

THE ARCHAEOLOGY OF  
LOWER CENTRAL  
AMERICA

EDITED BY  
*Frederick W. Lange*  
AND  
*Doris Z. Stone*

A SCHOOL OF AMERICAN RESEARCH BOOK  
*University of New Mexico Press • Albuquerque*

Library of Congress Cataloging in Publication Data

Main entry under title:

The Archaeology of Lower Central America.

(School of American Research advanced seminar series)  
"A School of American Research book."

Papers presented at an advanced seminar held Apr. 8-14, 1980.

Bibliography: p.

Includes index.

I. Indians of Central America—Antiquities—Congresses. 2. Central America—  
Antiquities—Congresses. I. Lange, Frederick W., 1944- . II. Stone, Doris,  
1909- . III. School of American Research (Santa Fe, N.M.) IV. Series.

FI1434.A84 1983 972.8'01 83-21747

ISBN 0-8263-0717-5

© 1984 by the School of American Research.

All rights reserved.

Manufactured in the United States of America.

Library of Congress Catalog Card Number 83-21747.

International Standard Book Number 0-8263-0717-5.

First Edition

Dedicated to the memory of a pioneer  
in Central American archaeology,  
SAMUEL KIRKLAND LOTHROP

## The Greater Nicoya Archaeological Subarea

FREDERICK W. LANGE

*Department of Anthropology  
University of Colorado, Boulder*

This chapter examines similarities and differences among some sites and localities in the Greater Nicoya Archaeological Subarea (fig. 7.1) and broadly analyzes processes of ecological adaptation and cultural evolution as we presently understand them. Specifically, it assesses ecological influences on settlement pattern, the role of internal and external trade as cultural stimuli, and the overall limits placed on economic-political-social development. Common cultural characteristics present throughout the region continue to make "Greater Nicoya" as originally defined by Norweb (1961) a useful concept, but it is necessary to range north (Sheets, this volume; Healy, this volume), south, and southeast (Snarskis, this volume) to place Greater Nicoya patterns in a systemic areal context.

From north to south, reports on the following regions have been utilized: the interlakes area in Nicaragua (Wyckoff 1974); Ometepe Island (Haberland 1966b, 1978); the Isthmus of Rivas (Norweb 1961, 1964; Healy 1974b, 1980a); the Bay of Salinas and Rio Sapo areas (Lange 1971b); the Santa Elena Peninsula (Coe 1962a; Sweeney 1975); the Bay of Culebra (Abel 1978; Lange 1978; Lange and Abel-Vidor 1980); the Rio Sabalo area (Murray and Jess 1976); the Tempisque River (Lines 1936a; Baudex 1963, 1967; Hoopes 1979; Day 1982); the Tamarindo area (Coe 1962a; Sweeney 1975); the Guanacaste-San Carlos corridor from the Tempisque Valley to the

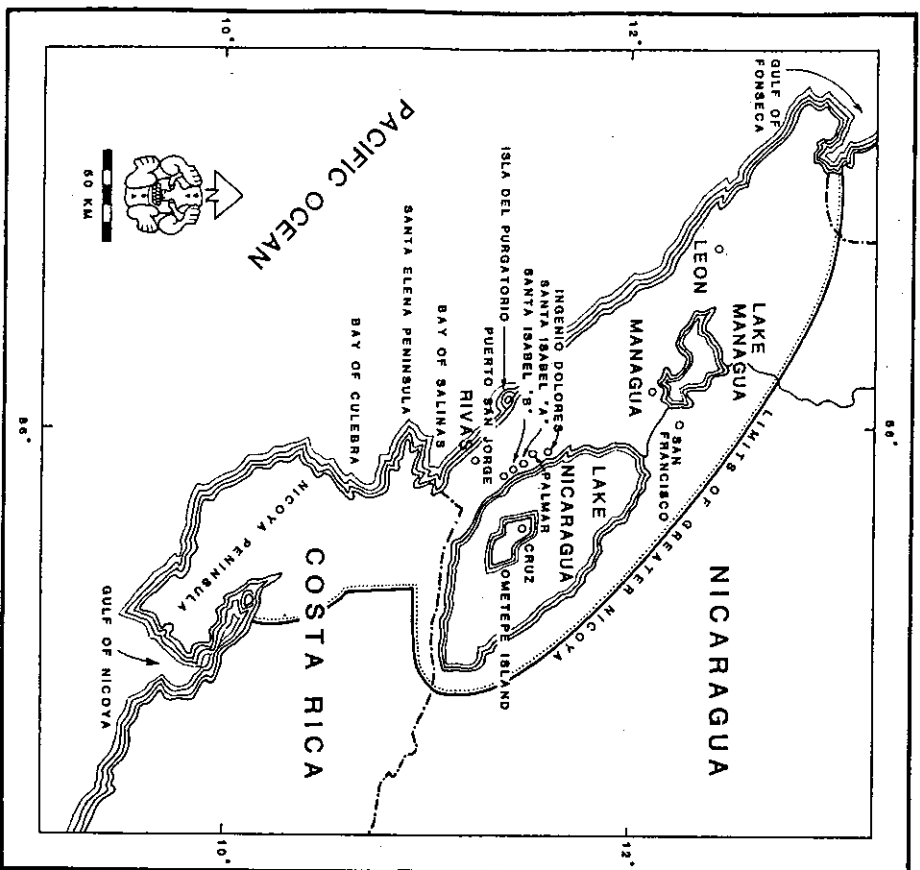


Figure 7.1. The Greater Nicoya archaeological subarea and sites in its northern sector (Nicaragua).

Atlantic watershed (Finch 1977; Dawson 1979; Nott 1979a, 1979b; Creamer 1979; Ryder 1980); the Nosara Valley (Lange et al. 1974); the Gulf of Nicoya (Robison 1979; Creamer 1980, 1983); Barrahonda (Laurencich de Minelli 1975, 1979); and the Nicoya Peninsula (Herra n.d.). Some of the reports focus on isolated sites, while work in the Rio Sapoa, the Bay of Salinas, the Bay of Culebra, the Guanacaste-San Carlos corridor, the Gulf of Nicoya, and the Nosara Valley was based on controlled systematic surveys.<sup>1</sup>

The Vidor site on the Bay of Culebra has been extensively excavated; principal published references are: Abel 1978; Lange 1978; Accola 1978a, 1978b; Moreau 1979, 1980; Kerbis 1979, 1980; Bernstein 1980; Vazquez and Weaver 1980; and Abel-Vidor 1980a. To the south and east, reports by Snarskis (1978), Snarskis and Blanco (1978), and Finch and Honetschlager (n.d.) have been utilized to broaden the contextual setting. Many of the above authors attempted regional syntheses as part of their reports; the most complete overviews have been written by Ferrero (1977) in Spanish and by Stone (1977) in English. All segments of the relevant chronological sequence have been recently reviewed and revised (Accola 1978a, 1978b; Healy 1980a; Lange 1980a, 1980b); see Lange and Abel-Vidor (1980; fig. 3) for a summary.

Despite general areal unity, significant distribution differences in some ceramic types exist, as well as differing patterns of cultural development, subsistence orientation, and degrees of impact by external influences. Taking these differences into account, we distinguish a northern sector and a southern sector in the Greater Nicoya area. The former was focused on the inland Nicaraguan lakes (fig. 7.1) and the latter on the plains and coastal bays of northwestern Guanacaste Province, Costa Rica (fig. 7.2). Both archaeological and documentary data seem to support this distinction (Abel-Vidor 1981a; Healy 1980a). This division into northern and southern sectors illustrates the buffer-zone or frontier nature of the area (Lange 1979a). Abel-Vidor (1981) has suggested that the term *interaction sphere* (Caldwell 1964) may be more appropriate.

Greater Nicoya is south of the distribution of even minor public architectural remains, and there have been no demonstrated physical intrasite distinctions setting off ceremonial from other activity areas or separating an elite from more common people. The absence of architecture also makes it somewhat more difficult to establish site hierarchies. Settlement data suggest that areal hierarchies may be more appropriate. The absence of architectural remains also means that various researchers (including myself in the following synthesis) have focused on ceramics,<sup>2</sup> lithics, human skeletal remains, inter-site spatial relationships, faunal and molluscan remains, and soil and morphological studies incorporating natural history data.

### Period I: ?–8000 B.C.

The Paleo-Indian period was a major research focus in some earlier field investigations in northwestern Costa Rica (Lange 1969), but relevant data remain almost nonexistent. The so-called Hartman point, identified by Swauger and Mayer-Oakes (1952), is still a lonely example, and even its provenience is uncertain. The area may have been so dry that it was not suited to habitation by the fauna these hunters relied on. Espinoza's (1976) claim of a Paleo-Indian site in Pacific Nicaragua is of doubtful authenticity, while Snarski's data from near Turrialba (1979b, this volume) suggest that such sites may more likely be found in lush, non-Pacific coastal environments. However, the apparent geographical distribution may simply reflect the limitations of the data.

### Period II (ca. 8000–4000 B.C.)

An area near the Bay of Salinas designated the Rio Antiguo (Murray 1969; Lange 1971b) had a number of sites with exclusively lithic artifact assemblages, although no temporally diagnostic artifacts were present. At the time of the research no comparable materials existed elsewhere in Central America, and the landowner's objections prevented any actual excavations. Morphologically, these lithic artifacts (fig. 7.3) have proven to be different from those found in association with ceramic-period materials and to be generally comparable to the lithic assemblages reported by Ranere (1976, 1980a, 1980b) from Panama. The placement of the Rio Antiguo materials is still somewhat tentative but more certain than it was a decade ago.

The impact of subsequent natural events on the archaeological record from this time period should also be considered. Radiocarbon-dated contexts bearing Zoned Bichrome-period ceramics (Aguilar, Abel-Vidor, personal communication; Sheets n.d.) have been found deeply buried under volcanic deposits in the Lake Arenal region of the cordillera section of Guanacaste. Also, as noted in chapter 3, in the Bagaces area of Guanacaste, in a higher, lush habitat more suited to late Pleistocene fauna, the Costa Rican Electric Company (ICE) secured two radiocarbon dates slightly in excess of 10,000 B.P. from test drillings for geothermal exploration. Both dates came from beneath the same lava flow, some 12–15 kilometers apart, one more than 33 meters below surface and the other 15 meters or so below surface. The total flow is considerably wider than the distance between the two samples. No sites of earlier or contemporaneous date will readily be found under this or similar flows; while not totally explaining our paucity of early cultural data, this is one contributing factor. There are no known sites in Greater Nicoya dating from Period III (ca. 4000–1000 B.C.).

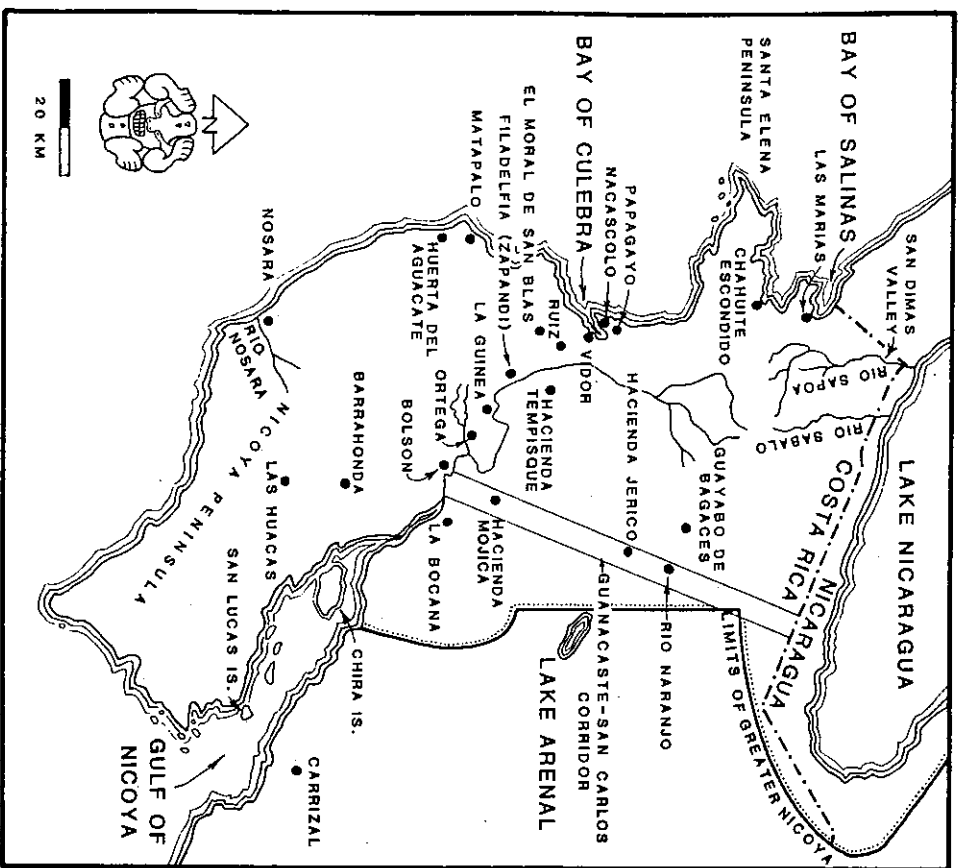


Figure 7.2. The Greater Nicoya archaeological subarea and sites in its southern sector (Costa Rica).

## Period IV (ca. 1000 B.C.-A.D. 500)

The Olmec are often thought to have been present during the Formative period in Greater Nicoya, but no supporting archaeological evidence exists. Various items of portable art bearing unmistakable Olmec motifs are attributed to the following sources: (a) post-Olmec prehistoric trade; (b) modern introduction into the Greater Nicoya area; or (c) pre-Columbian recycling of jade materials for reworking. Balsler (1974, 1980) suggested that later people imported finished jade objects from Mesoamerica to replenish depleted local sources, or that the Olmec expansion into the Greater Nicoya area was oriented toward control of the Nicoya jade sources.

Current data suggest, although not conclusively, that there were no jade sources in Greater Nicoya; most so-called jade artifacts are made of non-jade material readily available and, hence, not a stimulus for long-distance trade (Lange, Bishop, and von Zeist 1981). The lack of jade sources would rule out one basis for Olmec desire to control the area, and Pohlentenko (1981) has summarized available data indicating that significant Olmec presence in Greater Nicoya is unlikely.

Coe and Baudez (1961) first described the Zoned Bichrome period for Guanacaste, defining it temporally from 300 B.C. to A.D. 300. Until very recently, this continued to be the earliest known ceramic period, despite subsequent research in many other Pacific coastal locations. Haberland (1966b, 1969: 232) felt that the Angeles phase on Ometepe Island and the presence of Schettel Incised in the San Dimas Valley (Lange 1971b: 131) represented earlier Zoned Bichrome phases. This evidence was generally considered inconclusive because of an absence of confirming comparative sequences, lack of relevant radiocarbon dates, or incompletely published data.

The physical composition of the majority of excavated coastal sites has also presented a problem in most research. Coastal sites in Guanacaste are characterized by large shell middens, and it is the intermixed mass of shell, potsherds, adobe, faunal material, and other cultural debris that is most impressive as excavation progresses downward. Prior to roughly A.D. 400-500, the shell does not occur, and without the protective context of the midden, faunal material (both marine/estuarine and terrestrial) ceases to be preserved. The cultural sequence, however, continues deeper, and it is from these levels at Vidor (up to 6.5 meters below surface) that the earlier data came.

Reexamination of excavation reports by Coe and Baudez (1961), Baudez (1967), and Sweeney (1975) suggests that failure to recover more than a trace of earlier data resulted from the time and labor limits imposed on deep testing the sites they reported. This was also true for my own work at Las Marias (1971b: 91).

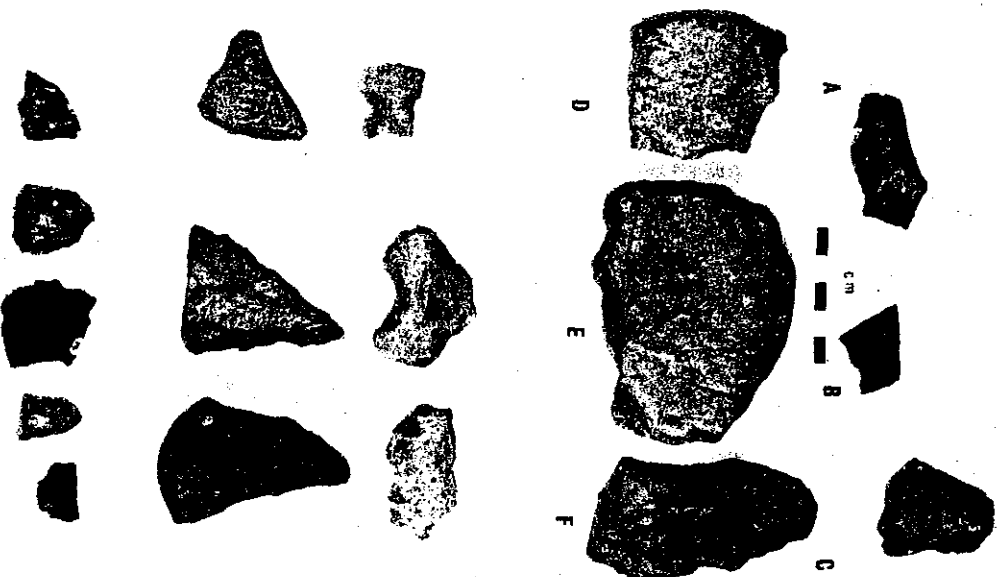


Figure 7.3. Archaeic lithic artifacts from near the Rio Antiguo locale, Guanacaste Province, Costa Rica.

Prior to 1975 most archaeological data from Greater Nicoya for the Zoned Bichrome period were from cemeteries, stratigraphic test contexts, and light surface scatters. The size of the cemeteries suggested large villages, but they were not readily apparent. At Vidor we encountered earlier levels underlying almost the entire site, demonstrating the existence of extensive habitation sites contemporaneous with the cemeteries.

Cultural contexts earlier than 300 B.C. have begun to appear in recent excavations. First, Snarkis reported one date as early as 1500 B.C. (with others clustering around 500 B.C. [appendix 6]) for the La Montaña complex on the Atlantic watershed of Costa Rica (1978: 105-6). More recently, a single date of 800 B.C. (appendix 3) was obtained at the Vidor site from a feature containing ceramics modally similar to those of La Montaña. A date (UCLA 2163) of 300 B.C. (appendix 3) was also obtained from the Rio Naranjo area along the Guanacaste-San Carlos continuum (Norr 1979b), again with modally similar ceramics. The Guanacaste ceramics show a general stylistic relationship to other Formative Zoned Bichrome ceramics present throughout Nuclear America.

Lange (1980a) has revised the Zoned Bichrome-period sequence based on excavations at the Vidor site and on reexamination of excavation data from other sites. The 800 B.C. date can also be considered only a current best effort, and earlier Formative ceramic complexes must eventually be found. Healy (1980a) has published the most recent cultural historical/ceramic sequence for the area, and should be referred to for detailed descriptions and illustrations of individual ceramic types.

The Zoned Bichrome period at the Vidor site was divided into three phases: the Loma B phase, roughly 800 B.C. to 300 B.C. and characterized by Bocana Incised Bichrome; the Orso phase, from roughly 300 B.C. to A.D. 300 and characterized by Rosales Zoned Incised, Ballena Incised, Tamino Incised, and Zelaya Painted (Bichrome variety) types; and the final Mata de Uva phase, from approximately A.D. 300 to A.D. 500 and characterized by Tola Trichrome, Guinea Incised, and Zelaya Painted (Trichrome variety). This new ordering fits well with previous sequences from the Greater Nicoya subarea. Not all significant cultural changes are paralleled by ceramic changes, and during this northwestern Costa Rican Formative period, important shifts in settlement and subsistence were occurring while the ceramics changes apparently evolved rather slowly.

Ceramics of the Loma B phase at Vidor have some modal similarities with the earliest so far identified in the intermontane Rio Naranjo area along the Guanacaste-San Carlos corridor and in certain examples of the La Montaña complex on the Atlantic watershed. They also were present in the Chombo phase on the Santa Elena Peninsula, in Minelli's work at Barrahonda, in the Aviles phase in Rivas, and in the Angeles phase on Ometepe Island—all demonstrating the broad distribution of a common

cultural base. Bocana Incised Bichrome is pan-regional at this time, with the Toya variety most characteristic of the northern sector, and the Bocana variety most characteristic of the southern sector.

These people adapted to multiple ecological settings, but there is no evidence of utilization of marine mollusca. At Vidor and other sites, insufficient evidence exists to assess other subsistence practices. The horizontal extent of Loma B-phase materials at the Vidor site indicates a relatively large and settled population. Adobe-lined hearths and ovens are present. No mortuary data are available.

The succeeding Orso phase at Vidor is also well represented at other sites throughout the area (the San Jorge phase in Rivas and on Ometepe; the Chombo phase on the Santa Elena Peninsula/Bay of Salinas; the later Catalina phase on the Tempisque River; at Barrahonda and the Monte Fresco phase in the Matapalo area). Rosales Zoned Incised was a pan-regional type at this time, but it is not found frequently in the intermontane zone; Puerto Black/Red was characteristic of the northern sector, and Zelaya Painted (Bichrome variety) was characteristic of the southern sector. Close modal parallels are seen between El Bosque ceramics from the Atlantic coast and Zelaya Painted. Mortuary patterns from the phase reflect social stratification, with some graves containing finely made Rosales Zoned Incised ceramics, ornamental metate seats, and accompanying jades. The social stratification reflected in the mortuary patterns indicates that at least low-level chiefdoms had evolved by this time. Some of the population lived in permanent, year-round settlements, while others appear to have practiced a "restricted wandering" (Beardsley et al. 1955: 136) pattern. Artifacts indicative of subsistence practices continue to be rare, and inferences based on these limited data should be carefully considered.

The final Formative Mata de Uva phase at Vidor (A.D. 300 to A.D. 500) is also reflected throughout the region (the San Roque phase on the Isthmus of Rivas and on Ometepe Island; the Murcielagos phase on the Santa Elena Peninsula/Bay of Salinas; the Ciruelas phase in the Tempisque Valley; the Las Minas phase in the Tamaindo area), and at Hacienda Jerico, Rio Naranjo, and Hacienda Mojica along the Guanacaste-San Carlos corridor. At Vidor and other coastal sites in Costa Rica, we see not only a ceramic shift to nascent polychromes, but an adaptive change—the shift to exploitation of marine resources (Lange 1978: 109). This subsistence shift stimulated coastal settlement, population growth, and cultural elaboration. The preserving contexts of the shell middens also provide us with a fuller picture of pre-Columbian life from this time onward.

Las Marias on the Bay of Salinas, Chahuite Escondido on the Santa Elena Peninsula, many sites around the Bay of Culebra, and Huerta del Aguacate and Matapalo near Tamaindo all have shell middens arranged loosely around open plaza areas (fig. 7.4). Cemeteries are found consistently

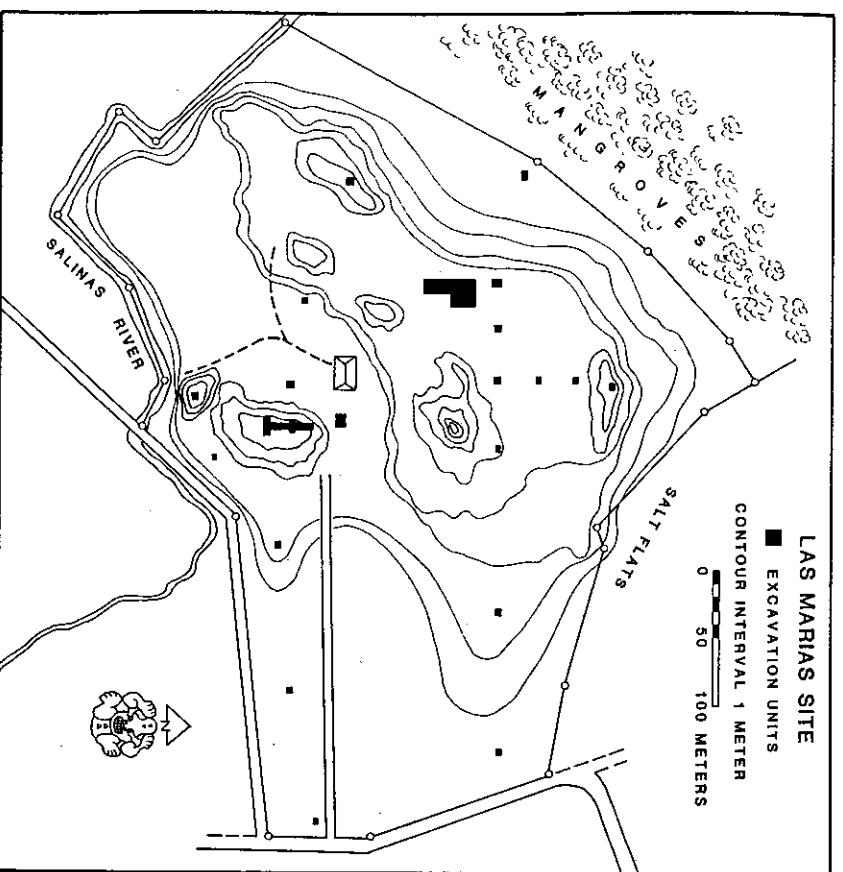


Figure 7.4. Las Marias site, Bay of Salinas. Typical configuration of coastal Guanacaste shell midden sites, with middens surrounding central plaza areas.

beneath these plazas, but no real architectural remains have been located. Some Middle and Late Polychrome mounds were superimposed on earlier burial locations, but the mounds were not used for burials.

Tola Trichrome and Charco Black/Red were pan-regional during this phase. Puerto Black-on-Red was characteristic of the northern sector, and Guinea Incised, Zelaya Painted, and Marbella Zoned Impressed were characteristic of the southern sector. Guinea Incised has strong Costa Rican Atlantic coastal analogs, as did Bocana Incised Bichrome and Zelaya Painted earlier in the period.

Mortuary customs from this time are known from limited examples. Inverted urn burials with infant and possibly fetal burials were found at

Vidor (fig. 7.5) and Chahuite Escondido. Excavations at Hacienda Mojica (Ryder 1980) near the Tempisque Valley produced an extensive cemetery almost exclusively from this period. No skeletal remains were preserved, but Tola Trichrome, Guinea Incised, Charco Black/Red, and Carrillo Polychrome vessels were prominent as grave offerings. No ornamental metates or jades were found. Ryder also noted a higher percentage of Atlantic ceramics at Mojica than had been found previously at any other site in Guanacaste.

At the Bolson site on the western side of the Tempisque, Bauder (1967: 304-5) excavated a cemetery from this period containing artifactual material similar to that from Mojica, but with skeletal material preserved. No analysis was made of the osseous remains. Day (1982) reported mortuary remains from this period from Hacienda Tempisque.

Burials at Hacienda Jerico, Guayabo de Bagaces, and Rio Naranjo along the Guanacaste-San Carlos corridor were in mounds filled with, and covered by, large river cobbles. These rock/rubble mounds are considered characteristic of Atlantic coastal rather than Pacific coastal mortuary patterns.

The only other extensive cemetery excavations from this period were those conducted by Hartman at Las Huacas early in the century (1907). Here, multiple tombs were found, the majority with more than one interment and most graves accompanied by metates, occasional mace heads, and jades. In contrast to Mojica, Las Huacas yielded only a few ceramic ocarinas and vessels, but no polychromes. On the basis of extensive pothunting, this same burial pattern is known from the Nosara Valley, but no controlled excavations have been carried out. The various elements in the burial complex, especially as they compare with broader distribution of particular artifacts, merit brief discussion, as they reflect patterns of social ranking.

The so-called metates are a misnamed component of the burial complex. Despite the thousands that have been recovered from mortuary contexts, very few have been found with manos. Other contextual and associated data have led Lothrop (1926), Lange (1971c), Bauder (1976b), and M. Graham (1979) to conclude that the metates found are ceremonial stools, thrones, seats, or "seats of power," rather than utilitarian items. Multiple functions must also be considered. Snarskis (this volume) has a somewhat different interpretation of this class of artifacts based on Atlantic coast data.

Mace heads have traditionally been referred to as war clubs. Until recently very little attention was paid to the contexts in which they were found, primarily because the vast majority were pothunted. Beginning with a reanalysis of Hartman's Las Huacas excavations (Lange 1971c), where the mace heads were found with the ceremonial seats, a number of mace heads were reported in mortuary contexts in the central highlands of Costa Rica (Snarskis 1979a). The discovery of a very similar mortuary complex at Grecia (also in the central highlands) and de la Cruz's analysis (1981) of mace





Figure 7.5. Infant urn burial, Vidor site, Bay of Culebra, Costa Rica (photo by Ricardo Vazquez L.).

heads found on the Atlantic watershed, in the central highlands, and in Guanacaste make it conclusive that these mace heads were symbols of rank, of clans, or of status. Almost identical forms are repeated across the country and indicate social and hereditary ties among geographically dispersed upper classes.

Jadeite artifacts, or artifacts of jadeite-like stone, are frequently found in burial contexts, often lying on the ceremonial seats, and are also associated with mace heads. We now are almost certain that some of these artifacts were made from imported stone or were imported already made, while others are locally produced. We cannot say whether the difference between the foreign and locally obtained stones indicates differences between the buried individuals, but the foreign jadeite artifacts displaying clearly identifiable Mayan or Izapan motifs may, in fact, denote special relationships between the deceased and foreign political, economic, or social partners. Taken as a complex, the ceremonial stool/mace head/jade combination symbolizes persons of status within the society, and suggests that the status was at least partially derived from access to exotic goods or contacts with foreign persons and that persons of status in the southern sector of Greater Nicoya interacted with persons of similar status in other parts of Costa Rica.

Carrizal, an extensively looted mortuary/habitation site dating to this time period from the eastern lowlands of the Gulf of Nicoya, yielded no Guanacaste ceramic types, but it revealed many types previously undescribed for Costa Rica. Ceremonial seats were present, and potters reported finding jade. Modal similarities with Carrillo Polychrome, Zelaya Painted, and Guinea Incised ceramics were present.

External trade at this time is indicated by the jadeite utilized in the manufacture of offerings found with numerous burials. While serpentine and other diopside-like raw materials were found in Costa Rica, no sources of jadeite have yet been identified. The closest indicated source is in Guatemala (Lange, Bishop, and von Zelst 1981), and a large number of specimens still cannot be related to any specific source.

In addition to the general Formative zoned bichrome techniques found in this period, a number of ceramic indicators suggest ties with other areas. These are almost entirely stylistic similarities rather than actual trade items. From the north, the influence of Usulután Ware is seen in various combed types in the Greater Nicoya area, and Usulután Ware seems to be quite similar to Rosales Zoned Incised; from the south, similarities are seen with Scarified Ware and Santa Maria Polychrome from Panama. A few trade pieces of Usulután Ware are present in Costa Rica. By the end of the Zoned Bichrome period in northwestern Costa Rica, the bases for further developments were firmly laid.

#### Early Period V (A.D. 500–800)

On the Bay of Culebra, the Early Polychrome period is the later part of Accola's (1978a: 145) Culebra phase, distinguished ceramically by Carrillo Polychrome, Galo Polychrome, Chavez White-on-Red, and Potosi Appliqué. His sequence started with the Culebra phase, and the initial levels showed blurring from the preceding Mata de Uva phase. Regionally, this corresponds with the Palos Negros phase (Rivas and Onetepe), the Santa Elena phase, Santa Elena/Bay of Salinas, the San Bosco phase (Tempisque) and the Matapalo phase (Tamarindo).

In general, sites from this period are more oriented to the coast (ocean or lake), and we are beginning to see the influence of marine resources on site location. Kerbis (1979: 38) noted that during this period, "the first [intensive] exploitation of molluscan faunas as well as the subsequent trends toward marine vertebrate exploitation" occurred.

Polychrome ceramic decoration became prominent; Galo Polychrome and Chavez White-on-Red are pan-regional at this time; no predominant types are characteristic of the northern sectors, while Carrillo Polychrome continues to characterize the southern sector. Galo Polychrome vessels reflect the Uluá-Yopoa region of Honduras, but they are local imitations rather

than imports. Careful comparative analysis of decorative motifs, as well as the paste itself, will be necessary to solve this problem. A few Urua marble vases have also been found in Costa Rica, and these are definitely trade items. An occasional negative-resist vessel from Costa Rica's Central Valley is found at this time.

Two stuccoed polychrome vessels found by pothunters on the Bay of Culebra, one a cylindrical, slab-footed vessel with Tlaloc motifs and the other a double bird effigy false whistling jar, were definitely introduced from foreign sources, most probably the Guatemalan highlands. The Bay of Culebra in general and the site of Nacascolo in particular were established as a trade enclave by this time. Excavations during 1980 at Nacascolo found numerous adobe oven complexes from this period (Vazquez, personal communication).

A Maya jade was also found in the cemetery at Las Huacas. We see southern materials moving north, and Panamanian/Costa Rican gold work has been found in El Salvador (Bray 1977). However, as in the preceding period, the actual number of foreign source objects is quite limited. The presence of socially stratified mortuary remains and foreign trade objects indicates that the chiefdom structure noted in the preceding Formative period continued. There is no evidence for further evolution of the chiefdom level of organization; for example, on the basis of present settlement survey data, it is not possible to distinguish between any primary and secondary sites. As noted earlier, areas and regions seem to have been more important than individual sites.

#### Late Period V (A.D. 800-1000) and

#### Early Period VI (A.D. 1000-1200)

These periods are represented by two ceramic phases on the Bay of Culebra. Accola (1978b) took the initial step, dividing the period into an earlier Panama phase (A.D. 800 to A.D. 1000) and a later Monte del Barco phase (A.D. 1000 to A.D. 1200), with an approximately 30-centimeter-thick volcanic ash layer separating the two phases at the Vidor site. These correspond to the earlier Apompuca and later La Virgen phases in the Isthmus of Rivas, to the single Doscientos phase on the Santa Elena Peninsula/Bay of Salinas and the single Palo Blanco phase in the Tempisque Valley. Accola feels that similar divisions can be made in the Tempisque and Santa Elena data. A brief reexamination of the Bay of Salinas data lends additional support to the division as do Healy's data from Rivas.

In the Middle Polychrome period, we see heavy dependence on marine resources and accumulation of large middens, some of which served as the bases for residences or other structures (as evidenced by daub fragments), while others were only garbage heaps. The refuse in these middens generally

reflects mollusca gathering from the mud-flat and near-offshore areas with fish remains from the same niches. Kerbis (1979) does not feel that open water sailing or any particular technological expertise was necessary to obtain pelagic tuna. During this period we note an increase in significant differences between the northern and southern sectors of the Greater Nicoya archaeological subarea. The evidence is most obvious in ceramics and subsistence activities.

Ceramically, the Papagayo and closely related Pataky Polychrome ceramics have a northern sector concentration, and the Mora-Birmania-Santa Maria-Atliplano ceramics are typical of the southern sector. Papagayo Polychromes have strong similarities to Las Vegas Polychrome from the Lake Yoia area of Honduras (Bauduz and Becquein 1973: 313) and are similar to trade ceramics found at Tula by Diehl et al. (1974). Persons familiar with both the Nicoya Polychromes and Las Vegas Polychrome agree with the opinion that the ceramics found at Tula are definitely not Nicoya in origin, and probably are Las Vegas (Bauduz, personal communication; J. Day, personal communication). This does little to alter the significance of Diehl's trade network argument vis-a-vis Tula, but it does correct a factual error and redirect the pertinent trade vectors.

While Papagayo Polychrome does occur in Costa Rica and is quite prominent in northwestern Guanacaste, it has a limited extension to the south and east and decreases significantly as one descends the Tempisque River. Also, Papagayo is not found in Atlantic coast and central highland trade/mortuary contexts with anywhere near the frequency of the Mora-Birmania-Atliplano group. Papagayo styles in Nicaragua also demonstrate distinctive differences in polychrome treatment and a broader elaboration of decorative motifs than is seen in Costa Rica. Based on extensive study of the collection from Hacienda Tempisque and other collections and on compositional analyses done at Brookhaven National Laboratory, Day and Bishop can distinguish between Papagayo vessels made in Nicaragua and local imitations made in Costa Rica (Day 1982). On the other hand, representative specimens of the Mora-Birmania-Atliplano group are all but absent from collections from Nicaragua.

Both the Mora-Birmania-Atliplano group and Papagayo group occur infrequently in the Costa Rican Central Valley and on both Costa Rican and Nicaraguan Atlantic watershed sites, but there are practically no examples of Atlantic Coastal ceramics traded to the west. As Stranskis pointed out (this volume), the Costa Rica Central Valley is culturally considered part of the Atlantic watershed, even though hydrologically it is part of the Pacific. There is a continuous pattern of nonmutual ceramic exchange between the Atlantic and Pacific throughout the known chronological sequence and, during the Middle Polychrome period, even an absence of the modal decorative similarities between the two areas which were apparent in Bocana

Incised Bichrome, Guinea Incised, and Zelaya Painted in preceding periods. This may be a result of the overwhelming dominance of polychromes in the Greater Nicoya area during this time.

A major interpretive problem remains—the absence of polychromes from the Atlantic watershed. Some limitations were placed on Atlantic Polychrome production by the absence of suitable pigments, but it remains to be explained why trade across relatively short distances was either restricted or rejected. Where Mora Polychrome and Papagayo Polychrome are present in non-Guanacaste mortuary contexts (Snarskis and Blanco 1978), there are indications that their presence can be interpreted as offerings by social or political partners, or family members, from that area and not simply trade goods that were placed in the graves. This is similar to Adams's model (1971) for a major burial at Alzar de Sacrificos, and I feel that it is applicable here as well (Lange 1980c).

Mortuary data from these periods are known from single and multiple primary burials at La Guinea excavated by Baudiez (1967) and by Hoopes (1979). Some primary single burials were also recovered at Vidor (Vazquez and Weaver 1980). Semiarctulate multiple burials, usually containing one central figure and the associated elements of numerous other individuals (fig. 7.6), have been excavated from Middle Polychrome contexts at four different sites on the Bay of Culebra. Some individuals were accompanied by fine polychrome pottery and trade goods such as copper bells, while others have had multiple ceramic offerings of varying quality (Wallace and Accola 1980). One individual exhibited tooth filing, a trait, also noted by Stone (1977: 68), that apparently reflected Mexican influence. A semiarctulate burial from the same time period was reported by Baudiez from the La Guinea cemetery (1967: 303). Stone (1977) reported a similar burial from El Moral de San Blas, and Lines also reported (1936a) a multiple burial from Zapandi on the Tempisque, but the human skeletal data are very sketchy in both cases.

While daub remnants from wattle and daub structures of the Middle Polychrome period have been recovered previously from many mound and midden contexts in the Greater Nicoya subarea and the midden profiles also revealed what have been considered living surfaces, the unstable nature of the midden context has prevented the careful excavation of a horizontal living floor. Hoopes (1979) has made a valuable contribution in his excavations at La Guinea; he not only increased our knowledge of mortuary behavior, but he discovered and reported on a habitation structure found with the cemetery. The house had a packed sand floor, indoor hearths, and was supported by poles covered with daub. He also described the recovery from inside the house of a bone implement referred to locally as a "cacho" and similar to what Flannery called a "piscador" in Oaxaca (1976: 37). Linares (1980: 139, citing personal communication from R. Cooke) notes



Figure 7.6. Multiple burial, Nacascolo, Bay of Culebra, Costa Rica (photo by Henry Wallace).

similar implements from central and western Panama. Hoopes (1979) also described the presence of a large shell, which, based on comparison with historical accounts, might possibly have been used as a hoe. If properly interpreted, the presence of both these implements in a domestic context would indicate the use of maize. Although Hoopes did not recover botanical evidence for corn, analyzed skeletal material from the Late Polychrome skeletal material from La Guinea (Norr 1980) indicates a 69 percent dietary dependence on maize.

Though difficult to determine from the published data, the emphasis on mollusca exploitation and fishing does not seem to have been nearly as intensive in Nicaragua as it was in Costa Rica. In Nicaragua documentary sources for the succeeding Late Polychrome period indicate an important emphasis on agriculture, but excavation data do not yet support this. The Guanacaste landscape presents different opportunities and challenges from those of the Isthmus of Rivas, and there are natural limitations on agriculture. The artifact evidence for agriculture is very limited. Whole manos and metates have not been found in domestic contexts anywhere in Greater Nicoya—except La Guinea—during these periods, and many fragments that are recovered have been reworked into nutting stones—pestles and mortars

used to exploit locally available nuts, berries, and acorns. Even the presence of manos and metates is not conclusive evidence of agriculture, since many other uses for these implements are recorded in the Southwestern and Mesoamerican ethnographic literature. Conclusive evidence for agriculture is also absent from Nicaragua, and lithic evidence is surprisingly sparse, as Healy (1974b: 452) noted:

Chipped stone was rarer than ground stone in Rivas. In actuality, neither was especially plentiful in comparison to the quantities of stone artifacts from Mesoamerican proper. [With reference to Seibal] . . . the paucity of the Lower Central American materials was rather strikingly pointed out, considering we were dealing with seven sites in contrast to one Maya site. Not only were there four or five times as much Maya material in sheer bulk quantity, but the diversity and quality of tool types . . . was notable, especially in light of the natural stone resources of Rivas versus the Maya lowlands.

People were raising agricultural crops, regardless of the archaeological evidence, but either their relative importance in the diet or methods of preparation were such that the artifactual data are extremely sparse. Also, the primarily vertical excavations carried out to date do not yield household patterns in which such artifacts might be encountered. However, the total amount of excavation that has been done, vertical and horizontal, has yielded almost nothing but broken implements, and no blanks or other indications that manufacture and utilization of agriculturally related implements was taking place have been found.

Evidence of foreign trade during this period includes a limited number of Tohil Plumbate vessels and occasional copper artifacts such as the bell found with the Nacascolo multiple burial (Wallace and Accola 1980). Although none have been recovered from scientific excavations in the Greater Nicoya area, almost all known plumbate vessels (perhaps less than a dozen in total) are said to have come from the Bay of Culebra zone. One obsidian blade was recovered from Middle Polychrome contexts at the Vidor site, while other examples of obsidian blade fragments and flakes have been surface collected or recovered from looters' backdirt at this and other sites. Obsidian is found only in very limited quantities in the Greater Nicoya area, and trade in this commodity (whose nearest source is apparently in northern Nicaragua and may be as far away as Guatemala) probably began earlier. Mexican traders may well have been seeking cloth dyed with purple dye (Creamer 1983).

In the Bay of Culebra distinctions based on total site area and variations in the material culture recovered from excavations can be made for certain sites. There are differences between sites in terms of quantities and quality of polychrome ceramics recovered from mortuary contexts and the presence or absence of trade items such as plumbate, copper, and obsidian artifacts.

However, whether these differences resulted from the Bay's trade role or from further evolution of the chiefdom organizational structure, in which certain sites became more important than others, cannot presently be discerned. We can say that during the Middle Polychrome period, despite apparent increases in population size and the intersite differentiations noted above, there were no trends in the direction of permanent architecture or other archaeological indicators of collective activity that might indicate more distinct stratification of the social organization. Social evolution appears to have leveled off with chiefdoms at moderate stages of complexity. As Payson Sheets commented during seminar discussions, such leveling off need not indicate stagnation, but possibly a stable-state relationship between environment, population, and social organization.

Large portions of the Greater Nicoya area were apparently only sparsely occupied during this time, and there are no indications of competition or hostility between different groups. Day (1982) indicated that a significant percentage of the ceramics at Hacienda Tempisque pertained to this and the following period.

#### Late Period VI (A.D. 1200–A.D. 1550)

Sites with Late Polychrome components are generally concentrated on or near the many embayments of the northern coast of the Nicoya Peninsula but are absent from the straighter southern Pacific coast and inland areas. Related components are also found on islands in the Gulf of Nicoya and around the periphery of the gulf. Sites from this period are mostly concentrated along the shore of Lake Nicaragua and are relatively infrequent on the Atlantic coast of Costa Rica and Nicaragua (Snarskis, this volume).

This period is represented by the Ruiz phase on the Bay of Culebra, the La Cruz B phase on the Bay of Salinas/Santa Elena Peninsula, and the Alta Gracia phase on the Isthmus of Rivas. Sites from the period are apparently absent from other locations. Late Polychrome materials were quite limited in sites reported by Baudex for the Tempisque Valley (1967) and absent in inland work reported by Murray and Jess (1976) and Norr (1979a, 1979b). Salgado and Day (personal communication) have reported large Late Polychrome concentrations on the Tempisque River just east of the Bay of Culebra, but these are considered to be part of a general coastal system.

Polychrome ceramics reflect external cultural influences from various, and in some cases still unknown, sources. Vallejo Polychrome (fig. 7.7; Baudex 1967; Accola 1978a: 81) reflects Mexican influence and is representative of the northern sector, as is Madeira Polychrome. The exact nature of the cultural contact is still far from clear, but it is suspected that Vallejo Polychrome reflects the Mixteca-Puebla expansions; as Smith and Heath-Smith (1980) have pointed out, the Mixteca-Puebla expansion is a much



Figure 7.7. Vallejo Polychrome (photo by Horace Day).

more complex phenomenon than previously detailed, and utilization as an explanatory device requires careful analysis of a number of different expansions which had different directions, strengths, and purposes.

The Greater Nicoya archaeological sequence provides no definite evidence of major Mexican population movements, such as the site-unit intrusion (Willey et al. 1955) at Kaminaljuyu. The lack of presence may be one reason for the leveling off of cultural evolution in the area. Abel-Vidor has observed (1980b, 1981) that in Greater Nicoya, Mexican trait-unit intrusions (Willey et al. 1955), seen in motifs on certain ceramics and in adaptation of Tlaloc vessels and motifs, have passed through the cultural filtering process that would have taken place during the course of a lengthy, overland dispersal of people from Mexico southward. Site-unit intrusions or more numerous specific trait-to-trait correlations would be expected had movement been via more rapid water routes. While we feel we have evidence that such water contacts did occur, we would currently infer that the primary dispersal of significant cultural traits took place overland.

Murrillo Appliqué (fig. 7.8; Baudéz 1967; Accola 1978a: 75) is a ceramic type characteristic of the southern sector of the area, appearing as a well-defined type without apparent evolutionary roots in other ceramics. While

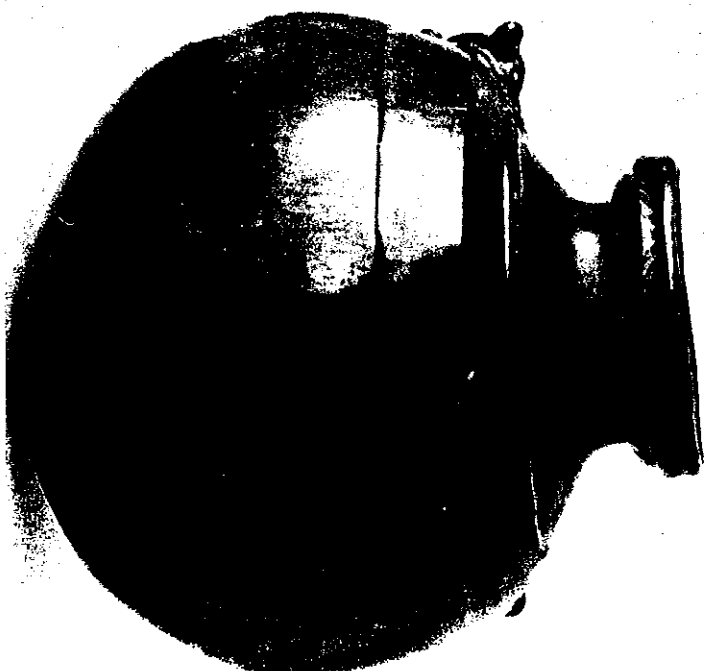


Figure 7.8. Murrillo Appliqué (photo by Horace Day).

the most likely source would appear to be the northern South American Caribbean area, given gross similarities between Murrillo and various appliqué-decorated types present in those areas (Lange 1971b), there has never been any firm evidence for external contacts on the basis of formal similarity. Ceramics illustrated by Linne (1929) do bear substantial resemblance and suggest one potential source area.

Surveys on Isla Caño (Finch and Honetschlager n. d.) on the south Pacific coast of Costa Rica, where Murrillo might be expected if it indeed had southern origins, revealed only a single sherd and a few additional examples of somewhat similar material. Creamer (1980, 1983) reported finding Murrillo on many of the islands she surveyed in the Gulf of Nicoya, as well as ceramics similar to those found on Caño. The island's ceramic assemblage is generally distinct from adjacent coastal assemblages. Creamer's excavations on islands in the gulf have indicated an interesting paucity of polychrome ceramics.

Bramadero Polychrome is also representative of the southern sector during this period. The fact that some types, such as Murrillo Appliqué and Bramadero Polychrome, extend just so far to the north, and other types, such as Jicote Polychrome and Vallejo Polychrome, extend just so far south, crisscrossing the area, again points out that this is indeed a cultural frontier or buffer zone (Lange 1979a), or, following Abel-Vidor's interpretation, reflects the limits of distribution of various elements in an interaction sphere.

Subsistence emphasis at this time in the Bay of Culebra area was on marine mollusca and estuarine fish, with minor emphasis on hunting (Kerbis 1979). Comparative data from Late Polychrome components of the Bay of Salinas and the Santa Elena Peninsula (Sweeney 1975: 456-57) also suggest that hunting was of minimal importance during this period. Agriculture was practiced, although, again, the amount of direct botanical or artifactual evidence is quite limited. The first non-legged, basin-shaped metate recovered from a controlled context in Guanacaste was found at the Ruiz site (Lange 1980b), and one similar specimen was reported from Rivas by Healy (1974b: 440). This form of metate is in a clear minority in contrast to the more elaborate three- and four-legged metates.

In addition to stone cels, lithic materials associated with the Late Polychrome components at the Ruiz site and Las Marias site included metate and mano fragments, many of which had been reworked into nutting stones (Lange 1971b: 53). Stone cels would appear to indicate land-clearing activities related to agriculture, although they may have been used for cutting wood for house construction, firewood, and possible watercraft. Bernstein's (1980) analyses of cels from numerous sites in coastal Guanacaste indicate a variety of uses.

Mortuary data are limited for this period. A multiple secondary burial at Las Marias on the Bay of Salinas, associated with a single Murrillo Appliqué bowl, a multiple burial associated with a zapatero form and other vessels at the Vidor site, and an interment with an undetermined number of individuals at El Moral de San Blas are typical. Filed dental mutilations were observed in this last burial (Stone 1977: 68). Creamer (1980: 5) reported a burial on San Lucas Island in the Gulf of Nicoya that contained "a child interred with three ceramic vessels, the annular base of a polychrome vessel, bone earpools and a necklace of shell beads, drilled human teeth, and a small eagle of gold/copper (*tumbaga*) alloy."

Healy summarized the major trends of the period in Pacific Nicaragua:

The archaeological remains suggest that there were fewer Late Polychrome sites . . . but that these, with numerous low mounds, were larger in overall dimensions than earlier times. . . . The last Rivas period was marked by more numerous and diversified stone tools . . . than previously. There was also a quantum jump in sheer quantity of ceramic remains. Altogether . . . there are strong impressions of a sizable Nicarao population living in nucleated villages. . . . Hunting, fishing, and farming were still important. (1974b: 525-26)

Wyckoff (1973: ms) suggested a major subsistence shift from heavy shellfish reliance in Middle Polychrome times to more hunting in Late Polychrome times, based on data from the San Francisco site between Lake Mangagua and Lake Nicaragua, and from Healy's site J-R1-4: Santa Isabel "A" (excavated by A. H. Norweb) about four kilometers north of Puerto San Jorge on the shore of Lake Nicaragua. There is some doubt that faunal collection methods at either site were adequate to yield a picture of ecological trends. If this is so, it is a distinct and very interesting contrast to patterns observed on the Pacific coast of Costa Rica at the same time. Norr's (1980) analysis of C<sup>13</sup> and C<sup>12</sup> data from coastal Guanacaste human bone materials indicates a diet that included an 80-90 percent combination of marine fauna and C<sup>4</sup> plants, while only 10-20 percent of the diet came from C<sup>3</sup> plants and terrestrial fauna.

Direct indications of foreign objects are also limited for this period. Occasional copper artifacts are assumed to have a foreign origin, as are the very limited indications of gold metallurgy that have been identified. Metallurgy in northwestern Costa Rica during this period has been discussed by Lange and Accola (1979), but, in general, we suspected that the goldworking was being introduced from the south and copper techniques from the north. At about this same time, gold metallurgy was also introduced to the west coast of Mexico.

Obsidian has been found in Guanacaste and also on the Atlantic coast of Costa Rica from contexts of this period, indicating a further geographical extension of trade. The ceramic dissimilarity between Atlantic and Pacific Costa Rica, which was a strong feature of the preceding period, changes somewhat in the Late Polychrome period. Thin-walled, incised tripod vessels occur on both sides of the central range and share many form and decorative modes.

In Nicaragua, a very limited amount of Vallejo Polychrome has been found on the east side of Lake Nicaragua. The availability of gold in northeastern Nicaragua also raises the possibility that some of the metal artifacts reported from the Chontales area may have been manufactured by local artisans, and goldworking in Greater Nicoya is described from the contact period (Fernandez Guardia 1889). These data directly contradict Hehins's contention (1979: 3) that gold artifacts in the isthmian area were mostly introduced from external sources.

### Beginning of the Historic Era

The prehistoric era in the Greater Nicoya Archaeological Subarea officially ended with the arrival of the Spanish in 1522. The use of 1550 as an end date for the Late Polychrome period indicates that the conclusion of relatively unaffected indigenous activity is purely arbitrary. The early Spanish *entradas* were casual, and Indian communities certainly continued be-

yond the 1520s. Abel-Vidor noted, "There is no doubt that Greater Nicoya was characterized by a plural society." Oviedo listed seven languages for the Nicaraguan colony: Chondales, Nicaragua, Chorotega, Oroci, Oroña, Cuetares, and Marbios. . . ." (Abel-Vidor 1981: 5). It is interesting that on the northern rim of the buffer zone in Honduras, Healy (this volume) also describes the pluralistic presence of seven languages at the time of contact. No contact-period sites have been definitely located or excavated, and this is one of the greatest shortcomings in our present knowledge of the area. Many researchers, most significantly Lothrop (1926) and Stone (1966b), have utilized some of the historical literature for the area, but a great wealth of documentary evidence remains unexamined. As long as sites facilitating the application of the Direct Historical Approach continue to be unexploited, the full advantages to be obtained from an interplay between the historical and archaeological data will not be realized.

Abel-Vidor (1980b, 1981) has recently studied many previously unutilized historic sources for Greater Nicoya and suggests that the northern sector had a considerably greater population density than the southern. She basically sees the Guanacaste coastal area as a hinterland to the Nicaraguan lakes region. The Nicaraguan part of Greater Nicoya has not seen active research in many years for various reasons, and it is essential that additional investigations be conducted there in the near future (see note 3). Such research will be necessary to try to resolve current discrepancies between documentary and archaeological data. An important example is in population estimates: Abel-Vidor (1981: 18) sees a population of about 500,000 in the lakes region of Nicaragua (although she has recently indicated [personal communication] that she views this number as being relative rather than absolute). Surveys in the area, although admittedly cursory, have not revealed settlement data that support such a high figure.

### Discussion

The preceding period-by-period review of regional cultural development in the Greater Nicoya area summarizes current available data on prehistoric settlement patterns, ceramic distribution, subsistence practices, mortuary behavior, trade, and regional interaction. The same discussion reveals current weaknesses in the regional data base and pinpoints foci for future research. The following research themes are briefly summarized:

#### *Chronological Framework*

The areal chronology is still deficient in terms of total time depth relative to other known New World sequences and in the fineness of subdivisions within the known sequences at different locations. Some ceramic types do

not always match the dated phases to which they normally correspond, but rather than assuming that the dates are in error or that the ceramics have a broader temporal range than we previously thought, we must consider that these data indicate something about the cultural development of the area. Within such a buffer/frontier zone, externally introduced motifs and techniques are going to reach different locations at different times and with varying degrees of local acceptance. Thus, I feel, we need to remain somewhat flexible in our use of correlations between particular dates, ceramic types, and cultural chronological devices such as horizon markers.

#### *Settlement Pattern*

Prior to 1978, most settlement data in the Greater Nicoya area were derived from the Lake Nicaragua shore in the northern sector of the area, the coastal Bay of Salinas and the Sapoa River Valley—an intermediate area which tends to have northern affiliations—and from coastal locations on the Santa Elena Peninsula, the Bay of Culebra, Tamarrindo Bay, and the Nosara Valley in the southern sector. Only Baudez's Tempisque River survey was away from the coast, and even this area is tied ecologically and geographically to the Gulf of Nicoya area.

In 1978, research in the Bay of Culebra and other coastal areas was supplemented by an examination of Atlantic-Pacific coastal pre-Columbian contacts. Several surveys followed a transect from the Gulf of Nicoya inland through a natural corridor in the Guanacaste Cordillera to the southern shore of Lake Nicaragua. These Guanacaste-San Carlos surveys further emphasized the lack of sites dating post-A.D. 800 in the interior highland areas. This settlement distribution favors access to marine resources and growing dependence on these resources, and is of comparative value to a similar study in Panama (Linares and Ranere 1980).

#### *Subsistence*

Subsistence data are best documented for hunting, fishing, and marine mollusca exploitation. Artifact analysis also indicates utilization of nuts and berries and food processing carried out by mashing and pounding. Direct artifact evidence and botanical remains indicating agricultural practice are still so limited that we must reserve judgment regarding the significance of agricultural products, especially maize, for these people. Brewbaker (1979) has presented challenging botanical-pathological data on limits of maize utilization in the tropics. Given the lack of artifactual evidence, contact-period documentary data for agriculture must be carefully interpreted and, if accepted, utilized with caution as to temporal and geographical extrapolation. A mixed economy with local variation seems to be the best present interpretation. Changes in subsistence activity around A.D. 400–500 are



seen as being significant in subsequent development of the area. These changes influenced settlement patterns and provided a basis for population growth and stable coastal settlements.

#### *Mortuary Patterns*

Data in this category are still very dispersed and sketchy. Practically the whole range of single, multiple, primary, secondary, and cremated burials representing both sexes and all ages, even fetal, have been found. Hilltops, riverbanks, middens, and central plazas between middens have all served as burial loci. From no single location, however, do we have a sufficient sample from a single time period to begin to characterize burial practices for specific age-sex-status groups during a particular time or to observe how these patterns compare throughout the subarea synchronically or change diachronically. We can say that different interment practices applied to various members of society and that some were interred with rather elaborate grave offerings, sometimes of foreign origin or locally available exotic materials.

Examination of the skeletal remains allows us to suggest that either fat/protein dietary deficiencies or chronic intestinal diseases afflicted a large percentage of the population (Vazquez and Weaver 1980). The bones occasionally show dental mutilation and are generally free of traumas suggesting either rugged activities or warfare.

The stable carbon isotopic analyses of bone collagen from Costa Rican skeletal materials have given us improved data regarding diet (Norr 1980). As Norr showed in her results, Late Polychrome-period skeletal remains from the La Guinea site (Hoopes 1979) suggest an estimated 69 percent of the diet can be attributed to C<sup>4</sup> plants (maize). La Guinea is sufficiently far from the Gulf of Nicoya or Pacific coast that we can assume that very few, if any, marine fauna entered the diet. The remainder of the diet at La Guinea was made up of C<sup>3</sup> plants (non-maize) and terrestrial fauna. From the Late Zoned Bichrome period (A.D. 300-500) she found no maize consumption indicated in samples run on bone collagen from the inland Mendez site. The total lack of maize in the diet would seem unusual, except that Linares (1980a: 246) also reported total lack of botanical or artifact evidence for maize at A.D. 600 in sites in the Bocas del Toro region of Panama.

From skeletal samples from three Middle and Late Polychrome-period coastal sites in the Greater Nicoya area, Norr reported estimates of 82-93 percent of the diet of these individuals consisted of some combination of C<sup>4</sup> plants (maize) and marine fauna. Given the greater archaeological evidence for marine exploitation at coastal sites than for maize agriculture, I am inclined to believe that the major portion of the represented dietary percentage was from marine resources. However, the inability to distinguish between C<sup>4</sup> plants and marine fauna is one of the current limitations of the

stable carbon isotopic method of analysis of bone collagen. The analysis of bone collagen from these sample individuals for the stable nitrogen isotopic composition N<sup>15</sup>/N<sup>14</sup> is currently in progress for an estimate of the relative combination of terrestrial and marine organisms in the diet (Norr 1981), and this may help solve this particular problem.

#### *External Contacts: The Frontier/Buffer Zone Interaction Sphere*

Some ceramic parallels are seen with the Atlantic watershed of Costa Rica throughout the known prehistory of the two regions, but there are only limited indications of active trade between the two. The barrier maintenance factors between the two zones have yet to be defined. From farther afield, north or south, we find the evidence for external influence almost always appears as filtered ideas or representations, very seldom as actual trade items, and never as intrusive components indicative of actual foreign occupation.

#### *Conclusion*

The Greater Nicoya Archaeological Subarea, although exposed for two millennia to external cultural impulses from more developed societies, remained relatively isolated, and strong local traditions persisted. The extent to which these external forces actually influenced local developments has been variously appraised, but this area never underwent substantial development or change as a consequence. There is a particularly distinct lack of architectural features, generally assumed to reflect available and organized labor groups. Factors limiting growth in lower Central America and the Greater Nicoya Subarea relative to that achieved in El Salvador, Guatemala, western Honduras, and Mexico can be summarized as follows:

1. *Geographical distance from major centers of political and economic power in Mexico, Guatemala, and Peru was of primary importance.* Distances, given prehistoric transportation and communication, were simply too great to allow an external group effective control over the area. From what we know of the *pochteca*, elite group interaction, runner-messenger systems, and coastal travel, such communication might have been established given suitable economic or social incentives; however,

2. *there were insufficient concentrations of desirable/unique natural resources to justify such efforts.* Jade sources are no longer assumed to be within the area. Necessary raw materials were generally distributed and equally available. In terms of a simple economic model, other local raw, perishable, or exotic items simply did not have a high enough yield ratio to make the effort worthwhile; and

3. *human resources that could be harnessed for labor projects were lacking.* The population density in this area was low, with major concentrations



early in central areas and later principally along the coast. The Nicaraguan lakes appear to have attracted a steady and large population. There were no large geographical units within this area, such as the valleys of Teotihuacan, Oaxaca, or Guatemala (Lange, chap. 3, this volume), which in contrast to rugged or barren countryside surrounding a large oasis would attract population concentrations, particularly agriculturalists.

4. *Hydraulic controls have been another factor often noted as a possible explanation for the development of complex societies, but in Greater Nicoya* (a) there are no arid areas with major water sources where control of water would be important; (b) water courses tend either to be very small or to be raging tropical torrents uncontrollable by any means either prehistoric or modern; and (c) the population density was simply insufficient, relative to supplies, to bring about competition for and, hence, a desire for control of water with attendant social and economic mechanisms.

The current archaeological data base represents broad regional comparisons based on survey of selected zones, limited stratigraphic test excavations, and even more limited horizontal excavation. Such data do not yet permit the detailed comparison of multifaceted patterns. If we are to develop a useful understanding of this complex frontierbuffer zone, future research emphases must: (a) focus on excavations that will give us comparative data based on patterns, (b) gradually fill the many spatial lacunae that dot the research area, (c) renew work on the Isthmus of Rivas in Nicaragua, and (d) systematically utilize the ethnohistoric data for the region.

In addition to considering the foci of future research, we must also consider who the researchers will be. The vast majority of the research in the Greater Nicoya area has to date been done by foreigners, but the mention of Costa Rican students, even minimally, in the bibliography of persons who contributed to the preceding data is a significant step. For myriad reasons, students whose cultural roots are in the Greater Nicoya area should assume a greater responsibility for research.

The National Museum of Costa Rica has developed a core of well-trained students.<sup>3</sup> In terms of financial resources, international interest in the area will continue to be necessary and, indeed, appropriate to the extent that we consider its broad implications for New World culture history. Nonetheless, it is very clear we have entered a new era in which the spirit of true cooperation and mutual benefit must prevail.<sup>4</sup>

## Notes

1. Research in Costa Rica from 1969 through 1979 was assisted by grants and support from the Organization for Tropical Studies, Inc., the National Geographic Society, the University of Wisconsin-Madison, Beloit College, and the Associated Colleges of the Midwest. From 1976 through mid-1979, financial support for field

research was provided primarily by the National Museum of Costa Rica. Numerous Costa Rican, North American, and European students participated in the fieldwork, and the efforts of many of them are reflected in the bibliographic citations for this chapter. Their work has been dedicated and their ideas stimulating. In addition, I would like to specifically acknowledge the assistance of Dr. Andrew Hunter Whiteford in getting the fieldwork started in 1969 and Dr. J. Robert Hunter of the Associated Colleges of the Midwest for keeping it going in the early stages. It is most appropriate that Bud Whiteford, in a letter I received on a rainy night and read by flashlight in a tent on the Bay of Culebra, first suggested I contact Doug Schwartz and the School of American Research with the idea for a seminar, and for which this paper was eventually prepared. Hector Gamboa P., head of the Department of Anthropology and History, and Luis Diego Gomez P., director of the National Museum of Costa Rica, both had tremendous influence on the course of the research. Daniel Oduber Q. made archaeological research an emphasis of his presidential administration from 1974 to 1978; he stimulated significant research and supported increased levels of training for Costa Rican students. Jan and Frederick Mayer of Denver, Colorado, have helped support various avenues of analysis and publication through the years.

2. In July 1982 the JFM Foundation of Denver, Colorado, sponsored a conference on Greater Nicoya ceramics. Participants included Suzanne Abel Vidor, Claude Baudex, Ronald Bishop, Winifred Creamer, Jane Day, Paul Healy, Frederick Lange, Robert Stroessner, and Alice Tillet. Four days of discussions were devoted to clarifying terminology and classification of principal Greater Nicoya ceramic types, and the implications of the typological system. A follow-up conference on the same theme was also held in Costa Rica during the fall of 1982, again under the auspices of the JFM Foundation. Jan and Frederick Mayer are again recognized for their crucial support.

In 1982-83, the JFM Foundation supported the neutron activation analysis of 1,200 Greater Nicoya ceramic samples by the Brookhaven National Laboratory. The preliminary results indicated that Greater Nicoya ceramic production was initially relatively dispersed and became very centralized after ca. A.D. 800. In addition, in May 1983, the JFM Foundation supported a second conference in Denver. This meeting was attended by all the 1982 participants, as well as by Lorena San Roman de Callageos (director of the National Museum of Costa Rica) and Silvia Salgado and Juan Vicente Guerrero (employees of the National Museum of Costa Rica and students at the University of Costa Rica). The assistance of the Costa Rican Tourist Institute in facilitating the participation of the two students is gratefully acknowledged. Discussions at this conference led to a further refinement of nomenclature and chronological periods, all of which will be reported in a forthcoming summary report.

3. Since the completion of the field research on which this chapter is largely based, investigations have continued in two different areas of Greater Nicoya. On the Bay of Culebra, Ricardo Vazquez and Silvia Salgado of the National Museum of Costa Rica have supervised excavations at Nacascolo and Playa Panama, respectively; both of these projects have added to our knowledge of site patterning on the Bay of Culebra, and at Nacascolo significant additional mortuary remains have also been recovered. A UCLA research team under the direction of Dr. Brian Dillon

has also been working at Nacascolo in cooperation with the National Museum of Costa Rica. Winifred Creamer of Tulane University has been finishing (1983) a three-year project in and around the Gulf of Nicoya that promises to greatly enhance our knowledge of the prehistoric role of that important region. Luis Ferrero, ethnologist with the National Museum of Costa Rica, is also continuing important research into attempts by the protohistoric Mexican groups to extend their domain south and east of Greater Nicoya and into the Central Valley of Costa Rica.

Lange (in November 1982) and Lange and Sheets (in March 1983) had the opportunity to visit the Republic of Nicaragua and conduct surface surveys on the Pacific coast and on the eastern side of Lake Nicaragua. Sheets concluded that the obsidian industry on the Pacific coast was basically a local entity and not subject to Mesoamerican influence or control. On the eastern side of the two lakes almost no obsidian was present and lithic technology was devoted almost entirely to locally available cherts; these data are very closely related to the point Sheets made during the seminar with regard to the use of lithic criteria to help determine the southern boundary of Mesoamerica. Lange found that the northern sector/southern sector distinctions that had been established were validated by the surface distribution data and that the northern frontier of Greater Nicoya can be drawn at approximately the location of Managua and slightly to the east of Lake Nicaragua and the southeastern corner of Lake Managua. Only in the Late Polychrome Period does there appear to have been a significant amount of trade between the Pacific coast and the area east of the lakes. Likewise, only Late Polychrome ceramics such as Vallejo Polychrome were found in small numbers near the Bay of Fonseca.

The assistance, interest, and cooperation of the Gobierno de Reconstruccion Nacional of Nicaragua and Olga Martha Montiel, Amelia Barahona, Leonor de Rocha, and Anibal Martinez of the Ministry of Culture is gratefully acknowledged. Dr. Jaime Incer B. and Roberto Parrales S. also helped to make both visits a complete success.

4. My wife, Holley, and daughters, Heather and Kathy, have been involved in almost all of the research I have done in Costa Rica. I have been grateful for their participation and support.