Nacional de Arqueología/Ministerio de Educación y Cultura, Montevideo.
- \_\_\_\_\_, Sabine Eggers, Marta Lahr, Levy Figuti, Marisa C. Afonso and Maria Dulce Gaspar, 1998, Padrões de assentamento e formação de sambaquis em Santa Catarina. *Revista do Museu de Arqueologia e Etnologia* 8: 319–321.
- \_\_\_\_\_, Suzanne K. Fish, Maria Dulce Gaspar and Paul R. Fish, 1998, Some references for the discussion of complexity among the sambaqui moundbuilders from the southern shores of Brasil. *Revista de Arqueologia Americana* 15: 75–105. Instituto Panamericano de Geografía e Historia, Mexico.
- \_\_\_\_\_, and Maria Dulce Gaspar, 2001, O sistema de assentamento dos sambaquis da região da lagoa do Camacho, Santa Catarina: uma primeira aproximação. In *Arqueologia do Brasil meridional*, edited by Arno A. Kern and Klaus Hilbert. PUCRS (publicação digital), Porto Alegre.
- DeMasi, Marco A. Nadal, 1999, Mobilidade de caçadores coletores pré-históricos na costa sulbrasileira. Ph.D. dissertation. Stanford University.
- Dias, Jr., Ondemar Ferreira, 1972, Síntese da pré-história do Rio de Janeiro, uma tentativa de periodização. *Revista de História* 1 (2): 75–83. Rio de Janeiro.
- Dietler, Michael and Brian Hayden (eds.), 2001, *Feasts. Archaeological and Ethnographic Perspectives on Food, Politics and Power*. Smithsonian Institution Press, Washington, D.C.
- Duarte, Paulo, 1968, *O Sambaqui visto através de alguns Sambaquis*. Instituto de Pré-História da Universidade de São Paulo.

- Eastoe, C.J., S. Fish, P. Fish, M. D. Gaspar and A. Long, 2002, Reservoir corrections for marine samples from the South Atlantic coast, Santa Catarina State, Brazil. *Radiocarbon* 44 (1): 145–148.
- Empereire, Joseph, 1955, Informations préliminaires sur les sambaquis du littoral de São Paulo. *Anais do XXXI Congresso Internacional de Americanistas*, edited by H. Baldus, 2: 603–612. Ed. Anhembi, São Paulo.
- \_\_\_\_\_ and Annette Laming, 1955, Les sambaquis de la côte meridionale de Brésil: compagnes de fouilles (1954–1956). *Journal de la Société de Américanistes* 45: 5–163. Paris.
- Fernandes, José Loureiro, 1955, Os sepultamentos no sambaqui de Matinhos. *Anais do XXXI Congresso Internacional de Americanistas*, edited by H. Baldus, 2: 579–602. Ed. Anhembi, São Paulo.
- Figuti, Levy, 1992, Les sambaquis COSIPA (4200 à 1200 ans BP): étude de la subsistance chez les peuples préhistoriques de pêcheur-ramasseurs de bivalves de la côte centrale de l'état de São Paulo. Dissertação de doutoramento. Institut de Paléontologie Humaine, Muséum National d'Histoire Naturelle de Paris.
- \_\_\_\_\_, 1993, O homem pré-histórico, o molusco e o sambaqui: considerações sobre a subsistência dos povos sambaquieiros. *Revista do Museu de Arqueologia e Etnologia* 3: 67–80. Museu de Arqueologia e Etnologia, Universidade de São Paulo.
- \_\_\_\_\_ and Daniela M. Klokler, 1996, Resultados preliminares dos vestígios zooarqueológicos do sambaqui Espinheiros II (Joinville, SC). *Revista do Museu de Arqueologia e Etnologia* 6: 169–188. Universidade de São Paulo.
- \_\_\_\_\_ et al., 2004, Investigações arqueológicas e geofísicas dos sambaquis fluviais do vale do Ribeira de Iguape, Estado de São Paulo. Relatório final à FAPESP.
- Fish, Suzanne K., Paulo DeBlasis, Maria Dulce Gaspar and Paul R. Fish, 2000, Eventos incrementais na construção de sambaquis, litoral sul do Estado de Santa Catarina. *Revista do Museu de Arqueologia e Etnologia* 10: 69–87.
- Gaspar, Maria Dulce, 1991, Aspectos da Organização de um Grupo de Pescadores, Coletores e Caçadores: Região Compreendida entre a Ilha Grande e o Delta do Paraíba do Sul, Estado do Rio de Janeiro. Tese de Doutorado, Faculdade de Filosofia, Letras e Ciências Humanas da Universidade de São Paulo.
- \_\_\_\_\_, 1994, Datações, construção de sambaqui e identidade social dos pescadores, coletores e caçadores. *Anais da VIII Reunião Científica da Sociedade de Arqueologia Brasileira* 1:377–398. EDIPUCRS, Porto Alegre.
- \_\_\_\_\_, 1998, Considerations of the sambaquis of the Brazilian coast. *Antiquity* 72: 592–615.
- \_\_\_\_\_, 2000, *Sambaquis. Arqueologia do litoral*. Jorge Zahar Editora, Rio de Janeiro.
- \_\_\_\_\_ and Paulo DeBlasis, 1992, Construção de sambaquis. *Anais da VI Reunião Científica da Sociedade de Arqueologia Brasileira* 2: 811–820. Rio de Janeiro.
- Giannini, Paulo César F., 1993, Sistemas deposicionais no Quaternário Costeiro entre Jaguaruna e Imituba, SC. Tese de Doutorado. Instituto de Geociências, Universidade de São Paulo.
- Hurt, Wesley R., 1974, The interrelationship between the natural environment and four sambaquis, coast of Santa Catarina, Brasil. *Occasional Papers and Monographs* 1. University of Indiana Museum, Bloomington.
- \_\_\_\_\_ and Oldemar Blasi, 1960, O sambaqui do Macedo, Paraná, Brasil. *Arqueologia* 2. Universidade Federal do Paraná, Curitiba.
- Iriarte, José, I. Holst, O. Marozzi, C. Listopad, E. Alonso, A. Rinderknecht, and J. Montana, 2004, Evidence for cultivar adoption and emerging complexity during the mid-Holocene in the La Plata basin. *Nature* 432: 614–617.
- Klökler, Daniela Magalhães, 2000, Construindo ou deixando um sambaqui? Análise de sedimentos de um sambaqui do litoral meridional brasileiro – processos formativos, região de Laguna, SC. Dissertação de Mestrado. Museu de Arqueologia e Etnologia, Universidade de São Paulo.
- Kneip, Andreas, 2004, O Pavo da Lagoa, Uso do SIG para Modelamento e Simulação na Área Arqueológica do Camacho. Tese de Doutorado, Faculdade de Filosofia, Universidade de São Paulo.
- Kneip, Lina Maria, 1977, Pescadores e coletores pré-históricos do litoral de Cabo Frio, RJ. Coleção Museu Paulista, série *Ensaio* 2: 145–169. Museu Paulista da Universidade de São Paulo.
- \_\_\_\_\_, 1992, As habitações 1 e 2 do sambaqui da Pontinha (Saquarema, RJ). *Anais da VI Reunião da Sociedade de Arqueologia Brasileira* 2: 730–737. Rio de Janeiro.
- Krone, Ricardo, 1905, Contribuição para a etnologia paulista. *Revista do Instituto Histórico e Geográfico de São Paulo* 7: 471–481. São Paulo.
- \_\_\_\_\_, 1914, Informações ethnographicas do vale do rio Ribeira de Iguape. *Exploração do rio Ribeira de Iguape*, pp. 23–34. Comissão Geográfica e Geológica (Typographia Brazil de Rothschild e Cia), São Paulo.
- Lacerda, J. B., 1885, O homem dos Sambaquis, contribuição para a antropologia brasileira. *Arquivos do Museu Nacional* 6: 175–204. Rio de Janeiro.

- Ladislao Netto, A., 1882, A origem dos Sambaquis. *Revista Experimental de Antropologia Brasileira* 1(1):1–37.
- Lima, Tania Andrade, 1991, Dos mariscos aos peixes: um estudo zooarqueológico de mudança de subsistência na pré-história do Rio de Janeiro. Tese de Doutorado. FFLCH, Universidade de São Paulo.
- \_\_\_\_\_, 1995, Ocupações pré-históricas em ilhas do Rio de Janeiro. *Arqueologia do Estado do Rio de Janeiro*, edited by M. C. Beltrão, pp. 95–104. Arquivo Público do Estado do Rio de Janeiro.
- \_\_\_\_\_ and José M. L. Mazz, 2000, La emergencia de complejidad entre los cazadores recolectores de la costa atlántica meridional sudamericana. *Revista de Arqueologia Americana* 17, 18, 19: 129–175. Instituto Panamericano de Geografía e Historia, Mexico.
- Loefgren, A., 1893, Contribuições para a Archeologia Paulista: os Sambaquis de São Paulo. *Boletim Comissão Geográfica* 9: 1–91. SP, São Paulo.
- Martin, L., K. Suguio, and J. M. Flexor, 1986, Relative sea-level reconstruction during the last 7,000 years along the states of Paraná and Santa Catarina coastal plains: additional information derived from shellmiddens. *Quaternary of South America and Antarctic Peninsula*, edited by J. Rabassa, 4: 219–236. A.A. Balkema Publishers, Rotterdam.
- Mendonça de Souza, Alfredo A. C., 1981, *Pré-história fluminense*. Instituto Estadual de Patrimônio Cultural, Rio de Janeiro.
- Mendonça de Souza, Sheila M. F., 1995, Estresse, doença e adaptabilidade. Estudo comparativo de dois grupos pré-históricos em perspectiva biocultural. Tese de Doutorado. Escola Nacional de Saúde Pública/Fundação Oswaldo Cruz, Rio de Janeiro.
- Miller, Eurico T., 1969, Resultados preliminares das escavações no sítio pré-cerâmico RS-LN-1: Cerrito Dalpiaz (abrigo sob rocha). *Iheringia* 1: 45–112. Porto Alegre.
- Neves, Walter A. et al., 2005, A new early Holocene human skeleton from Brazil: implications for the settlement of the New World. *Journal of Human Evolution* 48:403–414.
- Price, T. D. and J. A. Brown (eds.), 1985, *Prehistoric Hunters-Gatherers: The Emergence of Cultural Complexity*. Academic Press, San Diego.
- Prous, André, 1977, Les sculptures zoomorphes du sud brésilien et de l'Uruguay. *Cahiers d'Archéologie d'Amérique du Sud* 5. École des Hautes Études en Sciences Sociales, Paris.
- \_\_\_\_\_, 1992, *Arqueologia Brasileira*. Universidade Federal de Brasília, Brasília.
- \_\_\_\_\_ and Walter Piazza, 1977, Documents pour la préhistoire du Brésil méridional 2: l'état de Santa Catarina. *Cahiers d'Archéologie d'Amérique du Sud* 4. Ecole Haute Etudes en Sciences Sociales, Paris.
- Rohr, João Alfredo, 1984, Sítios arqueológicos de Santa Catarina. *Anais do Museu de Antropologia* 17: 77–168. Universidade Federal de Santa Catarina, Florianópolis.
- Roosevelt A. C., M. Imazio, S. Maranca, and R. Johnson, 1991, Eighth millennium pottery from a shell midden in the Brazilian Amazon. *Science* 254: 1621–1624.
- Sassaman, Kenneth, 2004, Complex hunters-gatherers in evolution and history: a North American perspective. *Journal of Archaeological Research* 12 (3): 227–280.
- Scheel-Ybert, Rita, 1998, Stabilité de l'écosystème sur le littoral sud-est du Brésil à l'Holocène Supérieur (5500-1400 ans BP). Les pêcheurs-cueilleurs-chasseurs et le milieu végétal: apports de l'anthracologie. Ph.D. dissertation. Université Montpellier-Sciences et Techniques du Languedoc.
- \_\_\_\_\_, 2000, Vegetation stability in the southeastern Brazilian coastal area from 5500 to 1400 14C yr BP deduced from charcoal analysis. *Review of Palaeobotany and Palynology* 110: 111–138.
- \_\_\_\_\_, 2001, Man and vegetation in southeastern Brazil during the late Holocene. *Journal of Archaeological Science* 28: 471–480.
- Schmitz, Pedro Ignacio, 1987, Prehistoric hunters and gatherers of Brazil. *Journal of World Prehistory* 1 (1): 53–126.
- \_\_\_\_\_, Ivone Verardi, Marco A. N. De Masi, Jairo H. Rogge and André L. Jacobus, 1993, Escavações arqueológicas do Pe. João Alfredo Rohr, S.J.: o sítio da Praia das Laranjeiras II, uma aldeia da tra-dição ceramista Itararé. *Pesquisas* (Antropologia) 49.
- \_\_\_\_\_, Ana Luiza V. Bitencourt and Ivone Verardi, 1996, Escavações arqueológicas do Pe. João Alfredo Rohr, S.J.: Laranjeiras I, Pântano do Sul, Cabeçudas e visão de conjunto dos sítios Tapera, Armação do Sul, Laranjeiras I e II, Pântano do Sul e Cabeçudas. *Pesquisas* (Antropologia) 53.
- Simões, M.F. and C.G. Correa, 1971, Pesquisas arqueológicas na região do Salgado (Pará) - a fase Areão do litoral de Mariparim. *Boletim do Museu Paraense Emílio Goeldi* 48: 1–30. Belém.
- Silva, F.A., E. G. Neves, P. DeBlasis, 2004, Beleza, rigor e dignidade: a cultura material Tupi no tempo e espaço. *Conjunto Cultural da Caixa* 1–31. Museu de Arqueologia e Etnologia –Universidade de São Paulo.



- Storto, Camila, Sabine Eggers, and Marta M. Lahr, 1999, Estudo preliminar das paleopatologias da população do sambaqui Jaboticabeira II, Jaguaruna, SC. *Revista do Museu de Arqueologia e Etnologia* 9: 61–71. Museu de Arqueologia e Etnologia, Universidade de São Paulo.
- Tenório, Maria Cristina, 1991, A Importância da Coleta de Vegetais no Advento da Agricultura. Dissertação de Mestrado. IFICS, Universidade Federal do Rio de Janeiro.
- Wiener, Carlos, 1876, Estudos sobre os sambaquis do sul do Brasil. *Arquivos do Museu Nacional* 1: 1–20. Rio de Janeiro.