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Metallurgy, Balls, and Stone Statuary in the Diquís Delta, Costa Rica: Local Production of Power Symbols

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The Diquís, or Sierpe-Térraba, Delta is known in American archaeology for the discovery of a great quantity of elaborate metal objects and monumental stone balls, the latter measuring in some cases more than two meters in diameter. A great deal of important archaeological data has been lost in this area since the end of the 1930s due to extensive looting and wide-ranging cultivation in the alluvial plain, where the principal archaeological deposits are found. In this article we will explore the association of these metal objects (gold and gold-copper alloys), the monumental sculpture (stone balls and peg-base statues), and the remains of large settlements containing earthen mounds, foundations, plazas, and cemeteries dated between A.D. 800 and 1550. This evaluation is based on data from various studies conducted in the region over the course of nearly sixty years, but is limited by a lack of context for many of the objects, a scarcity of horizontal excavations, and the relatively small amount of information available, particularly regarding the size of the archaeological sites and their internal conformations.

The Diquís Delta of Costa Rica's southern Pacific region sits within the Greater Chiriquí Archaeological Region (Fig. 1). The delta appears to have been a site for the local production of power symbols. These were intended for public use—internal and external collective images—and personal use—to indicate status. Additionally, these symbols may have been ethnic identifiers for the people of the region.

Three types of artifacts have been found in the delta that are unique to the Greater Chiriquí region and appear to have been part of the specialized industry for the production of power symbols: The first of these are stone balls. These are some of the most intriguing items in American archaeology because of their almost perfect shapes, smooth finishes, large sizes (of some examples), and their discovery in groups. The second type of artifacts are the flattened, peg-base statues depicting standing men and women, in many cases wearing zoo-

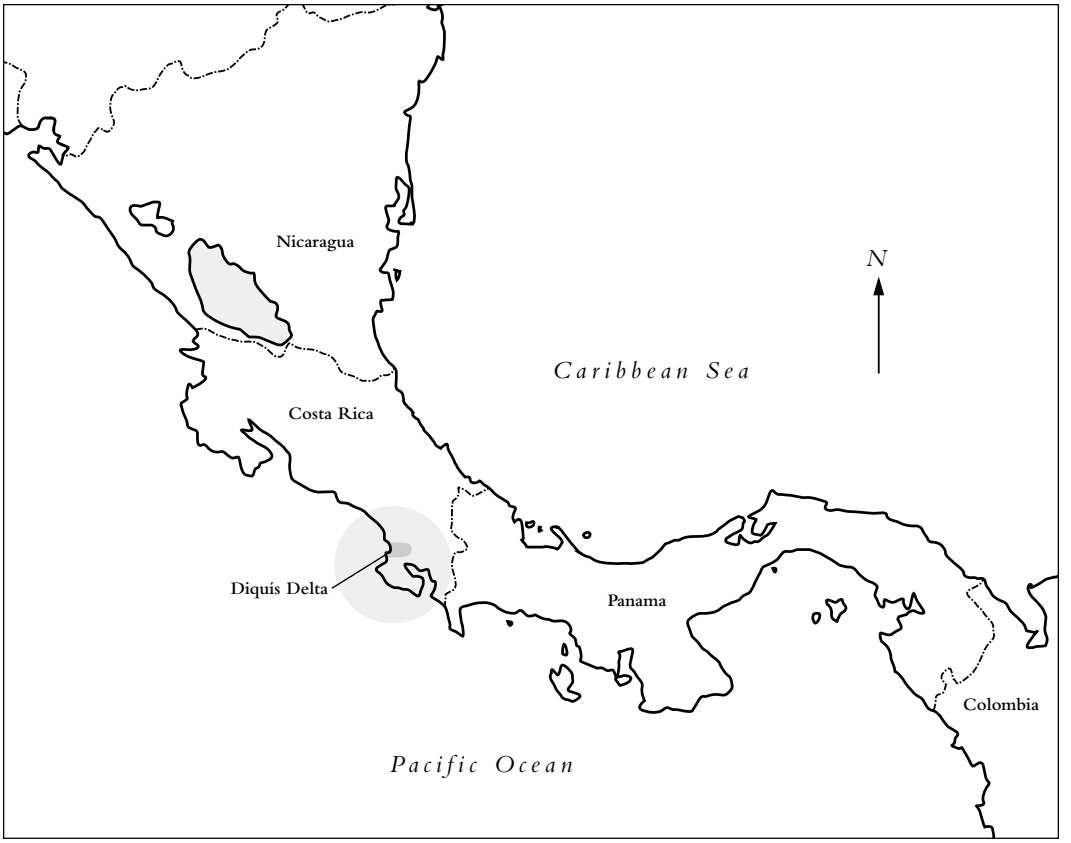

Fig. 1 The Diquís Delta, southern Central America

morphic masks or headdresses. Stylistically, these represent unique elements of limited dispersion, leading various authors to propose that they are an art form indigenous to the delta (Stone 1943; Mason 1945; Lothrop 1963). The third group of artifacts to be studied is that of the delta's metallurgy, represented by assorted gold and *tumbaga* (gold-copper alloy) objects. Some scholars suggest that the Diquís Delta developed its own metal object production because its styles and technology differed from those of production centers in Panama, Colombia, and other parts of Costa Rica.

The monumental stone balls and peg-base statues may form part of a group of collective public symbols. The metal objects, especially those that display a high degree of technical skill and detail as well as great symbolic content, were for individual consumption. Objects made of perishable materials, such as staves, bone pendants, shells, and fabrics may have also been for personal possession. The use of these objects, together with the construction of mounds and public plazas point to a complex society with established social structures, in

which ideological and symbolic elements were fundamental to the society's organization, consolidation, and effective functioning.

The Diquís, or Sierpe-Térraba, Delta is one of the most important estuary systems in southern Central America (Figs. 1 and 2). It starts at the junction of the Grande de Térraba and Sierpe Rivers, which flow into the Pacific Ocean. The Grande de Térraba River is fed by rivers and streams descending from the Talamanca range and forms the most extensive watershed in Costa Rica (Fig. 3). The Sierpe River has its source in a lagoon within the delta and is fed by the Chocuaco River and streams descending from the Osa Hills.

The towns of Palmar, Ciudad Cortés, Sierpe, Coronado, and San Buena are located in the extensive alluvial plain of the Sierpe-Térraba Delta (Fig. 4). This plain is bordered from the northeast to the southeast by the Costeña Range, to the south and southwest by the Osa Hills, and to the west by the Pacific Ocean. The plain is strategically situated and can be easily reached because of its proximity to the Golfo Dulce (accessible by land or by sea), to the Chiriquí in Panama, and to the Gulf of Nicoya in Costa Rica's northern Pacific region. Facing the delta is Caño Island, an important point for Pre-Columbian trade and commerce (Finch and Honetschlager 1985). Beginning at the Osa Hills on the delta's southern border is the Osa Peninsula, which is approximately 1,100 square kilometers and contains one of the principal placer gold deposits in Costa Rica (Berange 1987; Organización de Estados Americanos 1978). In archaeological terms, the Diquís Delta forms part of the Diquís subregion in the Costa Rican part of the Greater Chiriquí archaeological region. Various authors have proposed that the delta represents one of the centers of local development in Greater Chiriquí (Haberland 1984; Baudez et al. 1993; Hoopes 1996).

The Archaeological Context of Metallurgy and Statuary in the Sierpe-Térraba Delta

Among the archaeological studies conducted in the Diquís Delta are works by Stone (1943), Lothrop (1963), and Baudez et al. (1993). These studies concentrated on deposits located in the Palmar Sur–Sierpe region, part of the delta's alluvial plain. For thirty years this region was used for banana cultivation and then for the cultivation of cacao and African palms. By the time archaeologists began working in the Palmar Sur-Sierpe region, its forests had been lost and other modifications of the land were well advanced. These factors, combined with the plain's thick sedimentation, prevented early researchers from producing detailed documentation of the archaeological sites in the area. Between 1991 and 1992, Ifigenia Quintanilla carried out a survey of parts of the Sierpe-Térraba Delta. The study was exploratory in nature and included Ciudad Cortés, Ojo de Agua, and San Buena on the alluvial plain, the Osa Hills, Violín Island, and Coronado, Chontales, and Balsar, the small valleys formed by the tributaries of the Grande de Térraba in the Coastal Range (Quintanilla n.d.). The survey documented fifty-two archaeological sites, each with distinct characteristics and phases of occupation. The archaeological record of the Sierpe-Térraba Delta thus far suggests that the area was occupied from the first millennium B.C. until the arrival of the Spanish conquistadors (Stone 1943; Lothrop 1963; Corrales, Quintanilla, and Barrantes 1988; Baudez et al. 1993; Quintanilla n.d.; Badilla, Quintanilla, and Fernández 1998).

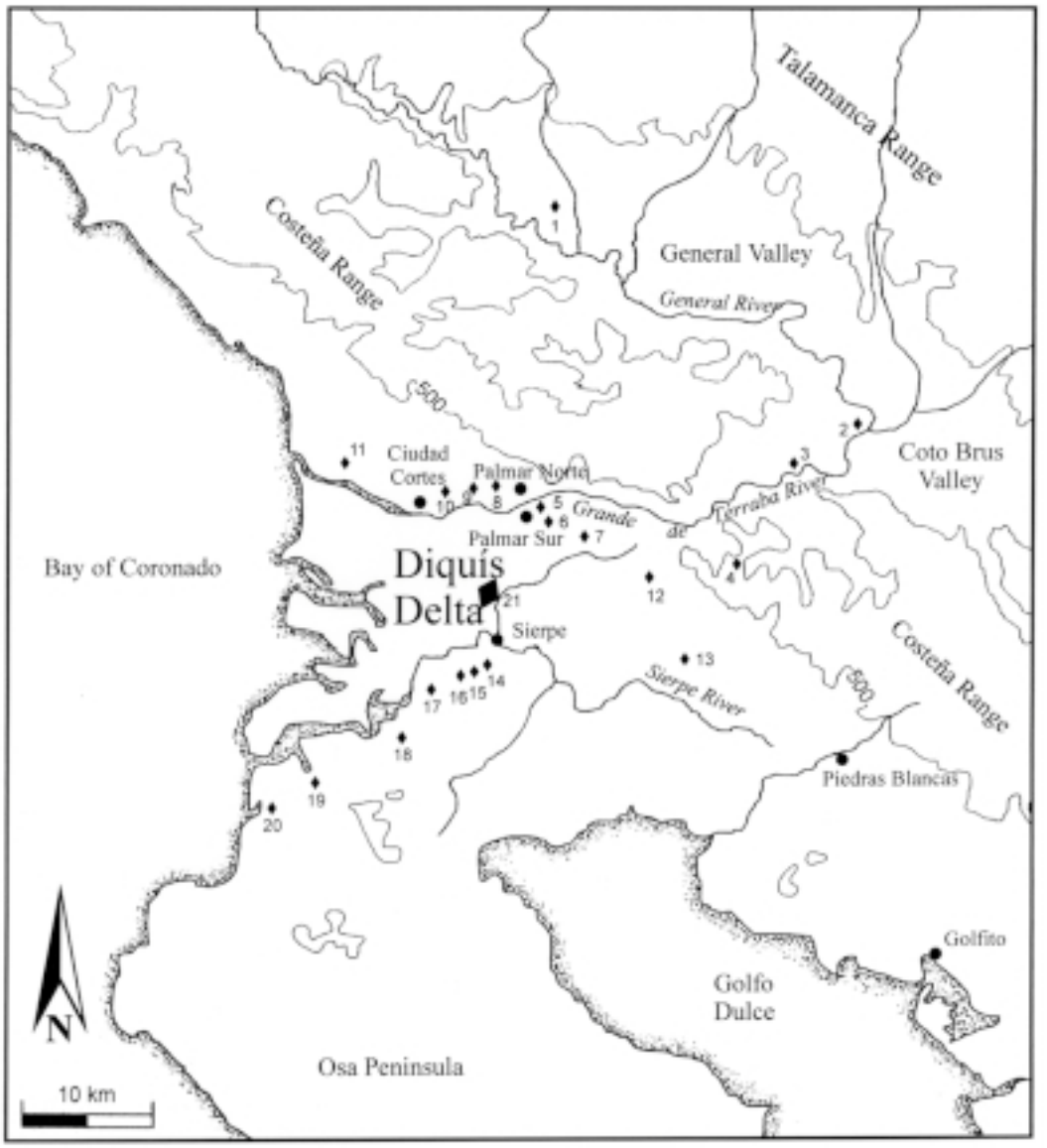

Fig. 2 The Diquís Delta of the southern Pacific region of Costa Rica and some of the archaeological sites of the Diquís archaeological subregion: 1. Rivas-Panteón de la Reina; 2. Murciélago; 3. Curré; 4. Coquito; 5. El Silencio; 6. Cansot; 7. La Olla; 8. Batambal; 9. Camaronal; 10. Grijalba; 11. Estero Rey; 12. Alto La Soledad; 13. Jalaca; 14. Sierpe; 15. Varillero; 16. Miramar; 17. Guacimo; 18. Beto Rojas; 19. Muñequera; 20. Drake; 21. Palmar Sur-Sierpe (Farms 2, 3, 4, 6, 7).

Fig. 3 The Térraba River receives water descending from the Talamanca range and from a part of the Costeña Range. This is the principal watershed in Costa Rica.

Fig. 4 On entering Palmar Norte, the Térraba River spreads into the shape of a fan, and, where it joins with the Sierpe River, forms the Sierpe-Térraba alluvial plain.

Baudez et al. (1993) conducted important survey work in the Palmar Sur banana plantations, dedicating their efforts to establishing a local ceramic sequence. They documented human occupation from A.D. 700 (Camíbar Phase) to A.D. 1200 (Palmar Phase). In later surveys of adjacent sectors, Quintanilla (n.d.) discovered ceramic material and lithics associated with the Curré Phase (1000 B.C.–300 B.C.), the Aguas Buenas Phase (300 B.C.–A.D. 800), and the Chiriquí Phase (A.D. 800–1500). In addition to Quintanilla's research, archaeological studies carried out on Caño Island by William Finch and K. Honetschlager (1985) and by Francisco Corrales and Magdalena León (1987) recovered ceramic material possibly from the Curré Complex and the Aguas Buenas and Chiriquí Phases. The delta and its environs thus formed a large occupation center, not an isolated backwater as the Palmar Sur–Sierpe occupations seem to indicate. The presence of ceramic material with decorative and formal elements associated with what Corrales (1985, n.d.) defines as the Curré Complex for the middle basin of the Térraba River indicates the presence of settlements dating to approximately 1500 B.C.–500 B.C.

Although ceramic material and lithics were found from the Aguas Buenas Phase no housing or funerary constructions have been successfully documented; at the same time, however, the studies conducted have not been exhaustive in places that are difficult to access. Nevertheless, abundant ceramic material and fragmentary lithics have been found that could correspond to domestic debris (Quintanilla n.d.). Baudez et al. (1993) discovered ceramic material and lithics from this same phase (which they call the Camíbar Phase) in Palmar Sur–Sierpe, assigning their creation to the later part of the phase. They found no associated architectonic remains. The number of archaeological sites in the mountain ranges, foothills, and the alluvial plain increases for the Chiriquí Phase. The settlements are larger and greater architectural development appears, evidenced by the identification of foundations, mounds, and cobblestone areas (Quintanilla n.d.).

It is possible that the principal Pre-Columbian settlement of the Diquís Delta was at the site of the present-day town of Palmar Sur and the United Fruit Company banana plantations at least between A.D. 600 and 1200. This settlement, or collection of settlements, is characterized by the presence of large stone-walled mounds, house foundations, paved streets, cemeteries with rich offerings, and dense ceramic and lithic deposits distributed over approximately 900 hectares. In addition, there are open fields, or plazas, containing large sculptures in the form of almost perfect balls in groups and human and zoomorphic statues.

The wide distribution of deposits recorded by various researchers points to a continuity of occupation in the Palmar Sur–Sierpe megasite beginning around 600 A.D. with a period of dense occupation between A.D. 1000 and 1200 (Stone 1943; Lothrop 1963; Baudez et al. 1993; Quintanilla n.d.; Badilla, Quintanilla, and Fernández 1998). Baudez et al. (1993) published a map showing the distribution of archaeological remains from their detailed survey and from information provided by Stone (1943) and Lothrop (1963) (Fig. 5).

Palmar Sur–Sierpe's principal architectonic concentrations are located in Farms 4 and 6 (to use the nomenclature of the United Fruit Company). It is there that the most important groups of stone balls have been discovered, along with mounds up to thirty meters in diameter and three meters in height, paved roads, and human and zoomorphic statuary. The

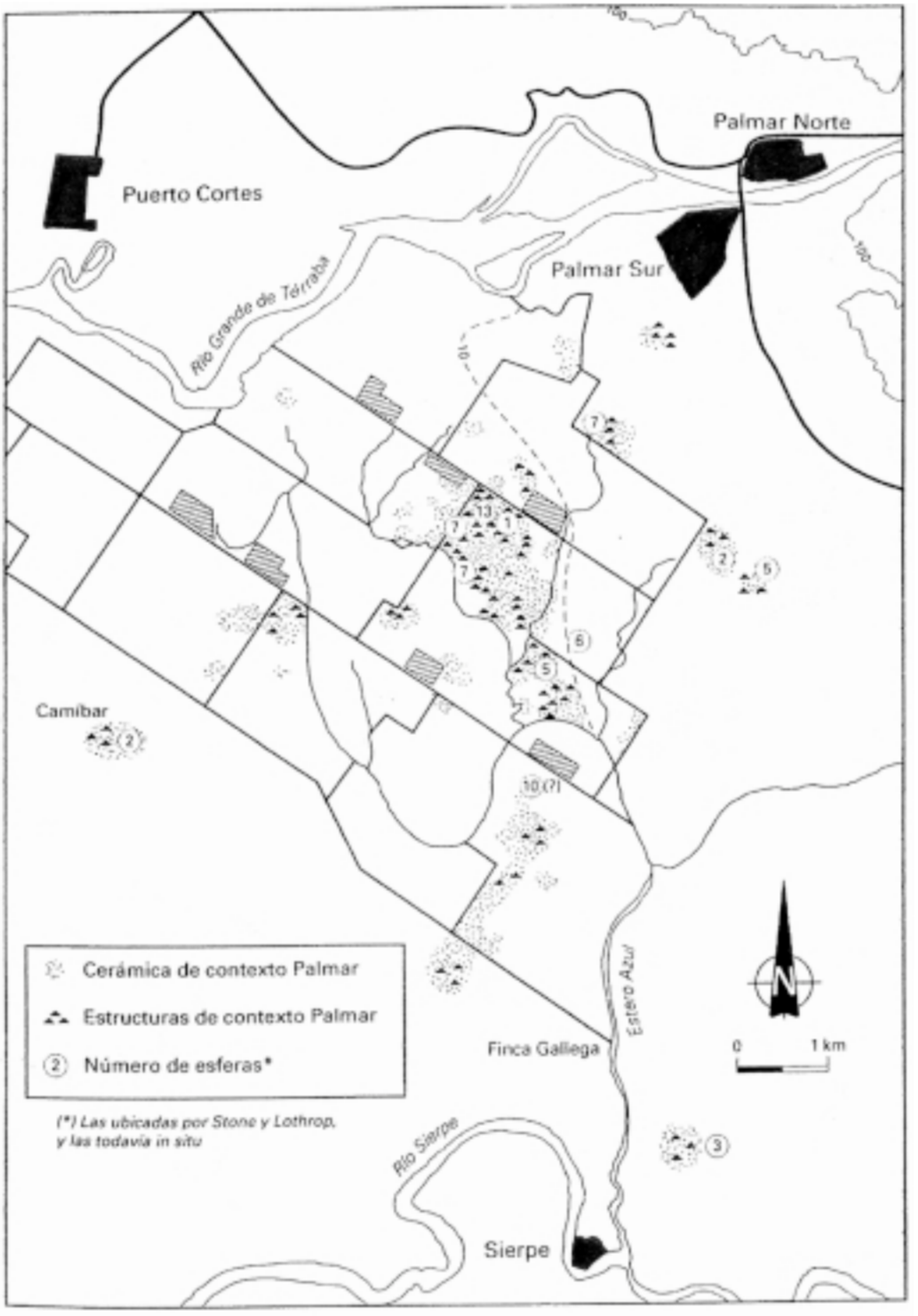

Fig. 5 Distribution of archaeological materials in Palmar Sur–Sierpe (after Baudez et al. 1993: 41)

center of this large site appears to have been at Sections 23 and 36 of Farm 4, which was excavated by Lothrop (1963) and is the site of ongoing rescue archaeology efforts by Adrián Badilla (Badilla, Quintanilla, and Fernández 1998) (Fig. 6). More than twenty stone balls were discovered in Sections 23 and 36, in open fields, vestibules, and the upper parts of mounds. Some of the balls located within the mounds were lying on paved surfaces similar to those outside the mounds (Fig. 7). In Farm 6, a group of five balls sit in what appears to have been an open, unpaved field, surrounded by mounds and foundations and possibly paved streets and cemeteries. Excavations suggest the area was a plaza in which the groups of balls were arranged in lines oriented toward the cardinal points, particularly east-west.

Sections 23 and 36 may also be the location of two interments that contained one of the principal finds of metal objects in Costa Rica. Lothrop (1963) provides an account of a witness to the plundering of two tombs. One of the interments contained a large metate, a stone ball approximately twenty-five centimeters in diameter, and monochrome and polychrome ceramics. Lothrop offers no information about the quantity of gold objects in this tomb, some of which were acquired by Robert Bliss and currently form part of the Dumbarton Oaks collection. The other interment also contained a metate and a stone ball, this one sixty centimeters in diameter, along with monochrome ceramics and eighty-eight gold objects. Eighty-seven of the objects from this group were acquired in 1956 by the Banco Central de Costa Rica and are currently held in the bank's Museo del Oro Precolombino. During the rescue archaeology efforts at Farm 4, which is close to the two aforementioned interments, workers found a small gold sheet three millimeters in diameter on the surface of recently plowed land. This fragment could have resulted from a die strike (Badilla, Quintanilla, and Fernández 1998), perhaps an indication of goldworking near the area.

Peg-base statues have also been discovered in the same sectors of Palmar Sur–Sierpe as architectonic remains, stone balls, and interments with rich gold offerings. Some of these statues were found next to or on top of mounds (Lothrop 1963; Stone 1943). They have also been found in deposits, where they were often piled up, broken, and show evidence of having been burned (Stone 1943; 1977; Lothrop 1963; Quintanilla n.d.; Hidalgo 1994). These deposits are located in the alluvial plain as well as in the Osa Hills and the Costeña Range, at Farm 2, Section 40; Farm 5, Section 32; Farm 4, Sections 23 and 36; Farm 6, Camaronal; and Caño Island, among other sites.

At Muñequera, in the Osa Hills near the mouth of the Sierpe River, archaeologists found a deposit comprising a group of broken statues along with four-footed metates with feline heads and tails (Quintanilla n.d.). Although the deposit was not associated with any type of structure, its discovery is noteworthy because the cache appears to be similar to others found by hunters and tomb robbers in different parts of the Osa Hills and to those reported by Stone (1943) and Lothrop (1963). Additionally, the collection records of the Museo Nacional de Costa Rica list a group of zoomorphic statues and sculptures from Sections 23 and 36 of Farm 4, the same area where the aforementioned large gold deposit was found in conjunction with architectonic remains. These objects were seized by Costa Rican authorities from illegal traders in the 1950s.

Fig. 6 Partial view of a rectangular architectonic structure at Farm 4. Notice the pavement and the wall constructed of round stones from the Térraba River.

Fig. 7 Rescue archaeology excavations conducted by the Museo Nacional de Costa Rica at Farm 4 in 1996. Note the paved entrance to a mound and the positioning of a stone ball to one side of the entrance. Photograph by R. Rubí, Fundación Museos, Banco Central de Costa Rica.

Stone (1963) has published data for metal objects and other specialized crafts from the Jalaca site, located in the delta on the southern border of the Sierpe-Térraba alluvial plain. One group of artifacts in a funerary context is noteworthy for its examples of bone and shell work and its association with metal (tumbaga) objects. Jalaca is exceptional among archaeological sites in Costa Rica's southern Pacific region, where preservation of organic remains is rare. Bones from species outside the region that were carved with great mastery and found with objects of metal, bone, shell, and ceramics have shed light on what are thought to be household goods from the Chiriquí Phase. There is insufficient information about the rest of the cemetery. Where persons buried at Jalaca lived remains unknown. Nevertheless, the delicacy of the bone work contrasts with the tumbaga objects, which appear to have been for "general use," unlike the discovery at Farm 4.

Available information indicates the presence of other archaeological sites in the delta where ball arrangements are associated with architectonic groupings. Plunderers have found metal objects in some of these areas. The balls appeared not only in large settlements, but also in small villages in the environs of the delta. The same distribution pattern applies to metal objects. The oral history of the southern Pacific region tells of modern vendors selling gold pieces, an indication of other archaeological sites with significant quantities of gold. Various legends exist among tomb robbers specializing in gold objects in the southern Pacific region. These legends were widely told in the 1950s and 1960s but are almost unknown by archaeologists today. In the oral tradition, Coquito, Panteón de la Reina, Puerto González Víquez, La Vaca, and La Vaquita are named as sites where large quantities and outstanding examples of gold objects were discovered. These locations correspond with recorded proveniences for the majority of pieces in museums worldwide. Only a partial picture can be reconstructed of the destruction of the Sierpe-Térraba Delta's archaeological remains and the social relationships that may have existed between the people of the delta and neighboring regions.

The Stone Sculpture of Sierpe-Térraba

J. Alden Mason (1945), Stone (1943; 1977), and Lothrop (1963) have pointed out the unique characteristics of the Diquís Delta that support the theory that it is an area distinct from neighboring regions in terms of stone sculpture. This theory is useful at present for understanding the interaction between the industries specializing in stone and metal and the production of power symbols in this part of southern Central America. Here, the focus is on understanding these relationships within their social contexts.

There are various types of stone sculpture from the Sierpe-Térraba Delta, of which stone balls and anthropomorphic peg-base statues are the most characteristic. The obviously zoomorphic sculptures and statues of indefinite form, called "ghosts" by Lothrop (1963), are rare and little studied and therefore are not included in this article. However, they do appear to have been contemporaneous to the others, starting in approximately A.D. 800, since they have been discovered in both habitational and habitational-ceremonial sites of the Chiriquí Phase.

Fig. 8 The stone balls are almost perfectly round and have a smooth finish. This ball was found in 1993 at Farm 6, Palmar Sur–Sierpe. Photograph by R. Rubí, Fundación Museos, Banco Central de Costa Rica.

Stone Balls

The stone balls of Costa Rica are the most distinct form of monumental sculpture in southern Central America (Fig. 8). They differ from other round stones reported in America in three principal ways: their almost perfectly round shape, the smooth finish of the majority of them (especially the larger ones), and their discovery in groups, some forming lines or geometric figures, such as triangles or rectangles (Fig. 9). To date, stone balls have been reported in thirty-four archaeological sites in Costa Rica and one in Panama, at Paso Canoas, near the border (Fig. 10 and Table 1). The greatest concentration of balls is in the southern Pacific region of Costa Rica, with the main concentration in the Diquís Delta (Fig. 11). Here the balls are not only the most plentiful but also the largest.

On the basis of published archaeological data, the total number of balls known for the region appears to be 176. Of this number, ninety-eight are found in Palmar Sur–Sierpe on former banana plantations. Some of these balls surpass two meters in diameter and weigh several tons. Many balls have been removed to other parts of the country or shipped abroad. The total number in the region in Pre-Columbian times was most probably far greater.

It appears that stone ball manufacturing did not arise exclusively in the Sierpe-Térraba Delta, but also developed in neighboring zones of the Diquís archaeological subregion. Stone balls have been discovered at Bolas (Drolet 1983; 1992), Agua Buena (Minelli and Minelli 1966), and Costa Purraja and Obando (Hoopes n.d., 1993). These sites appear to be associated with ceramic material dating to the late Aguas Buenas Phase (A.D. 400–800). In addition, small groups of balls are reported associated with habitational elements at these sites or, as Robert Drolet wrote about Bolas site, there seems to be an association between one particular residence and the interments of people of rank within the mounds (1983: 36).

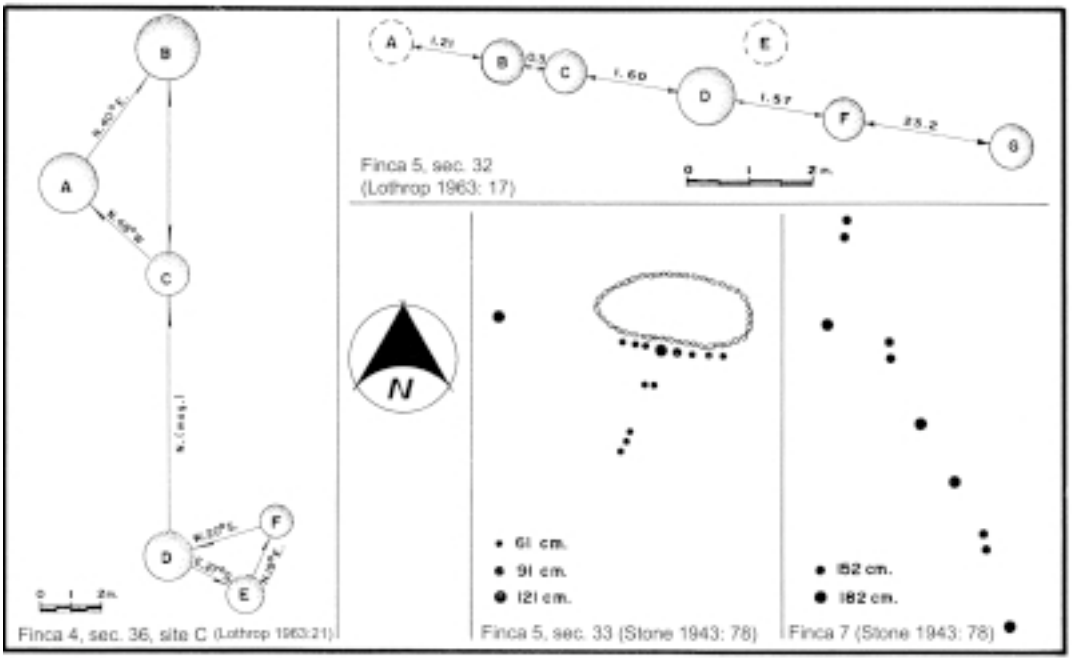

Fig. 9 Groups of stone balls at Palmar Sur–Sierpe (after Stone 1943 and Lothrop 1963)

It is important to note the discovery of stone "barrels" and stone balls at three sites: Agua Buena in San Vito, Costa Purruja, and Obando in the coastal area of Golfito and the Coto River. The barrels are cylindrical sculptures generally no more than fifty centimeters in height and forty centimeters in diameter; some of them bear petroglyphs. The Barriles site, near the border of Costa Rica and Panama, is named for these objects and is one of the most frequently mentioned sites in Greater Chiriquí archaeology. It is little studied, however, and has been altered by a great deal by plundering. Barriles is also known for its large "Man-on-Slave" statues, which various archaeologists have interpreted as an indicator of the rise of ranked societies in the Greater Chiriquí region (Corrales, Quintanilla, and Barrantes 1988; Olsen Bruhns 1992; Hoopes 1996). It is also known for its large, four-footed metates with multiple trophy heads around the rims (see Hoopes and Fonseca, this volume, Fig. 2).

To date, no stone barrels have been found in the Sierpe-Térraba zone. At Varillero, in the Osa Hills, however, fragments have been found of a metate with decorations on its supports and rim similar to those from Barriles (Quintanilla n.d.). This site has also produced ceramic material corresponding to the Curré Complex and Aguas Buenas Phase, and is one of the few locales in the southern Pacific region showing early occupation. It is possible that this site and other Aguas Buenas sites in the Osa Hills contain essential information helpful to understanding the development of specialized industries and the transition from egalitarian to class-based societies in the Greater Chiriquí region.

The stone balls of the Sierpe-Térraba Delta were made primarily from three types of rock: gabbro, granodiorite, and limestone. These are found in the mountain ranges surrounding the delta, especially in the Costeña Range (Mora n.d.). Coincidentally, Cansot, the only

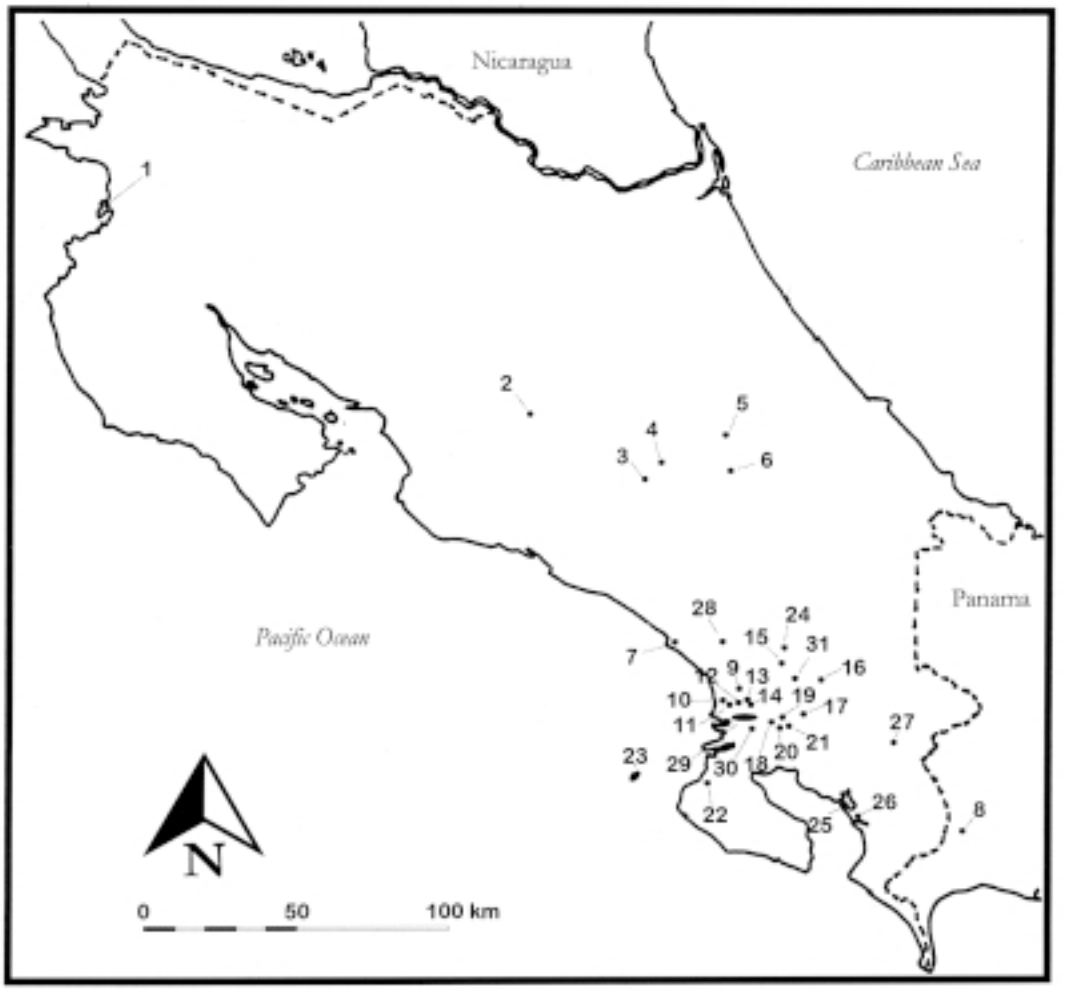

Fig. 10 Archaeological sites in Costa Rica and Panama with reports of stone balls: 1. Papagayo; 2. La Fabrica; 3. Orosi; 4. Santiago; 5. T'alari; 6. Platanillo; 7. Uvita; 8. Santa Marta; 9. San Felipe; 10. Estero Rey; 11. Ojo de Agua; 12. Grijalba; 13. Camaronal; 14. Batambal; 15. Caracol; 16. Bolas; 17. Changuena; 18. El Silencio; 19. Cansot; 20. La Olla; 21. Alto La Soledad; 22. Drake; 23. Caño Island; 24. Cambute; 25. Costa Purruja; 26. Obando; 27. San Vito; 28. Pejibaye; 29. Palmar Sur–Sierpe (Farms 2, 4, 5, 6, 7); 30. La Hacienda; 31. Térraba.

site that shows possibilities of being a workshop for the manufacture of the balls, is located in this same area (Quintanilla n.d.).

The diameter of the majority of the balls ranges from 60 to 120 centimeters, but there are some examples with diameters greater than 150 centimeters that weigh several tons. In Farm 4 and Farm 6, balls have been discovered with diameters greater than 170 centimeters; three of them remain in situ on Farm 6 along with three smaller ones. Apparently, the two balls now at the Colegio de Palmar Norte come from this sector. They measure 212 centimeters in diameter and weigh more than 8 tons.

Fig. 11 Transporting the stone balls was a complex job. Today heavy machinery is used to move balls like this one weighing more than 7 tons.

At El Silencio, at the foot of the Grisera Hills, the largest ball discovered to date measures 257 centimeters in diameter and weighs approximately 15 tons. It originally sat midway up a slope in a spot designed especially for it. The only other objects found near the ball were scattered fragments of ceramic material and waisted axes. The placement of this ball raises the possibility that its location held some significance, perhaps commemorative or symbolic.

The production of stone balls was highly specialized work requiring a great investment of collective labor. It entailed a detailed knowledge of stone fracture patterns, chipping, and polishing. Workers probably used heat and abrupt cooling to loosen convex layers and measuring sticks (of wood or stone) to create the almost perfectly round balls. Chisels, hammers, and abrasives would have been fundamental to the process of chipping and polishing. Levers may have been used to move the block during production and transport. The transport of the spheres from their production sites as pre-forms or finished products required the organization of a considerable work force for moving the blocks and for preparing the land over which the stones were towed. It is important to remember that the area where the balls have been discovered has levels of precipitation that can reach 5,000 millimeters annually (Ash and Solano n.d.). Such rainfall, together with the dense vegetation of the area's tropical forests, means that the preparation of the transport routes likely required cutting down trees and, in the case of the larger balls, possibly positioning tree trunks or paving stones (Fig. 11).

Anthropomorphic Peg-Base Statuary

The elongated, flattened peg-base statues of men and women represent a unique style associated with the Diquís Delta and its immediate environs (Stone 1943; 1977; Mason 1945; Lothrop 1963). The arms and legs of these statues are separated by cuts in the rock. The arms hold staves or are crossed and cover the chest. Hands and feet show individual fingers and toes, separated by incisions in the stone (Figs. 12 and 13). The statues were made primarily from four types of material: gabbro, granodiorite, limestone, and sandstone. A triangular coverlet for women and exposure of the genitals for men differentiate the sexes. Female figures are relatively abundant, a fact documented by Lothrop (1963). Males and females are naked, but wear belts, bracelets, and necklaces, and in some cases possibly display tattoos. The height of the statues varies between fifty centimeters and two meters. Their bases are flattened and in the shape of a peg, suggesting an upright position. In general, sculptural detail is concentrated on the front of the statues, although in some cases there is a demarcation of pelvic bones and shoulders or cords crossing the back (Lothrop 1963; Stone 1977).

Lizard or feline masks, sometimes with serpents emerging from the mouth, are a central motif in peg-base statuary in the delta. (This motif also appears on staff handles made from deer antlers from Jalaca [Stone 1963] and on metal objects from the delta.) Geometric motifs are prominent features of the masks. Some figures have axes and hold trophy heads over the chest or, in the majority of cases, have them hanging by a cord in front or behind. Some statues represent prisoners with tied hands.

Peg-base statues seem to have their origin in the "man-on-slave" statues from Barriles that have been dated by association to the Aguas Buenas Phase and that had very limited distribution. Both types of anthropomorphic statues make use of a base to plant the statue and keep it upright, possibly indicating that they were designed for display in public places. On the other hand, some important settlements in the Diquís subregion, such as at Curré, Murciélago, and Rivas, show little or no evidence of peg-base sculptures. This could be the result, as Drolet (1983; 1988; 1992) proposes, of specialization in artisan industries among settlements in the Térraba River basin. This distribution pattern may result from other factors in addition to specialization, since other areas of the Diquís Delta have peg-base sculpture as well as stone balls, polychrome ceramics, feline-shaped metates, and other highly detailed objects.

Metallurgy in Costa Rica

Information on the origins of metal objects in Costa Rica is scarce (Snarskis 1986; Herrera 1998). The data available show that thus far the oldest metal objects found correspond to a period between A.D. 300 and 800. These discoveries are concentrated in the central part of the country and the northern plains, possibly making these areas the point of introduction for the objects as well as for the science of metallurgy in this part of southern Central America. Warwick Bray (1990) proposes a model for the introduction of metallurgy

Fig. 12 Heads and torsos of peg-base statues (a, b, c, d), and a zoomorphic sculpture with feline traits (e) from the Diquís Delta (after Lothrop 1963)

Fig. 13 A female peg-base sculpture. Note that the triangular-headed serpents emerging from the mouth iconographically resemble serpents represented in metal objects. Photograph by P. A. Ferrazzini, courtesy of the Museo Barbier-Mueller d'Art Precolombí, Barcelona.

in lower Central America in which various cultures between Costa Rica's Atlantic watershed and northern Colombia mixed through gradual and indirect trade. Exchange systems tied to the area's sociopolitical elites may have favored the introduction and learning of techniques that led to technological and conceptual adaptations in local metallurgy.

The presence in Costa Rica of metal objects displaying formal and technological links with specimens from areas in northern Colombia and Panama led Bray (1990) to put forth the idea of an "Initial Style," the introductory phase of metallurgy in Panama and Costa Rica. He has also argued for the existence of an "International Style," a pan-regional style originating in Panama and Costa Rica. In the midst of these dynamics of regional styles and technological adaptations of foreign designs, local styles developed that incorporated new techniques and iconographic variations previously found as local expressions in ceramics and stone (Fernández 1999).

The metallurgy that developed in central Costa Rica beginning in A.D. 500 was incorporated into the metallurgy that began developing after A.D. 700 in the southeast and northeast of the country. These two styles are related by iconography, technological details, and open-mold casting without use of a core (Fernández and Segura 1998). Data is limited for the origin of metalwork in the Diquís Delta. There are no references to metal objects produced prior to A.D. 800 that are associated with archaeological sites in the delta. The introduction of metallurgy to the delta appears to have been delayed, but, once introduced, local styles developed rapidly.

Metallurgy in the Diquís Delta

Contextual information is largely lacking for the majority of Pre-Columbian metal objects originating in Costa Rica and now housed in museums worldwide. All available data—given their formal and technological characteristics and the testimony of people who collected them—indicate the country's southern Pacific region as their point of origin. For example, more than ninety percent of the collection of the Banco Central de Costa Rica's (BCCR) Museo del Oro collection is identified as coming from southern Costa Rica.

Pre-Columbian metal objects from the southern Pacific region were made of gold or copper and in some cases the gold-copper alloy known as *tumbaga* or *guanín*. The Diquís Delta, located as it is in the northern part of the Osa Peninsula and connected to Punta Burica, has been labeled a "metalogenic" province, meaning it has a concentration of mineral ore in economically exploitable form along with placer gold deposits (Organización de Estados Americanos 1978). The rivers and streams descending from the mountains of the Osa Peninsula carry gold in their sediment. Today gold is still extracted manually from the Sierpe, Drake, Llorona, Brujo, Corcovado, Sirena, Claro, Nuevo, Tigre, Agujas, Barrigones, Conte, Rincón, Riyito, and the Esquinas Rivers (Fig. 14). In a few cases, it is industrially recovered. On Violín Island in the delta, gold is found in sediments in small gorges. In this area in the 1960s, prospectors found a nugget weighing 2.3 kilograms, the largest reported in Costa Rica. Other alluvial gold deposits can be found in various rivers of southern Punta Burica and in the La Vaca River (Castro and Vargas 1982; Cooke et al., in this volume).

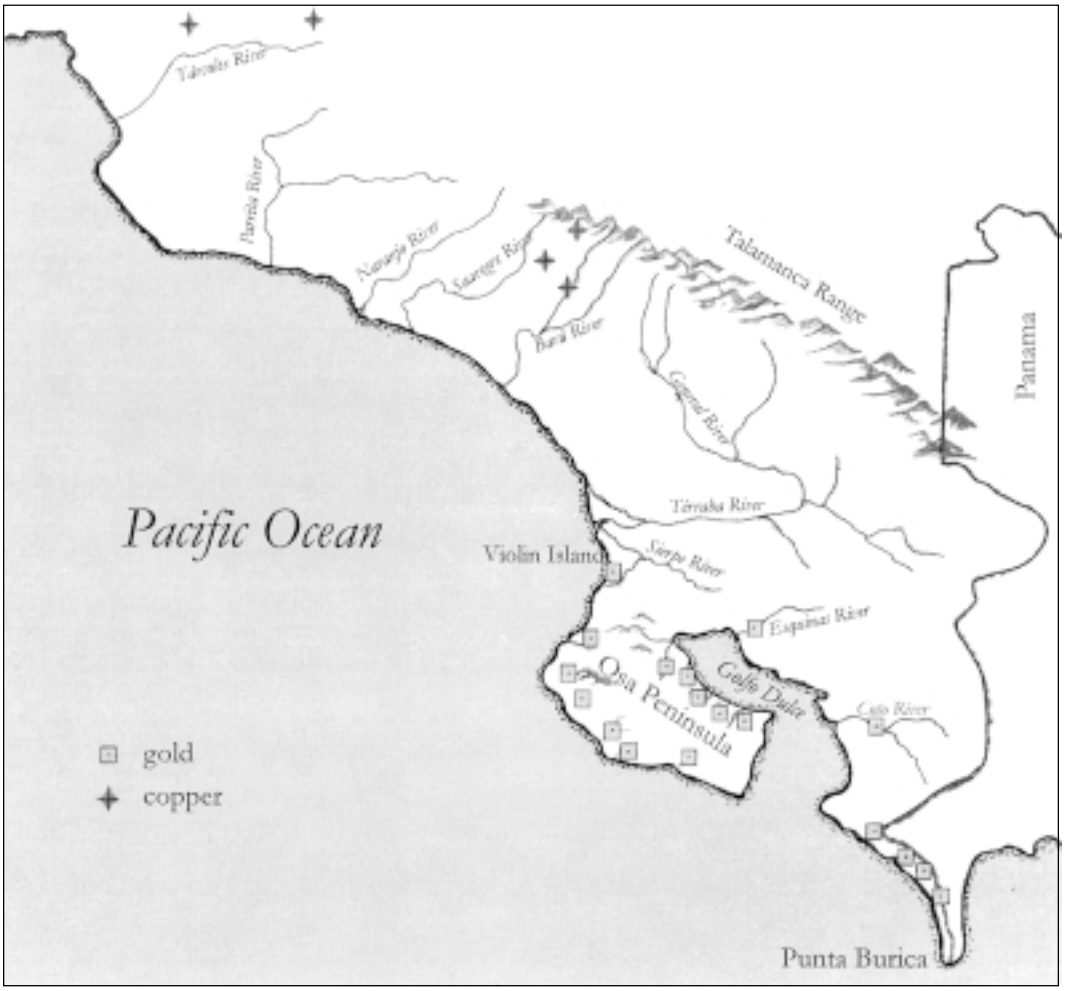

Fig. 14 Gold and copper deposits in the central and southern Pacific regions of Costa Rica

To date, no natural copper deposits have been discovered in the southern Pacific region. The most famous Costa Rican copper deposits are located in Guayabo de Mora and Tarbaca de Aserrí, in the Central Region, associated with the Viejo and Tigre Rivers and the Tarbaca Gorge. The Talamanca Range also contains veins or scatterings of sulfide and porphyritic copper, along with mineralizations that include pyrite, chalcopyrite, and pyrrhotite (Castillo 1997).

There have been few studies of the physical and chemical mineralogical composition of Pre-Columbian metal objects from Costa Rica. Recently, analysis has been carried out on select Costa Rican Pre-Columbian metal objects as part of an exploratory study for the Pre-Columbian Metallurgy Techniques project conducted by the Museo del Oro Precolombino (Fernández and Segura 1998). Among the samples are three objects from Farm 4 in Palmar Sur that were analyzed by X-ray fluorescence spectroscopy. Preliminary results show these disks to be composed of gold, copper, and silver (Table 2) (Fernández and

Segura 1998). Ottavio Durando (1959) revealed the presence of silver in Pre-Columbian metal objects from the southern Pacific region and, because of the data available at that time, determined that it must have come from foreign sources. Recent analysis, however, shows that the percentage of copper and silver in these sheets is similar to the amounts in natural gold nuggets collected from rivers in the Osa Peninsula. The peninsula nuggets that have been used for comparative analyses are also similar in composition to one another. This suggests that these laminated objects were produced locally, utilizing placer deposits from the Osa Peninsula and neighboring areas in the southern Pacific region.

Analysis of ten cast objects from Palmar Sur and neighboring zones reveals average values ranging between seventy percent and ninety percent gold, less than ten percent silver, and ten to twenty percent copper. The sample used was not large enough to establish a pattern of alloy ranges. The objects' forms, styles, and manfacturing techniques do suggest metallurgic production unique to the southern Pacific region, specifically to the Diquís Delta and neighboring areas.

In order to determine local production of metal objects in the Diquís Delta, the group of metal objects from Farm 4 and from the collection of BCCR's Museo del Oro Precolombino has been used to establish a series of classifications. These are defined according to manufacturing technique, form, and distinctive characteristics that can be typified as the local style of the Diquís Delta. Moreover, these classifications take into account particular technological and formal divisions that allow their consideration as part of an iconography associated with other artisan production in southeastern Costa Rica. There are two Diquís subdivisions: cast objects and sheet objects (Tables 3 and 4).

Cast Objects

Four classifications of cast objects have been established based on the Farm 4 analyses (Table 3). These groups display elements associating them with the technological tradition of northern Colombia, which features open-mold casting with oxidation gilding and cast filigree. They also resemble goldsmithing styles developed before A.D. 700 in central Costa Rica, an area noted for the use of direct wax models without cores for shaping cavities and for distinct motifs that include a man with a lizard mask and serpents emerging from his mouth. These motifs have antecedents in jade figures and flying-panel metates from the period A.D. 1 to 500 (Snarskis 1998; Fernández 1999; Hoopes and Fonseca, this volume).

The main morphological characteristics of the Diquís style are the presence of cast filigree or modeled lizard decorations; wings in the form of a half moon with marginal decoration of braided cord, balls, or rectangles; slightly curved rectangular bars that frame the figures or resemble bird tails; articulated objects linked by hooks that are part of the casting; and hanging plates (Fig. 15a, b, c, d, e; Aguilar 1972: figs. 14, 15, 23). The Diquís style generally exhibits casting problems, with mold fractures visible on various parts of the figures.

Lothrop (1963) identifies a group of possibly local objects from Farm 4 as variations of the Veraguas type. He based his conclusion in part on the poorly executed finish on some of

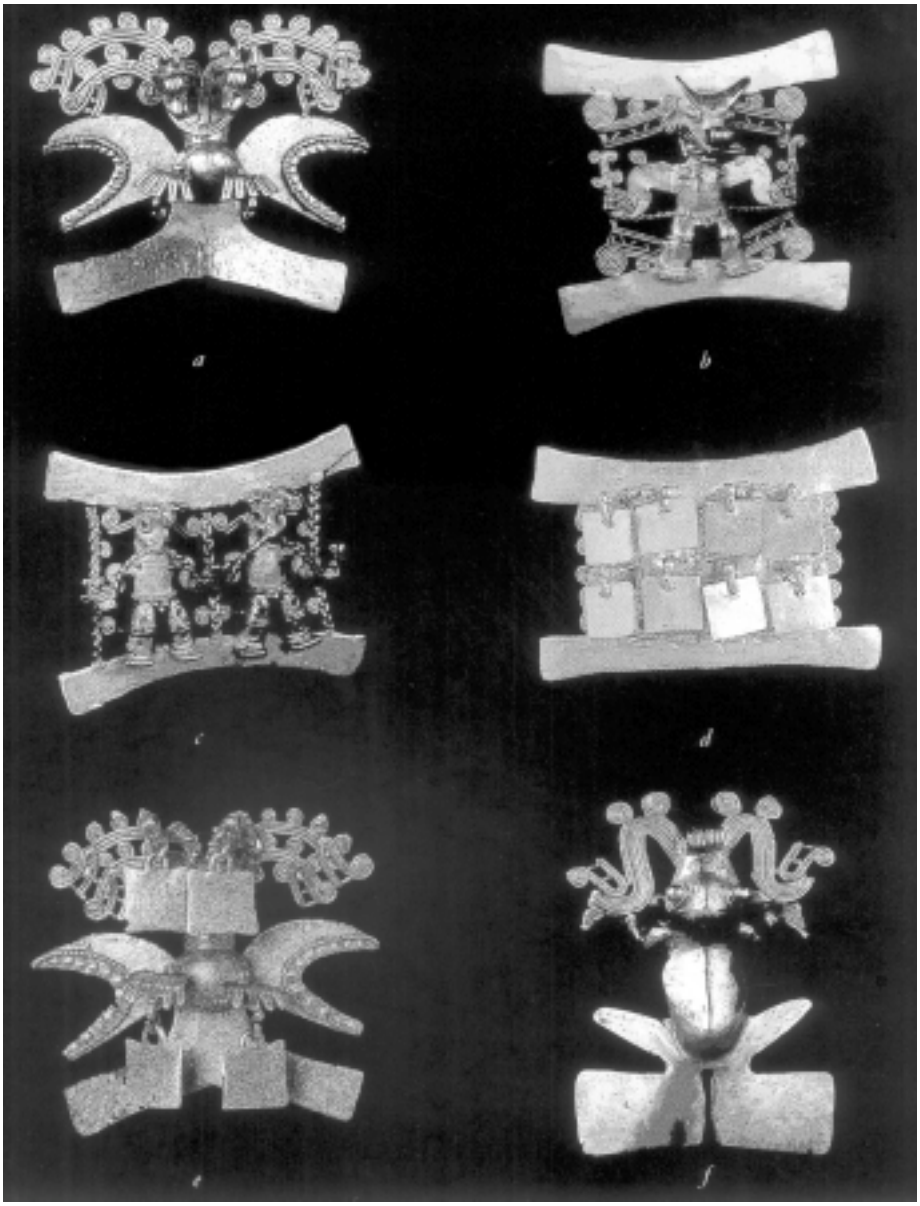

Fig. 15 Cast gold objects from Farm 4, Palmar Sur–Sierpe. Banco Central de Costa Rica, Museo del Oro.

the pieces. These objects consisted of birds with unusual wings and claws, lateral head decorations, and combinations of spirals and lizard stylizations of cast filigree; some pieces have plates that hang from their claws (Lothrop 1963: pl. xxxiv). These objects comprise Group 1 in this study. Group 2 consists of anthropomorphic figures with animal heads (Lothrop 1963: pl. xxxv). Similar objects have been reported from Chiriquí by William Holmes (1887: fig. 6) and at the Panteón de la Reina site in Costa Rica by George McCurdy (1911: figs. 272, 372). Lothrop (1937: fig. 163a) relates these to similar pieces from Coclé that bear a crown of small birds in the form of a hat on the head of a figure.

Groups 1 and 2 are associated with another type of figure that Lothrop reports from Chiriquí and Veraguas (1950: fig. 110c; 1963: pl. XXXVI). In this study, it is included in Group 3, which is characterized by reptile stylizations of cast filigree attached to figures in the form of a hat. Wings in the form of a half moon with marginal decoration of braided cord are a formal defining element of this group. Stylistically related examples are reported at Veraguas and Chiriquí. The pieces from Diquís, however, exhibit slightly different formal characteristics that render them distinct from, though related to, the Panamanian pieces (McCurdy 1911: figs. 366, 369). There appear to be technological variations in alloy and surface finish, but these must be confirmed through further comparative analyses of objects originating from Panama and southern Costa Rica.

Reptile-stylized false filigree is a common design element among the Diquís and the Veraguas and Chiriquí styles. Claws in the form of separated fingers, made with cords and associated with hooks for hanging plates, tend to be more closely related to Diquís pieces than others, which usually have claws with joined and bent fingers (Holmes 1887: fig. 8; Lothrop 1937: fig. 44; McCurdy 1911: figs. 354, 356, 357). Wings in the shape of a half moon with braided-thread marginal decorations are prevalent among Diquís figures, in contrast to Veraguas and Chiriquí figures, which usually have flat arms, bent downward, without volume (McCurdy 1911: fig. 370). Hands in an oval position made with twin threads bent at the ends are a shared regional trait.

Another formal trait that is undoubtedly characteristic of the Diquís Style consists of slightly flat rectangular bars that surround the figures on top and bottom. Bars on Veraguas and Chiriquí figures are curved more and have stylized reptile extensions (McCurdy 1911: figs. 365, 369). Curved bars appear on Diquís bird tails. On articulated objects of three or more parts, the sections are linked by hooks such that the second piece hangs from the top piece and the third in turn hangs from the second. This arrangement constitutes Group 4 (Table 3).

Within Group 4 is a collection of six pendants from the second interment at Farm 4 that Lothrop describes as bat gods (Lothrop 1963: pls. XVII, XVLIII). This collection is characterized by the presence of two identical anthropomorphic figures marked on the upper and lower parts by slightly curved rectangular bars. Another characteristic of Group 4 is an elongated headdress in the form of cast filigree reptile stylizations. These pieces have six to twelve plates hanging from hooks on the front of the figures. Also among the Farm 4 group is a series of cast objects representing frogs, bells, and Veraguas-Chiriquí style birds that are not considered part of the Diquís style.

Frogs with flat, rectangular legs found in Chiriquí interments are without a doubt of both Panamanian and Costa Rican origin (McCurdy 1911: fig. XLVIII; Holmes 1887: fig. 13; Lothrop 1937: fig. 86a). Such frogs have been reported around Puerto González and La Vaca (Balser 1962), in the Panamanian border region, as well as in Palmar Sur. Due to their widespread appearance, they are not considered part of the Diquís style, although they share formal elements, such as serpents made from cast filigree (Fig. 15f). This is also true of the bells from Farm 4 with reptile-man figures. Similar specimens have been reported from Chiriquí by Holmes (1888: figs. 41–43).

The Veraguas-Chiriquí type birds found at Farm 4 and identified by Lothrop as Veraguas style have bent wings and long, curved beaks (Lothrop 1963: pl. XXXIII). They resemble birds with habitats along southeastern Costa Rica and the Veraguas-Chiriquí regions of Panama. The discoveries from Farm 4, however, appear to be technologically distinct in their alloys and gilding.

As part of the Pre-Columbian metallurgy project of BCCR's Museo del Oro Precolombino, ten bird objects of the Veraguas type (with various dates) from southeastern Costa Rica were analyzed for chemical composition. Preliminary data suggest differences in alloy composition between these figures and Veraguas type birds from Farm 4. The alloys of the Farm 4 birds appear to be more consistent with alloys from Group 4 than with alloys of birds typically considered Veraguas-Chiriquí.

Although more analysis of Costa Rican metalwork needs to be carried out, preliminary studies suggest a local production of forms decorated with styles having a more widespread distribution and regional character than previously thought. At any rate, the large collection from Farm 4 reveals local production of gold objects as well as interaction with other regional groups.

Sheet Objects

The manufacture of sheet objects in Costa Rica occurred concurrently with the production of cast objects. Some Diquís cast pieces exhibit hammering as a finishing technique. This is evident on the rectangular legs of frogs and on some of the rectangular bars of Diquís figures. Analysis with a scanning electron microscope and X-ray fluorescence spectroscopy revealed that two circular disks and a tubular bead were hammered from nuggets (Fernández and Segura 1998). Four groups of sheet objects have been identified based on the form and decoration of discoveries from Farm 4 (Table 4). Most of these objects are circular disks with repoussé in patterns of points, balls, and rectangles in relief, as well as conical protuberances made with dies (Figs. 16a, b, c, d, e).

Within the Farm 4 group are thirty flat disks of various sizes that have been placed in Group 1a. Group 1b consists of various sized disks with stylized reptile decorations and associated in some cases with relief cones (Fig. 16e). It is possible that this group is not directly related to the Farm 4 discovery; however, because there is a large quantity of this type of object in the collection of the Museo del Oro Precolombino reportedly from Palmar Sur, it was included in this category. Technologically these pieces exhibit the same characteristics as the rest of the hammered objects and have border decoration of points, allowing them to be labeled as being of local Diquís production.

Group 1c comprises disks with conical reliefs (Fig. 16b). Lothrop (1963) considers them typical of what he calls the Veraguas style found at Chiriquí and in northern Colombia. Although it is certain that a stylistic and functional relationship exists between Costa Rican objects and finds from these areas, the objects from Farm 4 and its environs exhibit homogeneity in thickness, gilding, and the use of balls and repoussé in border patterns. Such decorative elements are also found in cast objects determined to be of local production.

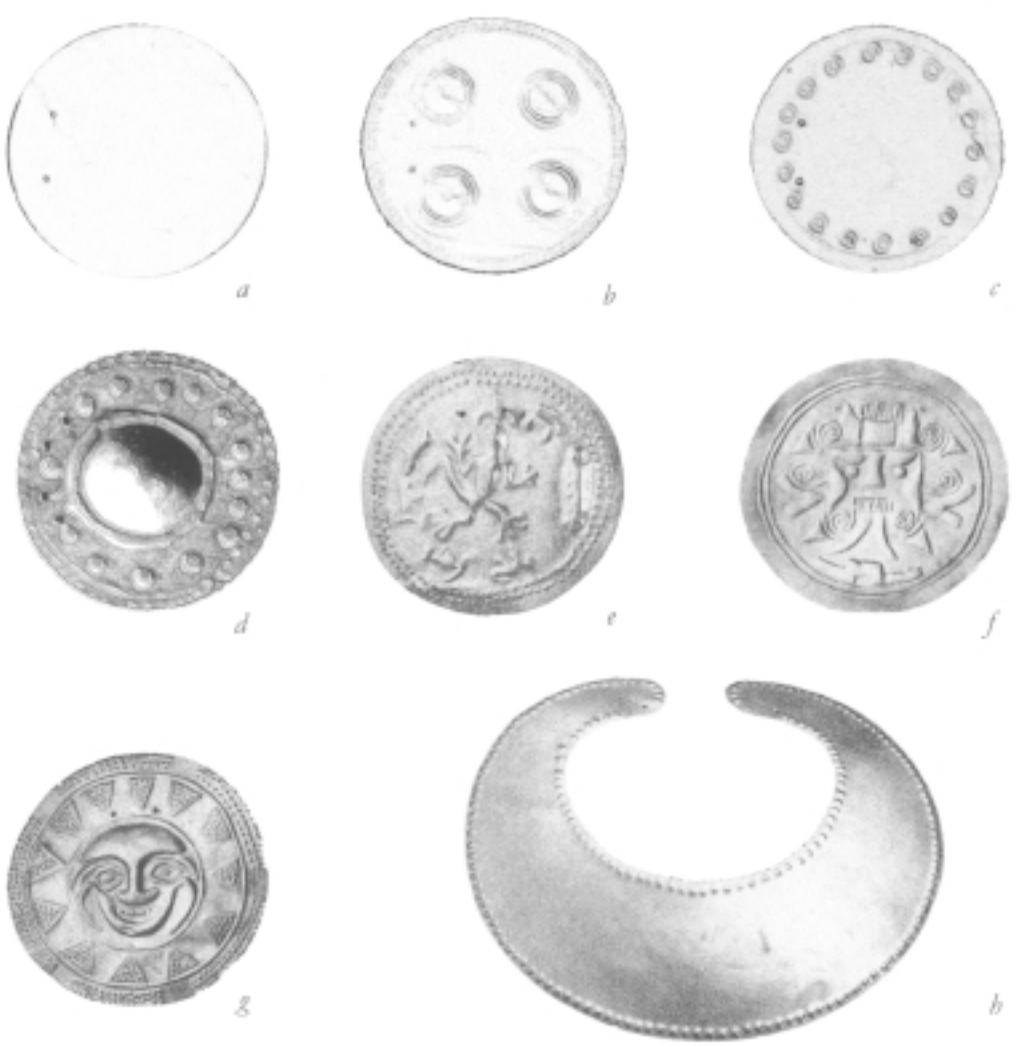

Fig. 16 Laminated gold objects from Farm 4, Palmar Sur–Sierpe. Banco Central de Costa Rica, Museo del Oro.

Five of the Farm 4 disks exhibit little iconographic relationship to the Diquís style, and therefore may be of foreign manufacture (Fig. 17f, g). At the same time, however, the disks with rectangular and border repoussé are widely represented in areas bordering Farm 4 (Lothrop 1963: pl. XLVIII). For this reason they are included in Group 2, as are horseshoe-shaped breastplates with similar decoration (Fig. 16h). Group 3 consists of diadems, bracelets, and anklets from Farm 4. Marginal decoration of points and balls in relief links them by iconography with the rest of this group (Fig. 17). Group 4 is composed of beads made from doubled sheets with little decoration.

This article has attempted to characterize local goldsmithing production in the Diquís Delta. It is clear, however, that other goldsmithing styles characteristic of southeast Costa

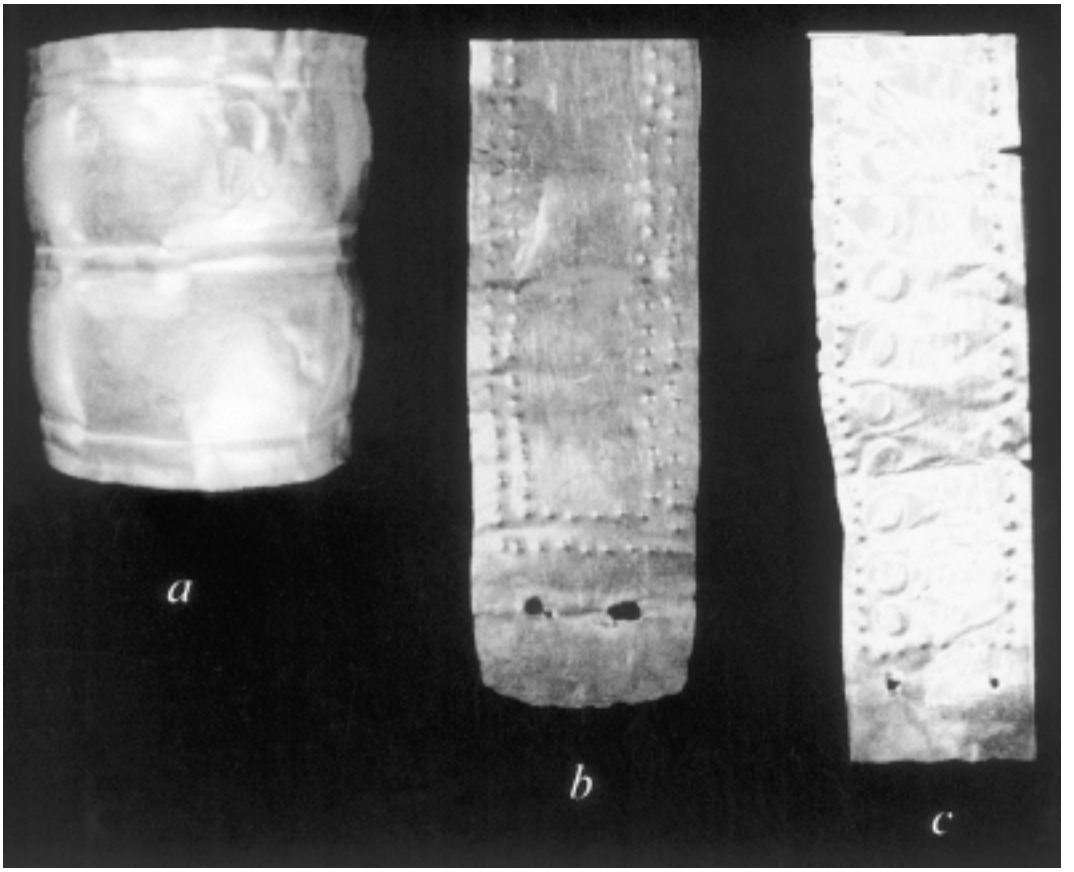

Fig. 17 Sheet gold objects from Farm 4, Palmar Sur–Sierpe. Banco Central de Costa Rica, Museo del Oro.

Rica are present, as well as objects that can be classified as reflecting regional styles that arrived in the delta through trade. Thus, the possibility exists that within the Diquís Delta the production of metal objects served two purposes: the creation of objects for use by the local elite and the production of trade goods. The Diquís Delta appears to have been a producer and recipient in a dynamic and complex network of local, regional, and greater regional relations.

Local Styles

The relationships among statuary, stone balls, and metallurgy in the Diquís Delta are apparent on various levels. At one level are their contemporaneity and association within the same social context, while on another are their shared stylistic elements. Stylistically, the relationship is strongest between statuary and metallurgy because of shared iconographic motifs. In this respect, the stone balls are a peculiarity in that their central motif is roundness, which contrasts with representational styles in Greater Chiriquí statuary, metallurgy, and ceramics. While representations in other artistic media, such as ceramics, are concerned with

the natural world, the balls represent an abstraction involving the conceptual elaboration of roundness in a solid body. It is highly probable that this representation relates to the worldview, cosmology, or astronomical knowledge of the balls' makers. The balls' locations in public areas and their associations with habitational and ceremonial sites point toward their use as symbols of power and as ethnic identifiers.

It is possible that a relationship exists between the stone balls and representations of balls in repoussé and cast metal on objects, similar to the relationship between the protuberances on laminated objects and the border decorations on the curved wings of cast objects. These same globular representations can, however, be found on gold objects reportedly from Panama and Colombia, and thus are not restricted locally.

Peg-base statues are stylistically linked with representations in metal and other lithic materials in their depiction of human figures with lizard or feline masks and two-headed serpents with triangular heads. The metallurgical motif of a man with a lizard mask and serpents emerging from his mouth constitutes a central representation in peg-base statuary in the Diquís Delta. This motif is also present as staff handles made from deer antlers from Jalaca. Likewise, bone figures carved in the round from Jalaca are similar to other statuary in the round from the delta. Two-headed serpents with triangular heads emerging from the mouth and appearing as cords on the body are often found on various metal objects and peg-base statues from the Diquís Delta. This might be an indicator of local and contemporary manufacture of both forms of artistic media.

Production of Power Symbols in Sierpe-Térraba

The production in the Diquís Delta of stone balls, peg-base statues, and personal ceremonial objects of gold and gold-copper alloys can be explained in the political, economical, and social contexts of these complex societies. The specialized production of stone sculptures and metal objects together with other artistic expressions that are not preserved in the archaeological record may form part of what can be called an "atmosphere of power," in which the handling of ideological and symbolic affairs was a necessary and vital complement to the economic and political activity of the societies in the delta. Among the societies that once inhabited the area, the elite demonstrated their power through their access to magnificent goods, such as metal objects for ornamental and possibly for ritual use, and their ability to mobilize and organize manual labor on a large scale for the production of finely crafted objects and other collective works.

It is possible that early populations in the delta and its environs acquired such "exotic" objects as gold through trade. For reasons unknown, this situation changed around A.D. 800, when conditions for the specialized production of highly detailed objects emerged.

Placer deposits on the Osa Peninsula and Violín Island were determining factors in the development of a specialized gold object industry in the delta and its environs. The availability of this resource at a time when the possession of metal objects became an important goal for the regional elite must have been of great benefit to the people inhabiting the area. The presence of gold in the Osa Peninsula must have made control of the area of great importance.

Metallurgy rapidly developed in the Diquís Delta and its environs after A.D. 800. It is possible that the Delta saw the arrival of specialized artisans from production zones in Panama and Colombia or that local artisans were displaced to other specialized production centers, subsequently returning and beginning an intensive exploitation of available resources. A combination of the two is also possible, or, as in Bray's (1990) networking theory, there might have been a gradual migration of knowledge between neighboring villages. It is necessary to note that this extraordinary production occurred in the southern Pacific region of Costa Rica in the absence of prior traces of technique development and independent experimentation. This is particularly remarkable given the technological command and the development of unique delta styles.

In the case of statuary, there was a long tradition of Greater Chiriquí stonework, with balls and peg-base statues developing over hundreds of years in different areas. What is important in the case of the Diquís Delta is the appropriation and reprocessing of technology, forms, and styles, and above all the large scale on which production occurred.

These developments must be understood within the context of societies with surpluses and high levels of food production, permitting the dedication of labor to non-agricultural pursuits. Goldwork required individuals dedicated to the extraction of the metal, its initial treatment, and production of objects, including oven preparation, cutting wood for fuel, creation of clay molds, extraction of wax from beehives, experimentation with techniques, finishes, soldering, and so on. Although not everyone participating in the process had detailed knowledge of the entire process, the creation of the objects and decisions about iconography required artisans with great technical skill and knowledge of the symbolic world of the society in which they lived and for which each object was produced.

Metal objects were possessed by individuals for ornamental use in daily wear and, above all, for special activities. This is no different from the role of other specialized products. All such objects belonged to a universe in which the use of public symbols (balls and peg-base statues, monumental architecture, public spaces) and lavish objects for personal use (metal ornaments and other objects not preserved in the archaeological record) form part of a set of visual images that demonstrate, at an ideological and symbolic level, the power, productive capacity, and organization of this society.

Chieftains, Power, and Stratification in the Diquís Delta

The data presented in this article point to the existence of complex societies in the Diquís Delta, where an important production of power symbols occurred through stone sculpture and metallurgy. In addition to this, we would like to propose that there was centralization evidenced by a hierarchy among settlements and differential access to luxury goods. However, this requires more study and for now is no more than a working hypothesis.

Following Timothy Earle (1987; 1997), the legitimization of power and the centralization and appropriation of access to goods by certain members of the group might have resulted from success in increasing the production of food—through better technologies, improvement of species, use of various food resources—and success in the organization of

work, leading to the formation of a ruling class charged with organizing production, distribution, and relations with other groups. Moreover, this ruling class likely controlled ideological apparatuses through such roles as military leaders, priests, physicians, and masters of collective works. The use of knowledge, oral tradition, and medicine must also have been fundamental.

The distribution of such architectural remains as mounds, foundations, and paved streets and the density of ceramic material and lithics suggests that a primary center developed within the Palmar Sur–Sierpe area that was able to play the determining role in the centralization and coordination of economic, political, and social activities between the villages of the Diquís Delta and its environs after A.D. 800.

Among the principal settlements in the delta, a large investment of collective effort is in evidence for the construction of works that could have been intended for public and individual use by different sectors of the group. The construction of mounds with stone walls and earthen fill, the building of roads, the clearing of large tracts of forest, and the transport of large stone balls indicate the presence of an organized population ready to undertake such works.

Assuming that the Diquís Delta was a zone of local development within the Greater Chiriquí region, the presence of stratified societies is likely. This stratification can be thought of in qualitative terms as segments of society distinguished by rank, status, and role in production. It can also be viewed in terms of differentiated access to goods, indicative of control over the economy by elites (Earle 1987; 1997). If Lothrop's information about the two interments in Farm 4 is reliable, it would indicate the presence of individuals of high status who were buried with gold goods in a display of quantity and quality unique in Costa Rica. This, like the other proposals raised in this work, must be verified against the archaeological record.

The material conditions in the delta and its environs after A.D. 800 can be see in preceding phases. In other words, excess production and specialized artisans and groups with rank or power must have existed in the Aguas Buenas Phase as Drolet (1983; 1988; 1992), Corrales, Quintanilla, and Barrantes (1988), and Hoopes (1996) have proposed. The later occupations of the Diquís Delta benefited from this process of social change.

Developments in the delta are not unique in the southern Pacific subregion. Rivas (Quilter and Blanco 1995), Murciélago (Drolet 1983; 1988; 1992), Curré (Corrales 1985; 1988), and Grijalba (de la Fuente n.d.) also achieved important architectural development. It would appear, however, that Murciélago and Rivas never developed the public symbols that occurred in the Diquís Delta and its immediate environs.

One issue requiring greater documentation is local production for local consumption of highly elaborated objects with ideological and symbolic content, such as the stone balls, the peg-base statues and statues carved in the round, and the metal objects in the Diquís Delta after approximately A.D. 800. The absence of some of these elements or their limited presence in sites with complex architecture within the same subregion might indicate that the production of the majority of these objects was directed toward the internal consolidation of a society that we cannot yet identify. In this sense, the production of specialized

industries in ranked or class-based societies can be considered not only in terms of exchange goods between and for the elite, but also in terms of the ideological manipulation of aesthetics, value as a people, and ethnic identity.

Acknowledgments This work is the product of many years of investigation. Two projects form the basis for this article. We would like to express our gratitude to the institutions that supported them for their confidence and support. The Museo Nacional de Costa Rica made it possible for Ifigenia Quintanilla to undertake the project "Man and Environment in the Sierpe-Térraba Delta, Costa Rica," and the Fundación Museos of the Banco Central de Costa Rica enabled Patricia Fernández to carry out the Pre-Columbian Metallurgy Techniques project. Eugenia Ibarra, Francisco Corrales, John Hoopes, Jeffrey Quilter, and Roberto Herrscher contributed valuable feedback on various drafts of this essay. We thank them for their contributions and patience. We would also like to thank the Museo Barbier-Mueller d'Art Precolombí in Barcelona for providing photographic material. Our thanks also to the Fundación Museos of the Banco Central and to Rodrigo Rubí for help with photographs and illustrations.

Table 1. Archaeological Sites with Reports of Stone Balls in Costa Rica and Panama

Site	Location	Archaeological Region	No. of Balls	Source
A-10 La Fabrica	Alajuela, Central Area	Central	1	Guerrero, Juan Vicente, personal comunication 1993
Orosí	Orosí, Cartago	Central	±8	Hartman 1901
Platanillo	Turrialba	Central	3	Kennedy 1966
Talari	Bajo Pacuare, Turrialba	Central	4	Hurtado and Gómez 1988
Alto la Soledad	Fila Grisera, Olla Cero	Greater Chiriquí	1	Corrales, s.d.
Cambute	Buenos Aires	Greater Chiriquí	1	Drolet and Markens n.d.
Caracol	Buenos Aires	Greater Chiriquí	1	Drolet and Markens n.d.
Changuena	Middle basin of the Térraba River	Greater Chiriquí	2	Stone 1954
Farm 1, Section 19	Palmar Sur–Sierpe, Diquís Delta	Greater Chiriquí	5	Lothrop 1963
Farm 2	Palmar Sur–Sierpe, Diquís Delta	Greater Chiriquí	7	Stone 1943
Farm 2, Section 40	Palmar Sur–Sierpe, Diquís Delta	Greater Chiriquí	7	Lothrop 1963
Farm 4, Sections 23 and 36 (Sites A, B, C, E, G)[1]	Palmar Sur–Sierpe, Diquís Delta	Greater Chiriquí	20+8	Lothrop 1963; Badilla, Quintanilla, and Fernández 1998
Farm 5	Palmar Sur–Sierpe, Diquís Delta	Greater Chiriquí	3	Stone 1943
Farm 5, Section 32	Palmar Sur–Sierpe, Diquís Delta	Greater Chiriquí	7	Lothrop 1963
Farm 5, Broken Stone	Palmar Sur–Sierpe, Diquís Delta	Greater Chiriquí	1	Lothrop 1963
Farm 5, Section 19	Palmar Sur–Sierpe, Diquís Delta	Greater Chiriquí	1	Lothrop 1963
Farm 5, Section 33	Palmar Sur–Sierpe, Diquís Delta	Greater Chiriquí	14	Stone 1943
Farm 6 (East End)	Palmar Sur–Sierpe, Diquís Delta	Greater Chiriquí	2	Lothrop 1963
Farm 6 (West End)	Palmar Sur–Sierpe, Diquís Delta	Greater Chiriquí	5	Lothrop 1963
Farm 7	Palmar Sur–Sierpe, Diquís Delta	Greater Chiriquí	10	Lothrop 1963
Caño Island	Caño Island	Greater Chiriquí	2	Finch and Honetschlager 1985; Corrales and Leon n.d.

Table 1. Continued

Site	Location	Archaeological Region	No. of Balls	Source
La Hacienda	Sierpe, Diquís Delta	Greater Chiriquí	5	Quintanilla, in prep.
La Olla	Fila Grisera, Olla Cero	Greater Chiriquí	5	Stone 1943
P-254 Plantation 6	Palmar Sur–Sierpe, Diquís Delta	Greater Chiriquí	6	Baudez et al. 1993; Quintanilla n.d., in prep.
P-257 El Silencio[2]	Palmar Norte, Diquís Delta	Greater Chiriquí	1	Quintanilla n.d.
P-260 Grijalba	Ciudad Cortés, Diquís Delta	Greater Chiriquí	1	Quintanilla n.d.
P-261 Cansot[3]	Fila Grisera, Olla Cero	Greater Chiriquí	2	Quintanilla n.d.
P-263 San Felipe	Ciudad Cortés Wetlands, Diquís Delta	Greater Chiriquí	3	Quintanilla n.d.
P-283 Ojo de Agua	Ojo de Aqua, Ciudad Cortés, Diquís Delta	Greater Chiriquí	6	Quintanilla n.d.
P-284 Estero Rey	San Buena, Ciudad Cortés	Greater Chiriquí	9	Quintanilla 1992
P-295 Camaronal	Palmar Norte, Diquís Delta	Greater Chiriquí	2	Hidalgo 1993, Quintanilla n.d.
P-297 Drake	Devke, Agujitas	Greater Chiriquí	4	Quintanilla n.d.
P-299 Batambal	Palmar Norte, Diquís Delta	Greater Chiriquí	2	Quintanilla n.d.
P-313 Costa Purruja	Golfito	Greater Chiriquí	1	Hoopes n.d.
P-315 Obando	Golfito	Greater Chiriquí	4	Hoopes n.d
P-63 Curré	Curré	Greater Chiriquí	1	Quintanilla, in prep.
P-97 Bolas	Bolas	Greater Chiriquí	5	Drolet and Markens n.d.
San Vito	San Vito	Greater Chiriquí	1	Minelli and Minelli 1966
Térraba	Bajo Veragua, Térraba, Buenos Aires	Greater Chiriquí	2	Drolet 1981
Santa Marta	Chiriquí, Panama	Greater Chiriquí	1	De la Guardia 1963
Papagayo	Culebra Bay	Greater Nicoya	2	Baudez 1959

[1]In 1996 rescue archaeology occurred in this sector. Eight stone balls were found, some of which could be those reported by Lothrop.
[2]This is the location of the largest ball reported to date. The ball has a diameter of 257 centimeters and weighs approximately 15 tons.
[3]The balls at this site appear to be in a workshop. Gabbro and granodiorite outcroppings are nearby.

Table 2. Quantitative Analysis by X-ray Fluorescence Spectroscopy. Percentage of Elements in Metal Objects and Gold Nuggets from Southeastern Costa Rica

Object	Dimensions	Gold	Silver	Copper
Circular Disk	11.90 cm. Diam.	95	3.7	1.38
Circular Disk	9.30 cm. Diam.	93	5.9	1.4
Laminated Bead		93.87	5.92	0.21
Agujas River Nugget		96.66	3.05	0.29
Tigre River Nugget		94.84	3.21	0.14

Note: Concentrations were determined by X-ray fluorescence spectroscopy.

Table 3. Formal characteristics and techniques of cast metal objects from the Diquís Delta, Costa Rica found in the BCCR collection

Forms	Manufacturing Technique	Distinctive Traits
Group 1 Bird figures with lateral decorations of spirals and lizard stylizations	Casting open in the head, beak, and abdomen areas Gold-copper alloy with gilding Use of cast filigree Use of cast plates added to the objects	Wings in the form of a half moon with or without border decorations of balls in relief; balls are made with wax using repoussé Claws with separated digits made like cord and associated with hooks to hang plates Forked tails with laminate finish 7 to 12 cm high and 11 to 13 cm wide Objects more wide than high
Group 2 Anthropomorphic figures with zoomorphic heads or masks	Casting open in the head area Gold-copper alloy with gilding Use of cast filigree	Reptile stylizations in the form of headdresses, on the lower part of figures, and occasionally at the ends of wings Flat, slightly curved bars above or below figures Human bodies with belts and anklets Bird or reptile masks 7 to 9.5 cm high and 7 to 9.5 cm wide; square objects
Group 3 Two-headed or single-headed bird figures with stylized headdresses of reptiles or flat bars	Casting open in the head and beak areas Gold-copper alloy with gilding Use of cast filigree Balls in relief on the edges of the wings detailed using wax Cast plates added to the figures Figures divided into two or three parts joined with hooks produced in the same casting, sections attached in the way that plates are hung from the claws of some figures	Stylized reptile headdresses in one or two bands and flat plates; eyes in the form of bells Figures with decorative filigree bordering the eyes and chin; outline of the eyes form the body of a bird and the outline of the beak and tail form a quetzal Wings in a half moon with border decoration of braided or single threads and balls in relief Claws with digits formed like thread, the majority with hooks suspending plates Flat, forked tails with straight tips Figures rigid or divided into two or three parts, joined with hooks that allow movement when suspended Suspension hoops worn by use 7.8 to 8 cm high and 8.6 to 9.2 cm wide; objects more wide than high

Table 3. Continued

Group 4 Single or double anthropomorphic figures marked by flat, slightly curved bars	Cast figures of gold-copper alloy with gilding Figures modeled and molded directly in wax without using a partial nucleus Majority of objects show casting defects due to breaks in the mold Cast plates added to the figures	Anthropomorphic figures single and in pairs; nose seems to represent a bat face; eyes rounded, twisted, or square designed using wax; arms are always slightly curved and solid; trunk and legs show lateral hollows, perhaps resembling a skeleton; presence of nipples and navel Crownlike braided thread or heads of small birds; legs bound at the knees; cord braided with serpent tails is held in the hands and held in the mouth Rectangular, slightly flat bars above and below the figures Suspension hoops do not show wear from use, some figures do not have them Groups of nine plates hang from the front of the figure with hooks 4 to 7 cm high and 6 to 9 cm wide; objects are more wide than high

Table 4. Techniques and Traits of Sheet Metal Objects from the Southern Pacific Region of Costa Rica

Forms	Technique	Traits
Group 1a Flat and concave disks	Hammered from nuggets Use of molds to create concavity	Flat disks without decoration or with border decoration of repoussé points Concave disks without decoration or with border decoration of repoussé points Presence of decorations on top of smoothed or erased decorations Suspension holes on the upper part for wearing from use Diameter of 3 to 21 cm
Group 1b Disks with zoomorphic decorations (reptile)	Hammered from nuggets Use of repoussé as a decorative technique	Primarily schematic reptilian zoomorphic decorations Occasionally have decoration of repoussé points Diameter of 5 to 10 cm
Group 1c Disks with conical decorations	Hammered from nuggets Use of molds to create the conical protuberances Use of repoussé for decoration	Conical decorations in patterns of one to seven cones, occasionally mixed with circles and repoussé points around the edges Suspension rings for wearing Diameter of 7 to 30 cm
Group 2 Disks and pectorals in the shape of a horseshoe	Hammered from nuggets Use of repoussé as a decorative technique	Marginal decoration of balls and rectangles in relief and occasionally a central cone, without the presence of zoomorphic or anthropomorphic figures Diameter of 11 to 22 cm Pectorals 9 cm in width and 29 cm in height
Group 3 Diadems, bracelets, and anklets	Hammered from nuggets Use of repoussé as a decorative technique	Smooth or with border decoration of balls and rectangles in relief Suspension holes for wearing Diadems averaging 55 cm length and 2.5 to 5 cm in width. Bracelets 8.5 cm in width and averaging 25.8 cm in length Anklets 11 cm in width and averaging 33 cm in length
Group 4 Sheet beads	Hammered from nuggets	Thin, coiled sheet without decoration 3 to 10 cm in length (the largest beads being used as earrings)

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