

SAN CRISTOBAL ARCHAEOLOGICAL SITE, MANAGUA, NICARAGUA:  
SITE REPORT AND PRELIMINARY CERAMIC ANALYSIS

A Thesis

by

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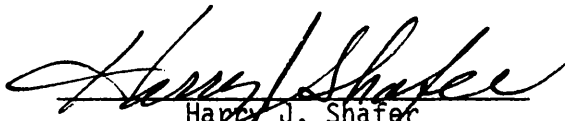
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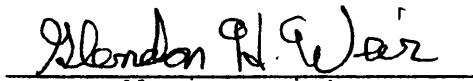
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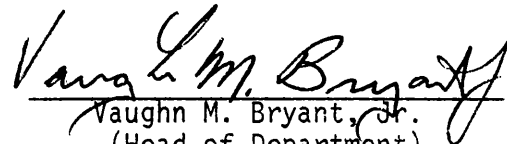
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## ABSTRACT

San Cristobal Archaeological Site, Managua, Nicaragua:  
Site Report and Preliminary Ceramic Analysis. (December 1983)  
Sue Bursey Wyss, B.A., North Texas State University  
Chairman of Advisory Committee: Dr. Harry J. Shafer

San Cristobal archaeological site, a pre-Columbian village of elevated housemounds and ceremonial mounds near the shore of Lake Managua, Managua, Nicaragua, was studied during the field seasons of 1977, 1978, and 1979. The field report and identification of the bichrome, trichrome and polychrome ceramics show an occupation from the Zoned Bichrome period, 300 B.C. to conquest. Nine of the types identified exist in the ceramic sequences already established for the region and clearly place San Cristobal within the sphere of the Greater Nicoya Subarea Ceramic Complex. Sketches and photographs of ceramic types are included in the thesis.

**DEDICATION**

**To the people of Nicaragua,  
wherever they may be.**

## ACKNOWLEDGMENTS

This thesis was produced as a result of the interest and help of many friends and colleagues for many years. Vivian Hays Gillespie shared the sun, dust and doubts of that first difficult field season at San Cristobal; Dr. Ted Rea supported us both in the field and by his continual search in Panama and Washington for articles pertinent to the area. Aldo Knopffler, owner of San Cristobal, willingly allowed me to work for three years and supplied valuable historical information about the area. Jaime Incer and Debbie de Jerez of the Banco Central and Jorge Espinosa, "Instituto Geografico Nacional", all gave valuable advice during the fieldwork.

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Photographs for the thesis were done by Jean Cristensen, sketches by Roger Coleman, and maps by Mike Nash, department of Anthropology, Texas A&M University. Without their help and that of Kelly Shea, this thesis would have been an impossibility. My fellow graduate students shared ideas, information and support continually.

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## INTRODUCTION

Nicaragua, which has areas of identified pre-Columbian sites along its Pacific and Caribbean coasts, the shoreline of its two great lakes, and on the islands of the lakes, is the least studied archaeological area between Mexico and Peru.

Work has been done in the last twenty years in four areas, the Rivas Peninsula and the Island of Omotepe in southern Nicaragua, on the Tipitapa River between the two great lakes, and at Bluefields on the Caribbean coast. Excavations were designed to provide material for ceramic chronologies. No holistic studies have been undertaken to understand in situ developmental and diffusionary processes.

Fernando Oviedo, one of the first historians and naturalists to visit Nicaragua in the 16th century, provided an excellent first hand description of the villages that dotted the shoreline of Lake Managua (Oviedo 1976:376). The continuous line of thatched roof and pole houses located around ceremonial mounds, temples and market areas were populated by Chorotega speaking peoples who also populated the Nicoya Peninsula of Costa Rica, southern Honduras, and the states of Guerrero, Oaxaca and Chiapas, Mexico (Lothrop 1926:21).

The San Cristobal archaeological site, located on the shore of Lake Managua, fits much of Oviedo's description and using it as a model, excavation and study procedures were designed to provide data for a holistic study of the Pre-Columbian culture of the village.

This thesis follows the format of American Antiquity.

Aerial photography, oral history from the owner, Aldo Knoepffler and the farm manager, original maps of the farm as well as walking surveys of the farm were used to determine the perimeters of the village. Visible mounds were located on a sketch map and excavated areas were placed on a topological map. A trench was opened in one housemound and test units were excavated in level areas between the low mounds to determine living patterns. Excavations in the level areas between the taller, ceremonial mounds were made to identify activity areas. Collections of all ceramic, lithic and faunal material, as well as special artifacts were made at 10 cm intervals from fine wire screening. All of the material from the burials was also preserved. This will provide material for many future research projects.

This site is characteristic of the remains of the pre-Columbian villages of the Lake Managua area; they are basically low mounds randomly located around taller ceremonial mounds or at times only concentrations of ceramic sherds on the surface of a field. The area is one of heavy agricultural activity, both cotton and rice are cultivated around the lake, and frequent plowing has obliterated many of the low mounds. The area lacks the monumental architecture found to the north in the core area of Mesoamerican civilization, first defined by Kirchoff (1943) as Mexico, Guatemala and Belize, and has often been considered an area difficult to work in. Baudez (1970) cites three major reasons for the area having been ignored for so long: 1) an almost complete absence of building stone, 2) scattered

settlement patterns, and 3) the disappearance of perishable structures and materials due to the pervasive humidity in the region.

Cultural material excavated in three field seasons at San Cristobal consists of excellently preserved ceramic, lithic and faunal remains. According to Olga Linares, Smithsonian Institute for Tropical Research (personal communication 1978), the preservation of cultural remains, especially faunal material at San Cristobal, is the best she has seen in Lower Central America. Apparently heavy rainfall levels and semi-tropical environments are not always destructive environments for preservation when they are also combined with volcanic soils having good drainage.

This thesis reports the excavation, preliminary analyses, and description of part of the ceramic materials recovered at San Cristobal. These materials consist of the bichrome, trichrome and polychrome ceramics of Unit C, Mound I, which were stratigraphically excavated by the author in the field seasons of 1977, 1978 and 1979. Unfortunately, the Nicaraguan civil war of 1979 brought all work at San Cristobal to an abrupt halt.

## REVIEW OF LITERATURE

Nicaragua's two important colonial cities, Leon and Granada were located in centers of heavy Indian population: Leon on the north shore of Lake Managua and Granada on the northwest shore of Lake Nicaragua. In 1527 Gonzalo Fernandez de Oviedo y Valdez was sent to the area by the King of Spain to begin chronicles of the daily life of the new government. He also recorded the habits, beliefs and rituals of the native population, and identified the flora and fauna of the area. His 50 volume work, Historia general y natural de las Indias, islas y Tierra Firme del mar Oceano, was published from 1535 to 1557 and provides an excellent first-hand report of Nicaragua at the time of Spanish occupation.

Oviedo identified four principal groups of Indians as the occupants of the area which is bordered on the northwest Pacific coast by the Gulf of Fonesca and on the south by the Nicoya Peninsula of Costa Rica. The Chorotega, "the old ones", inhabited the area around the Gulf of Fonseca, Leon, Managua and Masaya as well as the Nicoya Peninsula of Costa Rica where they were called Orotina. The Nicaraguans (Nicarao), or Mexicans as Oviedo called them because "their language was that of the Indians of Mexico or Temestitlan of New Spain" occupied the area of El Viejo, Chinandega, the Rivas Peninsula to the west of Lake Nicaragua, as well as the islands in the Lake. The third group, the Chondales (Chontales), inhabited the eastern side of Lake Managua and were referred to only briefly as being very different in looks and language from the Chorotega and

Nicarao (Oviedo 1976:303). Brief reference was also made to groups speaking completely different languages in the interior of the country.

Between 1514 and 1556, Oviedo made many trips to Central America and the West Indies, and dedicated long portions of his books to descriptions of the Chorotega and Nicarao peoples of Nicaragua. They were always referred to as being very different from one another in language and culture. Although they had the same types of temples and both practiced human sacrifice, their ceremonies and rites were different and they could not communicate with one another. That there was animosity between the Chorotega and Nicarao before the arrival of the Spaniards was commented on by Oviedo; the only time he saw a Nicarao in a Chorotega village was as a slave or sacrificial victim (Oviedo 1976:136).

The best source for these conflicts and the migrations of the Nicarao into the area was given by Juan de Torquemada who recounted others' eye witness reports in his chronicles Veinte y un libros rituales y monarquia indiana, con el origen y guerras, de los Indios Occidentales, de sus poblaciones, descubrimiento, conquista, conversion y otras cosas maravillosas de la misma tierra written in 1723. As a Franciscan friar in Mexico, Torquemada learned Nahuatl, the language shared by the Nicarao of Nicaragua with groups in Mexico, and studied the prehispanic traditions of the Indian speakers of this language as part of his evangelical labor. As well as history he also wrote plays in Nahuatl (Arellano 1976:94).

According to legend, the "Naturales" or Chorotegas originated in the valley of Cholula, Mexico, and lived at one time in Xoconochco (Soconusco, Chiapas, Mexico) (Torquemada 1975:107), on the Pacific coastal frontier of Mexico and Guatemala. The first migrations of the Chorotega are not detailed, but when the Nicarao, who according to migration legends, originated in Anahuac, were pushed out of Mexico because of the warlike Olmec about the time of the break up of the Toltec empire, twelfth century A.D. (Lothrop 1926:398), the Chorotega were already settled in Nicaragua. The Nicarao, who probably migrated as part of the Pipil Indian groups of the same language, encountered fierce resistance to their entry into Nicaragua but were able to fight their way past the Chorotega in northern Nicaragua and settle on the shores of Lake Nicaragua and on the island of Omotepe, as they had been instructed in legend (Torquemada 1975:109). Torquemada relates the decimation of the Indian population on the north shore of Lake Managua to the eruption of the volcano Momotombo near Leon and estimated the total Indian population at the time he wrote the book in 1753 at 5,000 (Torquemada 1975:102). Oviedo attributes their decimation to the cruel measures of the Spaniards. Neither mention disease.

E.G. Squier published two volumes in 1852 titled Nicaragua: Its People, Scenery, Monuments and Proposed Inter-Oceanic Canal aimed at presenting the advantages of locating an inter-oceanic canal which would connect the Caribbean to the Pacific via the San Juan River, Lake Nicaragua, and over the narrow isthmus of Rivas to the Pacific. He also included data on Nicaragua's pre-Columbian stone monuments

that still exist around Lake Nicaragua, and identified a 200 word vocabulary in use on the Island of Omotepe as being of Uto-Azteca roots.

Dr. J.F. Bransford, also in Nicaragua to serve as medical officer on a survey for the interoceanic canal, published a volume of archaeological research on the island of Omotepe in Lake Nicaragua and San Jorge on the western shore of the lake. Archaeological Researches in Nicaragua, published by the Smithsonian Institution in 1881, describes 788 objects in the collection that was excavated by the author and, for the first time, provenience was noted for each object. Dr. Bransford identified and thoroughly described three important ceramic types, Luna, Santa Helena and Palmar, as well as describing 200 vessel burials.

In 1882, Dr. Earl Flint of the Peabody Museum defined Chorotega pottery as clearly Aztecan after visiting the Rivas Peninsula with Bransford. Another early publication was that of Bovallious (1886) in which he described Nicaraguan stone statues.

Samuel K. Lothrop did the first modern, organized study of the ceramics of Nicaragua in 1926. His two volume work, The Pottery of Costa Rica and Nicaragua, is still a widely used reference. After examining 40,000 specimens in museums and private collections, he concluded that the Pacific coast of Nicaragua and the Nicoya Peninsula of Costa Rica were one archaeological area although inhabited by two very different groups, the Nicarao and the Chorotega. The basic art forms and styles of the pottery studied by Lothrop were found to be of independent origin, neither from the north nor the

south (Lothrop 1966:180). As yet, the ceramic types of the Nicoya area cannot be divided into Chorotega and Nicarao origin, and the stone statuary presents even greater mysteries, although Lothrop (1921) attributes them to the Chorotega. Two stone statues identified as Chorotega by Lothrop underlie stelae four and five at Copan which date to 523 A.D. and 452 A.D., respectively. He suggests that they were the early occupants of the area and were driven out by the Maya and dispersed to Chiapas, Mexico and Nicaragua (Lothrop 1926:87). The early polychrome period, which marks a definite change in the Nicoya area, began about this time.

Doris Stone (1966b) suggests that the first inhabitants of the western shores of Nicaragua's lakes and the Nicoya Peninsula were the Chibchan speaking Corobici who were driven to the interior by the Chorotega. There are no historical records of their presence in the area but some stone bowls at San Cristobal would perhaps suggest affiliations.

Of eight major linguistic trunks in this hemisphere, four are represented in the small area of Middle Central America. The Chorotega belong to the Oto-Mangue linguistic family which is found in northwest Costa Rica, western Nicaragua, southern Honduras, and the southern states of Guerrero, Oaxaca and Chiapas in Mexico (Lothrop 1926:21). Squire identified the Nicarao vocabulary that he collected in 1852 on Omotepe as being Uto-Aztecan; the Hokaltec linguistic group was identified in Subtiaba, near Leon; and Chibchan on the western side of Lake Managua and through central Costa Rica (Baudez 1970)(Figure 1).



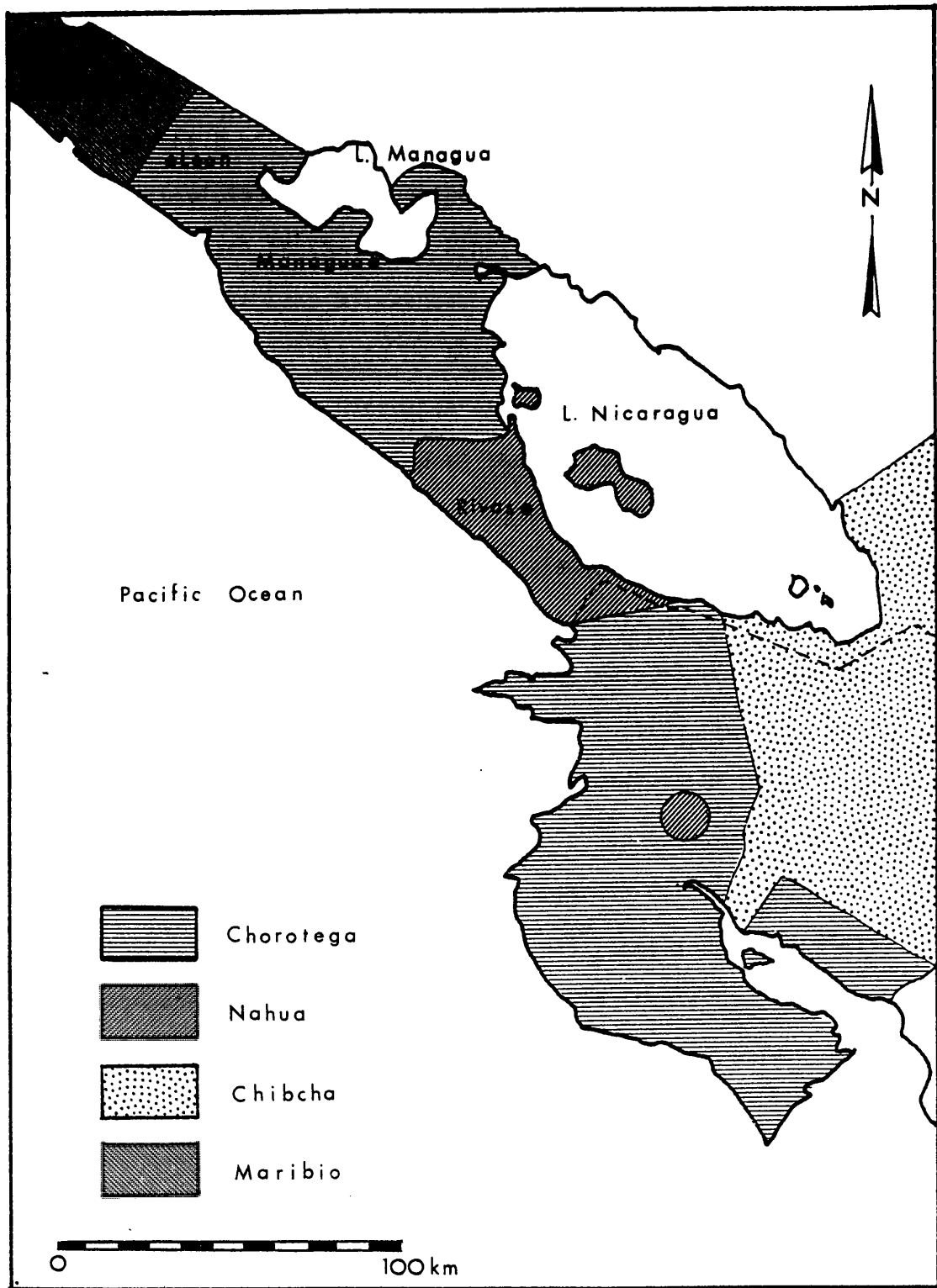


Figure 1. Major Linguistic Areas of Nicaragua

Although archaeological activity existed in El Salvador, Honduras and Costa Rica in the early decades of the century, Nicaragua only began to attract professional attention in the 1960s. The Peabody Museum Project of 1959-1961 sponsored excavations by Gordon R. Willey and Albert H. Norweb in the Rivas Peninsula of Nicaragua and on the Island of Omotepe in Lake Nicaragua. Preliminary analyses of this ceramic material was initiated by Norweb and published as Ceramic Stratigraphy in Southwest Nicaragua in 1964.

Wolfgang Haberland excavated on the Island of Omotepe in 1962 under the sponsorship of the Hamburg Museum of Ethnology and Prehistory. In his publications (1963a, 1963b, 1966, 1969) he identified and described Managua polychrome which he found in collections in Managua and felt it to be the only true Nicarao ceramic type. In discussing Nicarao migrations into Central America, he suggested that their arrival might have been as late as 1400 A.D. due to the intimate relationship of Managua ware to Nimbalaria Trichrome from the central depression of Chiapas which was part of the last Chiapas phase, Tuxtla, A.D. 1350 to Conquest (Haberland 1974:558). If the Nicaraos arrived only 200 years before the Spaniards, that could explain the pure Nahuatl culture exhibited to Oviedo.

Pottery excavated by Haberland on Omotepe, Luna Polychrome in particular, was not identified as having any northern affiliation, although the language spoken on the Island at the time of the Squire visit was identified as Uto-Aztecan. If the ceramics excavated by Haberland were from the Nicarao, there should have been other examples of Pipil pottery types as well, such as Marihua Red on Buff which is

prominent along the proposed migration route of the Pipiles to El Salvador and Nicaragua (Haberland 1974:558).

In 1976 Paul Healy analyzed the ceramic material excavated by Willey and Norweb in the Rivas Peninsula and published his findings as a PhD thesis at Harvard. His study was directed toward the chronological organization of the ceramics of the little known area of Rivas, and the creation of a framework of spatial-temporal systemics. Healy found many similarities in ceramics of the Nicoya subarea by comparing Rivas ceramics with the analyses of Baudéz (1967) in Tempisque, Costa Rica, and noted that the surveys and excavations of Fred Lange in 1969, 1970, and 1971, along with his material, began filling in the cultural picture for southern Nicaragua and northwest Costa Rica. These studies suggest that Rivas and Guanacaste were closely connected in the Zoned Bichrome Period and were very similar in the Middle Polychrome Period, but less similar in other periods. Healy stated that the evidence indicated that the Greater Nicoya Archaeological Sub-Area was a definite cultural entity by 350 B.C. and developed regional differences by 300 A.D., perhaps due to the Nicarao migrations to the area (Healy 1980:301).

Lydia Wickoff, Yale University, produced an abbreviated study of Nicaraguan ceramics (1971) based on an excavation at San Francisco on the Tipitapa River between the lakes. Richard Magnus, Yale, (1974) wrote a doctoral dissertation on the archaeology of the south Misquito Coast of Nicaragua.

The Denver Conferences on Greater Nicoya Ceramics of 1982 and 1983 brought together archaeologists interested in the Greater Nicoya

area to begin procedures to generate a unified set of ceramic descriptions from those originated by Baudez (1967), Healy (1976a, 1976a), and Sweeney (1975, 1976). Those efforts are being focused on bichrome, trichrome and polychrome ceramics to identify common types in the 134 types named in the three classifications (Denver Conference 1982).

Temper and paste analysis through neutron activation of ceramic samples from all of the time periods of the Greater Nicoya core area, the Central Highlands and Atlantic watershed of Costa Rica, western Panama, the Atlantic and Pacific Coasts of Nicaragua, El Salvador, and the Lake Yojoa and Gulf of Fonseca regions of Honduras, were done by Ron Bishop at the Brookhaven Institute. These data are also being integrated into the Denver system (Lange personal communication 1983).

One of the research needs defined by the Conference in 1982 was the importance of more field work in Nicaragua in order to eliminate the imbalance between Nicaraguan and Costa Rican data bases and to define the northern boundaries of the Greater Nicoya area.

In a recent trip to Nicaragua, in April 1983, Payson Sheets and Fred Lange visited a number of sites and based on the surface collections made, recommended that certain sites be further studied. San Cristobal was included as a site that could potentially provide important information about the ceramic development on the western side of Lake Managua. Hopefully, the material that has been excavated for this study will aid in the better understanding of the cultural history of the area.

## GEOGRAPHIC SETTING

Nicaragua, the largest of the Central American countries, 130,000 square km, is bordered on the north by Honduras and on the south by Costa Rica. It consists of three geographical zones: the Pacific, the Central Highland, and the Caribbean. The Pacific zone is cut by a volcanic chain running northwest to southeast which extends from the Mexico-Guatemala frontier to central Costa Rica, a total distance of over 1,400 km (Figure 2). This volcanic chain has distributed lava rock or volcanic ash soils over 70% of Nicaragua (Incer 1975).

Two large bodies of fresh water, Lake Managua (Xolotlan) and Lake Nicaragua (Cocibolca), occupy the great Nicaraguan depression which extends from the mouth of the San Juan River to the Gulf of Fonseca on the Pacific. The two lakes are joined by the Tipitapa River, which drains Lake Managua into Lake Nicaragua. Since part of the river is an underground connection, marine life does not move from one lake to another and there are marine and faunal components present in Lake Nicaragua that are not present in Lake Managua (Incer 1976:3). The capital of Nicaragua, Managua, is located on the southwestern shore of Lake Managua.

Throughout this area there are two seasons, a wet season, "invierno", and a dry season, "verano", which are clearly distinguishable. In the Managua Valley, during the rainy season from May to November, there is an average rainfall of 1,000 to 1,500 mm which is followed by the six month long rainless, windy summer. Due to the long dry season, the Pacific coast is an area of large

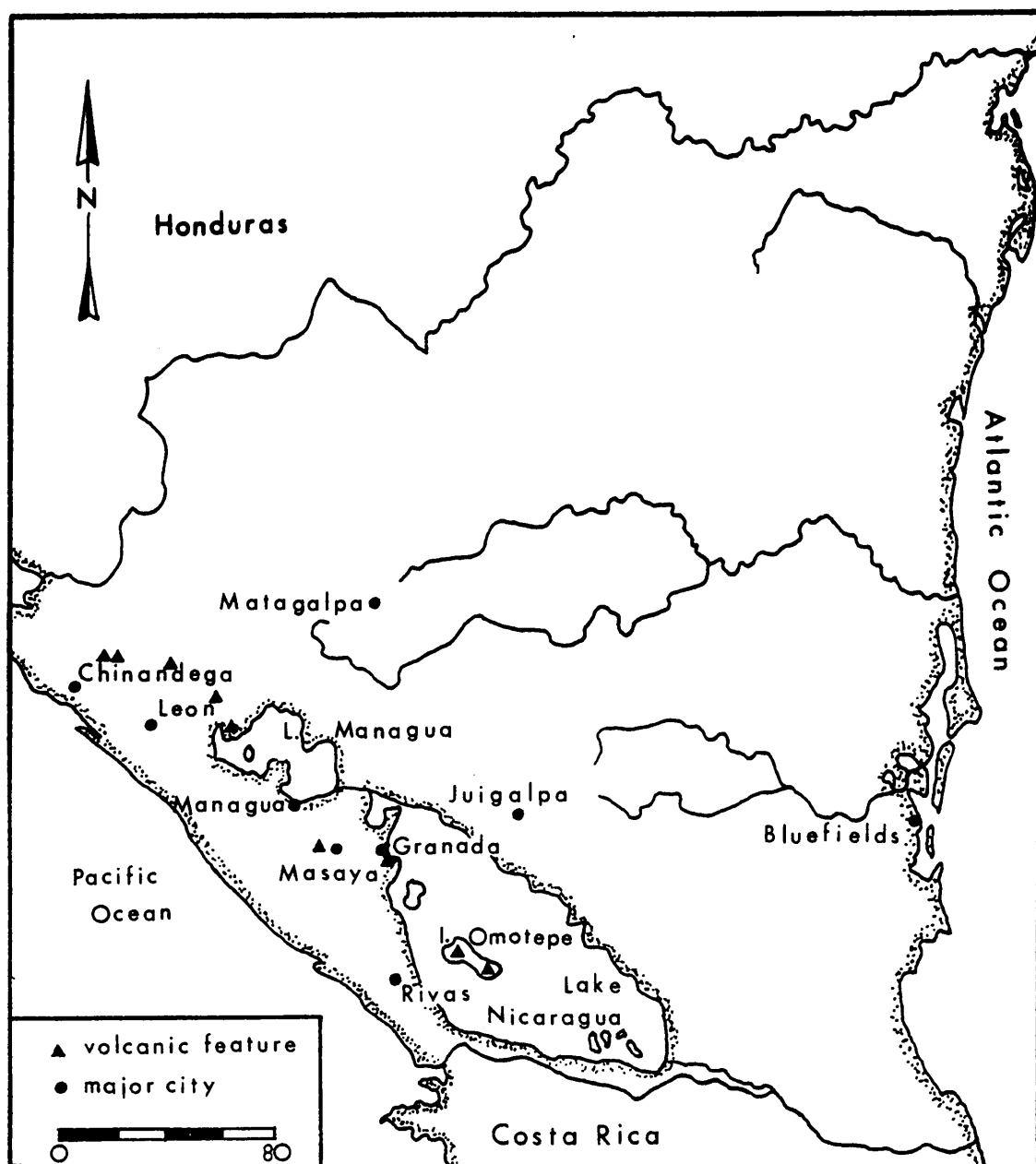


Figure 2. Map of the Republic of Nicaragua

grasslands with temperatures rising to 29.4 degrees C and humidity levels of 90%. From January through April winds of 30-40 km per hour are common (Incer 1975:23). At the time of the arrival of the Spanish, the Pacific coast of Nicaragua and the shores of the lakes were heavily populated by agriculturally based natives. In the narrow coastal strip along the Pacific coast of El Salvador and Nicaragua, Oviedo noted a continual group of villages four to five leagues (20-25 km) apart, concentrated principally around the shores of Nicaragua's many lakes. Today's population is still concentrated in the same area around the two lakes in Managua, Masaya and Granada.

## FLORA AND FAUNA

Oviedo (1976) is again the best source of information concerning the flora and fauna of Nicaragua in the early 1500s, (Tables 1, 2). He wrote many volumes about plants, animals, and their local uses from first hand observations. He was the first authority to write of the fishes of the two large lakes of Nicaragua. Ironically, he argued that the presence of sawfish, sharks and tarpon in Lake Nicaragua are due to the connection of the lake with the Caribbean via the San Juan River, an argument that was discounted by later naturalists and which is considered correct today (Villa 1976:102). Squier also referred to the importance of fish to the Indians and describes a fishing scene on Lake Managua that emphasizes this importance:

At one point bushes were planted in the lake [Managua], like fish weirs between which women were stationed with little scoop nets, wherewith they ladled out myriads of little silvery fishes, from the size of a large needle to that of a shrimp, which they threw into kettle-shaped holes, scooped in the sand, where in the evening light, leaping up in their dying throes, they looked like a simmering mass of molton silver. These little fishes are called "sardinas" by the natives, and are cooked in omelettes, constituting a very excellent dish, and one which I never failed to order whenever I visited Managua. The first travelers in Nicaragua mention this novel fishery as then practiced by the aborigines, and it has remained unchanged to the present hour (Squire 1952(1):412).

Perhaps this observation helps explain the high volume of tiny fish vertebrae in the faunal remains of San Cristobal. Fish remains make up 90 percent of the total number of faunal materials at San Cristobal (Usrey 1979).



TABLE 1: SELECTED FLORA OF LAKE MANAGUA AREA

Medlar "nispero"	<u>Mespilus germanica</u>
Cacao	<u>Theobroma cacao</u>
Cotton	<u>Gossypium</u>
Bean	<u>Phaseolus</u> sp.
Corn	<u>Zea mays</u>
Squash	<u>Cucurbita</u> sp.
Gourd	<u>Cucurbita</u> sp.
Manioc	<u>Mannihot esculenta</u>
Papaya	<u>Asimina triloba</u>
Coconut	<u>Cocos nucifera</u>
Fig	<u>Ficus carica</u>
Mango	<u>Mangifera</u>
Tobacco	<u>Nicotiana tabacum</u>
Dates	<u>Lemnaireocereus griseus</u>
Coca	<u>Erythroxyton coca</u>
Agave	<u>Agave</u> sp.
Guayacan	<u>Guaiacum</u> sp.
Ceiba	<u>Bombax ceiba</u>
Madera Negra	<u>Lemnaireocereus griseus</u>

TABLE 2: SELECTED FAUNA OF LAKE MANAGUA AREA

Shark	<u>Carcharhinus nicaraaguensis</u>
Bull shark	<u>Carchrhinus leucas</u>
Sawfish	<u>Pristis perotteti</u>
Tarpon	<u>Tarpon atlanticus</u>
Sardine	<u>Melaniris sardina</u>
Tropical garfish	<u>Lepisosteus tropicus</u>
Caiman	<u>Caiman crocodilus</u>
Turtle	<u>Chrysemys</u> sp.
Peccary	<u>Tayassu</u> sp.
Barkless dog	<u>Caninis familiaris</u>
Raccoon	<u>Procyon lotor</u>
Turkey	<u>Meleagris gallopavo</u>
Wolf	<u>Canis lupis</u>
Anteater "pisote"	<u>Tamandua tetradactyla</u>
Rabbit	<u>Sylvilagus floridanus</u>
White-tailed deer	<u>Odocoileus virginianus</u>
Coati Mundi	<u>Procyrinoidae nasua narica</u>
Fox	<u>Uso syon cineoargenteus</u>
Agouti	<u>Dasyprocta punctata</u>
Iguana	<u>Iguana iguana</u>
Mouse	<u>Liomys salvin</u>
Jaguar	<u>Panthera onca</u>
Parakeet	<u>Aratinga</u> sp.

The importance that crocodiles or caiman had in accounts related to Oviedo would seem to indicate their abundance. One of the great fears of the Indians was of witches in the community who, at will, could change into a caiman or other animal, steal the children, and eat them to revenge some act (Oviedo 1976:454). Also present in the faunal remains of San Cristobal are also many turtle shells, some with carving and drilled holes, as well as many snake vertebrae. Appendix I lists mammal and fish remains identified in the preliminary analysis of faunal material of Unit I of San Cristobal (Usrey 1979).

Some of the animals described by Oviedo were wild pigs, rabbits, deer and tigers which were hunted. There were domesticated barkless dogs, turkeys, wolves and "pizotes" (anteaters), described as similar to a housecat but that would bite when hungry. Rabbit, deer, and barkless dogs were so abundant that stews of these meats were cooked and sold in the market (Oviedo 1976:109).

Fruits and vegetables abounded. In one detailed description of a village that he visited, Oviedo said that it was not visible until he was nearly upon it due to the quantity of fruit trees planted in the area. The favorite fruit of Oviedo was the "nispero" Mespilus germanica, which was grown only by the Chorotega. The cacao bean, Theobroma cacao, was grown only by the Nicarao, and was the universal form of exchange at the time of Oviedo's first visit in 1527. Although he mentions that the Nicarao and Chorotega were great enemies and that they never entered one another's villages or markets, the Chorotega also utilized cacao beans as their money. No intermediary traders were ever mentioned, but obviously some agent had to fulfill

that role. Cotton, beans, corn, squash and manioc were cultivated as were fruit trees of papaya, mamey, cocoanut, fig and perhaps mango. Two trees that especially impressed Oviedo were the guayacan, for its fine wood and also the healing power of the tea made from boiling its freshly cut branches, and the ceiba, which he said was the largest tree he has ever seen in any of his journeys. That is quite a statement since he traveled from Spain throughout the Caribbean, Mexico, Central America and down the Pacific coast and overland to Paraguay.

## GEOLOGICAL SETTING

Geology has influenced developments in Nicaragua more than in most countries because of the long line of active and inactive volcanoes on the Pacific coast extending from the Gulf of Fonseca to the islands in Lake Nicaragua. Seventy percent of the land surface of the country is covered by volcanic rocks or very fertile volcanic soils. The violent and extremely destructive earthquakes that Nicaragua has suffered, along with the periodic eruption of volcanoes are major factors in the history and culture of the country.

The Nicaraguan depression which hold the two large lakes, Lake Managua and Lake Nicaragua, crosses Nicaragua from the Gulf of Fonseca on the Pacific Ocean to the mouth of the San Juan River on the Caribbean. The surface features of the Managua region, geologically very young, are the result of the processes of surface vaulting, addition of layers of tephra from the nearby volcanoes, removal of material by erosion and, in part, the redeposition of soil and tephra moved downslope by surface water (Woodward-Clyde 1976:10). The shore line of Lake Managua, from Managua to Tipitapa, on which San Cristobal is located, is a jagged, eroded shore subject to heavy wave erosion when winds are from the northeast.

The major drainage basins in the Managua region are formed by tephra moved down to lower levels by wind and water erosion. Tephra, the general name given to pyroclastic material explosively ejected from a volcano, usually forms continuous layers over large areas around the source. Since it is deposited from the air, it initially

covers the entire land surface, blanketing hills and ridges, as well as valleys and lowlands. Individual tephra layers usually have distinctive characteristics that allow them to be described and identified. Tephra eruptions are generally short, a matter of hours or days, so the entire layer can be used to represent an instant of geological time.

The tephra is usually light and porous (pumice, volcanic cinders, and volcanic ash) and is vulnerable to rapid erosion until soil and vegetation begin to form on its surface. Much of the tephra is removed by erosion in the first months and years after it falls. The subsequent deposits of reworked tephra are approximately the same geologic age as the original layers (Woodward-Clyde 1976:14).

The Airport Graben, an area to the south of Managua that includes the airport, the Zona Franca, and San Cristobal archaeological site, is a deep alluvial fill deposited in the late Pleistocene and Holocene times (Figure 3). The bulk of the sediment of the Airport Graben can be traced to several volcanoes in the Masaya caldera, Santiago being the most active. Tephra from these volcanoes is moved westward by the prevailing winds and erosion to be deposited in the Airport Graben.

This area was studied by the consulting firm of Woodward-Clyde in 1976, after the earthquake, in order to determine the seismic hazards for the area. Fifty trenches were dug in the Managua area and the stratigraphic layers under Managua have been dated by Carbon-14, paleontological methods and by hydration rim dating. The formations at the Zona Franca are sedimentary deposits derived from tephra that appear in the stratigraphic column. Using the principles of

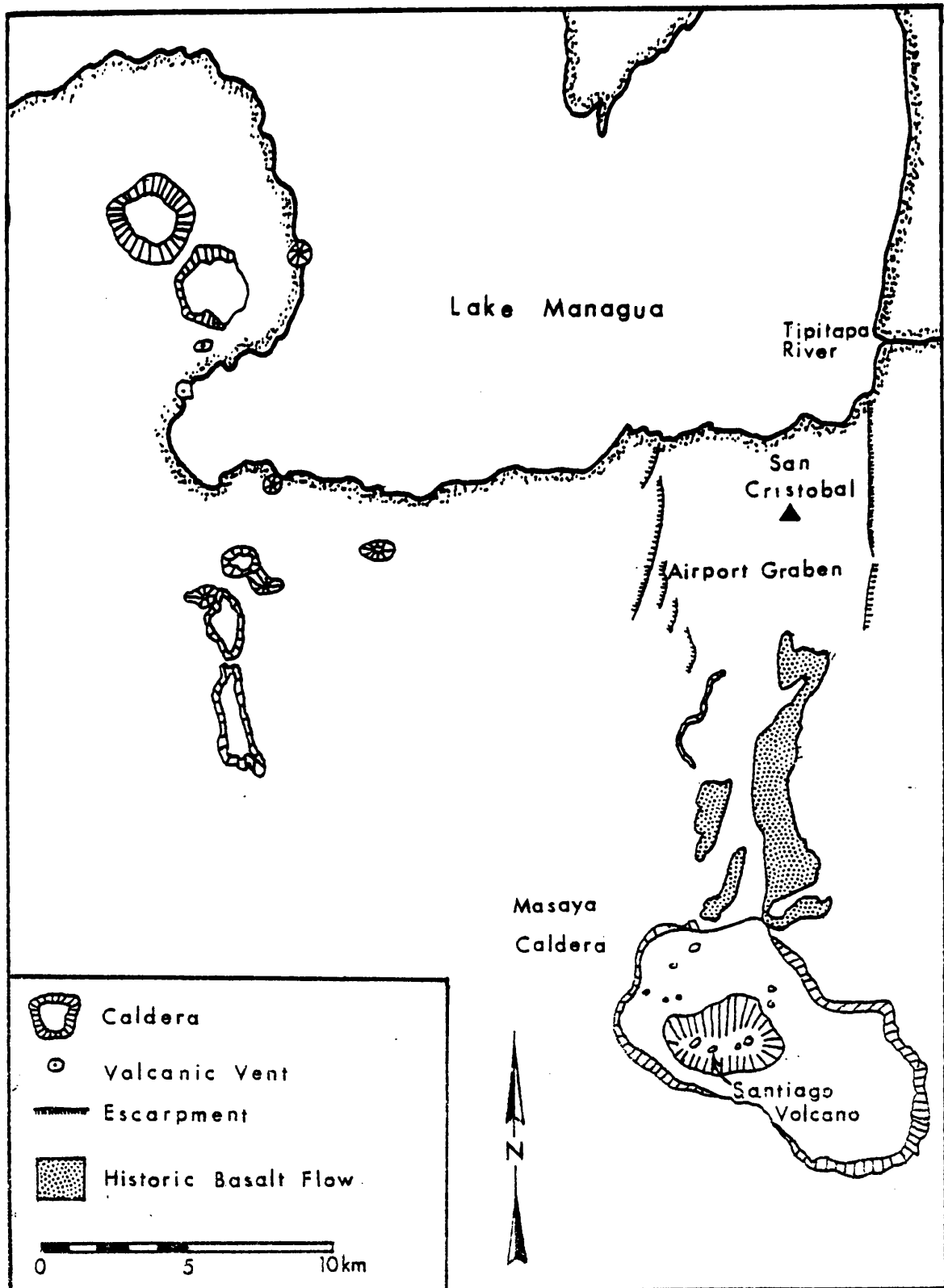


Figure 3. Prominent Land Forms In The Vicinity of San Cristobal

tephrachronology, an estimate of the age of the formations at Zona Franca has been made. Since San Cristobal is in the same area, only 1 km to the south of the Zona Franca, the age estimates can also be applied to the site.

The Zona Franca and San Cristobal, located in the Airport Graben, have been subsiding throughout late Pleistocene and Holocene times. Erosion in the uplands has produced sediments which have been transported down the local basins and then redeposited. Sediment accumulation rates in the Airport Graben are quite large when compared to the rest of the region. The Aguadora wells, south of the airport, indicate that the Las Sierras Formation is buried under more than 200 m of sediment. This is in contrast to other parts of the Managua region where the Las Sierras Formation is within a few meters of the surface and is often exposed in four meter deep trenches. This deep burial is one indication of the amount of subsidence and the rate of sediment accumulation in the Airport Graben (Woodward-Clyde 1976:42).

Another indication of rapid sedimentation was found in trench three of Woodward-Clyde. Here fragments of black, pre-Columbian ceramics, believed to be less than 3,000 years old, were found in alluvium 1.5 meters below the surface. An examination of the deposit indicated the fragments had been transported by water and were covered by water-borne sediment, and not buried in a grave site; therefore, the overlying alluvium could not be more than 3,000 years old. At this location, it appears that the average sedimentation rate for the late Holocene time has been more than 50 cm per 1,000 years (Woodward-Clyde 1976:18).



The Retiro Tuff was deposited from the air as a result of volcanic eruptions of fine ash. It is usually seen as several layers of buff colored, fine grained, indurated tuff that are below the modern soil surface. This tuff is widespread throughout the Managua area, and can be seen in almost every roadcut and ditch within the metropolitan area. The Retiro Tuff is believed to have been deposited 2,500 to 3,000 years ago in a catastrophic volcanic eruption. The modern soils of Managua which overlay the Retiro Tuff consist of some reworked alluvial deposits, tephra from small volcanic eruptions which quickly weathered to soil, and from weathering of the underlying Retiro Tuff. All artifacts found below the Tuff have been in burials that penetrated into these layers (Woodward-Clyde 1976:21).

The San Cristobal archeological site has a Retiro Tuff layer at a depth of 60 to 80 cm below the modern soil in most parts of the farm on which the site is located. Present house mound height is approximately 50 to 120 cm, but the height perhaps was greater at an earlier time. According to Woodward-Clyde, uncompacted man-made fill is especially vulnerable to compaction under seismic shaking as are recent alluvial deposits or soils with excess moisture. The soil of San Cristobal fits all of these categories. The Santiago Volcano, the active crater of the Masaya Caldera, is located 14.5 km due south of San Cristobal. The large Masaya crater has been inactive for the last 300 years, but its last eruption in 1670 sent lava flows to within 2.75 km of San Cristobal.

## CULTURAL HISTORY OF THE CHOROTEGA

Radiocarbon dating suggests that man passed through the Isthmus of Central America as early as 12,000 B.P. A "fishtail" point from a mountain island left when the Panama Canal was flooded was dated 9000 B.C., but there is no indication of permanent settlement prior to 4840  $\pm$  110 B.C. (Lothrop 1966:181).

Nicaragua has to date produced no early man sites, although there was a period of great speculation about the age of footprints in an ash layer at Acualinca and about human association with the Pleistocene site El Bosque (Bryan 1973; Espinosa 1975). The oldest ceramic period known, the Zoned Bichrome, has been dated at approximately B.C.300. (Healy 1980:306). Ceramics of this period are in association with metates, an indication of an agriculturally based, sedentary people. That would seem to suggest that the first permanent settlers of Nicaragua migrated from areas where agriculture was already developed (Norweb 1962:558).

The first identified inhabitants of Nicaragua and San Cristobal, although probably not the occupants during the Zoned Bichrome period, were the Chorotega (Oviedo 1976). Although there are no records or oral histories of the first Chorotega migrations to Nicaragua, they are generally accepted as having come from Central Mexico long before the Nicarao. Lothrop cites Chorotega pottery as underlying the first Mayan deposits at Copan and suggests that they were driven south into Nicaragua about 500 A.D.; this coincides with the first appearance of polychromes in Nicaragua (Lothrop 1926:xxxvi). By the time of the

Spanish conquest, Chorotega speakers were found in southern Honduras, Costa Rica, Nicaragua and the Mexican states of Guerrero, Oaxaca and Chiapas (Baudez 1970:19).

The best descriptions of Chorotega villages and their customs are in the first hand reports of Oviedo who first visited Nicaragua in 1527.

Chorotega villages were distributed around the Gulf of Fonseca, in southern El Salvador and southwestern Honduras where Oviedo referred to them as Chorotega Malalaca. Other Chorotega lived in villages around Lake Managua and on the Nicoya Peninsula of Costa Rica. At the time of the conquest there were heavy population concentrations at Leon Viejo, around the volcano of Momtombo, the Laguna de Teguancinalue (today the Laguna del Tigre), the Laguna de Tecuanauete (today the Laguna de Tecuaname), all along the lakeshore from Old Leon to Managua, around Laguna Tiscapa and Laguna Diria (today Apoyo), on the slopes of the Masaya caldera, around the volcanic crater of Nindiri and at the present sites of the towns of Masaya and Diriamba. The Chorotega villages were then interrupted by concentrations of Nicarao villages in the Rivas Peninsula. South of Rivas, in the Nicoya Peninsula of Costa Rica, Chorotega speaking villagers again appear. These settlements perhaps were made when the Nicarao drove the Chorotegas south out of Rivas (Lothrop 1926:398). Doris Stone (1972 :133-134) suggests that the Chorotega-Mangue moved into southwest Nicaragua and Nicoya during the early Polychrome Period and that the area was previously inhabited by the Corobici peoples. She dates the Nicarao arrival as coinciding with the expansion of the

Toltec empire, the Early Post Classic of Mesoamerica, A.D. 900-1200.

All of these hypotheses are based on stylistic resemblances in pottery and have not been independently substantiated in the field yet.

Oviedo visited a village of Chorotega speakers near Managua to judge for himself the effectiveness of the mass conversion to Catholicism that Gil Gonzalez and Francisco Fernandez had written of to the King of Spain. After reading one report from Gonzalez of the enthusiasm of the Indians in being baptized and in showering Gonzales with gold, he cynically remarked that, in spite of the fact that Gonzalez reported having explained to the Indians the basic tenets of Christianity and Catholicism, he doubted that Gonzalez bothered to mention that Jesus only baptized and taught, that he did not take all of his converts' gold or make slaves of the people (Oviedo 1976:9).

The settlements around Lake Managua were described thus:

I went to the villages of Managua of the Chorotega language; that was a truly beautiful and heavily populated area; it extended all along the shore of the lake from Leon to there, occupying a great deal of space, but it had no organization such as our cities, it was only groups of houses one after another with long intervals between them, and when it was most prosperous [before the plague of war], it was an extensive and varied settlement, like the ones in the Acala Valley or in Vizcaya and Galicia and in the mountains and in the valley of Ibarra and other places [where] the houses are separated but within view of one another. The ones of Managua stretched like rope along the shoreline of the lake, and not within three leagues nor one; but there were at the peak of prosperity ten thousand Indians with bows and arrows and four thousand souls, and it was the most beautiful settlement of all, and now it was the most abandoned and lonely that there was in that department, when I saw it, only three years after that letter and the sermons [sermons given in mass in Spain about the positive benefits to the Indians of becoming Christians based on Gonzalez' letters] (Oviedo 1976:376).

Oviedo continued with his description of the villages from Managua along the southern shoreline of Lake Managua to Tipitapa, the village where he describes the joining of Lake Managua to Lake Nicaragua by a swamp or navigable river in the rainy season.

Matinari had 4000 souls, 600 arrowmen and 1000 bowsmen, the chief Itipitapa [Tipitapa] commanded 3500 souls, 800 of them warriors; and six leagues further were 6000 more souls with 800 bowsmen. Finally, because I never tire of saying this, when Capitan Gil Gonzalez went to that land and later Capitan Francisco Fernandez, the lieutenant of Pedrarias, it seems that the land boiled with people according to what I learned there from those that saw it then. We will leave for now the emptiness of the present and the causes of so many deaths among the Indians . . .(Oviedo 1976:337).

The villages were organized around ceremonial plazas that contained a house of prayer with clay and wooden idols and large temples, described as low houses in the center of the village. For his services to the governor of Leon, Oviedo was rewarded with the village and lands of the chief Momotombo and he describes the type of wood which had been used in the construction of Momotombo's temple (which Oviedo tore down to build himself a horse stall). The prayer temple was built of a black wood called "yaguaguyt" or "madera negra" (Lemaireocereus griseus), which is extremely durable, resistant to rot, and so heavy that it would not float. The temple was said to have been at least 100 years old at the time it was dismantled, and the axes of the Spaniards broke as they tried to cut the wood (Oviedo 1926:9).

In front of the ceremonial or prayer temple area was a sacrificial mound described as man made, as tall as a lance, narrow at

the top and wide at the bottom, of the style of a hay stack, with small steps carved in it for the priest to climb up with his victim, man, woman or child, who was to be sacrificed in the presence of the villagers. The victim was placed on a stone slab, his head severed with a stone blade, and his heart removed. The head and heart were reserved for the gods and the chiefs, the idols were bathed in the blood of the victim, and parts of the body were distributed to the villagers to be eaten (Oviedo 1976:305-306). According to the oral history of San Cristobal, no large sacrificial slabs have ever been found in the mound.

Although Oviedo further describes the sacrificial rituals in other sections of his books, they are always included with descriptions of visits to Nicarao villages. He is very definite in saying that although the Chorotega as well as the Nicarao practiced human sacrifice and ate human flesh, their rituals and the ceremonies surrounding the practice were very different.

In one thing or in those that I will mention, they are the same; and it is that each generation of these people have plazas and markets for their business and markets in each main village; but they do not admit anyone in the markets and plazas who is not of the same language, and if others go, they are taken for sale as food or for slaves; they are also alike in that all of those I have mentioned eat human meat and worship idols and serve the devil in diverse ways of idolotry (Oviedo 1976:306).

Village markets were usually located in an area of ceiba trees, Bombax ceiba, the shade of two to four trees could easily accommodate a market for 1,000 to 2,000 people (Oviedo 1926:304). The markets were restricted to women, girls and boys who had not reached puberty.

Although men of the village were not allowed in the markets, men of the same language from other areas were allowed to enter. With the cacao bean as the exchange medium, one could buy a rabbit for ten beans, a slave for 100, the services of a prostitute for eight. Items for sale in the market were gold, cotton clothing, slaves, food, honey, and, one very popular item, the barkless dog (Oviedo 1976:304).

The Chorotegas were described as tall, more white than black, with pierced ears enlarged to insert earspools. Men also pierced their tongues and often their genitals. The lower lips were pierced to accommodate white bone buttons or gold buttons in the Nicoya Peninsula. Bodies were tattooed; each chief had a special tattoo which all of his people used to decorate their bodies. The inhabitants of the Nicoya Peninsula cut designs into their arms with a stone blade and darkened the design with a coal they called "tiel" (indigo). The most common design used in tattooing was the jaguar, a design found often in the designs of the ceramics (Oviedo 1976:186).

Cranial deformation was practiced among both the Chorotega and Nicarao. Skeletal remains from San Cristobal indicate cranial deformation of frontal elongation as practiced by the Maya, not the type described by Oviedo which was a deformation made in early childhood by depressing the center of the skull from front to back. Appendix II includes a discussion of this in the preliminary analysis of skeletal material from burials at San Cristobal (Roemer 1979).

The style of dress of the Chorotega was described quite thoroughly through Oviedo's eyes. Men wore sleeveless vests of fine and brightly colored cotton which they secured with long white cotton

belts wrapped around the body from the chest to the hips and then passed from back to front between the legs to cover the genitals. Women wore slips from the waist to the knee, the more important women wore slips to their ankles; collars tied around their necks covered their breasts. They adorned themselves with necklaces of beads, shells and other decorations. Various references were made to children with strings of green beads around their necks similar to emerald agates. The feet were covered in deer skin which was caught up around the ankle with leather thongs. Hair combs, made from deer bone or black wood, were set into bat guano which was then hardened by firing (Oviedo 1976:461).

The decorative cultural material found at San Cristobal included clay tubular beads, clay earspools, drilled turtle shells which conceivably were decorated with feathers and worn as breast pieces, carved bones and one jadeite bead.

Coca Erythroxylon coca, cacao, and tobacco were important to the men of the village. The use of coca was common among the warriors who chewed it going into battle to eliminate hunger and exhaustion. Cacao was used as a medicine: taken on an empty stomach it was believed to protect against snake bites; its oil was used by the chiefs on their beards and lips; Oviedo cured a severely injured foot by treating it with cacao oil. The chiefs of the tribes smoked rolled tobacco and the entire village drank chica, a fermented corn beer.

The interviews of Nicarao converts by Friar Francisco de Bobadillo, in Oviedo, described many customs that seem to also apply to the Chorotega.



Chiefs of the tribe were cremated with their worldly possessions and their gold, their ashes were then collected, placed in an urn and buried at the door of their house. No burials were made in the temples. Children were wrapped in a cloth and buried at the door of the house. If an adult had no children to inherit his goods, all of his possessions were buried with him. Figurines were broken over the burials to remember the spirit of the dead for 20 to 30 days (Oviedo 1976:335).

The five vessel burials at San Cristobal contained unburned human skeletons, there were dense layers of sherds immediately above the burials, but there were no burial offerings. The gold and jade that were abundant in Costa Rica have not appeared in archaeological excavations in Nicaragua (Balser 1968; Museo Nacional de Costa Rica); perhaps the gold was burned as Oviedo recorded or there was none left after Gil de Gonzalez great Christianizing sweep.

The Chorotega men were described as being brusque in their manner, very valiant and very dominated by their wives. Lothrop cites this as a South American trait. The Nicaraos, on the other hand, were very much the heads of their household and they gave the orders to their wives whom they dominated completely (Oviedo 1976:362).

### ARCHAEOLOGICAL SITES IN THE AREA

The first field work done in Nicaragua was by Gordon Willey and Albert Norweb in 1959-60 in the Rivas Penninsula of Nicaragua, followed by Wolfgang Haberland's studies on the Island of Omotepe in Lake Nicaragua. Both areas are about 100 km south of San Cristobal. The closest site is San Francisco, studied by Lydia Wyckoff of Yale, near Tipitapa, some 12 km south of San Cristobal.

Material excavated by Richard Magnus of Yale University on the east side of Lake Nicaragua in the Juigalpa area of Chontales is being studied at the National Museum in Managua at this time (personal communication, Fred Lange).

Jorge Espinosa, formerly of the Instituto Geografico Nacional, excavated two ceramic sites on the Pacific Coast, one in a World Bank housing project, Tepetate, on the north shore of Lake Nicaragua on the outskirts of Granada and in Managua at the site of the new Banco Central. This material is also unpublished.

Hermano Hildeberto Maria (Joaquin Matillo Vila), former director of the National Museum in Managua (1965, 1973, 1975), reported mound-plaza sites dotted around the coast of Lake Managua. An archaeological survey of sites around Lake Managua which he was directing was interrupted by the war (personal communication). Figure 4 indicates studied sites.

No known archaeological field work is underway at this time. Due to the location of San Cristobal, about 2 km from the end of the main runway of the airport and airforce base, permission for surveying and

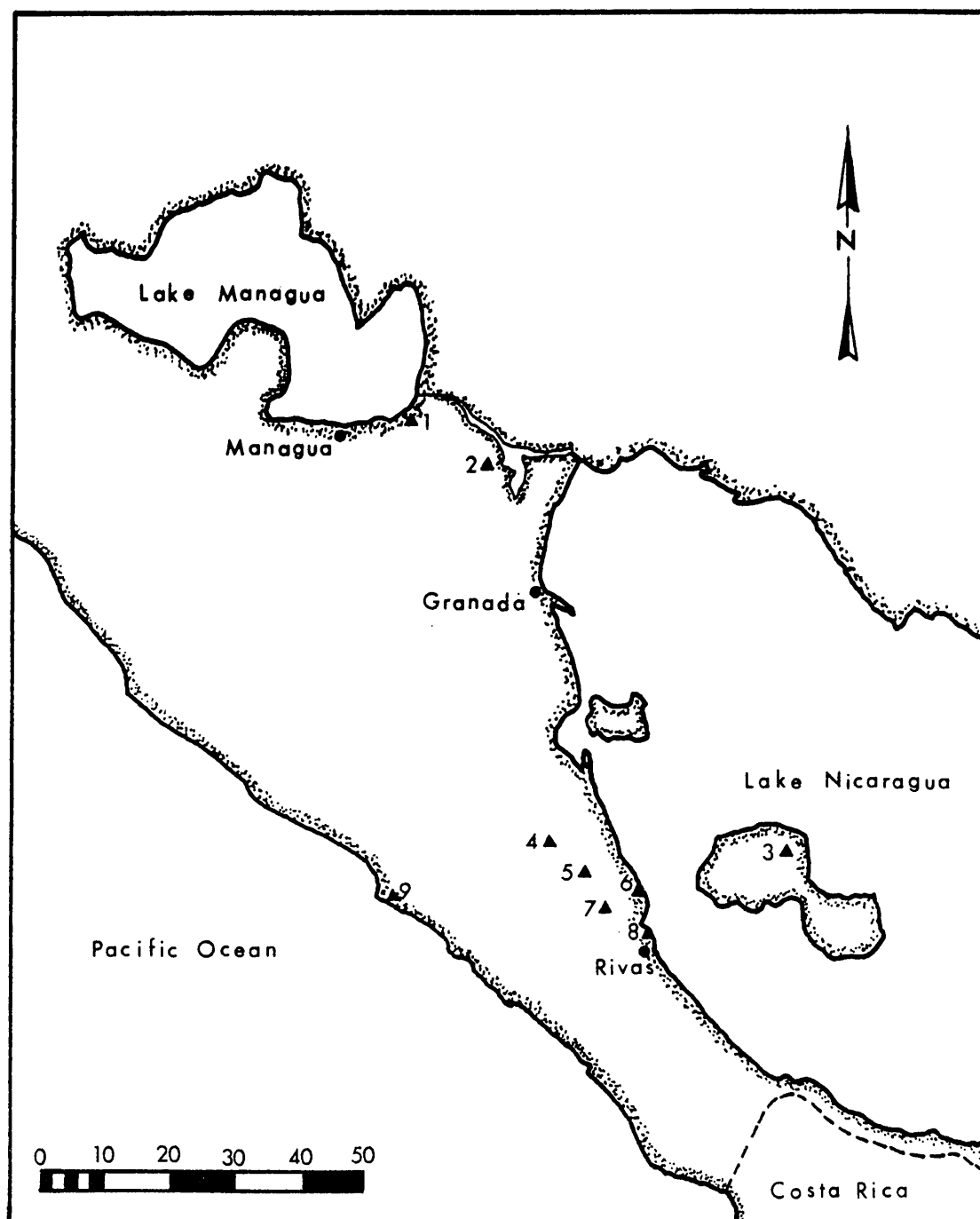


Figure 4. Archaeological Sites in the Region. 1. San Cristobal  
 2. San Francisco 3. Cruz 4. Ingenio Dolores 5. Palmar  
 6. Santa Isabel "A" 7. Santa Isabel "B" 8. Puerto San Jorge  
 9. Isla del Purgatorio.

excavation there is very complicated. Fred Lange and Payson Sheets included San Cristobal in a surface collection of sites in Nicaragua made in 1982 and reported good cooperation from the owner of the farm on which the site is located, Aldo Knopffler, and the government.

In July 1983 San Cristobal was nationalized and now forms part of the holdings of INRA, Instituto Nacional de Reforma Agraria (Mario Gonzalez, personal communication, August 1983).

## DESCRIPTION OF SITE AND ARCHAEOLOGICAL HISTORY

San Cristobal is a 700 manzana (1 manzana = 1.74 ha) dairy farm owned by Aldo Knoepffler and his brothers at km 14, North Highway, about 1 km south of Lake Managua. Two km inside the farm is an area that consists of approximately 60 low, circular mounds ranging in height from 50 to 100 cm and 30 to 40 m in diameter, scattered randomly over 120 manzanas. Centrally located among the low circular mounds are six larger ceremonial mounds, the tallest being about 8 m in height and 30-40 m in diameter. The site designation, NMN-2, is marked by a cement datum 3.17 km due south of Lake Managua, 2 km inside the farm, with an elevation of 58.78 m above sea level. Its exact geographic location as determined by Pandelis Lukis, U.S. Geodetic Survey, Managua, Nicaragua, is 12°08'06" latitude north, 86°08'38" longitude west of Greenwich (Figure 5).

The site is covered presently by low grasses and an occasional deciduous tree. Ground cover is burned off in March or April to make way for new growth as the spring rains begin. The soil is a homogeneous alluvial fill of volcanic ash overlying a solidified layer of tephra, the Retiro Tuff, at a depth of 1 to 1.5 m. This layer of tephra varies in thickness from 20 cm at one excavation site, Mound 1, to 2 m about 2 km further south in the farm. The water table at present varies from 1 m from the surface in the area of the farm adjoining Lake Managua to 4 m in the mound area of the site. According to the owner, Aldo Knoepffler (personal communication 1976), the area stood in water during the rainy season 50 years ago and is

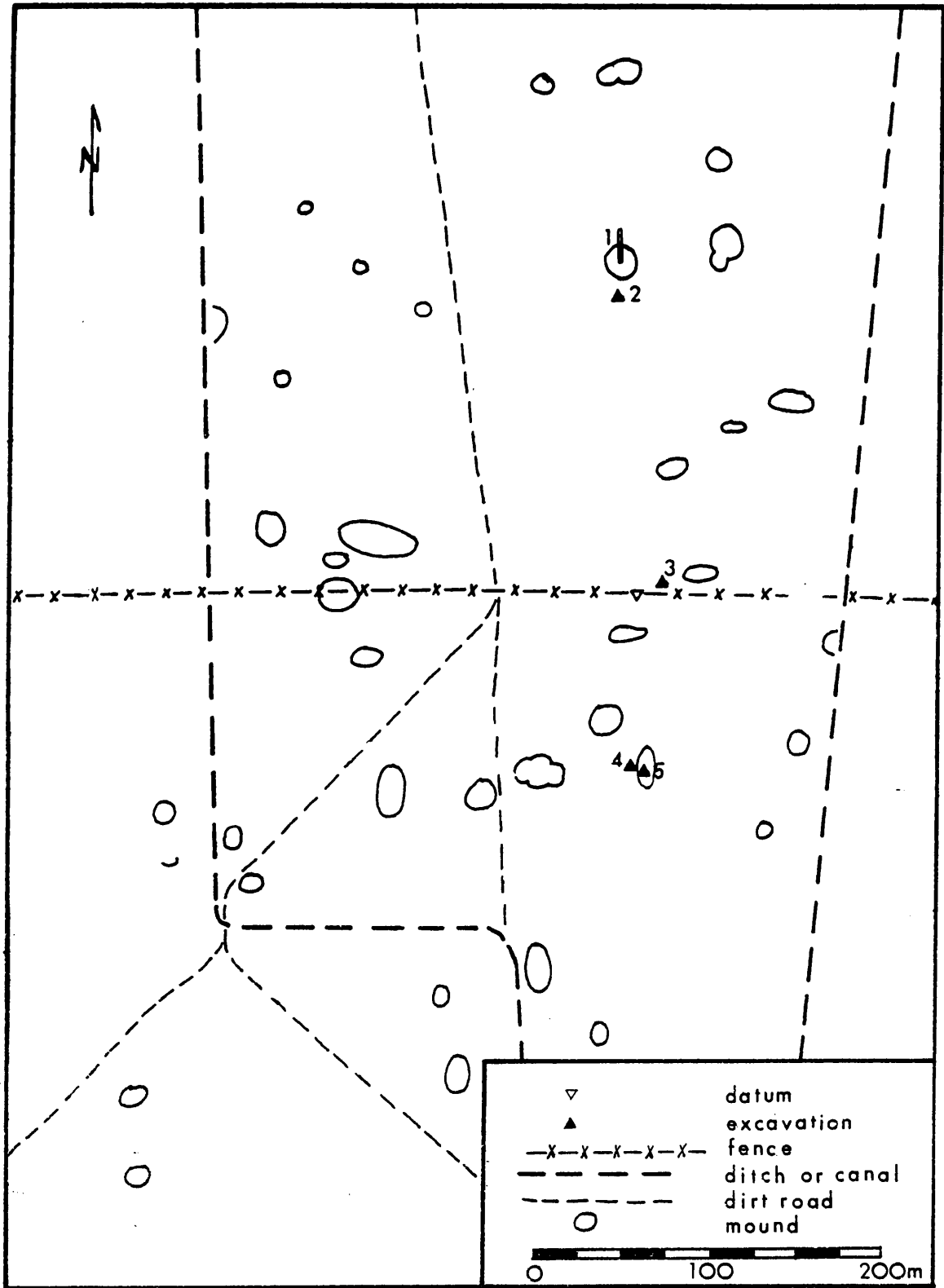


Figure 5. Site Map of San Cristobal

still occasionally flooded by Lake Managua. The farm is now irrigated from a well 18 m deep which pumps warm thermal waters from the Masaya caldera and the Santiago volcano which lies 14.5 km south of the datum. Surface lava from the last eruption of the Volcano Masaya in 1670 A.D. stops 2.75 km from the mound area. There are no rivers or streams on the farm or in the area to the south of Lake Managua due to the porosity of the soil and the fact that surface water immediately filters through the soil and enters the lake at subsurface levels.

San Cristobal has been known to local "pot hunters" for many years. Twenty five years ago field hands on the farm opened the largest mound for the owner, Mr. Wheelock, father of the present owner. After making an east-west trench through the center of the mound and destroying about one third of it, a large burial urn was removed. It was used as the base of a glass top table in the Wheelock home for many years but was destroyed by the earthquake in Managua in 1974. In the following years many mounds were opened by local people, usually by hiring farm hands to use shovels. Since all of the mounds and the entire farm is made up of a very sandy, unconsolidated soil, it is a simple matter to quickly do a great deal of damage. This is a common occurrence in most Central American archaeological sites (Sheets 1973).

About 25 years ago the two fields with the major concentrations of mounds were plowed for cultivation for the first time. Mr. Knoepffler said that it sounded like corn popping as the weight of the tractor and plow broke vessels very close to the surface. The first plow zone penetrated to 17 cm. The covering of pottery sherds on the

tops of mounds is probably a result of this plowing.

In 1972 Alonzo Heller, a local collector, had three mounds opened with a back hoe and awarded cash prizes to farm hands who could excavate whole vessels. His field notes were also lost in the earthquake of 1974 but most of the collection remains. It is not cataloged and is mixed with pottery from other sites in a small store room at his farm on the present site of INCAE, South Highway, Managua.

Large burial vessels with skeletons and polychrome plates are often found on San Cristobal by the farm hands as they dig irrigation canals and wells, or as they are uncovered by wind and water erosion. As many vessels appear to have been found off the mounds in flat areas as actually on the mounds.



## FIELD EXCAVATIONS - 1977, 1978, 1979

In 1977, San Cristobal was chosen as a study area for this thesis after visiting various mound sites around Lake Managua. The mounds of San Cristobal are located in grassy fields and are undisturbed by structures or heavy agricultural activity. Permission was granted to excavated only after Mr. Knoepffler was convinced that it would be a serious study of his site rather than just one more collector.

One of the objectives at San Cristobal was to identify the perimeter of the village from surface surveys, aerial photography, and oral history of the area from the owner and farm manager. The second objective was to secure controlled collections of cultural material from undisturbed housemounds and plaza areas for analysis.

Cultural material used in the analysis was collected by excavations in arbitrary layers, applying the geological principles of stratigraphy introduced in the United States by Nels Nelson in 1912 (Baudex 1970:33). Material collected in this way will provide a relative chronology. Radiocarbon dating gives more absolute dates, but charcoal samples adequately large for C-14 dating were not found.

Field methods were determined by consultation and guidance of Dr. Harry Shafer, Texas A&M University and Field Methods in Archaeology by Hester, et al. (1975). Between field seasons an effort was made by the author to further refine techniques by participating in field projects of Texas A&M at the Hoxie Bridge Site in Central Texas and Colha in Belize. Dr. Olga Linares, Smithsonian Institute of

Tropical Research, Panama, also aided in field procedures in a three day visit to San Cristobal.

Field work began in February 1977 at the beginning of the dry season. After a walking survey of San Cristobal, four seemingly undisturbed locations were chosen for excavation.. The datum was set on the fence line that divided the two mound areas. It is a 45 cm inverted cement pyramid with a copper plate designating the site NMN-2-2, (Nicaragua, Managua-2), following the system of the "Instituto Geografico de Nicaragua". The datum of San Cristobal is recorded on maps of the U.S. Geodetic Survey for the region.

Locations for excavation were: 1) NMN2-1, an undisturbed housemound chosen for a 20 m X 2 m trench to run from 4 m off the mound into the center; 2) NMN2, a 2 X 2 m test pit excavated in level ground near a large, damaged oblong mound east of the datum; 3) NMN2-3, a 2 X 2 m test pit on level ground in the area of larger, ceremonial mounds; and 4) NMN2-4, a 2 X 2 m test pit, 23 m due south of mound 1. In addition, the designation NMN2-5 was given to material recovered from an excavation in a small, damaged mound in the ceremonial group of field one.

Before the first surface collection was made, the waist-high grass of Mound 1 was cleaned with machetes. This was necessary because at the end of the rainy season the tall grass completely obscures the small mounds from view. This cleaning process inevitably disturbed surface material to some extent, but since the area was once plowed to a depth of 17 cm, the material was already mixed. Often the area is cleaned by burning in April before the rains begin in May.

The surface material collected was primarily heavily burned ceramic fragments of 2 to 3 cm, and small lithic fragments. So plentiful were the ceramic fragments that there was almost a solid ground cover of sherds.

After studying the stratigraphy, or lack of it, in the irrigation ditches and canals around the farm, I made the decision to excavate on arbitrary levels until stratigraphy was identified.

A trench was gridded on NMN2-1 at magnetic north-south dividing it into ten 2 X 2 m units with the designations from the center of the mound to the north as A, B, C, D, E, F, G, H, I, and J. Excavation began in J, 4 m off the mound.

No architecture or identifiable natural stratigraphy was ever found at San Cristobal. As a result, all excavations were done in arbitrary levels of 10 cm. No balks were left between units due to the loose, unconsolidated nature of the soil. All material was screened with 1/8" screen wire, and four categories of material were collected from the screen: ceramic, lithic, faunal, and beads. Ceramic material was placed in cloth geological sample bags and each bag was labeled with water proof markers. Faunal and lithic material were placed in paper bags and beads in plastic film holders. Each bag was marked in the following manner: site, level, class of material, date and excavator.

Excavation was done by the author with the help of Vivian Gillespie and Roberto Martinez in the first field season, and by the author and field hands in the following seasons. Screening was done by hired farm hands and the author.

The quantity of ceramic material was so great that the decision was made to retain only diagnostic material for analysis. Diagnostic material was defined as monochrome rims, bases, reworked, striated, punctated or modified sherds, all bichrome, trichrome or polychrome sherds and all slipped body sherds. While all ceramic material was collected and counted, monochrome body sherds were then discarded for all excavations except NMN2-1, Unit A; NMN2-2; NMN2-3; and NMN2-4. All material from these 2 X 2 m units was saved for analysis.

NMN2-1  
Unit J

Depth: 70 cm  
Total sherd count: 4,939  
Diagnostic sherds: 561

Unit J was excavated in arbitrary 10 cm levels to a culturally sterile depth of 70 cm. The first 15 cm was a hard compacted soil filled with roots. After 15 cm the soil was loose and of a homogeneous color. No stratigraphy was ever visible in the walls. At 40 cm the complete rim of a vessel appeared. Around the rim were a reworked rim sherd, and a round pumice stone. Small rounded pieces of the tephra of the Retiro Tuff were mixed in the soil. They were probably broken loose when the soil was excavated to position the burial urn whose cover rim was visible at 40 cm. By 50 cm, it was evident that the red, incised bowl was sitting as the cover to another vessel. The cover bowl was filled with soil but contained no cultural material. The boot shaped (Sacasa striated) burial urn was sitting on the hard layer of Retiro Tuff at 70 cm, no effort had been made to penetrate the layer. The burial consisted of skull fragments and a

few bone fragments as well as 12 large white beads with a chalk-like appearance, perhaps carved from shells. The burial and beads were mixed with soil that had filtered into the boot urn and eventually filled it. No other material was present. Level 3 produced the most faunal material, principally fish vertebra, and level 6 had the most abundant ceramic material, but it was also the area of the burial. Lithic material consisted of small fragments of debitage.

NMN2-1  
Unit I

Depth: 80 cm  
Total sherd count: 6,834  
Diagnostic sherds: 1,264

Unit I consisted of loose, alluvial soil without visible stratigraphy until 80 cm. At that depth the underlying Retiro Tuff formed a hard, thick layer which was not penetrated. Throughout this layer there were frequent rodent burrows and mud wasp nests that could cause a mixing of the cultural material.

NMN2-1  
Unit H

Depth: 80 cm  
Total sherd count: 6,352  
Diagnostic sherds: 937

Unit H was excavated to 80 cm and the tephra layer was broken with pick axes. It was about 30 cm thick; however no cultural material was found under this layer. The sherds in this unit were larger, some 8 to 10 cm in length, and the amount of lithic material also increased over J and I. The lithic debitage always contained

obsidian flakes. Three large sherds in level 4 fit together to form a partial bowl.

NMN2-1  
Unit G

Depth: 130 cm  
Total sherd count: 7,921  
Diagnostic sherds: 922

NMN2-1  
Unit F

Depth: 80 cm  
Total sherd count: 9,311  
Diagnostic sherds: 1,207

Units G and F were excavated simultaneously after reaching the 40 cm level in Unit G because of the location of two vessel burials on the meter line dividing the units. In Unit G a very high quantity of ceramic material was encountered: 10-20 cm - 400 sherds; 20-30 cm - 2,463 sherds; 30-40 cm - 2,139 sherds; 40-50 cm - 750 sherds. At 42 cm the base of an inverted red monochrome vessel became visible. Assuming that it was a cover vessel for a burial, Unit F was opened to compare it, level by level, with Unit G. Oviedo mentions the custom of the Nicaraos of breaking vessels over the burial site which was often at the door of the house. This would seem to represent a similar situation. At the 30 to 40 cm level of Unit F the sherd concentration was not as heavy, but the fragments were larger. Other than the heavy sherd concentration, no change was noticed that would have indicated intrusive burials.

Burial two of the trench was located 5.8 m south of burial one of Unit J. The inverted cover vessel was a red monochrome utilitarian

vessel decorated with hanging triangles filled with slash marks. It was covering a larger soil filled vessel whose rim had been broken off to accommodate the smaller rim of the cover vessel which was placed inside the rim of the base vessel to form a seal. In the base of the bottom vessel, after having removed about 3/4 of the soil, the back of a skull became visible. The burial urn was badly cracked and as it was removed it broke into many pieces. There was no cultural material with the skeleton fragments. The vessel containing the skeletal material was perforated by a small hole, about the size of a dime.

Parallel to the second burial, a third burial was revealed. This consisted of two very large vessels, the cover vessel was about five times larger than that of burial two. The cover vessel of burial three had a thick, flared rim which fit over the mouth of the primary burial vessel. It had a punctated design around the other rim and also at the base of the rim. It covered an even larger urn containing a complete skeleton in a flexed position; all spinal vertebrae in their correct positions were fixed to the side of the urn. Although there was insect damage to the bones, they were strong enough to be removed intact. In the 10 cm of soil in the base of the burial urn, there were 307 small, individual clay beads and 21 cylindrical beads; no other material was present. Special artifacts in association with the two burials are considered to be those in Level 4, the cover soil around the burials. In the heavy concentration of sherds in the two units, there were 14 tripod feet, one partial disk, one whole disk, three drilled sherds, three large sherds that fit to form part of a bowl and four figurines. The large urn of burial three had been

placed below the Retiro Tuff by breaking a hole only large enough to accomodate the urn. In excavating soil below the hole made for the burial, no cultural material was found.

NMN2-1  
Unit E

Depth:

This unit was left as a standing column between Units D and F to excavate by natural stratigraphy if levels could be identified. Due to the war and sudden termination of the 1979 field season, it was never excavated.

NMN2-1  
Unit D

Depth: 110 cm  
Total sherd count: 9,560  
Diagnostic sherds: 1,759

Unit D again presented no visible stratigraphy until the Retiro-Tuff was reached at 110 cm. Between 30 and 40 cm many sherds were found to be vertical in the soil but no rodent burrowing was evident. This could be the result of seismic activity frequent in the area, or just that disturbances were almost impossible to identify in such loose, unconsolidated soil. Between 40 and 50 cm black volcanic rocks appeared as well as fragments of charcoal. These black volcanic rocks were not common in the excavation although they cover a very large area within 3 km of San Cristobal as part of a surface lava flow from the Masaya Caldera. Unit D produced the first collectable amounts of charcoal which were recovered with a sterile knife and placed in aluminum foil bags. There were many seeds, and a heavy



concentration of faunal material, three times more faunal material than lithic. An orange powdery material appeared in the floor at 50 cm. Level 10 (90 to 100 cm) contained many snail shells. In the level that terminated with the Retiro Tuff, 100 to 110 cm, there were small amounts of ceramic material and snail shells.

NMN2-1  
Unit C

Depth: 110 cm  
Total sherd count: 15,343  
Diagnostic sherds: 3,389

Unit C was chosen as the unit for the preliminary analysis of all bichrome, trichrome and polychrome sherds for this paper.

Unit C, as all units, consisted of very hard-packed, root filled soil in the first 10 to 15 cm and sherds in this level were very small due to plowing. By 20 cm larger sherds begin to appear in very loose soil. From 20 to 40 cm, there were such heavy concentrations of ceramic materials that a living floor could never have existed under conditions found at excavation (5,561 sherds). By 50 cm there were charcoal samples, 10 tripod feet, and lava rocks lying flat in the northwest corner. At 100 cm larger pieces of obsidian began appearing. Sterile soil was reached at 110 cm. Soil from Unit C was saved for water screening.

NMN2-1  
Unit B

Depth: 30 cm  
Total sherd count: 4,978  
Diagnostic sherds: 833

Unit B was being excavated as the war suddenly intensified and the decision was made to concentrate on Unit A since all ceramic material was to be retained from that unit and, time permitting, Unit B would be completed later. In the 30 cm that were excavated, two pieces of carved bone were uncovered at 10 cm and at 30 cm there was a large bone concentration. Excavation of Unit B was never completed because of the increasing problems of security on the highway to the site.

NMN2-1  
Unit A

Depth: 150 cm  
Total sherd count: 16,940  
Diagnostic sherds: no total count

During the excavation of this unit no visible natural stratigraphy appeared, but after it was totally excavated, there were indications on the south wall of some kind of penetration. Throughout the unit there were human bones randomly scattered; by 10 cm human teeth had appeared. No vessel burial existed and it is the only excavated at San Cristobal that contained human bones outside a burial urn. All ordinary body sherds were saved for analysis. Figure 6 provides a profile of the trench of Mound I with features.

NMN2-2

Depth: 40 cm  
Total sherd count: 2,523  
Diagnostic sherds: 398

This 2 X 2 meter unit was located at the east edge of an elongated, damaged ceremonial mound near the datum. The exact

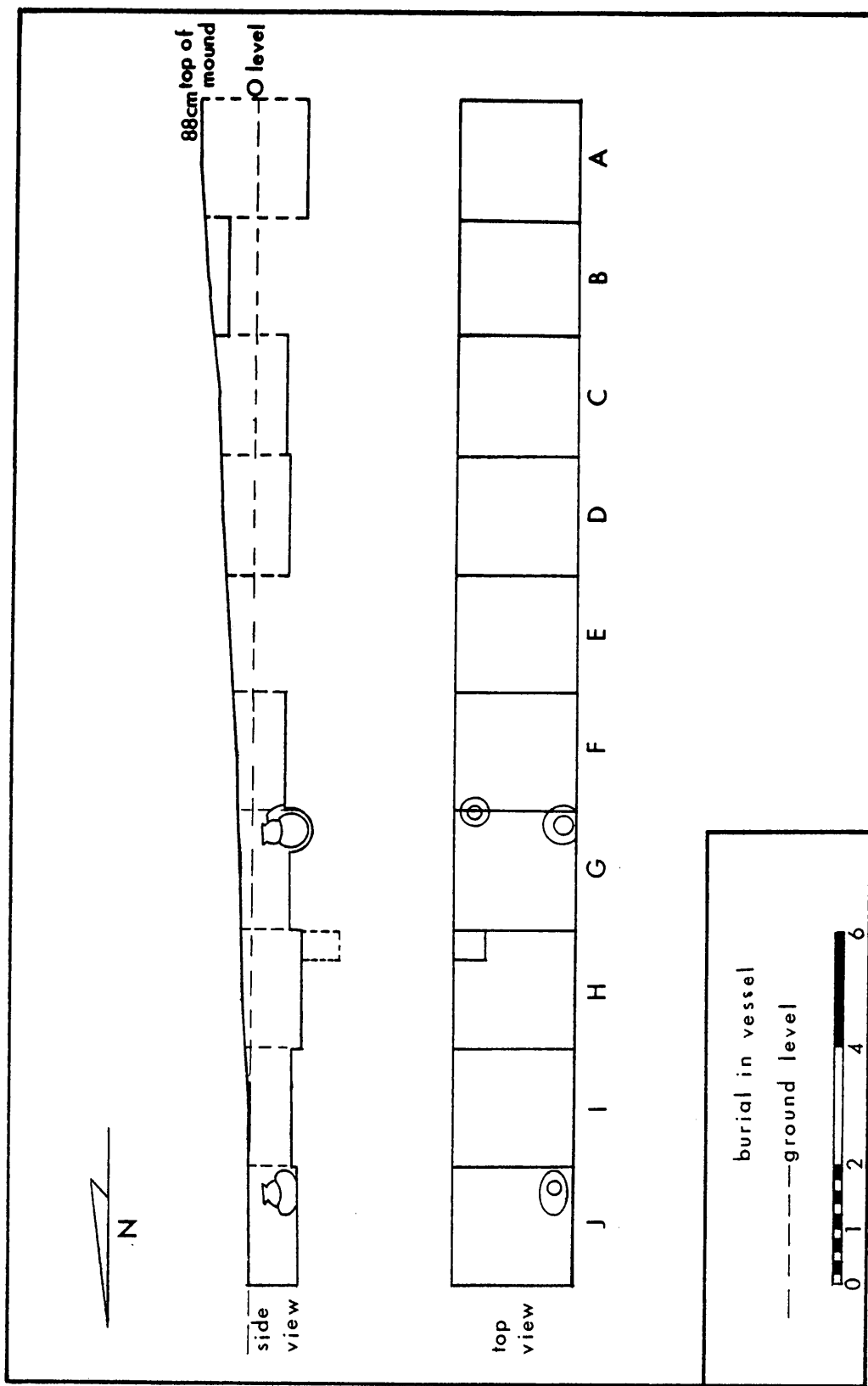


Figure 6. Trench Profile

location is on the site map. The first 20 cm consisted of very hard packed soil with heavy root penetration. From 20 to 40 cm the soil was loose and powdery as in all other excavations and produced abundant ceramic material. The Retiro Tuff underlies this area at 40 cm and excavation stopped at that point. All ceramic material from this unit was saved for analysis.

#### NMN2-3

Depth: 50 cm  
Total sherd count: uncounted

This is a 2 X 2 meter excavation in the field south of the datum on level ground between the two largest ceremonial mounds. Very little cultural material was recovered. All material was preserved. Location of this excavation is on the site map.

#### NMN2-4

Depth: 60 cm  
Total sherd count: 2,725  
Diagnostic sherds: 302  
Burials: 2

NMN2-4 is a two unit excavation located 23 m south and 2 m west of the trench of NMN2-1. It was situated on totally flat ground away from any housemounds. The original excavation was to be a 2 X 2 meter pit to collect ceramic material for chronological analysis, but two burials were uncovered in the unit. It was excavated by Vivian Hayes Gillespie (1977) and the excavation report is on file in the Department of Anthropology, Syracuse University. In this excavation as in the trench, there was an extremely heavy sherd concentration in the layer immediately above the first burial. The second unit of this

excavation was a .5 X .5 meter extension to enable Gillespie to completely excavate the second burial. Burial vessels were of the type common to the area, a Sacasa striated boot shaped urn containing the skeleton covered by a Vallejo bowl which was badly crushed. A second burial vessel was a red urn with no recognizable cover although many sherds were associated with it and could conceivably have been a crushed cover. These burials were so close to the surface, 30 cm, that the weight and force of the tractor and plow used for the first deep plowing could have destroyed the cover vessels.

## THE CERAMICS OF SAN CRISTOBAL

One of the principal objectives of this thesis is to identify types and varieties of ceramics in a portion of the collection from the archaeological site San Cristobal and propose a sequence for the site. The long term aim is to correlate the diagnostic traits from San Cristobal types with regional sequences, particularly that being developed for the Greater Nicoya Archaeological Area (Denver Conference 1982, 1983).

Material used for the San Cristobal analysis was produced by stratigraphic excavation techniques and seriation studies using variations in frequency of artifact style elements to infer the passage of time. Taylor, in the introduction to Chronologies in New World Archaeology, (Taylor and Meighan 1978) stated that the study of the ceramics to create a relative time-space sequence is the first essential step in broader research goals. No study in cultural change or comparative analysis can begin until the archaeological remains are in chronological order.

Phillips (1970) discussed the advantages of a type-variety system for the classification of ceramic materials. Types are based on criteria that can be identified on sherds of average size such as features of paste, surface, and decorative technique. Varieties can then be seen as local or temporal expressions of the type.

During the last decade the type-variety system of ceramic analysis has been used in southern Mesoamerica and in the four published ceramic analyses in the Nicoya area (Baudez 1967; Healy

1974; Sweeney 1975; Accola 1979). San Cristobal has definite ties to the Greater Nicoya area and the same system of classification was used in the descriptions of this study.

Excavations at San Cristobal produced 75,300 sherds from 12 units. Approximately 20 to 25 percent of the material of each unit was considered diagnostic; defined as all rim sherds, and body sherds that had been modified in any way such as modelling, striation, punctation, incising and all bichrome, trichrome, and polychrome sherds. The typology for this paper is based on the analysis of 1,650 sherds: the bichrome, trichrome and polychrome sherds and colanders of Unit C, part of the trench of housemound NMN2-1. The diagnostic sherds of utility ware were not included in the study.

The ceramic material from unit C of Mound I was chosen for analysis because it was considered to be a unit of undisturbed deposits. Rodent burrows are frequent in the entire area and probably cause some mixing, but it should be minimal.

When the analysis of San Cristobal material began, and the importance and necessity of comparing sherds with entire vessels became apparent, the political situation of Nicaragua had mandated international moves for everyone who could offer help. Thus, this classification has been done with the aid of books, long distance calls, and comments of interested archaeologists. No comparison has been made with any other type collection.

Setting up types for San Cristobal and determining which attributes to look for followed suggestions from Shepard's book, Ceramics for the Archaeologist.

Paste was described by stating the color according to the Munsell Color Chart (1976) and its characteristics: 1) fully oxidized - paste with colors clear throughout the cross-section of the wall; 2) incompletely oxidized - colors clear on the surface with grey interior; 3) reduced - dark cores and lighter outer zones caused by partial oxidation; and 4) smudged - black surfaces and a clear central zone. Paste uniformity is usually a characteristic of a type; diversity of paste within a type calls attention to differences in style that otherwise might pass unnoticed.

Temper has proven to be one of the most useful technical features by which to identify pottery. It also affords clues to the source of trade wares and indicates the relationships between types. Temper was identified by pulverizing a small portion of 150 sherds in Unit C. Components of the temper were identified with low power magnification. The tempering agents, the description, and the sherd used were then cataloged and separated for future study.

Surface decoration, slip and paints, as well as designs, are very similar in the majority of the sherds in the study and at times words do not seem adequate to describe the slight differences. Hopefully the sketches and photographs will aid in completing the picture for the reader. The bichrome, trichrome and polychrome sherds of San Cristobal utilize orange, red, black and grey blue paints on red, tan and cream slipped vessels. Although colors were coded with the Munsell Color Chart, many color tones in the collection are not shown on the chart.



The ceramics of San Cristobal are organized into types and varieties, groups and wares, after Healy (1980:82-83), with the addition of one new ware, Intermediate. The types and varieties are based on significant attribute clusters such as surface decoration, shape and design modes. Ceramic groups are clusters of closely related types, and wares are based on similar paste composition and surface treatment.

Ceramic groups recognized at San Cristobal are:

Aviles - Zoned red on natural ceramics. Zoning may take the form of ridges, incising, engraving, or by addition of a second paint, black.

Luna - Stylized fine-line painting on a white base slip with a varnish-like treatment of the surface.

Madeira - Painted motifs, friezes of jaguars, birds, feathered serpents and particular vessel form such as shallow bowls and pear shaped vessels.

Papagayo - Cream to white base slip with painted motifs secondary.

Rivas - Vessels with red to maroon slip which was polished. Additional decoration consisted of black or white painted designs or unslipped areas with plastic decoration.

Usulután - Multiple brush, resist painting.

Wares recognized at San Cristobal are:

Intermediate Ware - Paste color varies from orange-red (2.5 YR 4 4/6) to brown-red (2.5 YR 3 3/6) with a small group having dark brown (7.5 YR 7 7/7) paste. Temper is moderate to heavy, very visible

without magnification, of red ground stone, transparent quartz, green quartz, some ferrous particles and volcanic sand. Temper makes up about 40 percent of the paste and particles are much larger than the Nicoya Polychrome temper.

Luna Ware - Distinctive paste, either red brown (2.5YR4//6) to a characteristic "irridescent" grey (2.5YR5/0). Surfaces are slipped a cream white with yellowing common. Surfaces usually have a luster.

Nandaime Ware - Sandy paste; large particles of temper making up 50 to 75 percent of the paste. Temper is quartz, quartzite, feldspar. Paste color is brown (5YR4/4) to grey (2.5YR4/0). Paste is grotty. A red (10R4/8) to maroon red (10R4/6) slip is common, as well as cream.

Nicoya Polychrome Ware - Fine paste with sparse tempering, temper is less than 25 percent of the paste. Temper is ferrous balls, quartzite and an orange inclusion. Paste color is usually diagnostic, a light reddish brown (2.5 YR4.5/8). White (10 YR8/2) to cream colored (10 YR 7/4) slip is diagnostic.

Palmar Ware - Well mixed temper, usually 50 percent of the paste. Temper is quartzite, volcanic ash, mica perhaps, and andesite. Paste color is usually brown (5 YR 5/2) to dark brown (5 YR3/3) or grey. Surfaces are usually slipped after smoothing with a natural colored or red slip which is lightly polished.

Resist Ware - Paste color ranges from brown (7.5 YR 5/4) to a reduced grey black (7.5YR3/0). Tempering is largely ferrous particles, feldspar and quartzite. The surface treatment is more diagnostic, a characteristic resist treatment.

Twenty-one types and 13 varieties have been identified in the preliminary analysis of San Cristobal ceramics. Nine of these types are represented in the ceramic sequences of the Greater Nicoya Area.

Table 3 provides an alphabetical listing of the types and varieties.

TABLE 3: TYPES AND VARIETIES OF SAN CRISTOBAL

APOMPUA MODELLED

APOYO GREY

ARGUELLO POLYCHROME

BOCANA INCISED BICHROME

Bocana

Brown Banded

COMBO COLANDER

E E POLYCHROME

GUNMETAL GREY BICHROME

LACAYO RED AND BLACK POLYCHROME

LAS MERCEDES POLYCHROME

LUNA POLYCHROME

MANAGUA RED ON BLACK BICHROME

NERETTE POLYCHROME

OBANDO BLACK ON RED BICHROME

PAPAGAYO POLYCHROME

Culebra

Fonseca

Mandador

## Table 3 (continued)

Manta

Negro

PRINCESA POLYCHROME

PUMPKIN POLYCHROME

REA BLACK AND ORANGE POLYCHROME

SAN CRISTOBAL RED ON BUFF

SANTIAGO BICHROME

URCUYO WHITE ON RED

USULUTAN

VALLEJO POLYCHROME

Vallejo

Vallejo Incised

Black and Blue on White

Black on White

Mombacho

Mombacho Incised

UNNAMED CERAMICS AND SPECIAL ARTIFACTS

TYPE: APOMPUA MODELLED

VARIETY: Apompua

ESTABLISHED AS A TYPE/VARIETY: Healy (1980:88).

NUMBER OF SHERDS IN THIS STUDY: 1.

Ceramic Group: Rivas Group.

Ceramic Ware: Nandaime Ware.

DESCRIPTION:

Principal Identifying Modes:

- 1) Red (10R4/8) to deep maroon (7.5R3/6) slipped vessels with heavy paste.
- 2) Grooved or applique strips in white or unslipped bands.
- 3) Bands of decoration seem to have a very thin white paint through which the red bleeds.

Paste, Temper, Firing:

Paste: dark brown (2.5YR5/8) with a heavy temper of feldspar and quartz.

Temper: very visible to the eye. Makes up 50-75 percent of paste.

Surface Finish and Decoration:

The heavy red slip is lightly polished. Jab-modelled strip is in the center of a yellowish, unpolished band (Figures 10a;5d).

Form: Body sherd.

INTRA-SITE LOCATION AND CONTEXTS:

One sherd at 90 cm.

CULTURAL SIGNIFICANCE:

This type has been placed by Healy in the Zoned Bichrome period and Early Polychrome period.

TYPE: APOYO GREY

VARIETY: Grey, orange and black polychrome

ESTABLISHED AS A TYPE/VARIETY: this study.

NUMBER OF SHERDS IN THIS STUDY: 10.

Ceramic Group:

Ceramic Ware: Intermediate Ware

DESCRIPTION:

Principal Identifying Modes:

- 1) 6 to 12 mm horizontal band of red (2.5YR4/4/8) lightly applied over a heavy grey slip (10YR6/6/1). Bands of decoration vary in intensity depending on the number of layers of paint applied.
- 2) Decoration is predominantly on interior of vessel.

Paste, Temper, Firing:

Paste: red-orange (5YR5/6), very compact paste, not as fine as Papagayo.

Temper: quartz, sand, red ground sandstone.

Surface Finish and Decoration:

Bands are in red around the interior surface of the vessel; the width of the band is unusual. One sherd has a 23 mm wide horizontal band. It appears to be multiple applications of a very thin paint which gives varying intensities of color to the band. Other sherds have bands in red with geometric red and black squares, red dots in horizontal bands cut the square. Wear patterns on the exterior, base portion of sherds would seem to indicate use as a utility vessel.

Form: Composite silhouette fragments. Wall thickness: 9 mm.

INTRA-SITE LOCATION AND CONTEXTS:

Highest frequency at 100 cm, very small quantities in all periods.

CULTURAL SIGNIFICANCE:

TYPE: ARGUELLO POLYCHROME

VARIETY:

ESTABLISHED AS A TYPE/VARIETY: This report.

NUMBER OF SHERDS IN THIS STUDY: 16.

Ceramic Group:

Ceramic Ware: Intermediate Ware

DESCRIPTION:

Principal Identifying Modes:

- 1) Bold strokes of design covering large areas of vessel interior.
- 2) Exterior has one to two red parallel bands at rim.
- 3) Wide black outlines; designs in muted tones of red (2.5 YR 3 3/6) to red-brown (10 YR 6 6/3) with orange.
- 4) Grey smoked slip is very diagnostic, color is uniform, all sherds have maintained a high gloss. Slip is light grey (10 YR 7 7/2).

Paste, Temper, Firing:

Paste: dark orange brown (2.5 YR 3 3/6).

Temper: heavier temper than Papagayo cinnamon, large inclusions.

Surface Finish and Decoration:

Anthromorphic supports, same style crocodile head as in Fonseca, Mandador and Managua Red on Black, some sherds have exterior covered by red, orange, and black bands blending in to one another (Figure 12a). One group of four sherds look like miniatures of the group with design reversed, design is on the exterior rather than interior (Figures 12b, c, d, 16p, 17a, b).

Form: Composite silhouette predominates, one pedestal fragment.

INTRA-SITE LOCATION AND CONTEXTS:

Arguello Polychrome peaks at 40 cm.

CULTURAL SIGNIFICANCE:

Middle and Late Polychrome Periods.

TYPE: BOCANA INCISED BICHROME

VARIETY: Bocana

ESTABLISHED AS A TYPE/VARIETY: Coe and Baudez (1961), Baudez (1967), Lange and Scheidenhelm (1972) Healy (1976a;1980).

NUMBER OF SHERDS IN THIS STUDY: 32.

Ceramic Group: Aviles Group

Ceramic Ware: Palmar Ware

DESCRIPTION:

Principal Identifying Modes:

- 1) Heavily tempered, grotty paste, thick walled sherds
- 2) Dark red slip, (10R4/8) on exterior.
- 3) black band, 10 mm, around rim with grooved line through the center of the band.
- 4) Decorated only on exterior.
- 5) Grooved at leather-hard stage, edges rough.

Paste, Temper, Firing:

Paste: brown (7.5 YR 4/4) to dark brown-grey (7.5 YR 3/2); breaks very unevenly.

Temper: 50 percent or more of paste is temper: quartz, volcanic black particles.

Surface Finish and Decoration:

The dark red slip has been lightly polished. The black band at the rim or neck of the sherd seems to almost be absorbed into the vessel. Interior rims are smoothed and slipped red on most fragments. Many are burned. Grooving is heavy, edges are rough. The number of grooves varies from one to four.

One sherd has a band of fingernail punctation rather than a groove. All grooving and punctating is in the black area. Five of seven rims are grooved, four of 20 body sherds, one punctated body sherd. One sherd may be Schettel Incised rather than Bocana (Figure 15a, b, c).

Form: Rim fragments have many different shapes. The general wall thickness is 8-9 mm.



INTRA-SITE LOCATION AND CONTEXTS:

Peaks at 120 cm.

CULTURAL SIGNIFICANCE:

Bocana is an Early Bichrome ceramic, B.C. 300 to 300 A.D., found in Nicaragua and in Costa Rica .

TYPE: BOCANA INCISED BICHROME

VARIETY: Brown Banded

ESTABLISHED AS A TYPE/VARIETY:

NUMBER OF SHERDS IN THIS STUDY: 3

Ceramic Group: Aviles Group

Ceramic Ware: Palmar Ware

DESCRIPTION:

Principal Identifying Modes:

- 1) Brown bands (5-7 mm) on dark red slip, usually with grooved line through band.

Paste, Temper, Firing:

Paste: Same as Bocana.

Temper: Same as Bocana.

Surface Finish and Decoration:

Similar to Bocana variety with brown rather than black bands.

Form: Body sherds.

INTRA-SITE LOCATION AND CONTEXTS:

Zoned Bichrome period.

CULTURAL SIGNIFICANCE:

This is an unreported variety for the Zoned Bichrome period and needs to be compared with Zoned Bichrome to the north.

TYPE: COMBO COLANDER

VARIETY:

ESTABLISHED AS A TYPE/VARIETY: Healy (1976).

NUMBER OF SHERDS IN THIS STUDY: 244 (17 rims).

Ceramic Group:

Ceramic Ware:

DESCRIPTION:

Principal Identifying Modes:

- 1) Tecomate shaped, red slipped vessels with perforated bases.
- 2) Multiple perforations in rows to create colander.
- 3) Slip is burnished or lightly polished.

Paste, Temper, Firing:

Paste: fine, very dark brown (10YR5/4), no reduced cores.

Temper: very fine calcite, and feldspar in small portions. The paste and temper descriptions are very similar to Nicoya Polychrome ware.

Surface Finish and Decoration:

The base of the vessel is perforated with many rows of holes varying from needle size to that of a toothpick or fish spine perhaps. The size of the holes is uniform in each vessel. Vessel was perforated in a leather hard stage from the exterior. Exterior was smoothed after perforation; interior edges are very rough. All have exterior thickened rims (Figures 10a, b, 15e, f).

Two sherds have further decoration: one is a black banded fragment with punctations in the black area as well as the red area. The second decorated sherd has multiple, horizontal bands of red and blue-grey on a white slip (Figure 10c).

Form: Tecomate, rim sizes vary from 7 to 20 cm in diameter.

INTRA-SITE LOCATION AND CONTEXTS:

Peaks at 10 cm, composes 42 percent of the diagnostic sherds of this level. By 60 cm it declines to 17 percent of the collection.

CULTURAL SIGNIFICANCE:

This type vessel (Healy 1980:115) seems to be more common in Guatemala and Chiapas, Mexico than to the south in Rivas and Costa Rica. Healy had only nine sherds in his total study. There are hundreds of fragments in every unit at San Cristobal. Complete analysis will better situate this vessel in its correct context. It seems to be more frequent in sites located by lakes or the coast (Denver Convergence 1983).

TYPE: E E POLYCHROME

VARIETY: Lunoid

ESTABLISHED AS A TYPE/VARIETY:

NUMBER OF SHERDS IN THIS STUDY: 5.

Ceramic Group:

Ceramic Ware: Luna Ware

DESCRIPTION:

Principal Identifying Modes:

- 1) Heavy white to yellow cream slip, orange paste with grey cores.
- 2) Orange, brown and black designs, very carefully executed.
- 3) High gloss, bold designs.

Paste, Temper, Firing:

Paste: orange (5 YR 5/5/6) to grey brown (2.5 YR 5/0); paste is very hard.

Temper: quartzite, sandstone, ferrous particles and unknown orange flecks.

Surface Finish and Decoration:

Vertical and horizontal bands of orange, brown and cream outlined by thin black lines. Colors are clear and very well painted (Figure 17e,f,g).

Form: One pedestal fragment (Figure 17e). Body sherds..

**INTRA-SITE LOCATION AND CONTEXTS:**

Highest frequency: 70 cm.

**CULTURAL SIGNIFICANCE:**

It is found in association with known types of the Middle to Late Polychrome periods.

**TYPE:** GUNMETAL GREY BICHROME

**VARIETY:**

**ESTABLISHED AS A TYPE/VARIETY:** this study

**NUMBER OF SHERDS IN THIS STUDY:** 5.

**Ceramic Group:** Aviles Group

**Ceramic Ware:** Intermediate Ware

**DESCRIPTION:**Principal Identifying Modes:

- 1) Gunmetal grey slip (5 YR 4/4/1) on a roughly smoothed vessel; slip has good gloss.
- 2) Red-brown bands on exterior (2.5YR5/5/6).
- 3) Orange paste (5YR5/5/6).

Paste, Temper, Firing:

**Paste:** orange, heavily tempered paste, breaks unevenly.

**Temper:** large particles, abundant black sand in paste, quartzite, mica. Makes up more than half of the paste.

Surface Finish and Decoration:

Exterior has been smoothed and has a gloss, but the surface is not smooth; it has a rough texture similiar to an orange. One sherd shows a leg scar, the area is emphasised by a red-brown band around union site.

Form: Bowls with tripod supports. Wall thickness: 7 to 9 mm.

INTRA-SITE LOCATION AND CONTEXTS:

All of the sherds came from the Early Polychrome context of San Cristobal. Apoyo and Gunmetal Grey are coeval and are perhaps varieties of the same type. Apoyo has a finer paste and a smoother finish, but it varies in small degrees.

CULTURAL SIGNIFICANCE:

Both of these types, Gunmetal Grey and Apoyo would appear to be Early Polychrome utility vessels.

TYPE: LACAYO RED AND BLACK POLYCHROME

VARIETY:

ESTABLISHED AS A TYPE/VARIETY: this report

NUMBER OF SHERDS IN THIS STUDY: 4

Ceramic Group:

Ceramic Ware: Intermediate Ware

DESCRIPTION:

Principal Identifying Modes:

- 1) Deep red and black on cream slip, all sherds have gloss.
- 2) A red fret outlined by black along outer rim is very common. Horizontal thin black lines separate wide bands of cream slip.

Paste, Temper, Firing:

Paste: bright orange (2.5YR5/8) to brown (2.5YR3/3/6) with reduced cores.

Temper: particles are large and temper makes up about 40 percent of the paste. Temper is quartzite, sand, ground red stone.

Surface Finish and Decoration:

Most sherds retain their luster; two have red checkerboards set off by thin black lines. The designs generally do not cover as much of the slip as in Papagayo. One exterior has black serpentine lines filled with red. In the interior two red horizontal bands are common at the rim. Three sherds have buff interiors with red circles outlined by tiny red dots. One pedestal sherd. (Figure 14 c,d,e).

Form: Simple bowls, composite silhouettes, body sherds.

INTRA-SITE LOCATION AND CONTEXTS:

CULTURAL SIGNIFICANCE:

TYPE: LAS MERCEDES POLYCHROME

VARIETY:

ESTABLISHED AS A TYPE/VARIETY: This report.

NUMBER OF SHERDS IN THIS STUDY: 6.

Ceramic Group:

Ceramic Ware: Nicoya Polychrome Ware

DESCRIPTION:

Principal Identifying Modes:

- 1) Glossy grey black slip (10 YR 3/31 ) to (5 YR 2.5/2.5/1).
- 2) Clear orange (2.5 YR 6/6/6) , red (2.5 YR 4/4/6) and black paints.
- 3) Fine line black - designs often only outlines and not filled in.

Paste, Temper, Firing:

Paste: dark brown (10 YR 5 5/3) with reddish brown (5 YR 4/4/3) core; reduced cores common.

Temper: heavy temper, quartz, black volcanic sand, red particles.

Surface Finish and Decoration:

Thin line black with orange fill (Figure 17h).  
Ladders, one rim sherd with outstretched arm (Figure 17k).  
Very well made. Decoration only on exterior, highly polished (Figures 10d,e,f;17h,i,j,k,l).

Form: Out-turned rim sherds.

**INTRA-SITE LOCATION AND CONTEXTS:**

Highest frequency 70 cm.

**CULTURAL SIGNIFICANCE:**

Middle Polychrome period.

TYPE: LUNA POLYCHROME

**VARIETY:**

ESTABLISHED AS A TYPE/VARIETY: Bransford(1881), Lothrop (1926).

NUMBER OF SHERDS IN THIS STUDY: 24.

Ceramic Group: Luna Group

Ceramic Ware: Luna Ware

**DESCRIPTION:**Principal Identifying Modes:

- 1) Pink slip that looks like it was colored with crayola; (7.5 YR 8/8/4) perhaps burnished; to light tan (10 YR 8/8/3).
- 2) Medium gloss.
- 3) Designs in thin black lines with faces, eyes in orange; not as fine as illustrated in Bransford. Red-grey tones (5 YR 4/4/8) also used in the decorations.

Paste, Temper, Firing:

Paste: very dark reddish-brown paste (5 YR 3 3/3) to (2.5 YR 4 4/8).

Temper: transparent quartz, yellow quartz, green quartz in large quantities, black volcanic sand; reduced cores.

Surface Finish and Decoration:

Frets, wavy lines, eyes, faces, deep orange fill-in designs (Figures 17m,m,o).

Form: Composite silhouette, tecomates. One drilled sherd.

**INTRA-SITE LOCATION AND CONTEXTS:**

Peaks at 60 cm with Vallejo.

**CULTURAL SIGNIFICANCE:**

Luna has been established as a Late Polychrome type in the previous sequences of Nicoya.

**TYPE:** MANAGUA RED ON BLACK BICHROME

**VARIETY:** Managua

**ESTABLISHED AS A TYPE/VARIETY:** This report.

**NUMBER OF SHERDS IN THIS STUDY:** 61.

**Ceramic Group:** Papagayo Group.

**Ceramic Ware:** Nicoya Polychrome Ware.

**DESCRIPTION:**Principal Identifying Modes:

- 1) Heavy black slip or intentional smoking inside and out.
- 2) Dark red-orange bands (2.5 YR 4/4/8) to (5 YR5/5/8) horizontal around rim. Most common on exterior.
- 3) Matte finish.
- 4) Simple geometric designs or only red bands as decoration.

Paste, Temper, Firing:

**Paste:** bright orange (2.5 YR 5/8) with grey reduced core or cinnamon of Papagayo.

**Temper:** fine temper, ferrous particles, quartzite and orange inclusions. Fractures sharply. Less than 25 percent of paste.

Surface Finish and Decoration:

Managua vessels were slipped inside and out with a heavy black slip. Many had red band, also matte, 6 mm wide, parallel to rim, some only on the interior, some only on the exterior, others with bands on both sides. One sherd had step fret along the rim.



One whole support has the form of crocodile head, side slits to represent eyes, clay ball rattle inside support. Design is similar to Papagayo supports.

One sherd had light engraving. Four sherds were smoothed from reuse (Figures 10g,h,i;15 l,m,n).

Form: Simple bowls; wall thickness 4-6 mm.

INTRA-SITE LOCATION AND CONTEXTS:

Heaviest concentrations at 110 cm, represents .08 percent of the total sample studied. Present in every level except 120 cm.

CULTURAL SIGNIFICANCE:

This type is unknown in the Nicoya studies and also in Honduras (personal communication Day and Baudez). It is similar in shape, paste, and wall thickness to the Culebra variety of Papagayo. Originally, the grey Culebra sherds were sorted as a variety of Managua.

TYPE: NERETTE POLYCHROME

VARIETY:

ESTABLISHED AS A TYPE/VARIETY: This report.

NUMBER OF SHERDS IN THIS STUDY: 36

Ceramic Group:

Ceramic Ware: Intermediate Ware

DESCRIPTION:

Principal Identifying Modes:

- 1) Heavy cream slip with soft gloss (10 YR 8/8/3).
- 2) Delicate designs, well executed. Much open space; multiple exterior horizontal bands of shades of orange interspersed with cream bands and an occasional thin black line.
- 3) Deep red-orange to red (2.5 YR 4/4/8), black and pale orange (7.5 YR 7/7/6).

Paste, Temper, Firing:

Paste: brick red (2.5 YR 4/4/6) to dark orange brown (2.5 YR 3/3/1), reduced grey cores (5YR 4/4/1).

Temper: particles are larger than in other varieties of Papagayo and there is a higher percentage of temper in paste.

Surface Finish and Decoration:

Some sherds in this group have white a band over black line; considered diagnostic by Healy for Papagayo-Papagayo but they do not fit any other parts of his description. Two of the sherds are parts of pedestal bases with unslipped interiors (Figures 12a, 16m, n).

Form: Tecomates dominate, 1/2 of a pedestal base and one pedestal fragment.

## INTRA-SITE LOCATION AND CONTEXTS:

Peaks at 30 cm.

## CULTURAL SIGNIFICANCE:

Present in every level from surface to 100 cm., peaks with Vallejo.

TYPE: OBANDO BLACK ON RED

VARIETY: Obando

ESTABLISHED AS A TYPE/VARIETY: Coe and Baudez (1961:508), Healy (1980:158).

NUMBER OF SHERDS IN THIS STUDY: 4.

Ceramic Group: Rivas Group.

Ceramic Ware: Nandaime Ware.

## DESCRIPTION:

Principal Identifying Modes:

- 1) Simple black geometric designs on red-orange (10YR5/5/8) slipped sherds.
- 2) Dull finish.

Paste, Temper, Firing:

Paste: reddish brown (5 YR 5/4) to (2.5 YR 5 5.8).

Temper: transparent and greenish quartz. Black volcanic particles, iron ore, reddish and white ground stone. Heavy temper, at least 50 percent of the paste.

Surface Finish and Decoration:

Designs: Thin black lines, thin black band parallel to rim. Multiple thin vertical lines - wavy. Other geometric designs.

Very well done - all matte.

Completely slipped - interior and exterior.

Form:INTRA-SITE LOCATION AND CONTEXTS:

Although there are very few sherds of this and other types of Nandaime ware in the excavations, many whole vessels have been found on the farm.

CULTURAL SIGNIFICANCE:

Zoned Bichrome - Early Polychrome (Healy 1980:158). Commences and peaks in the latter half of Zoned Bichrome period.

TYPE: PAPAGAYO POLYCHROME

VARIETY: Culebra

ESTABLISHED AS A TYPE/VARIETY: Healy (1976) shown in Lothrop (1926) Plate XXIXa.

NUMBER OF SHERDS IN THIS STUDY: 52, one partial bowl.

Ceramic Group: Papagayo Group

Ceramic Ware: Nicoya Polychrome

**DESCRIPTION:****Principal Identifying Modes:**

- 1) Slip - Very grey (10 YR 5/1) smoked slip, with red-orange (2.5 YR 4/4/8) bands parallel to rim on exterior. The red-orange bands are the same color as Managua Red on Black. Designs are very difficult to see due to heavy smoking.
- 2) Design in the interior is wide 10 to 15 mm orange bands, and occasionally a step-fret in orange outlined lightly by black along the interior rim band.
- 3) Orange paste, reduced cores frequent. Intentional smoking.

**Paste, Temper, Firing:**

Paste: orange (2.5 YR 5/8) with reduced grey cores.

Temper: fine temper of quartzite, orange inclusions, 25 percent of paste, black volcanic sand.

**Surface Finish and Decoration:**

Very similar to Managua Red on Black and San Cristobal Red on Buff in wall thickness, shape, quality of paste, and paste color.

The majority of the sherds are only decorated with vertical and horizontal bands (Figures 11a,b,c; 16c, 3).

Form: Simple bowls.

**INTRA-SITE LOCATION AND CONTEXTS:**

Highest frequency at 50,80, and 90.

**CULTURAL SIGNIFICANCE:**

Papagayo marks a new ceramic tradition for the area. Slips are white to cream rather than red or orange base slip of the Early Polychrome period. New vessel forms like the composite silhouette bowls, annular bases, pear and egg shaped vessels and supports with human and animal faces begin to appear as well as the stepped fret, jaguars and feathered serpent. This would seem to indicate the sudden arrival of strong Mesoamerican influences. Papagayo polychrome has also been found at Dieha in Tula Hidalgo, Mexico (Healy 1980:170) and in Chiapas de Corsu, Mexico (personal communication Alice Tillett 1983).

TYPE: PAPAGAYO POLYCHROME

VARIETY: Fonseca

ESTABLISHED AS A TYPE/VARIETY: Healy (1976) shown in Lothrop (1926) Figure 34d).

NUMBER OF SHERDS IN THIS STUDY: 90.

Ceramic Group: Papagayo Group

Ceramic Ware: Nicoya Polychrome

DESCRIPTION:

Principal Identifying Modes:

- 1) Greyish smoked Papagayo slip, dull finish.
- 2) Exteriors usually have one or two horizontal bands at rim+ red (10 R 5/6) or red-orange (2.5 YR 4/8) bands.
- 3) Interiors are highly decorated.

Paste, Temper, Firing:

Paste: Papagayo cinnamon.

Temper: Papagayo, many with reduced grey cores.

Surface Finish and Decoration:

Designs are usually simple although a few sherds are highly decorated. Step frets and horizontal bands of orange, red and black predominate. Some exteriors have a scalloped red-orange band below the first rim band. Also seen in San Cristobal.

One large sherd has bands of eyes in scallops which is also used on San Cristobal Red on Buff (Figure 16 j).

The majority of the sherds are only decorated with vertical and horizontal bands (Figure 16 j,k,l; 11 d,e).

Very similar to Managua Red on Black and San Cristobal Red on Buff in wall thickness, shape, quality of paste, and paste color.

Form: Simple bowls.

INTRA-SITE LOCATION AND CONTEXTS:

Peaks at 100 cm; makes up 27 percent of the material at that level. Drops sharply to 8 percent at 110 cm and it is not present at 120 cm. This variety of Papagayo makes up 8 percent of the total group studied.

CULTURAL SIGNIFICANCE:

Fonseca is one of the earliest Papagayo and appears in the early part of the Middle Polychrome period.

TYPE: PAPAGAYO

VARIETY: Mandador

ESTABLISHED AS A TYPE/VARIETY: Norweb (1964), Healy (1976)

NUMBER OF SHERDS IN THIS STUDY: 54

Ceramic Group: Papagayo

Ceramic Ware: Nicoya Polychrome

DESCRIPTION

Principal Identifying Modes

- 1) Very bright red (10R4.5/8) and orange-red(2.5YR4/8) on buff slip.
- 2) Design outlined in heavy black lines.
- 3) Majority of decoration on exterior. Interior usually has horizontal red-orange bands at rim.

Paste, Temper, Firing:

Paste: Papagayo cinnamon.

Temper: Papagayo, very fine temper, less than 25 percent of paste.

Surface Finish and Decoration:

Black bands often divide the interior and exterior panels, decorations include many faces, both human and animal. Vessel walls are thicker than those of Fonseca, but in most ways they are very similar. Geometric zones of color are separated by buff slipped areas. Colors are brighter and stronger at the early levels and become paler closer to the Late Polychrome period(Figure 15 g,h,i).

Form: Thick walled composite silhouette and simple bowls. Supports in form of crocodile heads.

INTRA-SITE LOCATION AND CONTEXTS:

Peaks at 70 to 90 cm in a early, Middle Polychrome context.

## CULTURAL SIGNIFICANCE:

Middle Polychrome. Shown in Lothrop (1926:figure 60; Plate LX, 60-61).

TYPE: PAPAGAYO POLYCHROME

VARIETY: Manta

ESTABLISHED AS A TYPE/VARIETY: Norweb (1964), Healy (1976).

NUMBER OF SHERDS IN THIS STUDY: 7.

Ceramic Group: Papagayo Group.

Ceramic Ware: Nicoya Polychrome

## DESCRIPTION:

Principal Identifying Modes:

- 1) Exterior has black rim band and solid cover of bright orange slip (2.5 YR 5/8 to 10 R 4.5/8).
- 2) Interiors - great variation in design.

Paste, Temper, Firing:

Paste: Papagayo.

Temper: Papagayo.

Surface Finish and Decoration:

Every sherd in group has different design. This type seems to be too broad (Figure 16i).

Form: Simple bowls, one support.

## INTRA-SITE LOCATION AND CONTEXTS:

Peaks at 40 cm.

## CULTURAL SIGNIFICANCE:

Appears as a late Papagayo type.

TYPE: PAPAGAYO POLYCHROME

VARIETY: Negro

ESTABLISHED AS A TYPE/VARIETY: Healy (1976) - 19 sherds.

NUMBER OF SHERDS IN THIS STUDY: 4.

Ceramic Group: Papagayo Group.

Ceramic Ware: Nicoya Polychrome Ware.

DESCRIPTION:

Principal Identifying Modes:

1) White slip.

2) Black bands.

3) No gloss.

Paste, Temper, Firing:

Paste: Papagayo.

Temper: Papagayo.

Surface Finish and Decoration:

Sherds are too small to make any descriptive statements.

One figurine fragment - badly worn.

Form: Unknown.

INTRA-SITE LOCATION AND CONTEXTS:

CULTURAL SIGNIFICANCE:

Late Papagayo variety.

TYPE: PRINCESA POLYCHROME

VARIETY:

ESTABLISHED AS A TYPE/VARIETY: this study



NUMBER OF SHERDS IN THIS STUDY: 29

Ceramic Group:

Ceramic Ware: Intermediate Ware.

DESCRIPTION:

Principal Identifying Modes:

- 1) Bold colors, high gloss, orange dominates the colors.
- 2) Exterior usually has two parallel horizontal rim bands, interior more heavily decorated.
- 3) Red (10R5/8) Orange (2.5 YR 5/8).
- 4) Slip is white to cream yellow (5 YR 8/2) to (2.5 YR 5/8).

Paste, Temper, Firing:

Paste: brick red (2.5 YR 4/4/6) to dark orange brown (2.5 YR 3/3/6) reduced to grey (5 YR 4/4/1).

Temper: particles are large and there is a high percentage of temper in paste.

Surface Finish and Decoration:

Interiors have multiple horizontal bands of orange and black, step-frets, bands of red dots in white areas outline black bands. Only four sherds have the white line through a black band seen as diagnostic by Healy. One exterior has black horizontal bands separating red and white checkerboard design reminiscent of Healy's Pica, but it does not have the solid orange interior of Pica. Some exteriors have multiple exterior bands with different intensities of orange created by adding various layers of paint to intensify colors. The majority of the decoration is on the interior, five sherds are decorated on both sides. (Figure 17c, d).

Form: Bowls, and composite silhouette bowls.

INTRA-SITE LOCATION AND CONTEXTS:

Highest frequency 30 cm.

CULTURAL SIGNIFICANCE:

Late Polychrome

TYPE: PUMPKIN POLYCHROME

VARIETY:

ESTABLISHED AS A TYPE/VARIETY:

NUMBER OF SHERDS IN THIS STUDY: 4 (2 rims, 2 bodies).

Ceramic Group:

Ceramic Ware: Nandaime Ware.

DESCRIPTION:

Principal Identifying Modes:

- 1) Crudely made and decorated in bold oranges (2.5 YR 5/8).
- 2) Thin paints or washes carelessly applied on very thin cream slip.

Paste, Temper, Firing:

Paste: orange reduced cores

Temper: very heavy temper, crumbly, majority of paste is temper.  
Texturing on surface same as Gunmetal Grey.

Surface Finish and Decoration:

Thin cream or yellow slip, thin orange wash in triangle from rim to base, half of triangle a darker orange. Black wiggly line through triangle. Much slip and paint has flaked off. Pumpkin colored orange rim band, interior of one sherd, exterior of other (Figures 15p,q). Exterior of one sherd has step fret in black with orange fill. Black, buff, and orange horizontal bands alternate down exterior. Black band on rim separates interior from exterior designs.

Form: simple bowl.

INTRA-SITE LOCATION AND CONTEXTS:

Present from 70 to 110 cm.

CULTURAL SIGNIFICANCE:

Zoned Bichrome and Early Polychrome context.

TYPE: REA BLACK AND ORANGE POLYCHROME

VARIETY: Unknown

ESTABLISHED AS A TYPE/VARIETY: This report.

NUMBER OF SHERDS IN THIS STUDY: 3

Ceramic Group:

Ceramic Ware: Intermediate Ware

DESCRIPTION:

Principal Identifying Modes:

- 1) Black outlined designs with pale orange (5YR6/6/6) on light reddish-brown slip (10 YR 8 8/3).
- 2) Very thin slip on very thin walled vessel.
- 3) Resist interior.

Paste, Temper, Firing:

Paste: orange brown (5YR5/5/6) to (5 YR 4/4/3).

Temper: medium tempering - quartz and volcanic particles, about 30 percent of the paste. Red ground stone, ferrous particles, black volcanic sand, mica.

Surface Finish and Decoration:

Slip color is unique. A thin, very dull slip, dark tan is applied over the orange-brown paste. Designs are very simple, geometric bands in black with pale orange, the black outline is overlapped by filling color (Figures 12e; 15o).

Form: Simple bowl.

INTRA-SITE LOCATION AND CONTEXTS:

The bowl and large sherd came from the surface of damaged mounds. It is found in Unit C in level 3.

CULTURAL SIGNIFICANCE:

These sherds and partial bowl seem to fit early Polychrome descriptions but the provenience would not indicate that period.

TYPE: SAN CRISTOBAL RED ON BUFF

VARIETY: San Cristobal

ESTABLISHED AS A TYPE/VARIETY: This report.

NUMBER OF SHERDS IN THIS STUDY: 50.

Ceramic Group:

Ceramic Ware: Nicoya Polychrome Ware

DESCRIPTION:

Principal Identifying Modes:

- 1) Heavy cream to tan slip inside and out (10 YR 8 8/3).
- 2) Decorated with one or two red-orange bands (2.5YR5/8) around rim and intricate geometric designs.
- 3) Simple bowls and composite silhouette with tripod supports; bulbous supports.

Paste, Temper, Firing:

Paste: paste is fine red-orange to brown (2.5 YR 4 4/8) to (7.5 YR 4 4/4).

Temper: very fine tempering in small quantities. Contains quartz, volcanic black particles, red and brown ground rock.

Surface Finish and Decoration:

Slip: very pale brown to smoke grey.

Multiple red-orange bands varying in intensity from numbers of coats of paint. Decorations include border of eyes in interlocking scrolls, some vertical bands separated by horizontal bands. Wide decorated bands, 11 interior, 25 exterior. Sherds with heaviest decorations at deepest levels (Figures 12f; 13a; 16a, b, d).

Form: Simple bowls. One ring stand support (28 mm high) from 90 cm. Bulbous support fragments (6).

INTERSITE LOCATION AND CONTEXTS

At 100 cm it makes up .06 percent of the study collection.

**CULTURAL SIGNIFICANCE:**

San Cristobal is coeval with Mandador variety of Papagayo in the early part of the Middle Polychrome period at San Cristobal.

**TYPE:** SANTIAGO BICHROME

**VARIETY:**

**ESTABLISHED AS A TYPE/VARIETY:** This report.

**NUMBER OF SHERDS IN THIS STUDY:** 64 (31 of group burned or smoked) - 7 rims, 7 supports, 1 pedestal, 1 figurine fragment, and 1/3 of bowl.

**Ceramic Group:**

**Ceramic Ware:** Intermediate Ware.

**DESCRIPTION:**Principal Identifying Modes:

- 1) Tan to greyish slip (10 YR 8/8/3)9 to(10 YR 7 7/1).
- 2) Simple designs in deep red to maroon (2.5 YR 4 4/8) to( 2.5 YR 3 3/4) to fire darkened black.
- 3) Geometric designs in deep red, well executed (2.5 YR 5 5/8).
- 4) Mamiform supports.

Paste, Temper, Firing:

**Paste:** orange brown (5 YR 5/6) to red (2.5 YR 4 4/8). Some are very hard.

**Temper:** heavy, red ground stone, quartz, ferrous particles, black sand.

Surface Finish and Decoration:

Santiago is characterized by decorations in dark red to red-brown on buff. Geometric designs. Orange bands are intensified by multiple layers of paints.

Slip and paint retain light gloss in spite of smoking or burning on many sherds. Many mamiform supports, one slab foot (Figures 13b,c,d; 15 g,h,i,j,k).

**Form:** Tecomates, simple bowls. Two rim sherds appear to be bottle rims. Walls 6-8 mm thick, one figurine fragment.

**INTRA-SITE LOCATION AND CONTEXTS:**

Santiago peaks at 60 cm, and represents .08 percent of the material studied. It is present in every level from the surface to 110 cm and is most abundant from 40 to 70 cm.

**CULTURAL SIGNIFICANCE:**

It would seem to occupy a place in the later part of Middle Polychrome or the early period of Late Polychrome.

**TYPE:** URCUYO WHITE ON RED

**VARIETY:** Urcuyo

**ESTABLISHED AS A TYPE/VARIETY:** Norweb (1964), Healy (1980:233-237)

**NUMBER OF SHERDS IN THIS STUDY:** 6.

**Ceramic Group:** Rivas Group

**Ceramic Ware:** Nandaime Ware

**DESCRIPTION:**Principal Identifying Modes:

- 1) Dark red slip (10 R 5/6) to maroon (10 R 4/6).
- 2) Heavy temper.
- 3) White to orange painted designs (5 YR 6 6/8).

Paste, Temper, Firing:

**Paste:** orange-brown (5 YR 5 5/8), dark reddish brown (5 YR 3 3/4).

**Temper:** heavy temper - ground rock abundance of quartz, greenish quartz, bristite

Surface Finish and Decoration:

Red slip with yellow-orange paint in bands on red.

See Healy (1980:233) for a complete description of the type based on a large number of sherds.

Form:

**INTRA-SITE LOCATION AND CONTEXTS:**

Small percentages from 70 to 100 cm.

**CULTURAL SIGNIFICANCE:**

Late Bichrome and Early Polychrome

**TYPE:** USULUTAN

**VARIETY:**

**ESTABLISHED AS A TYPE/VARIETY:** Lothrop (1927) - El Salvador; Healy (1980).

**NUMBER OF SHERDS IN THIS STUDY:** 8.

**Ceramic Group:** Bichrome Group.

**Ceramic Ware:** Resist Ware.

**DESCRIPTION:**Principal Identifying Modes:

- 1) Negative resist painting on both sides.
- 2) Multiple brush in straight or wavy lines.
- 3) Grey slip with orange (10 YR 7/6) or orange slip with grey.

Paste, Temper, Firing:

**Paste:** very dark grey to black (2.5 YR 3/N3 to 10 YR 3 3/1).

**Temper:** green quartz, transparent quartz, ferrous particles, black volcanic sand, white ground rock.

Surface Finish and Decoration:

Usulután ceramics are a well known resist with a pale orange slip and grey areas or a grey slip with orange areas .

Form:

INTRA-SITE LOCATION AND CONTEXTS:

Peaks at 120 cm, the deepest level. Makes up .66 percent of all studied material at that level

CULTURAL SIGNIFICANCE:

Early Bichrome with ties to Mesoamerica.

TYPE: VALLEJO POLYCHROME

VARIETY: Vallejo

ESTABLISHED AS A TYPE/VARIETY: Coe (1962a:362), Norweb (1964:560), Healy (1980:242).

NUMBER OF SHERDS IN THIS STUDY: 54.

Ceramic Group: Madiera Group.

Ceramic Ware: Nicoya Polychrome.

DESCRIPTION:

Principal Identifying Modes:

- 1) Heavy white-cream slip frequently crazed and flaked, no gloss, (10 YR 8 8.2) to (10 YR 8 8.3).
- 2) Large amount of mica in temper very evident on surface of sherd.
- 3) Designs in black, pale orange, (5YR 6.1 6/8), red-orange (10 YR 6 5/8), blue-grey (10 YR 7 7/2) to (10 YR 6 6/1) and black.

Paste, Temper, Firing:

Paste: brown to reddish brown (5 YR 4/5).

Temper: about 50 percent of the paste. Heavy temper, lots of mica, quartz, black volcanic particles, biotite. Reduced cores.

Surface Finish and Decoration:

Matte to low gloss on all sherds. May show indications of having been burned in post-firing use. Designs are not heavy, much of the slip is visible. White to very pale brown. Interiors usually decorated with orange rim band.



The orange color is a pale, pumpkin colored paint; areas that are more intense in color may have received various coats of paint. Black varies from a true matte black to a brown-black. The blue of Vallejo-Vallejo is found only in this type; no other sherds use blue.

Mica in the temper has caused a flaking-spalling effect very characteristic of this type (Shepard 1957:31). Mica is conspicuous in low-fired pottery because the plates tend to become oriented parallel with the surface in the finish process. Mica, during firing, first dehydrates and then swells causing pitting by forcing off bits of paste.

Designs are outlined in black with blue or orange fill. The stepped pyramid outlined in black and filled by second color is a common design. Parallel orange lines with wavy black line between them, alternating orange, red, and black lines is also common. Blue was used sparingly. Three sherds have human faces, three have serpent heads. Two supports seem to be serpent or crocodile heads; one is a plumed serpent (Figures 17p,q; 18b,f).

Form: Bowls, composite silhouette, tecomates, perhaps plates judging from completely flat, heavily decorated sherd of bird beak.

#### INTRA-SITE LOCATION AND CONTEXTS:

Vallejo ceramics are very abundant at San Cristobal, 6.1 percent of the diagnostic sherds. Peaks at 60 cm.

#### CULTURAL SIGNIFICANCE:

Vallejo is considered to be of the Late Polychrome Period (Healy 1980:246). Analysis of designs on whole vessels indicate strong ties with Mexico. Lothrop (1926:Plate XCIIIa) depicts vessels with the winged head motif. Vallejo was identified in studies of Healy in Rivas, Wyckoff at San Francisco and Baudez in the Tempisque Valley of Costa Rica and has been associated with Nicarao influence in the area.

TYPE: VALLEJO

VARIETY: Vallejo Incised

ESTABLISHED AS A TYPE/VARIETY: Denver Conference (1980).

NUMBER OF SHERDS IN THIS STUDY: 27.

Ceramic Group: Madiera Group.

Ceramic Ware: Nicoya Polychrome Ware.

**DESCRIPTION:****Principal Identifying Modes:**

- 1) Colors are the same as Vallejo: orange, black and blue on light cream to pale tan slip.
- 2) Incising is heavy on fragments; it outlines designs or parallel lines. It is described as under-slip incising by Lothrop.
- 3) Slip crazed and flaked.

**Paste, Temper, Firing:**

Paste: Vallejo.

Temper: Vallejo.

**Surface Finish and Decoration:**

Slip: Vallejo. Designs are outlined by incising and set off between parallel incised lines, orange fill predominates. Wings, eyes, hooks, stepped pyramids. Three sherds have anthropomorphic features. Eight sherds have exterior incising, 14 have interior incising. Sherds are heavily decorated only on one site. The second site has only one or two orange rim bands (Figures 13e, 17r).

Form: The predominate shape is the composite silhouette bowl. Many fragments showed union with tripod supports. Bowls and plate fragments were also present.

**INTRA-SITE LOCATION AND CONTEXTS:**

See Vallejo.

**CULTURAL SIGNIFICANCE:**

Cover vessel of one urn in NMN2-4 is Vallejo incised.

TYPE: VALLEJO POLYCHROME

VARIETY: Black and Blue on White

ESTABLISHED AS A TYPE/VARIETY: This report.

NUMBER OF SHERDS IN THIS STUDY: 7.

Ceramic Group: Madera Group.

Ceramic Ware: Nicoya Polychrome Ware.

**DESCRIPTION:****Principal Identifying Modes:**

- 1) Vallejo paste and slip.
- 2) Black and blue bands - no incising, no orange.

**Paste, Temper, Firing:**

Paste: Vallejo.

Temper: Vallejo.

**Surface Finish and Decoration:**

Matte colors. Geometric designs, black dominates, blue is occasional fill. Half are fire darkened. Very worn (Figures 14a; 18a).

Form: One outcurved rim. Others are small body fragments.

**INTRA-SITE LOCATION AND CONTEXTS:**

See Vallejo.

**CULTURAL SIGNIFICANCE:**

Although there are very few Black and Blue on White sherds in this unit, they exist in large enough quantities at San Cristobal to deserve being separated into a variety.

**TYPE:** VALLEJO POLYCHROME

**VARIETY:** Black on White

**ESTABLISHED AS A TYPE/VARIETY:** This report.

**NUMBER OF SHERDS IN THIS STUDY:** 36.

**Ceramic Group:** Madiera Group.

**Ceramic Ware:** Nicoya Polychrome Ware.

**DESCRIPTION:**Principal Identifying Modes:

- 1) Vallejo paste, temper and slip.
- 2) Black paint (matte) on white slip.
- 3) Horizontal bands predominate.

Paste, Temper, Firing:

Paste: Vallejo.

Temper: Vallejo.

Surface Finish and Decoration:

One whole tubular foot - different than other Vallejo feet.  
 Decoration on exterior. Many sherds burned. Two smoothed sherds.  
 Many support sherds, one incised sherd (Figure 18g).

Form: Sherds very small, largest 4 X 5 cm.

## INTRA-SITE LOCATION AND CONTEXTS:

See Vallejo.

## CULTURAL SIGNIFICANCE:

Late Polychrome

TYPE: VALLEJO POLYCHROME

VARIETY: Mombacho

ESTABLISHED AS A TYPE/VARIETY: Denver Conference (1983).

NUMBER OF SHERDS IN THIS STUDY: 115.

Ceramic Group: Madera Group.

Ceramic Ware: Nicoya Polychrome.

## DESCRIPTION:

Principal Identifying Modes:

- 1) White to cream slip, crazed, flaked, mica visible on surface.

- 2) Orange and black designs on white slip, no blue.
- 3) Fire darkened - either intentional smudging or fire clouding on 46 of 115 sherds.
- 4) Designs were similar to Vallejo and Vallejo Incised.

Paste, Temper, Firing:

Paste: yellow-red (5 YR 5 5/6) to brown (7.5 YR 5/4).

Temper: heavy mica very evident. Temper about 50% of paste.

Surface Finish and Decoration:

Pale Orange (5 YR 6.1 6/8). Deeper orange (10 YR 6 5/8) and black are used in decoration. Slip (10 YR 8/8.2) to (10 YR 8/8.3) is often fire darkened grey.

Designs are usually outlined in black with orange fill. One surface is highly decorated; second has only orange and black bands. Fungus or chemical reaction with paint on some sherds. This group seems to be darkened by burning after being decorated through use. They are not uniformly smoked as are many sherds at San Cristobal.

Designs: Step frets, parallel lines dominate, flowers, faces, cross.

Supports: Two of human face have nose and ears in relief. One support is cylindrical - all hollow (Figures 14b; 17s; 18c,d,e).

Form: Composite silhouette with indications of support attachments. Tecomates.

INTRA-SITE LOCATION AND CONTEXTS:

Highest frequency at 60 cm.

CULTURAL SIGNIFICANCE:

Same as Vallejo.

TYPE: VALLEJO POLYCHROME

VARIETY: Mombacho Incised.

ESTABLISHED AS A TYPE/VARIETY: Denver Conference.

NUMBER OF SHERDS IN THIS STUDY: 30 (19 fire darkened).

Ceramic Group: Madiera Group.

Ceramic Ware: Nicoya Polychrome Ware.

**DESCRIPTION:**

Principal Identifying Modes:

- 1) Mica in temper.
- 2) Cream to grey slip, crazed and flaked.
- 3) Orange and black paint with incising.

Paste, Temper, Firing:

Paste: some sherds at 90-100 cm more like Papagayo but designs like Vallejo.

Temper: Vallejo.

Surface Finish and Decoration:

Slip: Cream to grey smoked. One with resist interior.

None incised on both sides. Designs outlined by incising, filled with black or orange horizontal and vertical lines, zig-zags, wings, or feathers, flowers. No faces, eyes, or anthropomorphic designs (Figure 17t).

Form:

**INTRA-SITE LOCATION AND CONTEXTS:**

Vallejo.

**CULTURAL SIGNIFICANCE:**

Late Polychrome

**TYPE: UNNAMED POLYCHROME**

One sherd with a bright orange slip, very heavy temper, more sand than temper, anthropomorphic design parallel to rim in heavy black lines (Figure 14f). The interior has pale orange rim bands (2) horizontal to rim, on bright orange slip.

TYPE: SPECIAL ARTIFACTS

Hollow figurines (Figure 18h,i), buff slip, heavy temper in brown paste, pale orange lines on modeled figures. One from surface and one from 90 cm, Unit C.

Figure 17j, spindle whorl; Figure 17k, clay pipe; Figure 17l,m, clay ear spools.

Burial vessels of San Cristobal are represented in Figure 8. Figure 7 provides the key of the color code for line drawings.

## ILLUSTRATIONS

The ceramics of San Cristobal are illustrated with line drawings and photographs.











	<b>Red</b>
	<b>Orange</b>
	<b>Dark Orange</b>
	<b>Buff</b>
	<b>Grey</b>
	<b>Pearl Grey</b>
	<b>Smoked Grey</b>
	<b>Brown</b>
	<b>Black</b>
	<b>White/Cream</b>

Figure 7. Color Code for Line Drawings.



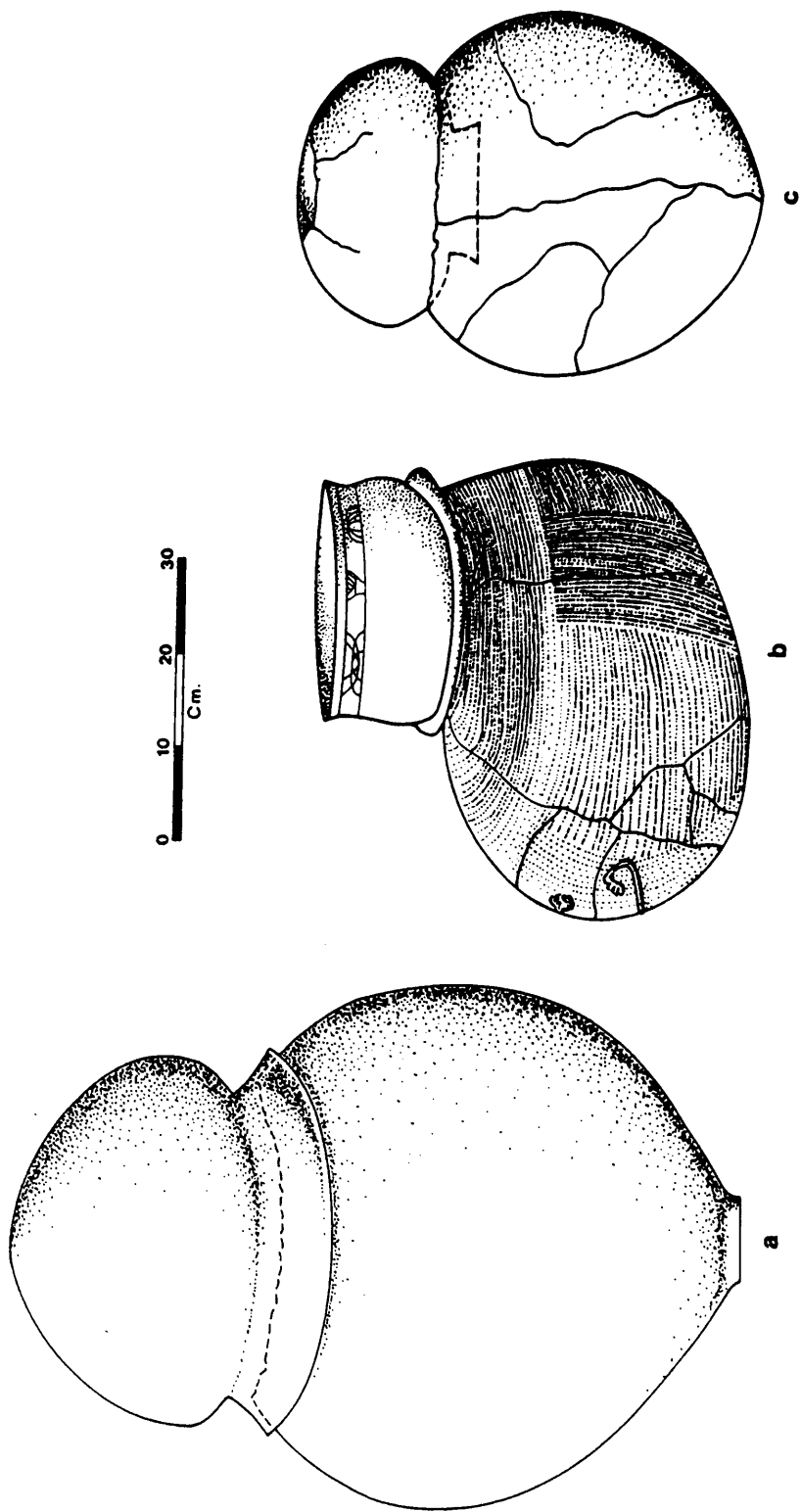


Figure 8. Burial Vessels of San Cristobal

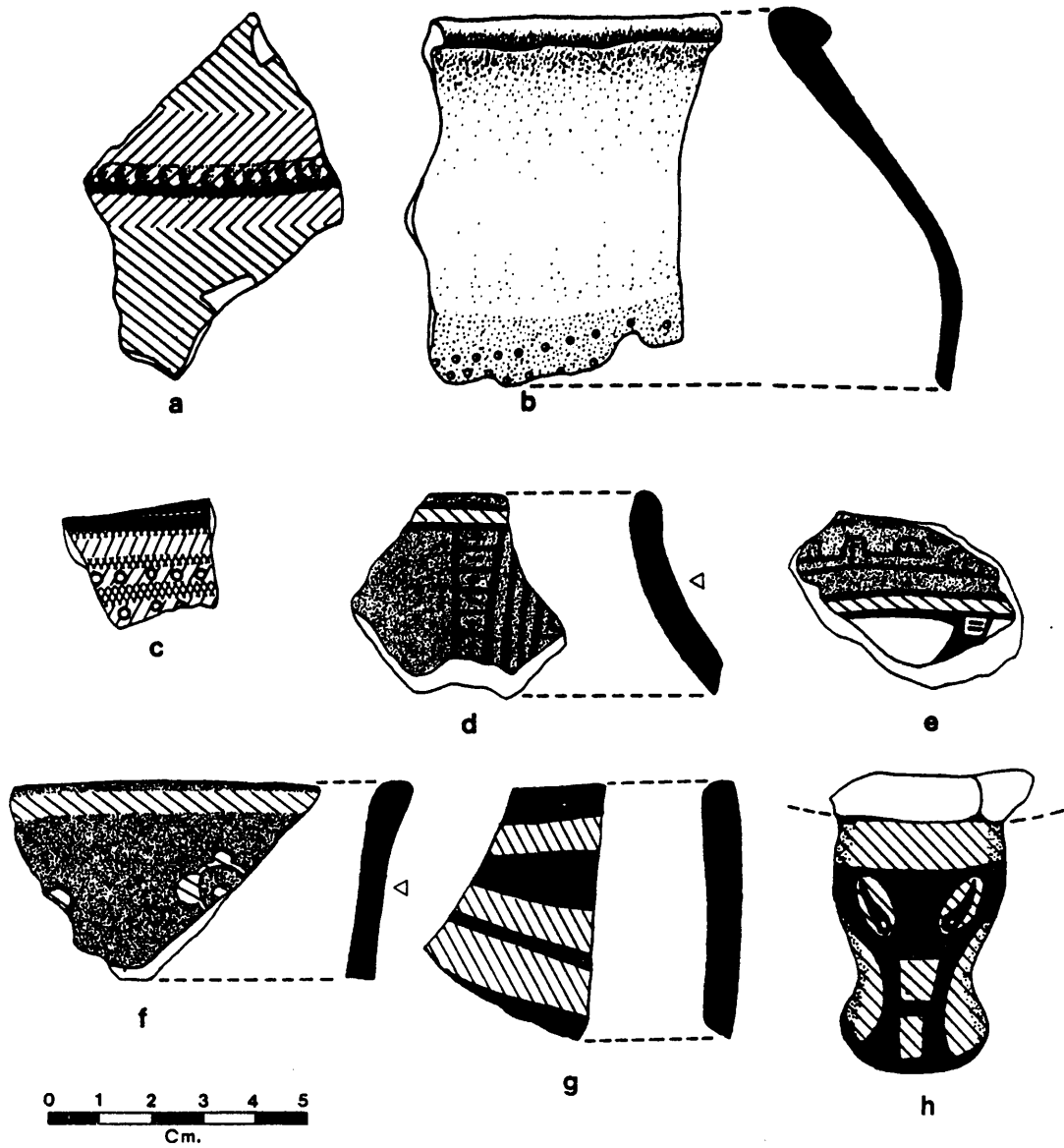


Figure 9. Line Drawings: Apompua, Combo, Las Mercedes, Managua

a. Apompua Modelled b. Combo Colander c. Combo Colander, polychrome  
 d. Las Mercedes e. Las Mercedes f. Las Mercedes g. Managua Red on Black  
 h. Managua Red on Black.

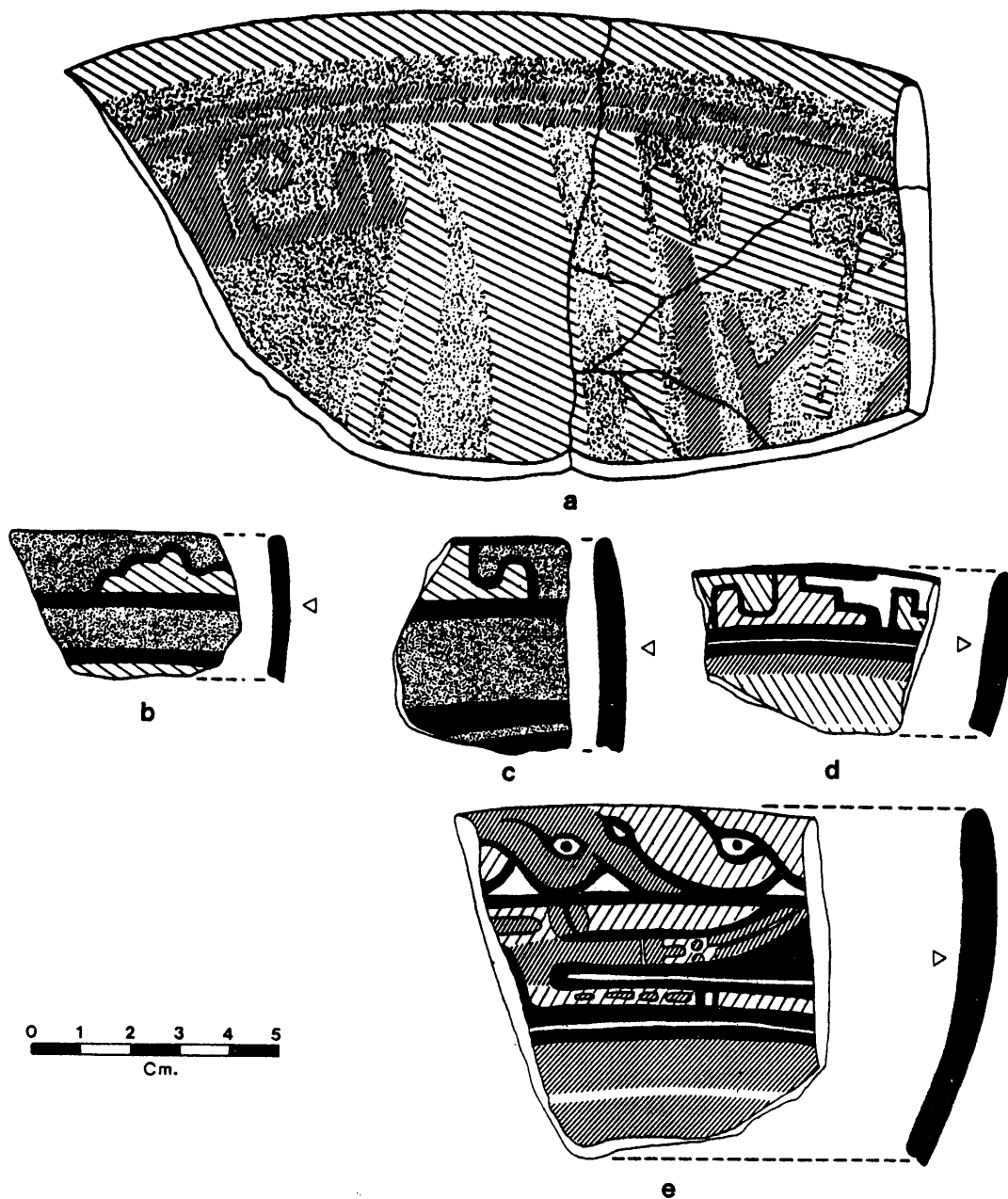


Figure 10. Line Drawings: Culebra, Fonseca

- a. Culebra bowl b. Culebra c. Culebra  
 d. Papagayo, Fonseca e. Papagayo, Fonseca.

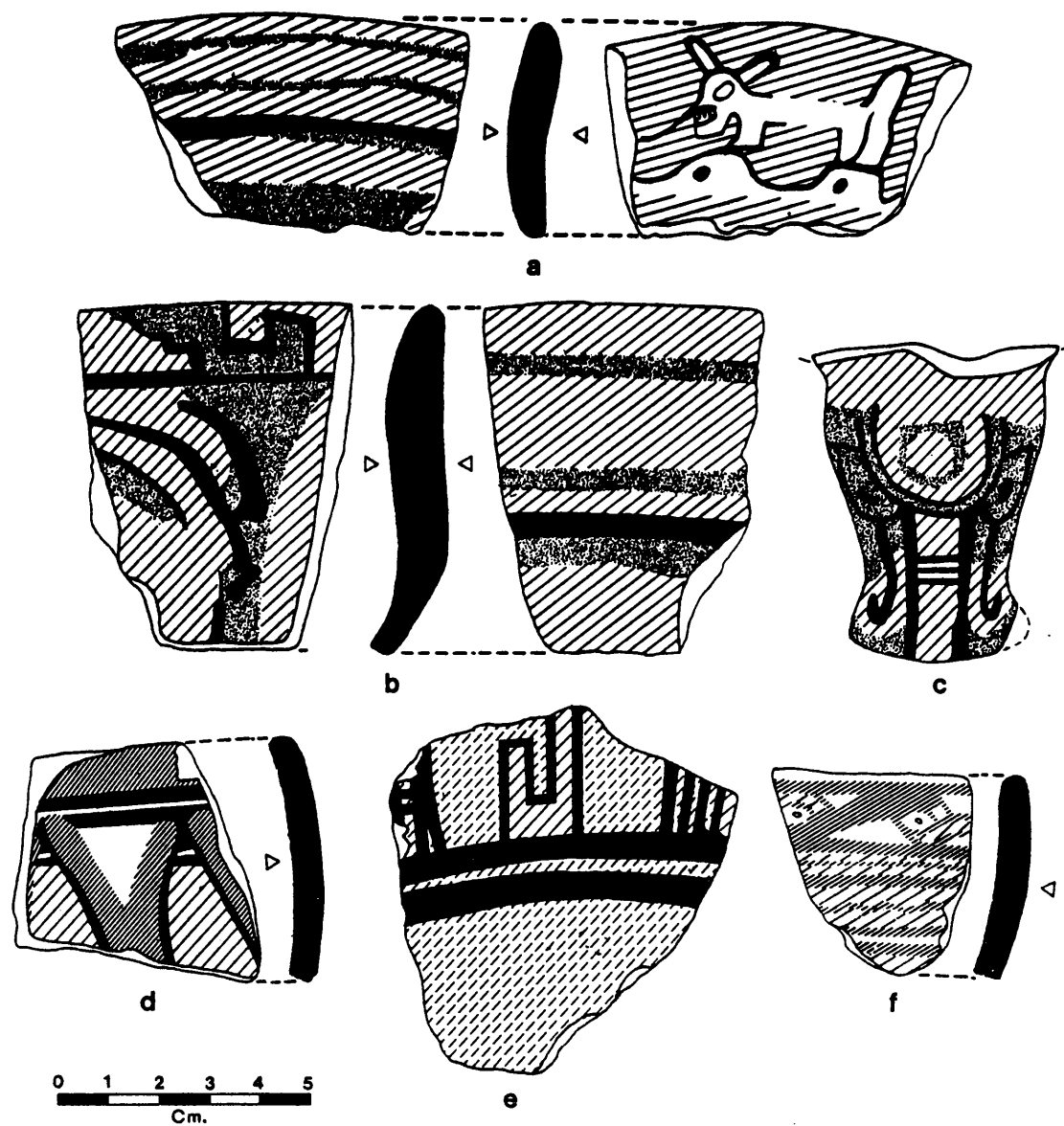


Figure 11. Line Drawings: Nerette, Arguello, Rea, San Cristobal

a. Nererrete, exterior and interior b. Arguello, interior and exterior c. Arguello support d. Arguello e. Rea Polychrome f. San Cristobal

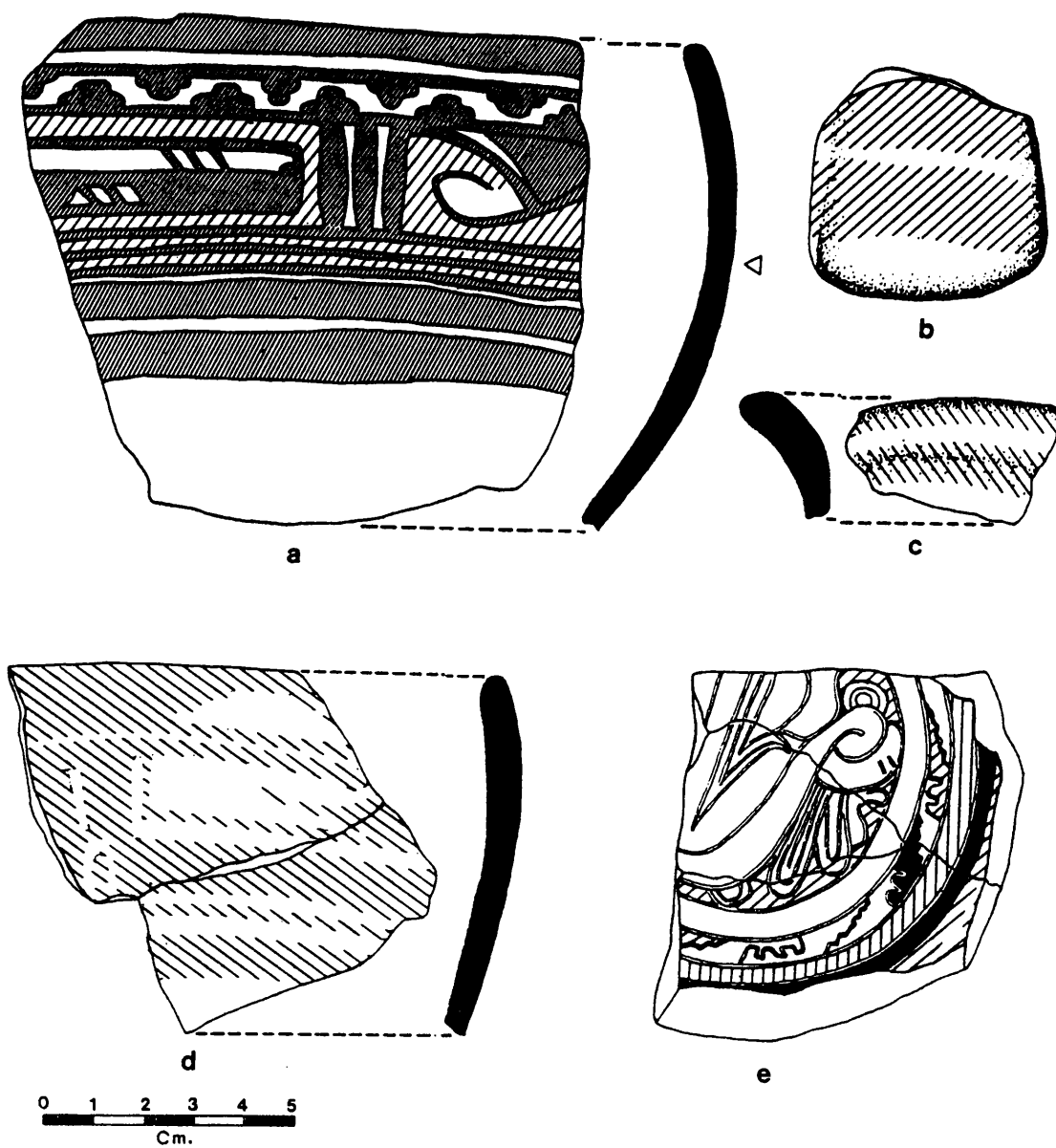


Figure 12. Line Drawings: San Cristobal, Santiago, Vallejo

- a. San Cristobal, 1/3 of bowl b. Santiago slab support  
 c. Santiago bottle rim d. Santiago bowl e. Vallejo Incised

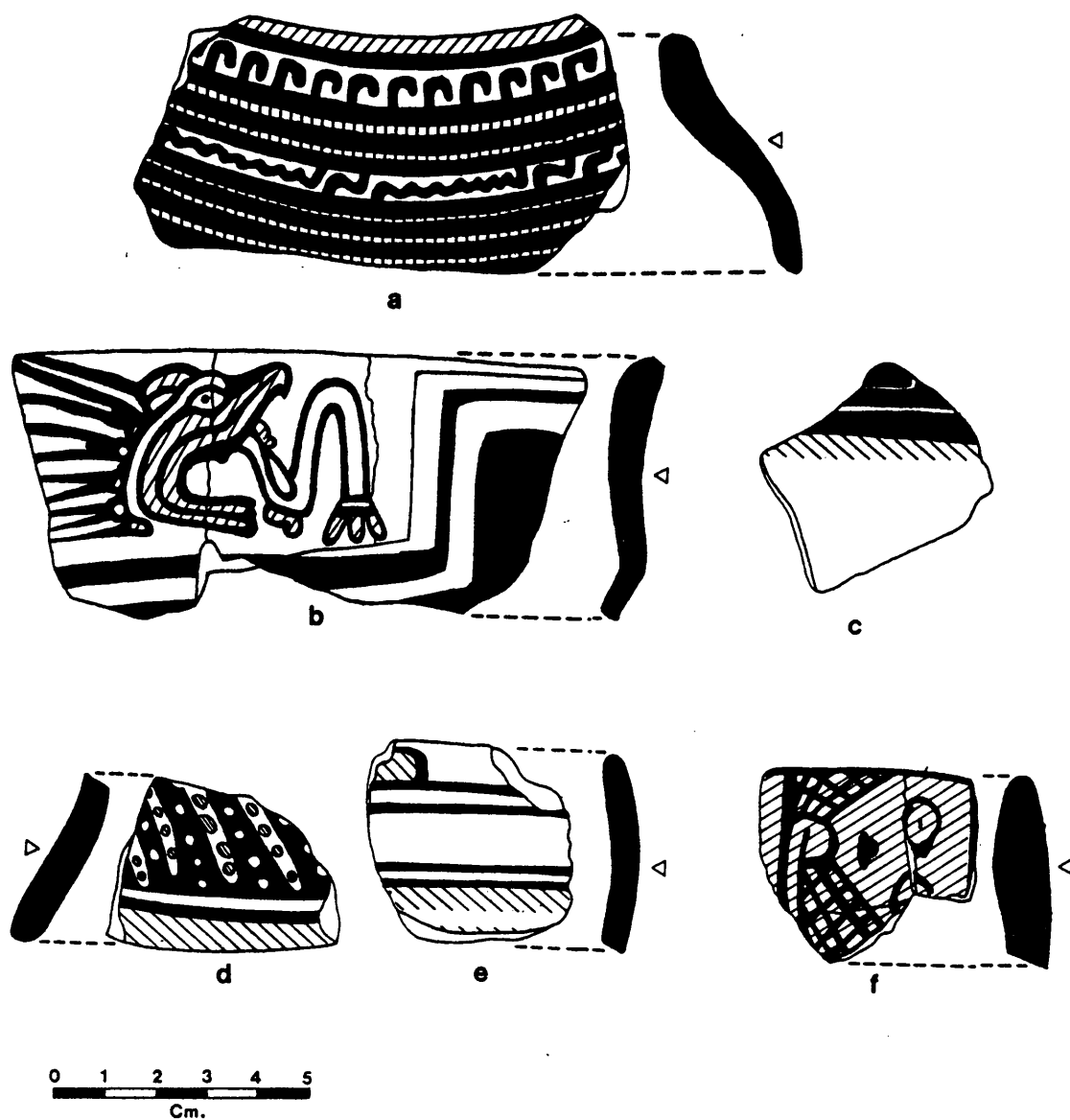
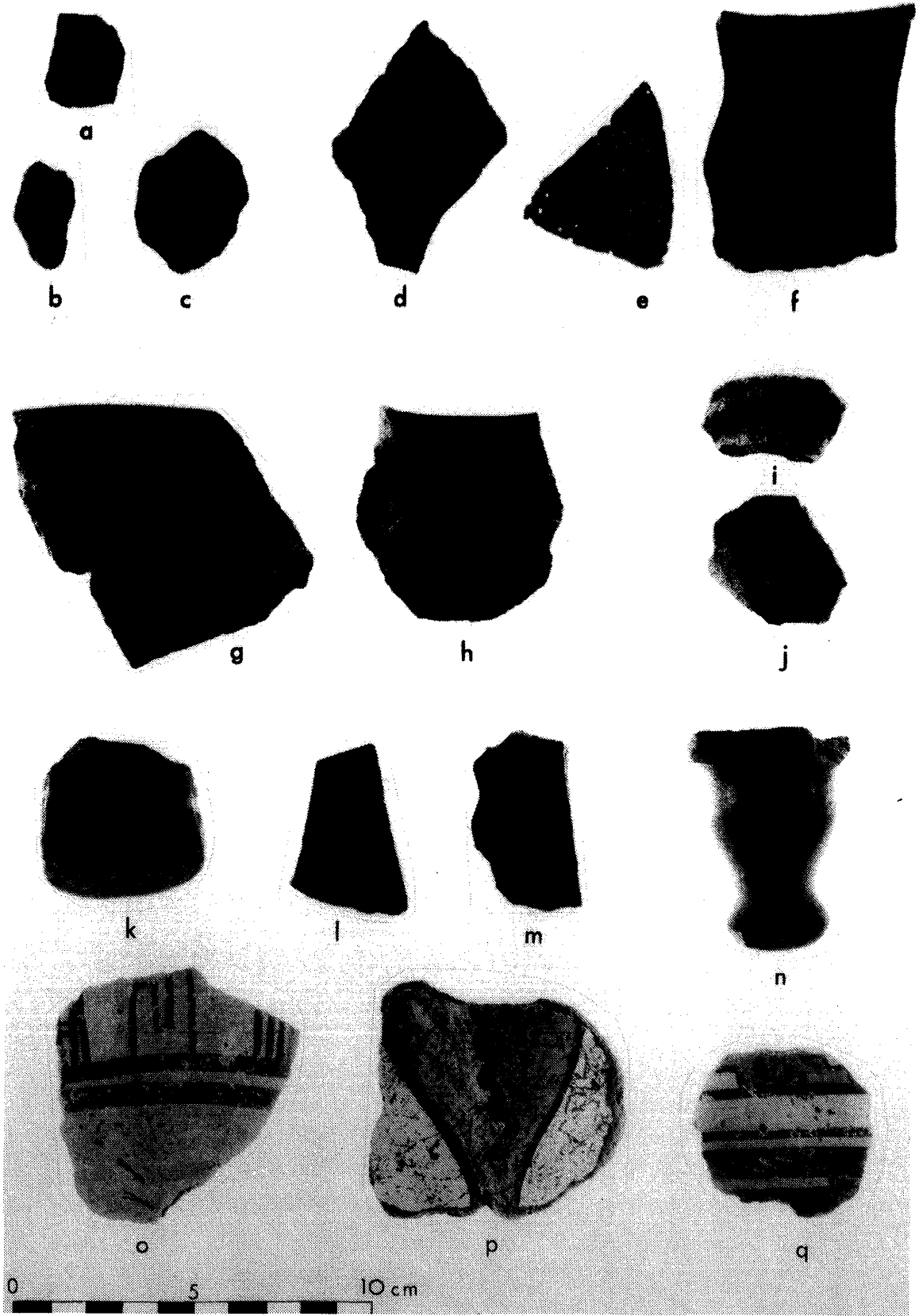


Figure 13. Line Drawings: Vallejo, Lacayo, Unknown

a. Vallejo Black and Blue, bowl fragment b. Vallejo,  
Mombacho c. Lacayo d. Lacayo pedestal e. Lacayo  
f. unknown

**Figure 14: Photographs: Bichrome and Trichrome Types**

- a. Bocana Zoned Bichrome
- b. Bocana Zoned Bichrome
- c. Bocana Zoned Bichrome
- d. Apompua Modelled
- e. Combo Colander
- f. Combo Colander
- g. Santiago Bichrome
- h. Santiago Bichrome
- i. Santiago Bichrome
- j. Santiago Bichrome
- k. Santiago Bichrome support
- l. Managua Red on Black Bichrome
- m. Managua Red on Black Bichrome
- n. Managua Red on Black Bichrome support
- o. Rea Black and Orange Polychrome
- p. Pumpkin Polychrome
- q. Pumpkin Polychrome





**Figure 15: Photographs: Middle Polychrome Types**

- a. San Cristobal Red on Buff
- b. San Cristobal Red on Buff
- c. Papagayo Polychrome, culebra variety
- d. San Cristobal Red on Buff
- e. Papagayo Polychrome, culebra variety
- f. Papagayo Polychrome, mandador variety support
- g. Papagayo Polychrome, mandador variety
- h. Papagayo Polychrome, mandador variety
- i. Papagayo Polychrome, mandador variety
- j. Papagayo Polychrome, fonseca variety
- k. Papagayo Polychrome, fonseca variety
- l. Papagayo Polychrome, manta variety
- m. Nerette Polychrome
- n. Nerette Polychrome
- o. Arguello Polychrome
- p. Arguello Polychrome

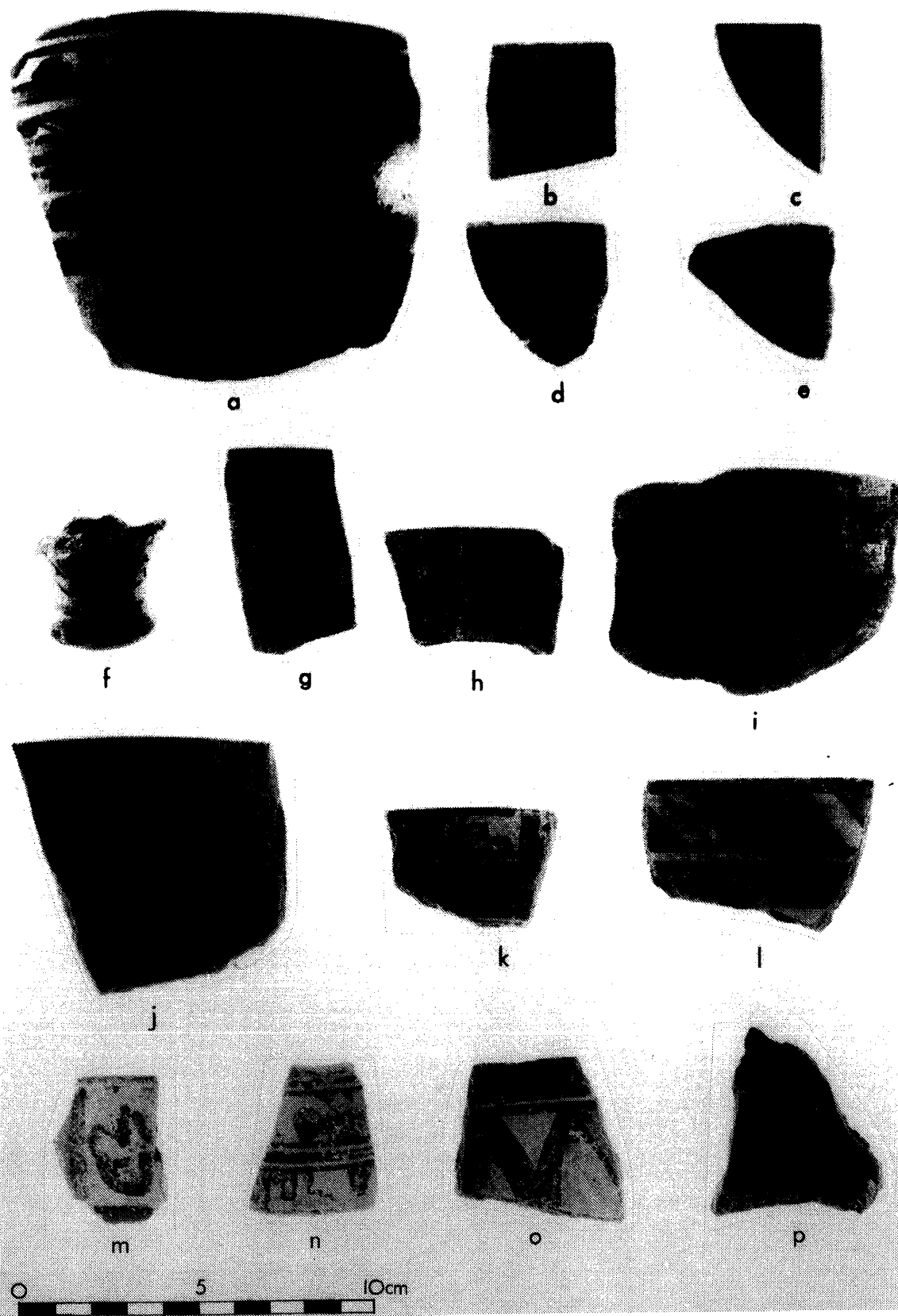
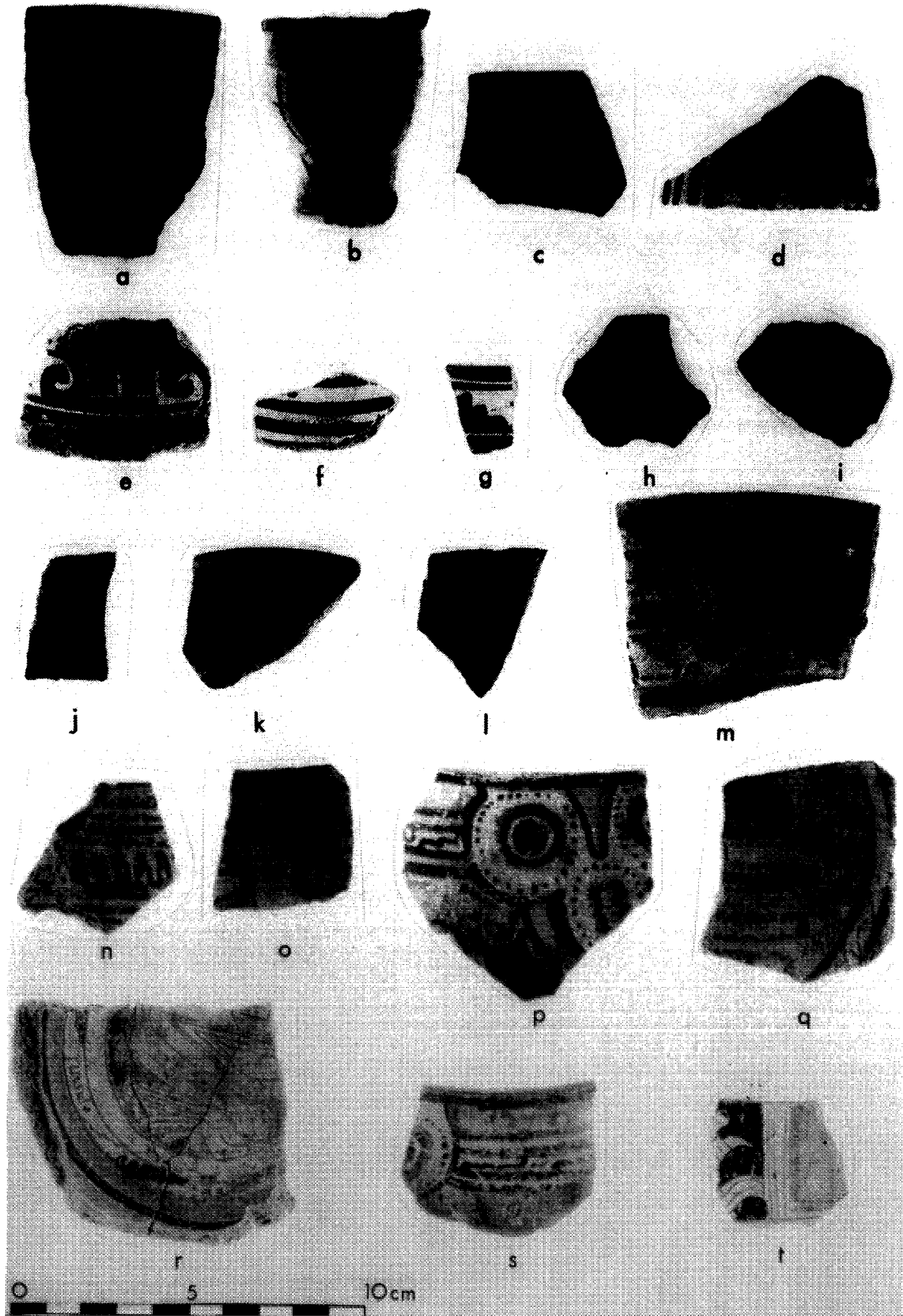


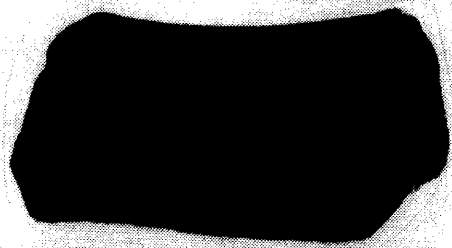
Figure 16: Photographs: Middle and Late Polychrome Types

- a. Arguello Polychrome
- b. Arguello Polychrome
- c. Princesa Polychrome
- d. Princesa Polychrome
- e. E E Polychrome
- f. E E Polychrome
- g. E E Polychrome
- h. Las Mercedes Polychrome
- i. Las Mercedes Polychrome
- j. Las Mercedes Polychrome
- k. Las Mercedes Polychrome
- l. Las Mercedes Polychrome
- m. Luna Polychrome
- n. Luna Polychrome
- o. Luna Polychrome
- p. Vallejo Polychrome, vallejo variety
- q. Vallejo Polychrome, vallejo variety
- r. Vallejo Polychrome, vallejo incised variety
- s. Vallejo Polychrome, mombacho variety
- t. Vallejo Polychrome, mombacho incised variety



**Figure 17: Supports and Special Artifacts**

- a. Vallejo Polychrome, black and blue variety
- b. Vallejo Polychrome, vallejo variety support
- c. Vallejo Polychrome, mombacho variety support
- d. Vallejo Polychrome, mombacho variety support
- e. Vallejo Polychrome, mombacho variety support
- f. Vallejo Polychrome, vallejo variety support
- g. Vallejo Polychrome, black and white variety support
- h. Figurine
- i. Figurine
- j. Spindle whorl
- k. Clay pipe
- l. Clay earspool
- m. Clay earspool



a



b



c



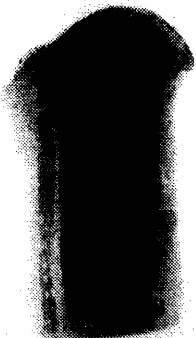
d



e



f



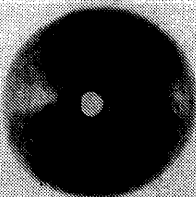
g



h



i



j



k



l



m



## THE SAN CRISTOBAL SEQUENCE

The analysis of the 1650 bichrome, trichrome and polychrome sherds in one unit of excavation at San Cristobal produced 22 possible types of ceramics with 11 varieties. They span a time period of B.C. 300 to post conquest. As to be expected, all ceramic types in the Nicoya sequences were not represented in this unit, a pattern that has existed in the known archaeological sites excavated in Nicaragua to date. There are nine common types which tie San Cristobal to Nicoya in the Zoned Bichrome, Early, Middle and Late Polychrome periods.

The initial types were sorted from surface collections using attribute clusters as the sorting criteria. All sherds of Units D,C, and three levels of A were then compared with the initial groups. From this sorting of about 3000 sherds, only the material from Unit C was used for the final analysis.

Although some types identified are represented by small samples in Unit C, they are present in high enough numbers in the larger sample to justify their designations as types or varieties. The decisions were based only on sherds; no whole vessels were available for examination.

No radiocarbon dating was done at San Cristobal. The chronology was determined by seriation, the arrangement of archaeological material in chronological order by linking and overlapping artifacts of similar paste and temper as well as surface treatment. Assuming that at a given period a culture manufactures and uses a unique assemblage of artifacts, identical or nearly identical artifacts are considered coeval in date. The stratigraphic order of the

similar artifacts will indicate which are earlier.

Seriation does not provide an absolute date for a site but it will provide a relative chronology that can be used for comparison in sample sizes which are large enough.

The dates and ceramic periods of the Nicoya Ceramic Sequence were used for comparison with the San Cristobal material due to evidence of the presence of Nicoya types at San Cristobal from surface collections. The four ceramic periods identified in the Greater Nicoya area are the Zoned Bichrome period B.C. 300 to 500 A.D.; Early Polychrome 500 A.D. to 800 A.D.; Middle Polychrome 800 A.D. to 1200 A.D. and Late Polychrome 1200 A.D. to post conquest.

The ceramic periods are divided into sequences based on peak frequencies of types. The peak concentration of a particular type is seen as an important indicator of change. The introduction of a type, its peak of frequency and decline serve as guidelines for the sequences and this data can be correlated with dated units from other areas.

The Zoned Bichrome period, the oldest established in the Greater Nicoya Area and in Nicaragua, is characterized by distinctive decorative types: incising, engraving, ridging and punctating in black and red or unpainted zones. Bichrome painting is usually black on a red base slip or resist decoration. At San Cristobal this period is represented by two types, Bocana and Usulután, a known Early Bichrome in El Salvador and Honduras. Bocana Zoned Bichrome is found in high concentrations in Costa Rica and seems to be common to Costa Rica and Nicaragua. Bocana Brown Banded, also from a Zoned Bichrome context, has not been identified in the Nicoya sequences. The small sample size of Bocana and Usulután (Table 4) presents an obstacle in detailed



Table 4. Ceramic Distribution and Frequencies

TYPE	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10	Level 11	Level 12
Bocana	1/.016		2/.0098	4/.024		1/.009	1/.01	3/.03	4/.04	6/.077	5/.217	1/.33
Usulután	1/.016						2/.02		1/.01	1/.0129		2/.666
Apompua				1/.006					1/.01			
Obando		1/.0104					1/.01		1/.01			
Urcuyo							1/.01		1/.01			
Rea			1/.0049							1/.01		
Santiago	3/.05	4/.04	11/.053	7/.042	4/.043	9/.081	7/.07	5/.05	4/.04	3/.038	2/.086	
Pumpkin							1/.01		1/.01		1/.043	
Apoyo		1/.01	1/.0049	1/.06					1/.01	1/.0129		
Gunmetal Grey			1/.0049				1/.01		1/.01			
Managua	5/.084	5/.052	17/.083	6/.036	5/.054	4/.036	6/.06	8/.08	8/.08	1/.012	4/.173	
San Cristobal		2/.02	5/.024	6/.035	3/.032	1/.009	3/.03	4/.04	5/.05	5/.064		
Papagayo	5/.08	10/.10	30/.147	19/.115	17/.186	12/.108	20/.20	31/.31	32/.32	35/.454	5/.217	
E E Polychrome			1/.0048			1/.009	2/.02					
Lacayo						1/.009		1/.01	11/.02			
Nerette	2/.033	4/.041	9/.044	7/.042	2/.021	1/.009	3/.03	4/.04	4/.04	1/.0129		
Arguello	1/.016	2/.02	1/.0049	5/.03	1/.01	1/.009	2/.02	2/.02	1/.01			
Princesa	1/.016	3/.03	6/.029	4/.024		1/.009	2/.02	4/.04	5/.05	2/.025	1/.043	
Combo	25/.42	32/.33	44/.215	42/.256	22/.241	19/.17	5/.05	19/.19	20/.20	16/.16		
Vallejo	12/.20	21/.218	62/.30	54/.329	27/.296	48/.432	24/.24	8/.02	11/.11	3/.038		
Luna	2/.033	3/.03	5/.0245	3/.018	2/.0219	4/.036			1/.01			
Las Mercedes		1/.01	3/.0147		2/.0219	2/.018	2/.02					
TOTAL	59	96	204	164	91	111	100	100	100	77	23	3
Misc. Polychrome	57	53	149	45	51	44	32	33	34	17	7	
GRAND TOTAL	116	149	353	209	142	155	132	133	134	94	30	3

analysis. It has not been determined whether or not the Usulután sherds are trade sherds or a local variety. Numerous examples of orange slipped resist vessels are shown in photographs of private collections from Nicaragua (Baudez 1970: cover photograph).

The Early Polychrome period, marked by the introduction of simple polychromes with hollow mamiform feet and the first utilization of graphite black paint (Healy 1980:301) are represented in Unit C in Obando, Apompua and Urcuyo. Sherds of these types are extremely rare in Unit C and the large initial sample sorted, but many whole vessels of these types are common from other areas of the site. Perhaps they were only used in association with burials of a certain class of the site. The first true polychromes of this period are usually decorated with linear and geometric designs in red and black on buff, orange or natural slip. Both Managua Red on Black Bichrome and Santiago Bichrome, two of the new types, occur at their highest frequencies in association with Apompua, Obando and Urcuyo. In design and paste, Managua seems to be an forerunner of the Papagayo Polychromes that mark the beginning of the Middle Polychrome period. Pumpkin Polychrome also fits the descriptions and provenience of the Early Polychrome period. Rea Polychrome fits the description as well but not the provenience.

The Middle Polychrome Period with Papagayo polychrome as a horizontal marker (Haberland 1978:404) is represented at San Cristobal by five known varieties of Papagayo polychromes in high concentrations. Two types identified for the first time in the area, Managua Red on Black and San Cristobal Red on Buff are possibly of the early Papagayo period. The characteristically bright orange paint with black and red on cream or fire darkened slip of Papagayo dominates the study

group from San Cristobal. Nineteen percent of all diagnostic material was represented by these five varieties.

The earliest varieties of Papagayo are Fonseca and Mandador, appearing at the end of the Zoned Bichrome-Early Polychrome period. Fonseca is the most prevalent type, and it appears in every level except the early Zoned Bichrome. The Combo Colander, also considered to be of the Middle Polychrome period is most prevalent in the first 10 cm of the excavation although it too appears through out the levels to 100 cm.

Vallejo Polychrome and Lunoid Polychrome, characteristic of the Late Polychrome period, are both present at San Cristobal; Vallejo appeared in all identified varieties and makes up 23 percent of the total collection. Coeval with Vallejo are Nerette, Arguello and Princesa Polychromes. They seem to be influenced by Papagayo, but the heavily tempered paste with orange to orange-brown colors, does not fit the Nicoya Polychrome paste or temper. These may possibly be a variety of Madera but that cannot easily be determined without whole vessels to compare them to.

Types representing all four identified ceramic periods for the Greater Nicoya area are present at San Cristobal, but no sequence is completely represented. It is a Middle to Late Polychrome site with Zoned Bichrome and Resist predating other deposits. In the Late Polychrome period as well as the Early Polychrome, there seems to be little correlation with the Rivas sequence which is geographically the closest area studied. Further comparisons with material from Southern Honduras will be interesting and perhaps show stronger ties between that area and San Cristobal than to the south. San Cristobal Red on Buff and the Combo Colander would both indicate northern affinity.

Baudez (personal communication) describes San Cristobal Red on Buff as a common type around the Gulf of Fonseca and Stone (1957) describes Tegucigalpa Polychrome as red on buff but does not give a complete description. A San Cristobal Red on Buff bowl fragment, large enough to determine its total decorative pattern and form, was recovered from a damaged mound at San Cristobal.

Complete type descriptions from San Cristobal must wait the total analysis of material from all 13 units excavated and comparison with entire vessels. When this is done, many of the types and varieties may be modified.

Firing techniques used at San Cristobal produced enormous quantities of smudged, over-fired, greyed, and fire clouded sherds which require a more technical analysis to determine whether or not they are the same type treated in different manners. Volume would suggest that much of the darkening was intentional. This does not seem to be a characteristic of the ceramics of Costa Rica although it was present in the Rivas area, particularly in the Culebra variety of Papagayo. It is also possible that Managua Red on Black is a lighter colored slip that has been intentionally blackened in firing.

Ceramic analysis of Unit C presents more questions than it answers; particularly about northern connections with Honduras and El Salvador through Usulután, San Cristobal Red on Buff and the Combo Colanders.

### SAN CRISTOBAL AS A CULTURAL ENTITY

Excavations at San Cristobal were designed to test various aspects of a model patterned after Oviedo's (1976) descriptions of Chorotega villages along the shore of Lake Managua.

Mounds described in historical accounts are in association with ceremonies, temples, and human sacrifice. The low, circular mounds scattered over the San Cristobal site have no remaining architectural structures, but the large quantities of ceramic sherds, faunal material and lithic debitage encountered in every level of the excavated areas would indicate that they were used for long periods as living areas. The average size of the mounds, about 40 m in diameter with a gentle slope providing about 1 to 1.5 m elevation, would provide a dry, flat area for construction of one or various thatched roof pole houses. The loose, unconsolidated soil of the area does not preserve traces of post holes or floors, and no construction materials have ever been recovered, but the type of construction described is typical of the area. It has not changed much in rural Nicaragua from conquest to the present. The slight elevation of the mounds would provide a dry living area when water levels rise during the rainy season. These approximately 40 house-mounds are located around four taller, seemingly ceremonial mounds. These would fit the Oviedo model.

Mound I was chosen for excavation because it appeared to be typical of the low mounds of the area. It was occupied for a period of 1500 years based upon dating from the types of ceramics found there. Its occupants appear to be of no special social rank .

All burials were in ordinary utilitarian vessels with simple, red monochrome covers. Each burial utilized a different type vessel which may indicate that any large vessel available was used. No burial offerings were associated with the vessels. This contrasts to other areas of the site that have been severely damaged by collectors. The Heller collection contains elaborately decorated cover vessels taken from an area considered by the farm hands to be the cemetery of pre-conquest San Cristobal. Skeletal remains in Mound I indicate primary burials with no signs of cremation, another practice noted by Oviedo. He commented that the chiefs and leaders of the tribes were cremated along with all of their possessions and their ashes were deposited in urns at the entrance to the house. This difference in burial customs could indicate a difference in rank of the inhabitants of Mound I or a different cultural group than that described by Oviedo. At the southern boundary of the farm, many vessels of the Early Polychrome period are found in perfect condition. There is no record of provenience, but they are not present in Mound I except in tiny sherd fragments in very small quantities. This may indicate social divisions in occupational areas of the site. No jade or gold has been reported in association with any burial at San Cristobal. The only cultural materials that can readily be identified as being made for ornamentation were small, tubular clay beads about the size of wheat straw. No drilled stone ornaments were found although there are some drilled, circular clay disks and carved bone fragments.

Tall ceremonial mounds used for human sacrifice are reported by all of the early chroniclers of Nicaragua. San Cristobal housemounds

are centered around four taller mounds, the tallest being about 18 to 20 meters. They would fit the criteria for ceremonial and sacrificial mounds cited in the literature. All of the taller mounds are partially destroyed, but field hands who helped open them have no stories of anything spectacular coming from them. One mound in the ceremonial area has been cut by a bulldozer to make way for a road, and in the exposed area no sherds or building material appears. Excavations in the level area between the ceremonial mounds produced very little cultural material, an indication that the area was not used for living sites.

The agricultural activities recorded by Oviedo as well as the market scenes he described would indicate a settled, farming population. One indication of weaving at San Cristobal is the recovery of a spindle whorl, although there is no provenience for it. Many notched rim sherds from utility vessels may have been used in weaving fishing nets for use in the nearby lake. At the time of Oviedo's visit, the inhabitants were dressed in brightly colored cotton clothing. I would anticipate further ceramic material associated with weaving as the analysis is expanded. Many polychrome sherds are smoothed and notched from wear, but not in the same way as the red rim sherds. A better knowledge of early weaving techniques is necessary to speculate on the cause of the smoothing and notching of these sherds. Mano and metate fragments are present throughout the site and would indicate a heavy use of corn in the diet. The Mexican tortilla is still a mainstay of the Nicaraguan diet.

Fish vertebra make up about 90 percent of the faunal material

recovered at San Cristobal and ties the village closely to the lake as a protein source. The Combo Collander vessel, present in large numbers at San Cristobal, would seem a perfectly designed vessel for straining the tiny vertebra from a fish broth. It is normally associated with sites along the coast or lakes and is present in much greater numbers at San Cristobal than in the excavations in Rivas.

The future analysis of the faunal material of San Cristobal should provide much information about the amount of protein provided by each in the San Cristobal diet. Elizabeth Wing (1978) has calculated the amount of usable protein of various species from faunal collections in the Vera Cruz area, and surprisingly fish did not make up the greatest portion of the diet. Her statistical formulas for calculating the protein available from certain species should be applicable to San Cristobal since many species are the same. Many of the bones of the faunal collection have not been identified yet.

Lithic analysis will also provide an insight into farming hunting activities. The unstudied lithic material seems to consist of unpolished axes and adzes used for farming or felling trees.

The ceramic analysis confirms a Chorotega occupational period defined by the Papagayo Polychrome sherds which were abundant immediately after the Zoned Bichrome period. There is a definite break in the types of ceramics manufactured at San Cristobal. The Zoned Bichrome material is crudely made with heavy volcanic sand temper making up 50 to 75 percent of the paste. Immediately above it, the well made, finely tempered Papagayo Polychrome vessels begin. There



is little indication of the Early Polychrome period and no sign of a slow transition from one period to another. It is as if a new group of occupants arrived with different techniques.

Vallejo Polychrome, a Late Polychrome period marker, represents another change at San Cristobal. The paste of the vessel is no longer the fine, compact paste of Papagayo Polychromes and mica is used in large quantities in the temper. This is a definite break with the previous period. Surface designs show the Mexican motifs of the plumed serpent and much stylistic affinity with the north. Although this was a Chorotega language area at conquest, and the Chorotega and Nicarao did not mix and were not even able to communicate according to Oviedo, they had a strong influence on this Chorotega village's ceramics.

We are still unable to define exactly which ceramic types belong to which groups that occupied San Cristobal. Papagayo Polychromes, supposedly representative of the Chorotega of Nicaragua and the Nicoya Peninsula of Costa Rica, are also prevalent in the Nicarao area of Rivas. It is possible that a Chorotega occupational period preceded the arrival of the Nicarao in the area, and that Vallejo is the first pottery introduced by the Nicarao after their migration around 1200 A.D. The other question posed by the ceramics of San Cristobal is that of the origin of the occupants during the Zoned Bichrome period. An analysis of the lithic assemblage of San Cristobal may give some clues to ties with other areas across Lake Managua and Lake Nicaragua. One stone basalt bowl fragment is very similar to those described by Magnus from the Atlantic coast of Nicaragua and may indicate ties or

migration patterns of early Pacific coast occupants.

Much remains to be studied about San Cristobal before the village as a cultural entity will emerge, but the material available in the collections should provide a solid data base for this endeavor.

## REFERENCES CITED

- Arellano, Jorge Eduardo, editor  
 1976 Nicaragua en los Cronistas de las Indias Serie Cronistas 2.  
 Banco de America, Managua, Nicaragua.
- Balser, Carlos  
 1968 "El Jade Precolombino de Costa Rica". Museo Nacional de  
 Costa Rica, San Jose.
- Baudez, Claude  
 1961 The Zoned Bichrome Period in Northwest Costa Rica. American  
 Antiquity 26:505-515.
- 1967 Reserches archeologiques dans la vallee du Tempisque,  
 Guanacaste, Costa Rica. Travaux et Memoires del Institut  
 des Hautes Etudes de l'Amérique Latine 18, Paris
- 1970 Central America. Translated by S. Hogarth. Archaeologia  
 Mundi, Geneva.
- 1976 "Llanura Costera del Golfo de Fonseca, Honduras". Vinculos  
 2(1):15-23.
- Baudez, Claude and Michael Coe  
 1962 Archaeological Sequences in Northwestern Costa Rica.  
Proceedings of the 34th International Congress of  
 Americanist 1:336-373.
- Borhegyi, S.F.  
 1959 Precolumbian Cultural Connections Between Mesoamerica and  
 Ecuador. Middle American Research Records 2(6):143-151.  
 Tulane University, New Orleans.
- 1960 Precolumbian Cultural Connections Between Mesoamerica and  
 Ecuador: Addenda. Middle American Research Records  
 2(7):159-160. Tulane University, New Orleans.
- Bovallius, Carl  
 1886 Nicaraguan Antiquities. P.A. Norstedt and Sonner.  
 Stockholm.
- Bransford, J.F.  
 1881 Investigaciones Arqueologicas en Nicaragua. Institucion  
 Smithsonian. Washington.
- Bryan, Alan L.  
 1973 New Light on Ancient Nicaraguan Footprints.  
Archaeology:146-147.

- Chapman, Ana  
 1960 "Los Nicaraos y Chorotega segun las fuentes historicas".  
Serie Historia y Geografia No. 4, Universidad de Costa Rica,  
 San Jose, Costa Rica.
- Coe, Michael  
 1962 Preliminary Report on Archaeological Investigations in  
 Coastal Guancaste, Costa Rica. Proceedings of the 34th  
 International Congress of Americanists 1:358-365.
- The Denver Conference on Greater Nicoya Ceramics  
 1982 The Denver Conference on Greater Nicoya Ceramics, Denver,  
 Colorado.  
 1983 The Denver Conference on Greater Nicoya Ceramics, Denver,  
 Colorado.
- Espinosa, Jorge  
 1976 Excavations Arqueologicas en El Bosque. Departamento de  
 Anthropologia e Historia, Instituto Geographico Nacional,  
 Managua, Nicaragua.
- Flint, Earl  
 1882 Antiquities of Nicaragua: Origin of the Palenque Builders.  
American Antiquarian and Oriental Journal 4:209-302.
- Gamboa, Hector P.  
 1974 Vocabulario Arquelogico Costarricense. Museo Nacional, San  
 Jose, Costa Rica.
- Gifford, James C.  
 1960 The Type Variety Method of Ceramic Classification as an  
 Indicator of Cultural Phenomena. American Antiquity  
 25:341-347.
- Gillespie, Vivian Hayes  
 1977 San Cristobal Archaeological Site NMN2-4. Ms. on file,  
 Department of Anthropology, Syracuse University, Syracuse.
- Glass, John B.  
 1966 Archaeological Survey of Western Honduras. In Handbook of  
 Middle American Indians edited by R. Wauchope, B.F. Ekholm  
 and G.R. Willey. 4:157-179. University of Texas Press,  
 Austin.
- Haberland, Wolfgang  
 1960 Ceramic Sequences in El Salvador. American Antiquity  
 26:21-29.  
 1963a Ceramic de Omotepe. Nicaragua Indigena 5(36):25-83.

Haberland, Wolfgang

1963b Omotepe 1962-1963. Archaeology 16(4)-287-289.

1964 Marihua Red-on-Buff and the Pipil Question. Ethnos 1-2:73-86.

1966 Early Phases on Omotepe Island Nicaragua. Proceedings of the 36th International Congress of Americanists 1:399-403.

1967 Early Phases and Their Relationship in Southern Central America. Thirty-eighth International Congress of Americanists 1:229-242, Stuttgart-Munich.

Healy, Paul

1976a Archaeology of Southwest Nicaragua. Ph.D. dissertation, Harvard University, Cambridge.

1976b La Ceramica de la Region Rivas. Vinculos 2(1):24-36. Museo Nacional de Costa Rica, San Jose.

1980 Archaeology of the Rivas Region Nicaragua. Wilfred Laurier University Press, Ontario.

Hester, Thomas, Robert Heizer and John A. Grahm

1975 Field Methods in Archeology. Mayfield Publishing Co., Palo Alto.

Incer, Jaime

1975 Geografia Ilustrada de Nicaragua. Italgraf S.A., Bogota, Colombia.

1976 Geography of Lake Nicaragua. Investigations of the Ichthyofauna of Nicaraguan Lakes, edited by Thomas Thorson, pp. 3-7. School of Life Sciences, University of Nebraska, Lincoln.

Kirchoff, P.

1943 "Mesoamerica: Sus limites geograficas, composicion etnica y caracteres culturales". Acta Americana 1:92-109.

Lange, Frederick W. and Kristin K. Scheidenhelm

1972 The Salvage Archaeology of a Zoned Bichrome Cemetery, Costa Rica. American Antiquity 1972:240-245.

Linares, Olga

1964 Ceramic Phases for Chiriqui, Panama and Their Relationship to Neighboring Sequences. American Antiquity 33(2):126-225.

1968 Cultural Chronology of the Gulf of Chiriqui, Panama. Contributions to Anthropology 8, Smithsonian Institute, Washington, D.C.

Lothrop, Samuel K.

- 1921 Nicaraguan Stone Statues. American Anthropologist 23:311-319.
- 1926 The Pottery of Costa Rica and Nicaragua, 2 volumes. Museum of the American Indian, Heye Foundation, Contributions #8. New York
- 1939 The Southeastern Frontier of the Maya. American Anthropologist 41:42-54.
- 1948 The Archaeology of Panama. In Handbook of South American Indians, edited by J.H. Stewart. 4:143-168. Smithsonian Institute, Washington, D.C.
- 1966 The Archaeology of Lower Central America. Handbook of Middle American Indians edited by Wauchope, Ekholm and Willey. 4:180-188. University of Texas Press, Austin.

Magnus, Richard

- 1974 Prehistoric Cultural Relationships of the Miskito Coast. International Congress of Americanists. 41(1):568-578.

Matillo Vila, Joaquin  
(Hildeberto Maria)

- 1965 Estas Piedras Hablan. Centro de Investigaciones Rupestres. Managua, Nicaragua.
- 1973 Omotepe, Isla de Circulos y Espirales. Estas Piedras Hablan, III. Centro de Investigaciones Rupestres, Managua, Nicaragua.
- 1975 Las Huellas de Acahualinca en el Panorama Arqueologica de Nicaragua. Museo Nacional. Serie Arqueologica No. 1, Managua, Nicaragua.

Meggars, Betty J.

- 1975 The Transpacific Origin of Mesoamerica Civilization: A Preliminary Review of the Evidence and Its Theoretical Implications. American Anthropologist 77:1-27.

Museo Nacional de Costa Rica

El Oro Aborigen de Costa Rica. San Jose, Costa Rica.

Norweb, Albert H.

- 1962 Ceramic Stratigraphy in Southwestern Nicaragua. Proceedings of the 35th International Congress of Americanists 1:551-561.

- Olsen, Stanley J.  
 1968 Fish, Amphibian and Reptile Remains from Archaeological Sites part 1. Peabody Museum, Cambridge.
- 1973 Mammal Remains from Archaeological Sites part 1. Peabody Museum, Cambridge.
- Oviedo y Valdez, Gonzalo Fernando  
 1976 Nicaragua en los Cronistas de las Indias, reprinted. Edited by Dr. Eduardo Perez-Valle, Serie Cronista No. 3. Banco de America, Managua, Nicaragua. Originally published 1535 as Historia General y natural de las Indias, islas y Tierra Firme del mar oceano. Sevilla, Spain. 50 vol.
- Phillips, Philip  
 1970 Archaeological Survey in the Lower Yazoo Basin, Mississippi. Papers of the Peabody Museum of Archaeology and Ethnology, Harvard University. Vol. 60.
- Roemer, Erwin  
 1980 Examination of a Small Collection of Mesoamerican Human skeletal Material from a Site Near Managua, Nicaragua. Ms. on file, Department of Anthropology, Texas A&M University, College Station.
- Schmidt, P.J.  
 1966 El Respiradero, Antiguo lugar de ofianda en el Cerro Concepcion, Isla de Omotepe, Nicaragua. Proceedings of the 36th International Congress of Americanists 1:429-433.
- Shepard, Anna O.  
 1976 Ceramics for the Archaeologist. Carnegie Institution of Washington, Washington, D.C.
- Sheets, Payson D.  
 1973 The Pillage of Prehistory. American Antiquity 38:317-320.
- 1976 Llopando Volcano and the Mayan Protoclassic. University Museum Studies #9. Southern Illinois University, Carbondale.
- Smith, Robert, Gordon Willey and James Gifford  
 1960 The Type-Variety Concept as a Basis for the Analysis of Maya Pottery. American Antiquity 25:330-340.
- Squire, E.G.  
 1852 Nicaragua: Its People, Scenery, Monuments and the Proposed Interoceanic Canal. 2 Volumes. Appleton Co., New York.

## Stone, Doris

- 1948 The Basic Cultures of Central America. In Handbook of South American Indians edited by Julian S. Steward. 14:169-193. Smithsonian Institute, Washington, D.C.
- 1950 Notes on Present Day Pottery Making and Its Economy in the Ancient Chorotegan Area. In Middle American Research Records edited by Robert Wauchope. 1(16):269-280. Tulane University, New Orleans.
- 1957 The Archaeology of Central and Southern Honduras. Peabody Museum of Archaeology and Ethnology Papers 49(3), Harvard University, Cambridge.
- 1966a Introducion a la Arqueologia de Costa Rica. Museo Nacional de Costa Rica, San Jose.
- 1966b Synthesis of Lower Central American Ethnohistory. Handbook of Middle American Indians edited by Wauchope, Ekholm and Willey. 4:209-233. University of Texas Press, Austin.
- 1968 An Interpretation of Ulva Polychrome Ware. Proceedings of the 39th International Congress of Americanists 2:67-76.
- 1972 Pre-Columbian Man Finds Central America. Peabody Museum Press, Cambridge.

## Sweeney, J.W.

- 1975 Guanacaste, Costa Rica: An Analysis of Precolumbian Ceramics from the Northwest Coast. Ph.D. dissertation, Department of Anthropology, University of Pennsylvania, Philadelphia.
- 1976 Ceramic Analysis from 3 Sites in Northwest Coastal Guanacaste. Vinculos 2(1):

## Torquemada, Juan de

- 1975 Viente i un libros rituales y Monarchia Indiana, edited by Lic. Jorge Eduardo Arellano, pp. 91-126. Reprinted Serie Cronistas No. 2, Banco de America, Managua, Nicaragua. Originally published in 1615, Madrid, Spain.

## Usrey, Steve

- 1979 Preliminary Analysis of Faunal Material from Site NMN2-1 in Nicaragua. Ms. on file, Department of Anthropology, Texas A&M University, College Station.



- Villa, Jaime  
1976 Ichthyology of the Lakes of Nicaragua: Historical Perspective. In Investigations of the Ichthyofauna of Nicaraguan Lakes, edited by Thomas Thorson. pp. 101-113. School of Life Sciences, University of Nebraska, Lincoln.
- Willey, Gordon R.  
Excavations at Siebal. Memoirs of the Peabody Museum of Archaeology and Ethnology 13(1)(2).
- Wing, Elizabeth.  
1978 Use of Dogs for Food: An Adaptation to the Coastal Environment. In Studies in Archaeology edited by Barbara L. Stark and Barbara Voorhies, pp. 29-41, Academic Press, New York.
- Woodward-Clyde Consultants  
1976 Seismic Hazard Study for the Zona Franca. Woodward-Clyde Consultants, Managua, Nicaragua.
- Wyckoff, Lydia L.  
1971 A Suggested Nicaraguan Pottery Sequence Based on the Museum Collection. Museum of the American Indian, Heye Foundation, New York.
- 1978 Western Nicaragua: A Study of Environmental Utilization and Change. Paper presented at the 43rd Annual Meeting of the Society for American Archeology, Tucson.

## Appendix 1: Identified Faunal Remains from San Cristobal

## Mammals

White tail deer	<u>Odocoileus virginianus</u>
Coati mundi	<u>Procyrinidae nasua narica</u>
Bobcat	<u>Lynx rufus</u>
Agouti	<u>Dasyprocta punctata richmondi</u>
Dog	<u>Canis familiaris</u>

## Reptiles

Snakes	viparid
Unidentified	
Spiny Iguana	<u>Ctenosaura similis similis</u>
Turtle	unidentified
Caiman	

## Amphibians

Frog	<u>Rana sp.</u>
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## Birds

Unidentified

## Fish

Gar	<u>Lepisosteus tropicus</u>
Catfish	unknown

For a complete discussion see Usrey(1980).

## Appendix 2: Ancient Human Skeletal Material from San Cristobal

Four burials at San Cristobal were of three very young children and one adult female. All were placed in ceramic vessels before burial. The general condition of all examined bone was good; it was cleaned and treated with polyvinyl acetate coating before the analysis.

Based on inspection of teeth, Burial I was a young child between one and two years of age. The incisors were erupted, the canines were not.

Burial 2 was also a child or infant under one year of age. The mandibular incisors were only slightly erupted.

Burial 3 was an adult female aged in the twenties or older. Sexing was based on examination of the innominates and sacrum. Using tibia measurements, a living stature of 147 cm may be estimated. The individual exhibits cranial deformation with the frontal region obliquely flattened.

Burial 5 was a young child ages in the range of three to five years. A full set of mandibular deciduous teeth exist.

This examination was done by Erwin Roemer(1980).

## VITA

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