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CULTURE HISTORY OF THE SAPOA RIVER VALLEY, COSTA RICA

A thesis submitted to the Graduate School of
the University of Wisconsin in partial fulfillment
of the requirements for the degree of Doctor of
Philosophy.

by

FREDERICK WILLIAM LANGE

Degree to be awarded

January 19—

June 1921

August 19—

To Professors: Donald E. Thompson
David A. Baerreis
William M. Denevan

This thesis having been approved in respect
to form and mechanical execution is referred to
you for judgment upon its substantial merit.

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Approved as satisfying in substance the
doctoral thesis requirement of the University of
Wisconsin.

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Date of Examination, 30 April 19 71

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A thesis submitted in partial fulfillment of the
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at the

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1971

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INTRODUCTION

As one looks at the Western Hemisphere, it appears that the southern continent is suspended from the northern, hanging by a thin cord, unsevered, except artificially by man. It has not always been this way. During the Pre-Pleistocene epochs, what is now Lower Central America was cut by a series of natural channels, and much of the present land mass was covered by the oceans. The current shape of the isthmus was established by the beginning of the Pleistocene and became an important testing ground of adaptation and survival as fauna and biota moving northward from South America came into contact with those moving southward from Mesoamerica.

This isthmus has also been a focus for historic interest in the New World; it was here that a European first gazed upon the Pacific Ocean, opening a new expanse for exploration and establishing a trans-shipment point essential to the development of the west coast of South America. In more recent times, man's engineering skills allowed him to slice through the area and connect the two oceans. But perhaps the greatest historical importance of this area lies in pre-Columbian times.

The isthmus provided the sole means of initial expansion from north to south once man had entered the New World, and allowed the spread of human cultural development into the 6, 860,000 square miles of the South American continent. The Republic of Costa Rica, located between Nicaragua on the north and Panama on the south, is one link in this isthmian chain.

My personal introduction to Costa Rica and its archaeology

occurred in April-May 1966 when I visited there as a tourist and had the opportunity to visit the National Museum and to examine archaeological excavations being conducted in the northwestern part of the country. It was shortly after returning to the United States from this trip that I saw a then recently published article in Science (Müller-Beck 1966). I was impressed by the boldness of the heavy black line descending from Mesoamerica, through Central America, and into South America, indicating the "invasion" by early peoples, when, from my recent (and admittedly superficial) experience it seemed that a broken line, in terms of representing the actual evidence, might have been more appropriate.

Carl Sauer (1959: 116) had previously noted:

The mainland "Istmo" is an unobstructed passageway, the only way between North and South available to men until they learned the use of boats. Mexico is the cone of the funnel, Central America is the narrowing tube through which poured all but the later migrants that peopled South America. Perhaps nowhere in the world has there been as narrow, long, and significant a land passageway.

Despite these logical assertions, there had been very little specific data to support them. Armillas (1961) stated:

The gradient of known carbon-14 dates and other considerations support the generally held view of an early drift migration from north to south through the Central American funnel and along the Andes, fanning out into the Argentinian grasslands and Brazilian parklands, although well substantiated findings of corresponding antiquity have not been made in the intervening area so far, no doubt through want of systematic research.

During the latter part of 1966 and early in 1967, I began to

develop a research proposal to return to Costa Rica and to attempt to make some contribution to the knowledge of the culture history of the northwestern part of the Republic. Very little previous work had been done in that area and selecting a research site was largely an arm-chair process. The Sapoa River Valley was finally selected because it presented a narrow "corridor" between Lake Nicaragua and the Pacific Ocean. It was hoped that we could find evidence of many different cultures and temporal periods in this narrow zone. To some extent this method of selection did not work, since the corridor zone turned out, in the field, to be so narrow as to preclude intensive habitation in its path. (Fig. 2).

Research in the Sapoa River Valley area during the 1969 and 1970 field seasons sought to obtain data to fulfill two basic objectives:

1) to survey and map manifestations of pre-Columbian occupations in the Sapoa River Valley and adjacent portions of the Bay of Salinas; and

2) to surface collect and conduct test excavations at sites in a variety of ecological and geographical locations.

The cultural data obtained from these operations was applied to testing three central hypotheses related to what was superficially known about the region. These were

1) The area was a path of possible north-south (and vice versa) migration through Central America.

2) The reliability of the line traditionally drawn through the area (as in Willey 1966: 86) to separate the Mesoamerican-

oriented maize-beans cultivators to the north and the root crop cultivators to the south; and

3) The post-projected common boundaries between the Corobici, Nicarao (Nahuat), and Chorotega-Mangue linguistic groups that were present in the area at the time of the Spanish contact (1522-28) (Fig. 1) all fell within the research area.

In its early stages, this proposal was reviewed and strengthened by Professors Andrew H. Whiteford and William S. Godfrey, Jr. of Beloit College, who had been my undergraduate advisors at that institution. It was at their urging and through their cooperation that the proposal was advanced to the office of the Associated Colleges of the Midwest in Chicago, which maintained a permanent station for undergraduate research in Costa Rica and of which Beloit was a member school.

Once the proposal had been accepted by the Associated Colleges and sponsorship assured, announcements were sent to the then 10 member institutions and a group of 6 undergraduate students were selected to accompany this writer into the field from January to June, 1969.

A second season was undertaken in the same area from January to June, 1970 and the writer was this time accompanied by a fellow graduate student from the University of Wisconsin, Miss Jennifer Taschek, and 9 undergraduates from the Associated Colleges of the Midwest.

From my first introduction to Costa Rica in 1966 through the completion of two seasons of field work in 1969-70, a large number

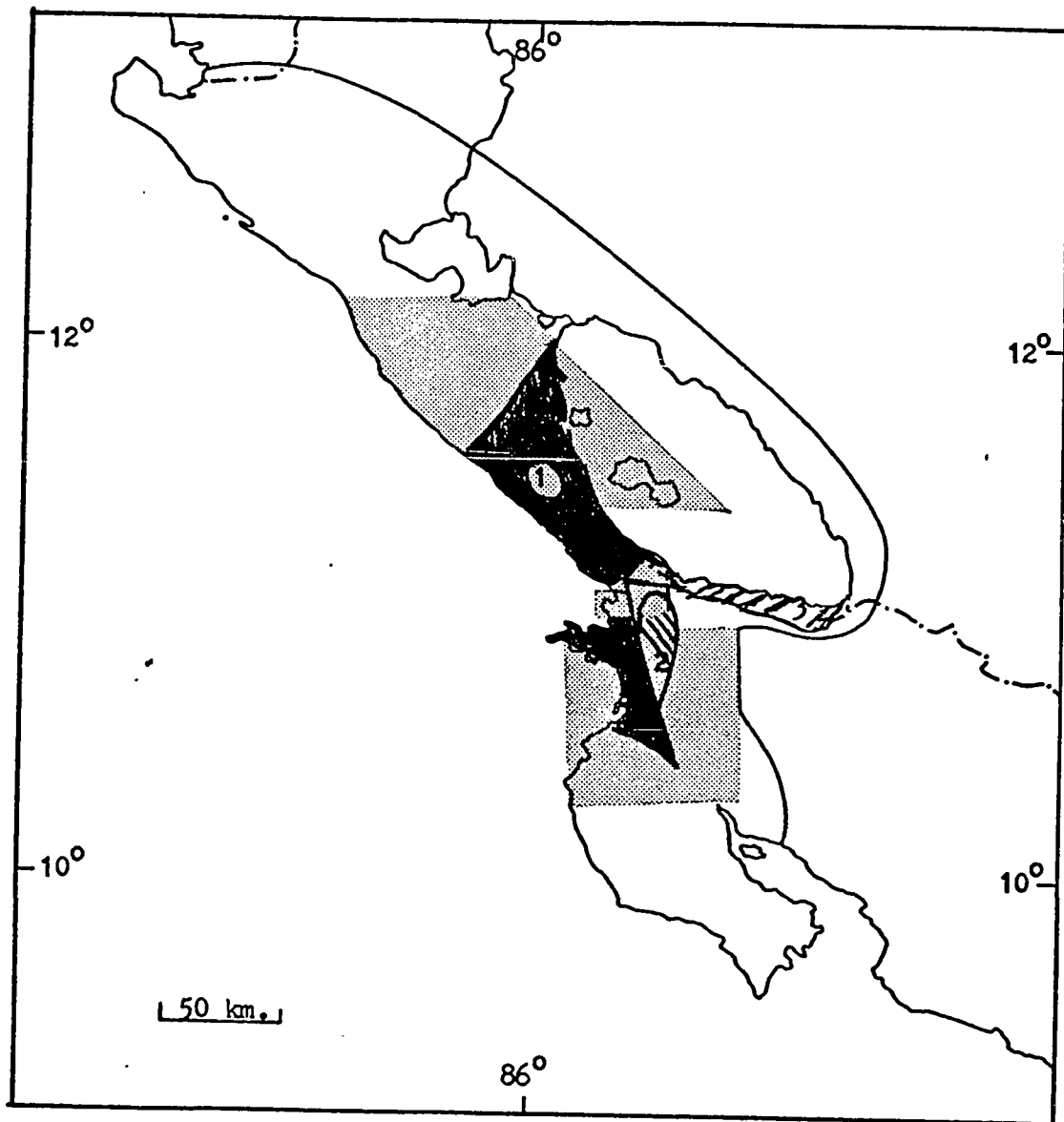


Fig. 1 Distribution of Linguistic Groups in the Sapoá River Area, Greater Nicoya Subarea, at the time of Spanish Conquest (after Stone 1966): 1) Nahuat (Nicarao), 2) Chorotega-Mangue and 3) Corobicí.

of people have encouraged and assisted my interest there. Unstinting help from many different quarters has made this not only a profitable field experience from a professional point of view, but has made it an extremely pleasant and humanistic one.

The Costa Rican people proved their international reputation for friendliness and hospitality. Most were faces without names, encountered along city streets and country trails, but who nonetheless made us feel completely at home and at ease in their country. Don Jaime Solera B., President of the Board of Directors of the National Museum, was instrumental in supplying the permit for the second season of work; Don Carlos Aguilar P., Archeologist at the University of Costa Rica, has been a steady friend throughout our work and provided moral support as well as a stimulating exchange of data on his research at Guayabo near Turrialba; Don Carlos Balser's courteous hospitality and fine cuisine at the Pension Canada have provided many a needed interlude from the grime and rigor of the field, and his knowledge of Costa Rican archaeology has been extremely helpful; Doña Rosa Vda. de Alan and her family of La Cruz have proven themselves perhaps the most tolerant people I have met anywhere---her large house has been general store, mail drop, and home to two different field parties and I am especially indebted to her for favors too numerous to mention; Don Luis Morice M., also of La Cruz, kindly allowed us to survey his extensive property around the Bay of Salinas and to conduct testing at one location during the 1969 season--the hospitality extended to me and a number of the students was also deeply appreciated; and Don Jose

Morales P. and his family of the ITCO Colony of San Dimas were helpful in many ways in our work on their property and in that general area.

Dr. J. Robert Hunter, Program Director of the Associated Colleges of the Midwest Central American Field Program in San Jose has given freely of his knowledge of Costa Rica, cut innumerable miles of red-tape on behalf of this project, and handled frustrating mopping up of details as we hurriedly entered and left the field each season. The hospitality of his family on numerous occasions was sincerely appreciated. Dr. Blair Stewart and Dr. Robert Voertman, also of the Associated Colleges, were instrumental in getting the first season of the project into operation and continued to have an interest in its activities. Dr. Mary Alice Ericson of Coe College has been a friend, advisor, and enthusiastic supporter of the project and I am grateful for the many different things she has done for me.

The Organization for Tropical Studies, Inc. and their San Jose representative, Mr. Jorge Campabadal, also lent important support to the project through the awarding of grants F69-36 and 68-22 for travel expenses and per diem, and through assistance in local arrangements and contacts. When we exceeded our air freight budget during the second season, they provided unsolicited additional funds and this willingness to assist the project is characteristic of the contribution they have made.

Dr. Claude F. Baudez of the Musee de L'Homme in Paris shared the benefit of his experience in Costa Rica with us during 3

visits in Honduras during 1969. Dr. Wolfgang Haberland of the Museum fur Voelkerkunde in Hamburg has been a stimulating correspondent and very graciously provided me with reprints of his Costa Rica and Nicaraguan research. He also paid me a very delightful and informative visit here in Madison during the fall of 1970.

Professor Gordon R. Willey, Peabody Museum at Harvard University, Dr. Gordon F. Ekholm, American Museum of Natural History of New York; and Dr. Frederick J. Dockstader of the Heye Foundation Museum of the American Indian, New York were all very cooperative in making collections of Costa Rican material housed at their respective institutions available for study. In addition, Professor Willey permitted me to examine and to copy portions of field notes compiled by A. H. Norweb in his work in southern Nicaragua. Dr. Michael D. Coe and Dr. Doris Stone provided encouragement when the first season's work was in the developmental stages. Mrs. Jeanne Sweeney, University of Pennsylvania, is currently working on materials excavated by Coe from a location immediately to the south of our research area. She visited us in the field during the 1970 season and also has been very generous in sharing her data with me.

Professor William M. Denevan first stimulated my interest in the broader problems of tropical subsistence for modern and pre-Columbian peoples and Professor David A. Baerreis read and commented helpfully on various proposals and applications relating to this research; both of these men also served as reading members of my

Dissertation Committee. Fellow graduate students who have shared many of the same interests as I have contributed to the research in numerous ways---to Jose Ball, Roland Bergman, and Barney Nietschmann I would like to express my thanks for many hours of lively discussion and debate.

The participation of students of the Associated Colleges of the Midwest in the field research has been important, not only in increasing the yield from each season's work, but also in providing many constructive suggestions and ideas. Many of their in depth independent research projects have provided data utilized here and, where not explicitly cited, their contribution is by no means forgotten (see Appendix 1 for listing of student research papers. Mark Kristensen, Nancy Little (now Mrs. Mark Kristensen), Thomas Georgeson, Linda McKenzie (now Mrs. Thomas Georgeson), Thomas Murray, and Margie Farmer participated in the 1969 season and James Faulwell, Carolyn Kurtz, David Karp, Kristy Scheidenhelm, Anne Yancey, Adele Karolik, Cathy Lair, and Charles Rydberg in the 1970 season.

Tom Murray returned at his own expense for the month of May, 1970 and was very helpful in supervising the San Dimas area phase of that season's work. Miss Jennifer Taschek, Department of Anthropology, University of Wisconsin, participated in the 1970 project under a National Science Foundation fellowship; information on marine exploitation on the Bay of Salinas contained in this report was largely gathered by her and is to be analyzed and reported in detail in her M. A. Thesis now in preparation.

A number of grants provided by the Ford Foundation have

made a very substantial contribution to my completion of this work. A grant by them during the summer of 1968 allowed me to take an intensive Spanish course taught by the Ibero-American Studies Program of the University of Wisconsin. Fellowships during the fall semester 1969, and academic year 1970-71 have allowed me a large amount of free time for research and writing. A dissertation preparation grant from the Ford Foundation also facilitated the preparation of many of the photographs (by Dan Slaby), illustrations (by Margie (Farmer) Planton), and maps (by Nancy Olmstead). A grant from the Graduate School of the University of Wisconsin during the fall of 1969 allowed me to visit and examine pertinent museum collections in Boston and New York City.

I owe a special debt of thanks to Professor Donald E. Thompson, my major professor, who actively encouraged and supported my interests in Central America and helped mold, shape, and prepare the applications and proposals under which this work was done.

Were it not for my wife, Holley, I would still probably be victim of the ignorant thought that Costa Rica is a small country on the northeastern shoulder of South America, for it was while she was an ACM student in 1966 that I first visited Costa Rica; in a very real sense she began the Costa Rican project. She has since washed and numbered potsherds, drawn maps, and the myriad other things that archaeologist's wives learn to do. To her the essence, if not the content, of this report is dedicated.

I would also like to make one negative citation, as it pertains to research problems encountered under the provision

of grants that indicate the directive to use a "U. S. Flag Carrier" for air transportation. In Central America this is a monopoly held by Pan American Airways, whose handling of our air freight shipment at the end of the 1970 field season resulted in the loss of one complete carton of artifacts, the loss of a majority of the contents of two others (totalling 65 excavation units), and one set of field maps.

CHAPTER I

THE RESEARCH AREA

The term "Intermediate Area" as applied to American archaeology was used by Haberland (1957) to describe the geographical region between the two areas of New World high civilization, Mexico on the north and the Central Andes on the south. Willey (1959: 184) used the term to designate "...the lands between western Honduras and northern Peru, in effect lower Central America and the North Andes." Rouse (1962: 34) followed Willey's definition closely and included "...eastern Honduras and Nicaragua, Costa Rica, and Panama; all of Colombia and Ecuador except the eastern, Amazonian sections; and the northwestern Andean corner of Venezuela." In the above uses, the term has a largely geographical meaning.

The initial need for a terminological reference for this area was brought about because it appeared to be a connector between the two centers of high civilization. As early as 1917, Herbert J. Spinden had hypothesized a connection between the early or "Archaic" cultures of Meso and South America. The concept of a "Nuclear" American common Formative base of development became a primary research interest of many persons (Porter 1954, etc.). James A. Ford (1966: 781) observed that:

In the past 20 years, Herbert Spinden's (1917) theory of the existence of an ancient common base for the Neolithic-level aboriginal cultures of North and South America has emerged from the category of speculation, and most of the archaeologists who have followed the rapid developments now accept it as a rather well documented fact.

While the decision has been made to apply the term "Intermediate Area" to the broader region under consideration, it would also be desirable to discuss other organizational models that have been employed.

Steward (1948: 1) included most of this area in what he called the "Circum-Caribbean Tribes," including more of western Honduras and less of southern Colombia than the Intermediate concept. Ecuador is completely excluded from the Circum-Caribbean frame of reference. This is probably an error, with a large Central American enclave in central Ecuador indicating that it might be well to extend the entire region at least that far south. While Steward included the Ecuadorian area with the Andean civilizations, subsequent development of knowledge about the area suggests that it is really quite distinct in its early stages of development from its southern neighbors, and has a tradition of northern contacts (Evans and Meggers 1966) prior to the Inca period. The western periphery, on the other hand, includes a significant portion of western Honduras that "...is decidedly Mesoamerican throughout the known course of its prehistory (Glass 1966: 157)," and should be eliminated from the definition.

Steward and Johnson (1948: xx) separated the Circum-Caribbean area into 3 distinct sections: Central America, Colombia-Venezuela, and the Antilles (Fig. 2). The first included the land from Honduras as far south as the Atrato and San Juan River Valleys in Colombia, the second included Venezuela west of the Orinoco River and the western two-thirds of Colombia, and

the latter grouping the Caribbean islands. The relationship of these islands to the mainland isthmus is not presently clear.

Steward clearly recognized the difficulties inherent in trying to culturally label this region susceptible to strong influences from both the north and the south. In fact, he found (1948: 1) one of its greatest unifying factors in a feature that was derived from historical event rather than from prehistoric cultural development:

The tribes described in the present volume are on the whole perhaps the least known ethnographically of any of the areas covered by the Handbook. Whether insular or on the mainland, they were readily accessible from the coast and were quickly overrun by the Spanish conquerors. The great majority of them have long been extinct culturally if not racially. Practically all that survive today were dislocated from their aboriginal habitats to new and often drastically different regions, and for 400 years they have been subject to influence not only from the Spaniards but from the descendants of Negro slaves who penetrated most of the Caribbean islands and coast.

Johnson (1948: 43) limited his discussion to the Central American portion of the area and made a usefully succinct statement on the overall research difficulties pertaining to cultural contacts:

It (Central America) has a fundamental unity in what may be a basic cultural tradition or cultural substructure. This basic culture has a distinctly South American cast, and the region marks the northern limit of culture complexes which were probably derived from South America. The region has, however, been exposed to influences from the northern, that is, Meso-American cultures. The continuing stream of cultural diffusion from both the north and south has produced a strong overlay of foreign elements which gives many local cultures a superficial similarity to those of

neighboring regions. These tend to obscure the basic cultures.

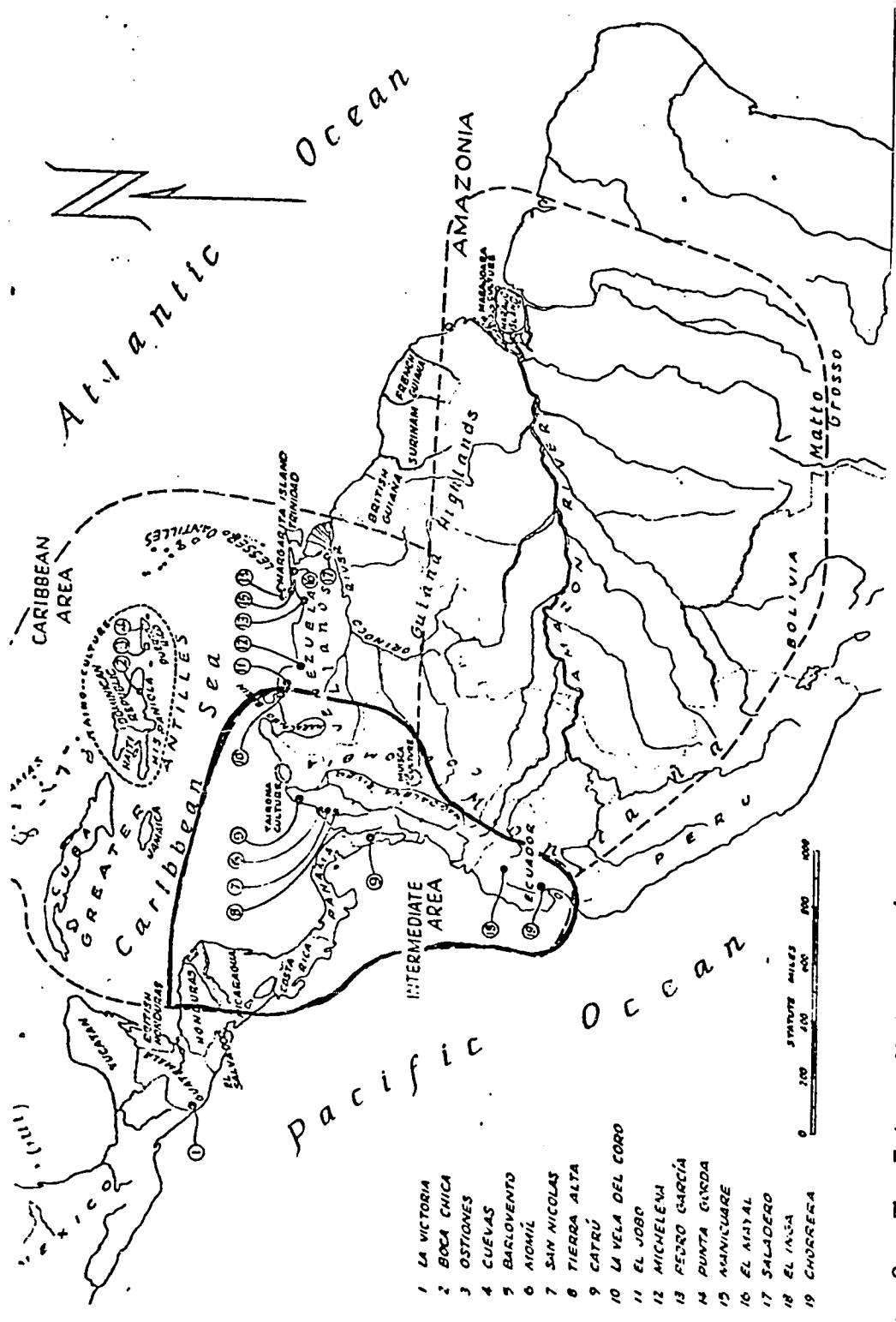
Murdock (1951: 134) described what he designated as the "Isthmian" area, it being limited to the core of the Intermediate Zone and included the countries of Costa Rica (with the exception of the Nicoya Peninsula) and Panama. Honduras, Nicaragua, Colombia, Venezuela, and Ecuador are all separated into other units and are not part of the Isthmian unit concept.

As Murdock (1951: 3) noted "The system of classification is based upon recognition of modern political divisions and aboriginal cultural differences. This has necessitated ignoring a third important basis of classification, geographical areas." By emphasizing the modern political units in contrast to natural geographical areas in his organizing scheme, Murdock obscured part if not most evidence of the pan-areal pre-Columbian cultures. While it may have been the clearest way of assembling the material he was presenting, its limited areal scope is ineffective for dealing with the prehistory.

The Intermediate Concept

The Intermediate Area has maintained its conceptual position as a "link," and the implication is that being between two highly developed areas, it had no cultural florescence of its own, but acted merely as a funnel, bridge, and backwater receptacle, between the two.

This concept can be challenged on two counts. First, growing amounts of data show internal cultural development and diffusion of indigenous traits and goods beyond the boundaries of the



- 1 LA VICTORIA
- 2 BOCA CHICA
- 3 OSTIONES
- 4 CUEVAS
- 5 BARLOVENTO
- 6 AIONIL
- 7 SAN NICOLAS
- 8 TIERRA ALTA
- 9 CATRÚ
- 10 LA VELA DEL CORDO
- 11 EL JOBO
- 12 MICHELENA
- 13 FERRO GARCÍA
- 14 PUNTA GONDA
- 15 MANICUARE
- 16 EL AYVAL
- 17 SALADERO
- 18 EL INSA
- 19 CHURRESA

Fig. 2 The Intermediate Area (from Rouse 1962: 35).

Intermediate Area. Second, many later contacts between Meso and South America may have been via water (Coe 1960:384), eliminating the function of an intermediary. Thus, both Mesoamerican and South American influences may have been introduced into the area, absorbed in local cultural development, and never passed to the other side.

A case in point is the relatively late spread of pre-Columbian metallurgy and specifically gold-working, from an apparent center in northwestern South America. The derived knowledge from this diffusion appears both in Mexico and in lower Central America in Nicaragua, Costa Rica and Panama. While the Intermediate Area may have acted as the transmitting agent for these techniques, it is also possible that the Central American development was a local adaptation from South American influences, and that Mexican gold-working techniques were acquired through direct maritime contacts. The role of a geographical "meeting ground" and a "connecting link" may be somewhat confused in a situation such as this.

While research is still in its early stages in the Intermediate Area and very little is known about regional, to say nothing of pan-areal, developments, there are growing positive indications that the traditional concept of this region as simply a "connector" will become increasingly outdated, and that "Intermediate" will refer increasingly to location rather than function.

The Greater Nicoya Archaeological Subarea

Within this broader concept of the Intermediate Area, the

specific concern of this study is with part of a sector referred to as the "Greater Nicoya archaeological subarea" by Norweb (1964:561), who stated that it "...includes most of Pacific Nicaragua and regions in northwestern Costa Rica adjacent to the Gulf of Nicoya" (Fig. 3).

Norweb's delineation seems to be somewhat more narrow than Lothrop's designation of the Pacific archaeological region, with the latter including both Lakes Nicaragua and Managua in their totality and some areas to the east of them (1926:xxv). Little work has been done east of the immediate Pacific slopes and the extent of the eastern boundary cannot be determined from present data.

Within this area, archaeological reconnaissances were made by Bransford and Flint, and excavations had been carried out by Norweb and Willey, Haberland, M.D. Coe, Baudez, and students from the Associated Colleges of the Midwest. Lothrop (1926:421-425) assembled and published a list of known sites.

Geography of the Greater Nicoya Area

This area lies to the east of the Middle American trench (West 1964:35) and has a northwest-southeast fracture zone running across the top of the Nicoya Peninsula and into the Pacific Ocean to a possible intersection with the east-west Clipperton fracture zone (West 1964:35). A volcanic axis runs through the non-Nicoya Peninsula part of the area and includes the active volcanoes Consiguina, El Viejo, Telica, Las Pilas-Cerro Negro, Momotombo, Masaya (caldera) and Mombacho, all in Nicaragua. Major inactive volcanoes include Concepcion in Nicaragua and Orosi and Rincon de la

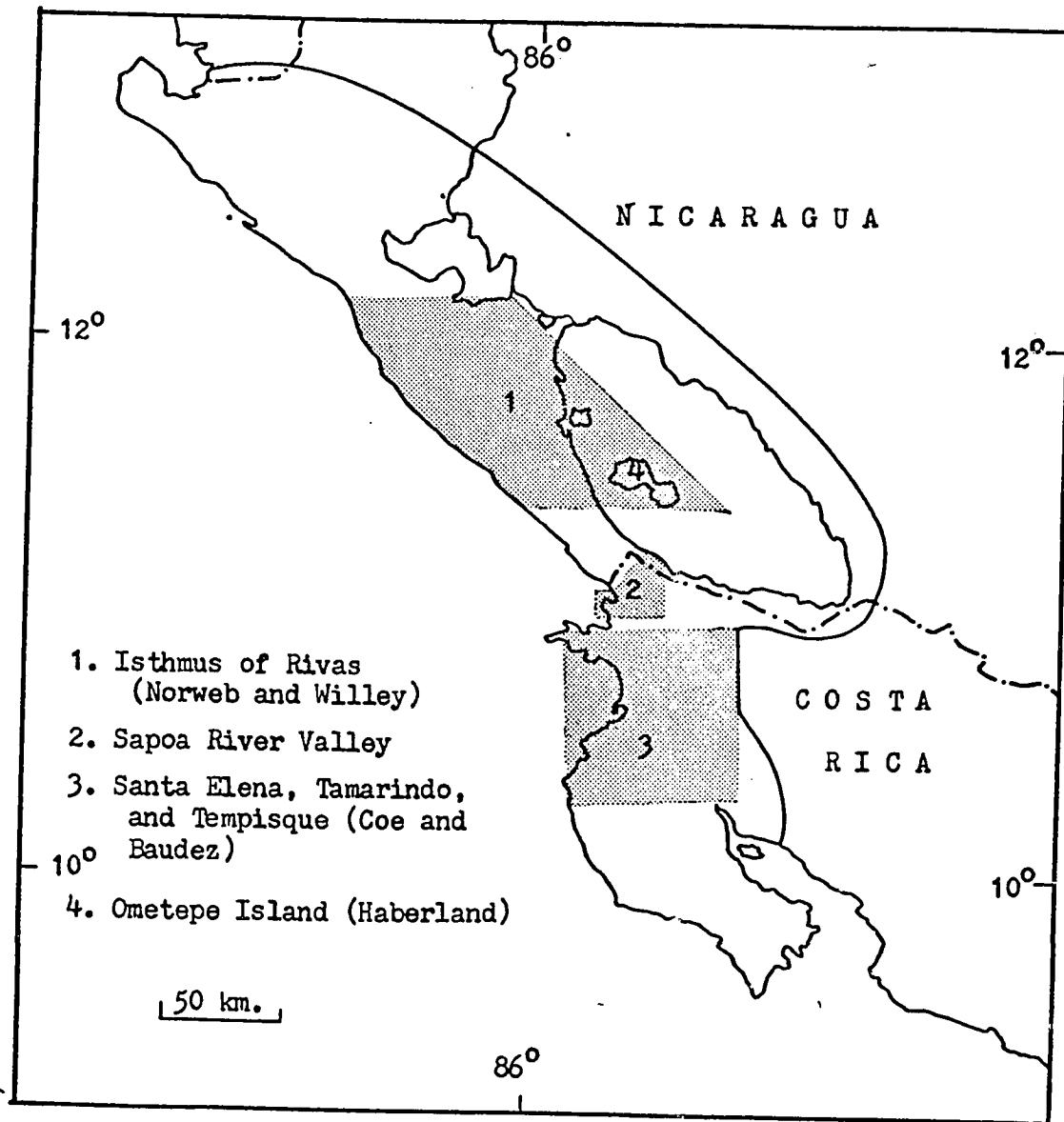


Fig. 3 Greater Nicoya Archaeological Subarea, showing major centers of research (1959-1970).

Vieja in Costa Rica

The surface geology of this area consists of Paleozoic to Cenozoic schists, gneisses, granites and similar forms. Quaternary sands, marls, marine gravel terraces, and coastal alluvium are found in the Nicoya Peninsula, with Tertiary and Quaternary volcanics appearing in the remainder of northwestern Guanacaste.

In Nicaragua, the southern Pacific coastal plain is composed mostly of Tertiary marine clastics and limestones, with small areas of Cretaceous and Jurassic limestones and Triassic shales on the west coast of Lake Nicaragua. Quaternary volcanics occupy the central portion of the plain and the north is covered by Quaternary sands, marls, marine terrace gravels and coastal alluvium.

Gabriel Dengo, a petroleum geologist, described (1962) two recent and related phenomena in the general area: the rise in the land relative to the level of the sea and the shrinkage of the surface area of Lake Nicaragua. In most other areas along the Central American Pacific Coast, the sea has risen with respect to the land in recent times. In the La Cruz region it appears that there is a somewhat special set of circumstances related to concentrated geologic activity.

The basic geologic formation, as described by Dengo (1962), present in the La Cruz region was illustrated by Murray (1969:258). The Pliocene Montezuma basaltic formation underlies the entire area and supports the overlying Bagaces formation of stratified volcanic tuff. This formation is over 125 meters thick in this area and extends over portions of the Guanacaste plain 60 kilometers south

to the town of Cañas.

Dengo placed this formation in the late Pleistocene, with the usual reservation about defining Pleistocene phenomena in non-glaciated regions. Chronological placement of these geological phenomena is somewhat difficult without more adequate data on the post-Pleistocene development of Lake Nicaragua and the rate of land-rise in the La Cruz area. Historical records dating to 1528 and surface archaeological materials dating to about 600 B.C., suggest that there has been no major volcanic depositional activity in this area since the latter date.

There are only two major river drainages in this entire area. One, the Estero Real, drains the northern Nicaraguan Depression into the Bay of Fonseca; the other, the Tempisque River, drains the Guanacaste plain and the Nicoya Peninsula headlands into the Gulf of Nicoya. Other fresh water sources consist mostly of short streams, and, in general, the Pacific watershed region is very narrow along these coasts (Tamayo 1964:107).

Wagner (1964) described the vegetation of this entire area as being of the "Seasonal Formation Series" with the exception of the lower Tempisque River Valley, which he termed as "Seasonal Swamp Formation Series." He noted (1964:245) that these Series are the result of the strong influence of man upon the landscape, both in terms of heavy pre-Columbian population and extensive grazing in post-Contact times. He gave a listing of plants common to seasonal formation in Nicoya (1964:246), and a partial listing of plants from the San Dimas, Costa Rica locality is given in

Appendix 2 .

Soils (Stevens 1964:308) consist of three major types. The most common are the young soils of recent alluvial volcanic materials subject to intermittent leaching, forming the core of the area. The Tempisque drainage of Costa Rica and the Estero Real drainage as far south as Lake Nicaragua and as far west as the northern Pacific coast of Nicaragua are composed of alluvial soils. The Nicoyan peninsula and the immediate Pacific coast as far north as the Nicaraguan border are composed of intensely weathered soils subject to intermittent leaching.

Soils of high to very high fertility cover a fair segment of the Nicaraguan part of the area, with level to undulating Andosols being found (from north to south) around Punta Consiguina and Punta Rosario; in the broad area from Chinandaga to Leon; on the south shore of Lake Managua and on the northwest shore of Lake Nicaragua; around the town of Rivas; and on Ometepe Island. Level to undulating noncalcareous brown soils are found from Puerto Somoza to San Juan del Sur along the coast in a strip decreasing in width as one travels from north to south. In the Costa Rican segment, highly fertile Andosols are found only in the Sapoa River Valley from the Nicaraguan border as far south as Sanzapote, a limited distance of 12 kilometers. Outside the area of highly fertile soils, the soils throughout the region are generally of sufficient fertility to support subsistence agriculture of varying intensity and with wide ranges of yield potential.

Certain soils are also evaluated as being highly unsuited

for agriculture. In Nicaragua these are the subtropical Brown Forest soils found on hilly and steep hilly uplands; Lithosols, Regosols, and Red-Yellow Podzolic soils on predominantly steep hills, mountains, and volcanic cones; and tidal swamps, coastal beaches, and certain alluvial soils. In Costa Rica, poor soils include Low-Humic Gley soils are found on beaches, dunes, deltas, marshes and swamps.

In Nicaragua, the unsuitable soils are concentrated around the mouth of the Estero Real on the Bay of Fonseca and in an area northeast of Leon, while in Costa Rica their extent is somewhat greater. There they cover most of the Tempisque River drainage basin, the northern end of the Cordillera de Guanacaste, and various Pacific coastal projections such as the Santa Elena Peninsula.

The present-day populations of these areas are not reliable determinants of carrying capacity estimates, since they reflect the historical development and political structure of the respective Republics. While these soil classifications are of necessity generalized, even within the worst fertility zones, fertile pockets do occur and these are populated and farmed today.

Climate

The Sapoa River area is part of a distinctive biotic zone that extends from Sinaloa, Mexico to Parrita, Costa Rica, characterized by high average temperatures, low rainfall, and a long dry season (Scott 1966: 2). Climatic information contained in the records of the Finca La Pacifica near Cañas, Guanacaste Province,

Costa Rica, were collected by the Organization for Tropical Studies, Inc. and form the basis of our knowledge about the region. Cañas is located some 65 miles south of the Sapoa River research zone.

The dry season extends from November to May, the remainder of the year comprising the rainy period. Rainfall during July and August tends to be extremely variable from year to year. In some years, there is only a general slackening, while in others there may almost be a drought from July to mid-September. Evaporation is an important factor in the measure of effective rainfall, and in the Pacific zone mornings are generally clear, even during the rainy season. The greatest percentage of rainfall is in the afternoons and during the night (Scott 1966: 2;5). Evaporation exceeds precipitation an average of 8 months out of the year.

Strong easterly trade winds blow from December to March or as late as April in the Sapoa area. These winds are considerably more noticeable on the plains and around the Bay of Salinas than in the river valley itself. Steady winds of 50 kilometers per hour blow on a round-the-clock basis during this period, with frequent gusts of up to 90 or more kilometers per hour. These winds are concentrated during the dry season and virtually disappear during the rainy period; the remainder of the year is virtually windless.

Figures 4, 5, 6, and 7 (after Scott 1966: 3-4) summarize the available data for rainfall, temperature, and sunshine in the Pacific region of Guanacaste.

A limited amount of climatic data is also available for the San Dimas ITCO Colony, in the northern portion of the research area.

	J	F	M	A	M	J	J	A	S	O	N	D	Entire year
High	35.0	35.5	35.5	35.0	35.5	36.0	34.5	35.0	36.5	34.5	33.0	34.0	36.5
Mean	27.4	27.6	29.0	28.3	29.2	27.9	27.5	28.4	28.0	27.0	26.2	27.2	27.8
Low	22.0	20.5	23.0	20.5	22.5	21.0	21.5	20.5	20.5	20.0	20.0	20.0	20.0
Var.	8.3	10.1	8.7	9.1	9.7	9.2	9.7	10.2	11.7	10.5	7.5	6.9	9.3

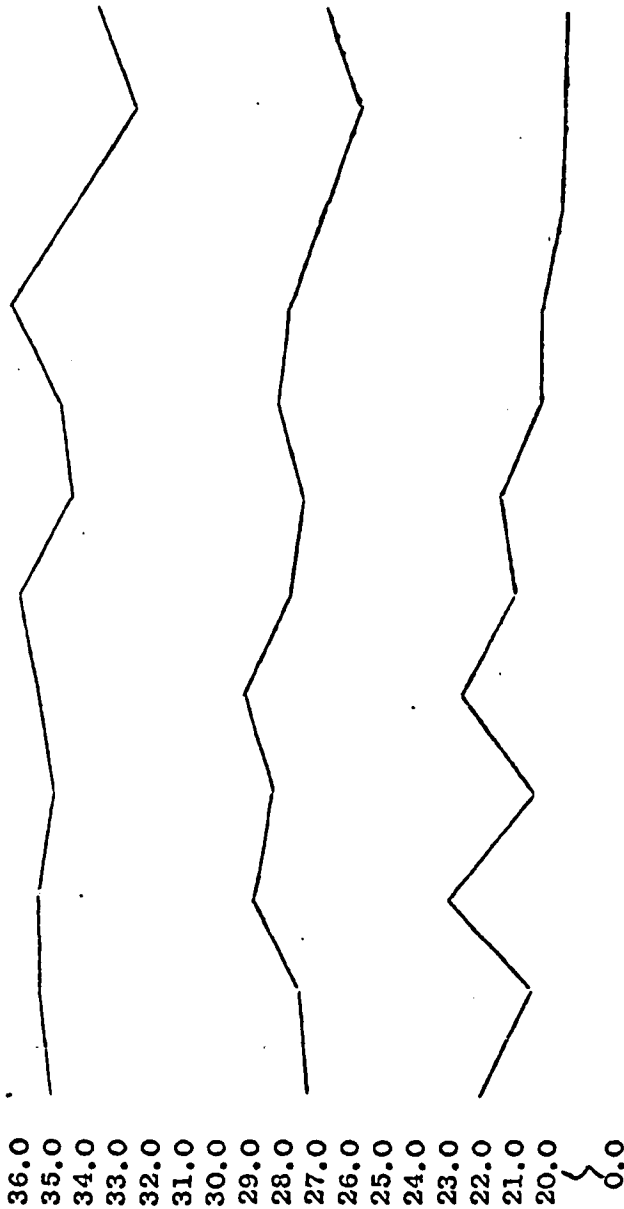


Figure 4. Temperature, Cafias, Guanacaste. 1963 absolute highs, averages, absolute lows and average daily variation (mean high minus mean low) in degrees Celsius.

	J	F	M	A	M	A	M	J	J	J	A	S	O	N	D	Entire year
Unobstructed Sunshine	290	279	242	241	168	138	156	134	114	175	251	2324	hours			
Relative Humidity	71	66	62	71	73	79	77	74	80	79	73	74%				
Evaporation	294	353	348	375	318	123	205	177	117	210	280	2932	mm			

Figure 5. Hours of unobstructed sunshine (1964), average relative humidity (1963) and total evaporation (1962), Cafias, Guanacaste.

	J	F	M	A	M	J	J	A	S	O	N	D	Entire year
	149	136	157	154	140	121	113	139	160	134	130	126	1654 hours
	Unobstructed Sunshine												
	79	84	87	87	92	93	91	94	92	88	90	---	(89) %
	Relative Humidity												
	89	80	150	136	117	95	102	108	106	92	72	73	1220 mm
	Evaporation												

Figure 6. Hours of unobstructed sunshine (La Loja average 1952-60), average relative humidity (Los Diamantes 1961) and total evaporation (Sarapiquí 1960).

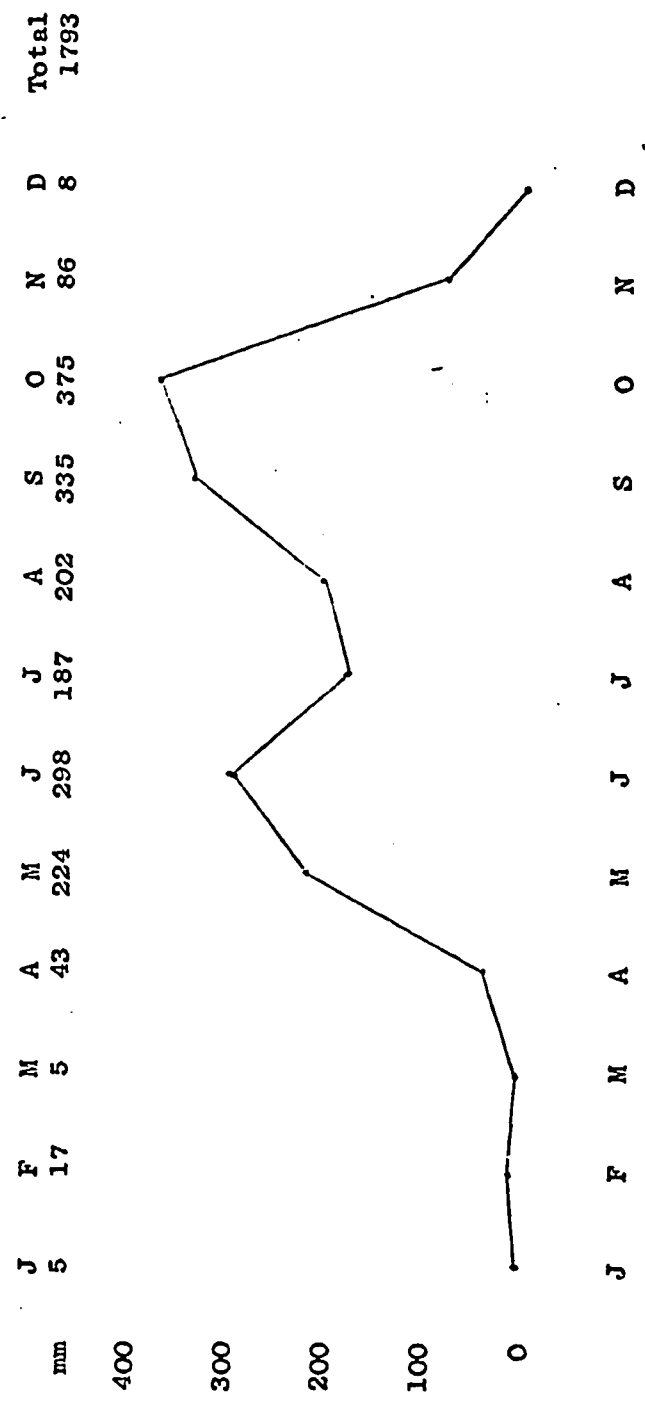


Figure 7. Rainfall, Cañas, Guanacaste. Fourteen year averages, 1951-64, in millimeters. 1960-64 high 1595 mm., low 1299 mm.

In contrast to the Aw tropical savanna climate that is characteristic of the rest of the area, San Dimas is relatively eastward and closer to the shore of Lake Nicaragua. This results in slightly higher annual rainfall for the region, with a total annual precipitation of 2026.91 mm. 94.06% percent of this rain falls from May to December, with the remainder falling during the rest of the year. The rainiest months are June and October, with average totals of 407.67 mm. and 337.70 mm. respectively; those with the lowest averages are March (20.42 mm.) and April (22.24 mm.).

History of Archaeological Research in the Area

The thrust of archaeological research in the Nicoyan area during the nineteenth century was antiquarian. By this it is meant that archaeological specimens, mostly from graveyard sites, were excavated and secured for aesthetic rather than scientific purposes. The sites listed in Lothrop's inventory (1926) were largely discovered and explored by North Americans and Europeans.

Two men, J. F. Bransford (1881, 1882) and Earl Flint (n. d.), deserve special mention. They made extensive surveys of the Nicoya region under the auspices of academic institutions and collected material for museums. Because of this latter fact, their provenience data, mostly of location and not of context, was quite good and would facilitate the re-examination of most of their sites. We, in fact, used a field map (Fig. 8) compiled by Flint in our survey of the Bay of Salinas region during the 1969 field season. Flint also compiled an extensive series of notes and

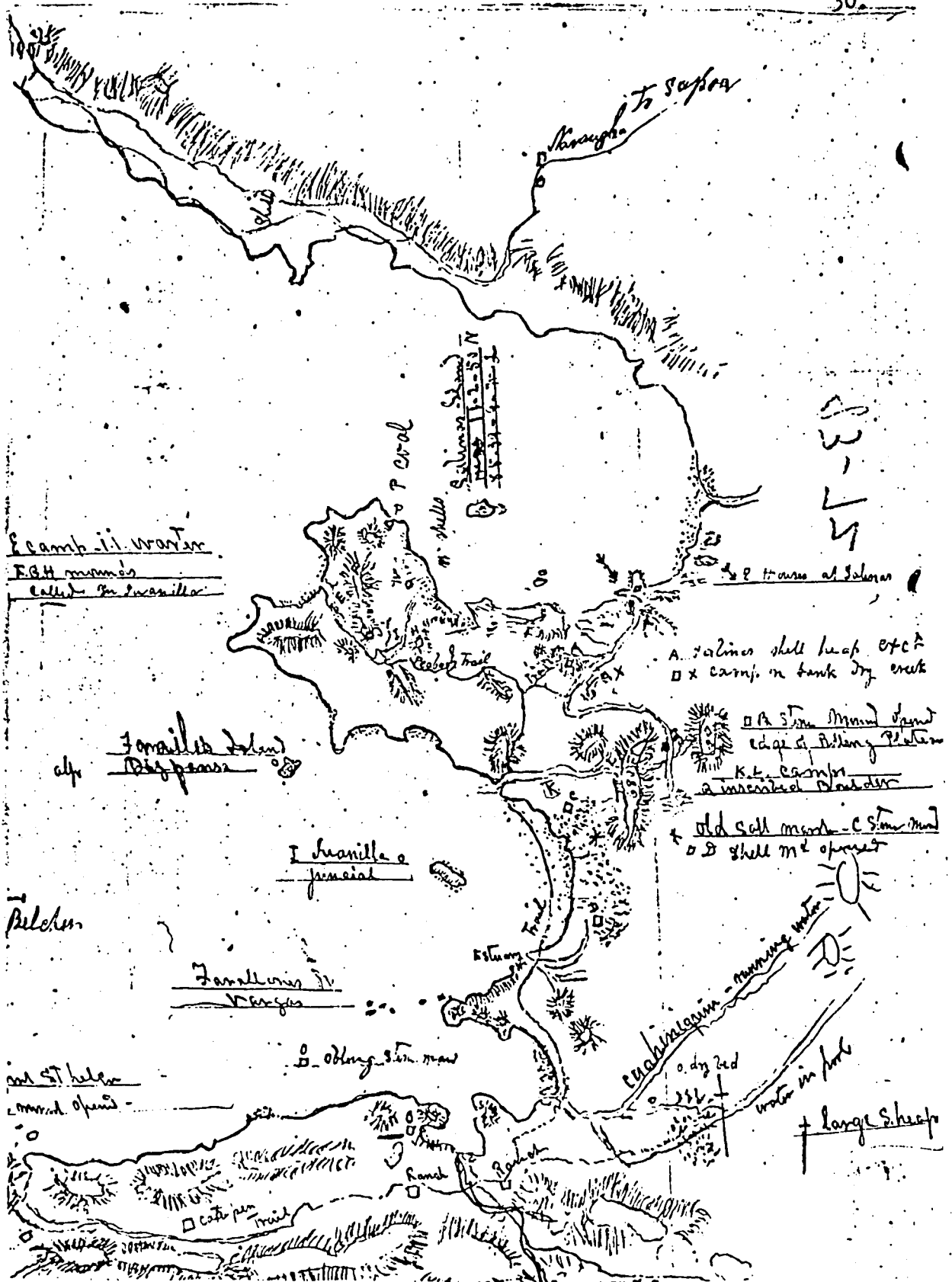


Fig. 8. The Bay of Salinas (upper center) and Santa Elena (center) areas as recorded by Flint (1883). From files at the Peabody Museum, Harvard University.

in these recorded a large amount of information on general ecological and archaeological distributions that is quite useful even today. The German anthropologist Sapper visited the Sapoa area in 1899 (Sapper 1902) and recorded a general description of the region.

Carl V. Hartman (1901; 1907), in his work in 1896, 1897, and 1903 on the Pacific coast of Costa Rica carried out the first excavations in the area which might be placed under the rubric "scientific." His excavations at Las Guacas and other sites are reported in detailed maps showing inter-grave and intra-grave relationships and distributions of artifacts. As Rowe (1959: 269) pointed out "The reader thus has at his disposal the actual evidence of archaeological associations, and he can, if he wishes, ask questions of the material which did not occur to the original excavator."

Until Hartman's work, thousands of items comprising grave goods from numerous cemeteries had found their way from Costa Rican and Nicaraguan sources into private and public collections throughout most of the world. Lothrop, in his monumental work The Pottery of Costa Rica and Nicaragua (1926) examined over 30,000 vessels in collections in the United States, in Latin America, and in Europe, devising a typological system based solely on descriptive attributes. He did not, however, conduct excavations at this time and no chronological framework was established, except for those ceramic types found in association with European trade products.

Lothrop subsequently conducted excavations in the Filadelfia region of the Nicoya Peninsula during 1948, but unfortunately these materials were not published.

The basic lack of work in the area is easily seen by consulting Lothrop's synthesis "Archaeology of Lower Central America." He listed (1966: 181) unpublished studies by Haberland, Richardson and Ruppert, and Norweb and Willey in Nicaragua. Since that time, both Haberland (1966) and Norweb (1964) have published brief summaries of their work.

In Costa Rica, no stratigraphic work was done until what Lothrop termed "recently," and work by Baudez, M. Coe, Haberland, and Stone had not yet been published in other than preliminary form when Lothrop wrote the synthesis. Since then, Baudez's work has appeared in one major publication (1967) and is directly pertinent to the area under consideration. Haberland's work in southern Costa Rica (1955) was already published, but is outside our immediate interest, as is Lothrop's work in the Diquis Delta (1963). Thus, until the 1960's the amount of scientific research in the Greater Nicoya area was negligible and even by 1970 there had been only testing and survey work of an exploratory nature.

The initial impetus for scientific research in the Nicoya subarea was fostered by the Institute of Andean Research through its Coordinated Research Program on the Interrelationships of New World Cultures. The aims of this project were stated by Ekholm and Evans (1962:255):

We are interested primarily in following out the very significant leads to an important aspect of Nuclear American culture history that are presented by the similarities that have been noted in the materials of the Formative Period in the Mesoamerican and Andean areas. The Central American and northern South American regions that lie between these two centers are in some ways very poorly known.

The field research program was officially begun in 1960 and included the excavations in the Isthmus of Rivas by Norweb and Willey and work on the Pacific Coast of Costa Rica by M.D. Coe. Although not officially under the combined project, Claude F. Baudez of the Musee du L'Homme in Paris was working in the adjacent Tempisque River drainage of the Nicoya peninsula and pooled his results with Coe to formulate the first basic chronological sequence for the area (Figs. 9, 10).

A long standing influence in Costa Rican archaeology has been the huaquero or grave-digger (robber), by definition a local inhabitant who loots pre-Columbian graves for the economic benefit derived from selling the grave contents to collectors, galleries, and museums. Many sites have been located by these men, but their contributions to science have been minimal. Fortunately graves are not usually found in association with habitation sites, so that the non-ceremonial remains of culture history are being preserved and in fact ignored because of their lack of material value.

It has been estimated that slightly more than 1 percent of the total population of the Republic of Costa Rica is dependent upon huaquero based economics and that approximately 5,000 men are involved in this "trade." The American influence is also a major factor in this practice. Members of the American Embassy staff in

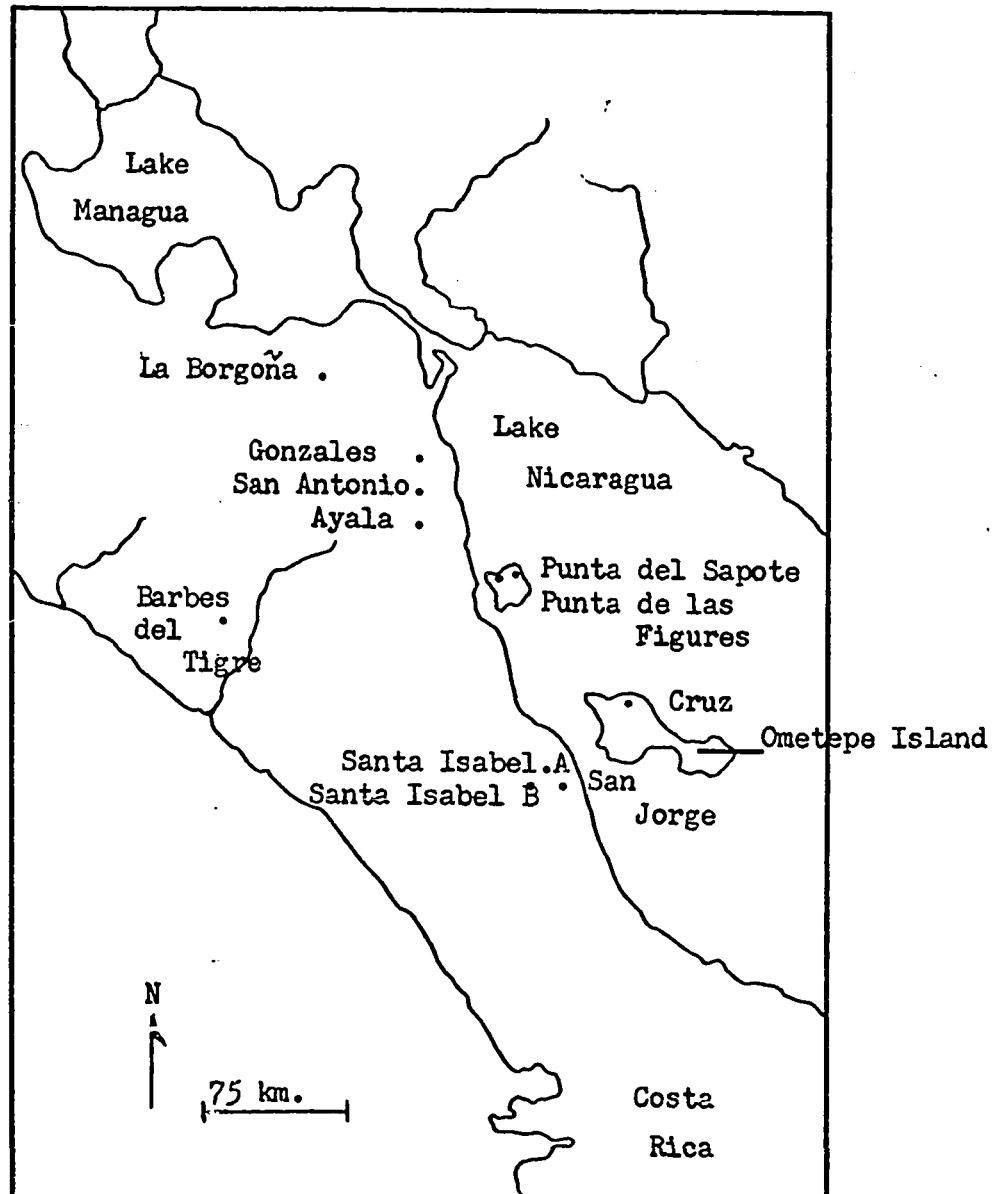


Fig. 9. Site in the Isthmus of Rivas (after Norweb 1961: 45); Haberland(1966: 1) also reported locating 52 sites on Ometepe Island.

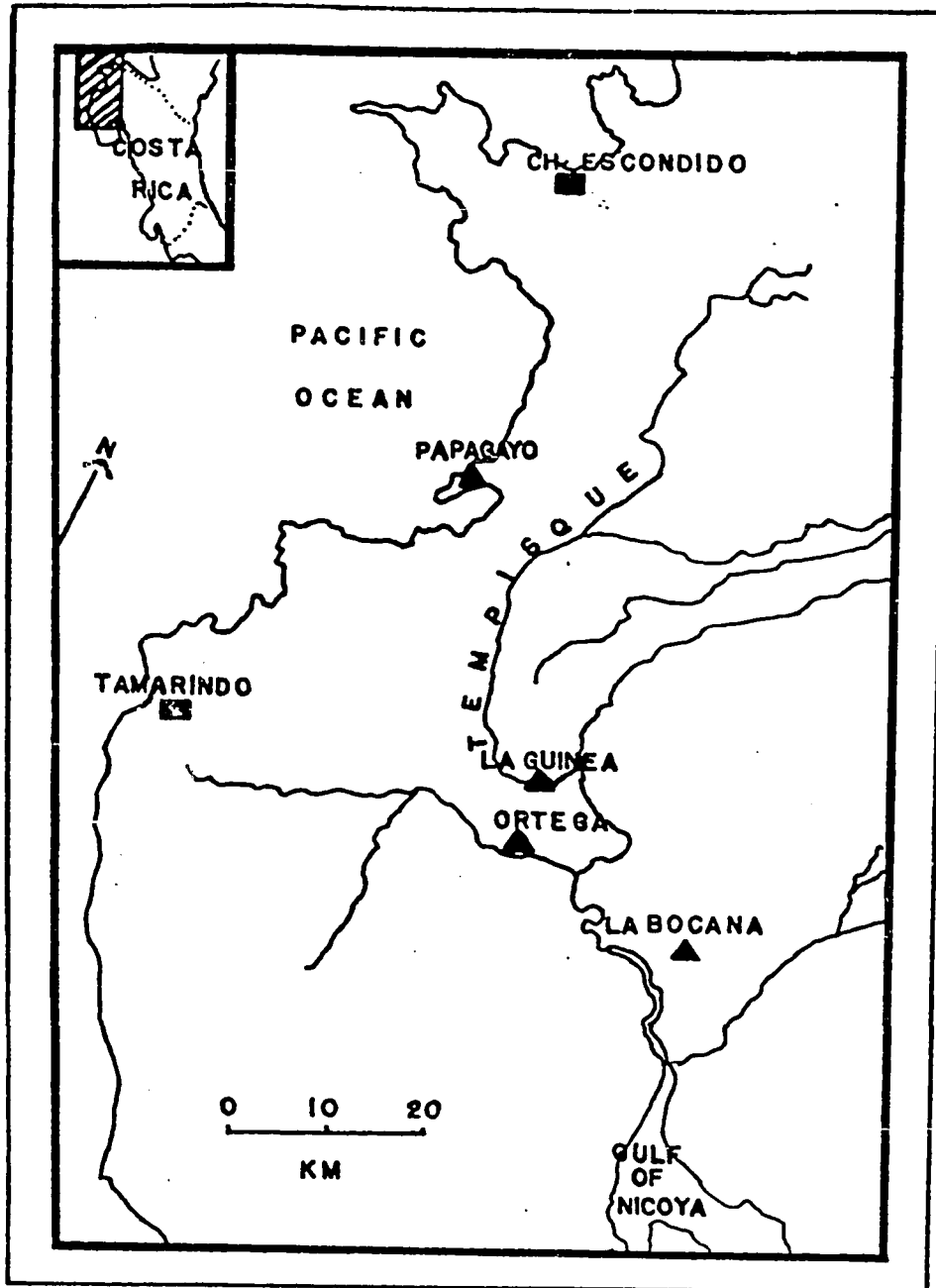


Fig. 10 Sites in the Greater Nicoya area excavated by Coe (squares) and Baudez (triangles). From Baudez and Coe (1962: 367).

San Jose and the Peace Corps are among the biggest buyers and some even engage huaqueros to take them digging. Diner's Club and American Express also contribute, perhaps unwittingly, by lending their charging privileges and advertising prestige to a number of establishments whose main source of revenue is the tourist sale of pre-Columbian artifacts.

The Spanish Conquest

Three separate expeditions comprised the Spanish entrada in the Nicoya subarea. The first of these arrived in 1522 when Gil Gonzalo Fernandez de Oviedo visited both Nicoya and Nicaragua and compiled a body of data which has been the source for much of the information on this region (1851-55). The final exploration of the 16th century occurred in 1561 when Juan de Cavallon marched overland from Nicaragua to Nicoya.

The linguistic pattern of the area at the time the Spanish arrived reflected recent shifts due to incursions of Mexican-derived peoples from the north. Corobici, which Stone (1966:211) felt was the mother tongue of the Nicoya Peninsula was, by this time, pushed to the eastern side of the Tempisque River. At the time of the Spanish arrival, two Mexican tongues predominated on the Nicoya Peninsula. The first of these was the Chorotega-Mangue in Nicoya, Orotina, and Orosi (Fernandez de Oviedo 1851-55, 3:111, 121) and the other the Nicarao in the Santa Elena Peninsula, Bagaces (Fernandez, 1881-1907, 1:270-272) and between the Corobicis and the Chorotega-Mangue to the Gulf of Nicoya (Fernandez de Oviedo, 1851-55, 4:108). Farther to the north, in Pacific

Nicaragua, Chorotega-Mangue was the most commonly spoken tongue.

These linguistic distributions were shown in Fig. 1. Their greatest significance for this report is that boundaries of all three of the major languages at Spanish contact appear within the area covered by the survey.

Lothrop (1926:30-86) extracted the material culture and ethnographic descriptions from various contact period manuscripts. His most important sources were Fernandez de Oviedo (1851-55, Book 42); Peter Martyr (1626); Benzoni (1857); Castaneda (1529); Andagoya (1765); Garcia (1881); and Motolinia (1914). Since there is nothing to be either added to or changed within Lothrop's lengthy descriptions, they are not repeated here. The reader is also referred to Stone's summary article on the ethnohistory of the area (1966). Some data specifically related to settlement pattern and subsistence is cited in that section of this report.

As with the linguistic data, one of the most important features of the material culture data is that it shows evidence of the area having been a cultural meeting ground of traits from the north and the south. Lothrop (1926:30) wrote:

From the north were derived the types of dress used by the Chorotega (except the Orotina), the Maribio, and the Nicarao; from the north came also the use of maize and cacao; and the custom of employing the latter as money; similarly the books of deerskin were of the northern provenience, as also the cotton armor, and the sword type widely in use. From the south, however, came the house types used in all parts of the area, but most noticeably the tree houses. The dress of the Guetar and Orotina was of southern derivation, as well as the penis string and tatooing. To the south we must also refer to use of coca and of intoxicating drinks in excessive quantities.

In general, we may summarize by saying that the peoples of Nicaragua borrowed more from the north than from the south, and that the reverse was true of the tribes of Costa Rica.

Geographically speaking, it must be noted that the bulk of the available data refers to Pacific Nicaragua and the southern Nicoya Peninsula, with a distinct lack of data about northern Guanacaste. One passing reference was gleaned by Radell (1969:56) from the Coleccion Somoza (Vol. I, pp. 89-107):

Gil Gonzalez remained at Nicoya ten days preparing for an overland journey to the north that would take him through almost 50 leagues of uninhabited territory, territory that could provide little water and almost no food. Gil Gonzalez says nothing of this part of the journey and simply tells us that after he had travelled 50 leagues he received news from the cacique Nicarao (Nicaragua). Emisaries, in the person of four minor chiefs, were encountered by the Spaniards within one league of the famed Indian capital, Nicaragua (Rivas).

This would have taken the Spaniards directly through the research area, and it would appear that northern Guanacaste, at least along the Sapoá River Valley where the army would have marched, had only a very sparse population.

CHAPTER II

SURVEY OF THE SAPOA RIVER AREA

To facilitate survey in the Sapoa River Valley area, the Peñas Blancas (3049 I) and Bahia de Salinas (3049 II) topographic quadrangles of the 1965, 1:50,000 series of the Instituto Geografico de Costa Rica were used. The topographic maps were arbitrarily divided into 8 more or less equal-sized "Areas" for survey recording purposes and were numbered consecutively I-VIII from north to southwest. Each kilometer square on the topographic map was also given an individual number, these being in the same order as the Areas and ranging from 1-226. During the 1970 season we were able to obtain both a large aerial photo of the San Dimas-Sapoa River area and a large scale plot map of the San Dimas ITCO Colony and sites surveyed and tested there during the second season are recorded with respect to surveyed plots.

In the portions of this report dealing with individual sites, the initial reference will be to either a plot or parcela number at San Dimas or to a code number reference to the map. For instance, Site RSVP-69-II-1 indicates that the site was located during survey by the Sapoa Valley Project in the 1969 season, was located in Map Area II, and was the first site found. More exact locations of the individual sites are given in the survey reports. The survey maps are on file with the Logan Museum of Anthropology, Beloit College.

With the exception of Areas I and VIII, all survey areas

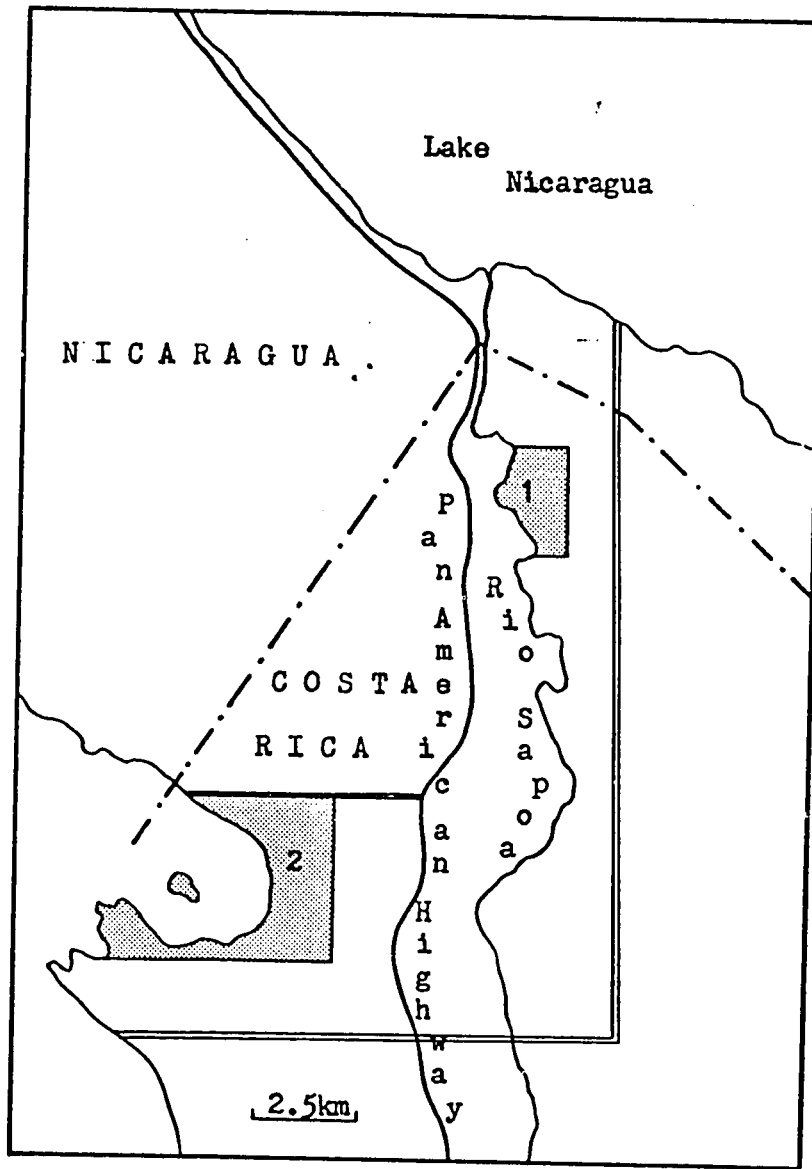


Fig. 11 Sapoa River Project Area, with subregions: 1) San Dimas Colony, 2) Bay of Salinas.,

were covered as thoroughly as time and conditions of terrain permitted. Extensive re-survey of the San Dimas area during the 1970 season showed that a number of sites were missed during 1969. This was largely because survey during the first season was conducted prior to burning over for cultivation, while the second season's work began while clearing and plowing of the soil was underway. In addition, a new government program initiated in 1970 meant that much of the agricultural colony was plowed for the first time. Although this did mean that a number of shallow sites that we later encountered had been disturbed, it did greatly increase survey results.

Inability to obtain multiple-entry visas for Nicaragua (Area I) made it impossible to spend more than part of 1 day there on survey, while a local "range war" made access to Area VIII difficult.

On survey, the usual pattern was for 2 or 3 members of the field party to go out with a local guide for a day-long reconnaissance of specific areas. These were not guides in the sense that they knew the location of sites, but rather they were familiar with the local people and landscape. Areas along either side of the river were covered extensively, while areas farther back were covered in a less thorough, though systematic, fashion.

Several factors affected survey in the project area. As mentioned above, much of the colony has to this time been pastoral rather than agricultural and thus the plow, one of the archaeologist's primary aids in revealing prehistoric sites, is little used. By contrast, a thick grass matting makes locating objects on the

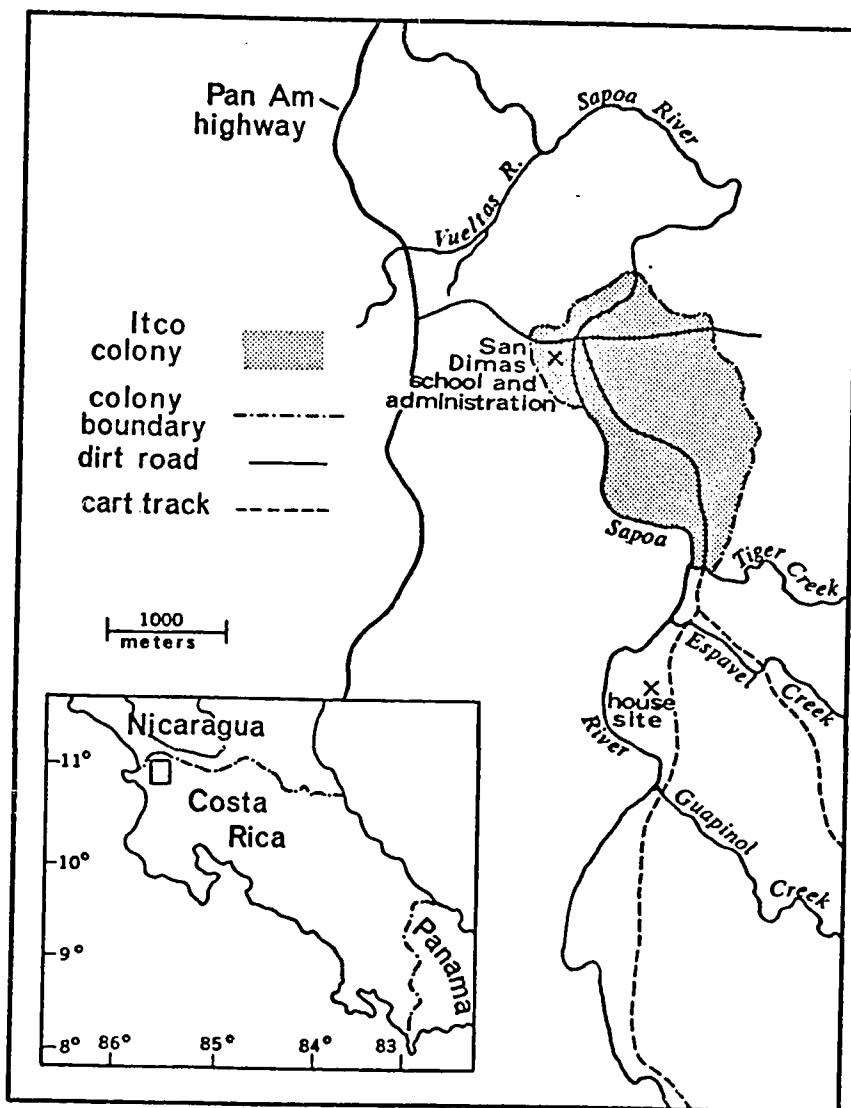


Fig. 12. Sapoa River Project area, location of San Dimas Colony region.

ground almost impossible, even after burning. A bucket-type soil augur was used with some success in combatting this problem; another possibility is to survey by testing. However, the latter is prohibitive in both time and effort and, as will be mentioned below, would have been illegal during most of the first season. With some experience in the area, we were able to predict ecological locations in which we might expect sites; in this respect survey by testing became more beneficial and was used with a degree of success during the 1970 season.

The ecology of the area also affected the outcome of the survey. We found that association with water sources and apparently water sources of year-round availability, drew a very tight parameter around the area containing sites. All were located along the river or its major tributaries, while survey in the drier, rougher regions to the east of the river produced not a single site. This adds to our impression that the climate has been relatively stable in the recent past. In other words, no location at which we found ceramic archaeological materials would be adverse to human habitation at the present time and, in fact, many sites were at the door-steps of modern houses. The classic example of this was probably Site 90, located directly on top of an old site and where the landowner very generously offered to permit the students to conduct a test excavation in a large pile of stones (thought to be a grave) in the bedroom! We declined.

One unforeseen event greatly curtailed work during the 1969 season. This was a decree by the Costa Rica government on 3 March

1969 suspending all permits to conduct excavations in the country pending a review and possible revision of the national antiquity law. This move resulted from a combination of political pressures and conflicts on the domestic scene and had not been contemplated when our permit was originally granted (see Current Anthropology 1969: 466). The decree was made in the middle of the field season and severely hampered our operation. A revision of the decree on 14 May permitted us to return to the field for a week beginning 2 June, but was of little help due to the advent of the rainy season and necessary termination of the project on 12 June. The survey portion of the project was greatly enhanced; however, the value of the survey was severely decreased by the inability to conduct test excavations at a sample of the sites located.

Fortunately, the opportunity for a second season allowed us to compensate for most omissions during 1969. Between June 1969 and January 1970, the Costa Rican Supreme Court had ruled the original executive decree of 3 March 1969 to be unconstitutional. We received the fullest possible cooperation from the government during the 1970 field season and were able to carry out all phases of our research without interruption.

Survey Results

Survey in the project area resulted in the location of 112 areas of pre-Columbian cultural activity. Of these 7 were cemeteries or single graves, 2 were petroglyph sites unassociated with other cultural material, 5 were shell mounds/middens, 4 were mounds or groups of mounds surrounding salt flats, 2 were collapsed rockshelters,

1 was the entrance to an underground cavern, 3 were suspected acorn processing sites, and 89 were open sites.

Speaking in broad geographical terms, 82 sites were located in the Sapoa River drainage, 7 were in the connecting area between the river and the Bay of Salinas, and 23 were located around the edge or backlands of the bay. These sites ranged temporally from Zoned Bichrome ceramics of the earliest known types in Costa Rica (B. C. 300 to A. D. 300) to Murillo types thought to have been in use at the time of the Spanish Conquest. A group of purely lithic sites were found along the banks of an extinct river and lake to the south of La Cruz, but the lack of stratigraphy at these sites makes their chronological placement somewhat uncertain.

Within the broad categories given above, the sites can be further divided into ecological zones for discussion. The extinct lake and river sites seem to represent occupation of the area when the climatic and ecological setting was different from the present and hence are discussed as a unit. The Sapoa River sites can be subdivided into 1) those on the floodplain or low, easily flooded terraces; 2) those in the three main "floor" areas but on hills or saddles safely above the water; 3) those in the more narrow part of the valley south of San Dimas, and 4) those located on the Guanacaste plain east of La Cruz.

The connecting area between the Sapoa River and the Bay of Salinas is an arbitrary unit and where possible, sites have been put in either the Bay or the River category rather than being left in this one.

The sites around the Bay of Salinas fall into four ecological categories: 1) those around the salitres or salt flats, 2) shell mounds or middens adjacent to estuaries and creeks (and often the salt flats), 3) on low elevations back from the beach and having no marine mollusca remains, and 4) those on the promontories extending down from the cliffs forming the back limits of the bay region.

Detailed site survey descriptions, sketch maps, and artifact analyses from all sites have been printed in the two annual field reports (Lange et al; 1969;1970) and are not repeated here. An index to all sites, arranged by the preceding ecological zones and containing information such as geographical location, temporal association if known, and reference to page location in either of the field reports is given in Appendix 3 .

Those sites that were tested or whose surface collections yielded diagnostic artifacts will be more fully described in the discussion in the following chapter on testing and excavation.

CHAPTER III.

TESTING AND EXCAVATION OF SITES IN THE
SAPOA RIVER AREA

A total of 24 sites were tested in the project area. Testing activity ranged from 2 or 3 1-meter square units at some sites to almost an entire season of excavation at Site 26. A total of 19 sites were tested in the San Dimas area, 1 in the area between the Sapoa River and the Bay of Salinas, 3 around the Bay of Salinas, and 1 site on the Salinas River, flowing into the bay from the southeast. More testing in the bay area would have been desirable, but we were unable to accomplish this; the major landowner had lost several prize breeding stock because huaqueros had failed to re-fill holes dug the preceding winter and he was unwilling to have anyone digging anywhere on the property.

In addition to the sites tested, surface collections from 8 sites contained diagnostic material. This relatively low yield of data from survey is a result of the rapid deterioration of sherd surfaces once they are exposed to the tropical rain and leaching. No painted ceramics survive in the open and thus, unless incised or appliqued pieces or diagnostic handles or legs are found, surface collections are often useless..

Tested and diagnostic sites will be presented in the context of the ecological subdivisions made in the section of survey results. In the San Dimas area, where a relatively large number of sites were tested, only a representative sample will be described. Temporal placement of the sites was made on the basis

of the ceramic assemblage present, as the project budget did not permit submission of radiocarbon material for dating.

FOSSIL LAKE AND RIVER SITES

The area of a former lake occupies part of the region between the Cordillera de Guanacaste and the Bay of Salinas. To the east of the Sapoa River is a generally sloping plain, with grades of less than 10 percent, sweeping up to the flanks of the volcano Orosi. It is on this plain that the lake bed is found; a few low-lying spots maintain a dry, marshy appearance even at the height of the dry season, suggesting the last stages of filling in the old bed. Lithic materials were found eroding out of exposed beaches and 2 of the 5 sites found in this area are reported here:

RSVP-69-V-69

This site is located in survey square 191 on an upper beach of the old lake and is extremely weathered. Probing with a bucket augur revealed that there was no depth to the deposit. The following cultural materials were surface collected at the site:

- 1 small blade
- 13 unworked flakes
- 1 tool fragment
- 1 core fragment

The core fragment and small blade are made of tan and gray chert respectively, while the tool fragment, showing properties of both a spokeshave and a graver, is made from quartzite.

RSVP-69-V-70

This site is located in the southwest $\frac{1}{4}$ of survey square 174. It is also on one of the upper beaches of the lake. Surface

45

49.

collection yielded the following cultural materials:

- 1 triangular projectile point fragment
- 4 side scrapers
- 1 utilized lithic flake
- 1 core fragment
- 133 un-utilized lithic flakes

All of the artifacts from this site were manufactured from chert. Quantities of very small chert flakes were also found and indicate that this site, as well as Site 69, had on-the-site stone-working, as contrasted with the Rio Antiguo sites discussed below.

THE RIO ANTIGUO SITES

This fossil river is about 2 kilometers south of the town of La Cruz, west of the Pan American Highway and the Sapoa River. The countryside around the Rio Antiguo consists of low volcanic foothills. Some are still covered with timber, but most have been cleared for cattle raising. The sites discussed below are in an area approximately 3 kilometers west of the Sapoa River and on the edge of the volcanic cliffs separating the modern river plain from the coastal lowlands. These cliffs are approximately 200 meters high and represent uplift of the land in "recent" times.

The present topography of the Rio Antiguo is rolling, with hills, bluffs, and eroding terraces flanking either side of the old river. Sites are located along the terraces and on bluffs from 20 to 30 meters above the river floor (Murray 1969:260). Deforestation has caused severe erosion in this area and there is no topsoil remaining.

The old river bed has filled considerably and without coring equipment it was impossible to determine the depth of the

old channel; its width was approximately 30 meters.

At the present time, geologic evidence of the area is inadequate to permit us to determine the point in time when orogenic movements raised the cliffs above the bay, the flow of the Rio Antiguo ceased, and the lake began to dry up. However, the previously discussed work by Gabriel Dengo, allows us to make an educated guess of B.C. 5000-7000.

In some areas of the Rio Antiguo, lithic implements were found eroding out of the volcanic ash and it is obvious that a more precise knowledge of the recent geological history of this region is necessary to implement chronological controls. Seven of the 11 sites surveyed in this area are reported below.

RSVP-69-V-16

This is an open site located west of the Pan American Highway. It is south of La Cruz in Survey Square 170 and situated on a point of land overlooking Tiger Creek. The site debris extends over an area perhaps 30 meters in diameter and includes both lithic and ceramic material. Three holes were drilled with a bucket augur to an average depth of 50 centimeters, but no depth of deposit was found. It is suspected that the association of lithic and ceramic material at this site is a result of telescoping by erosion and that the locality represents at least two different periods of occupation, with the lithic representing the river phase and the ceramics the creek phase. The following lithic materials were recovered from the site:

- 1 unifacially flaked weathered chert knife
- 1 unifacially flaked knife, chert

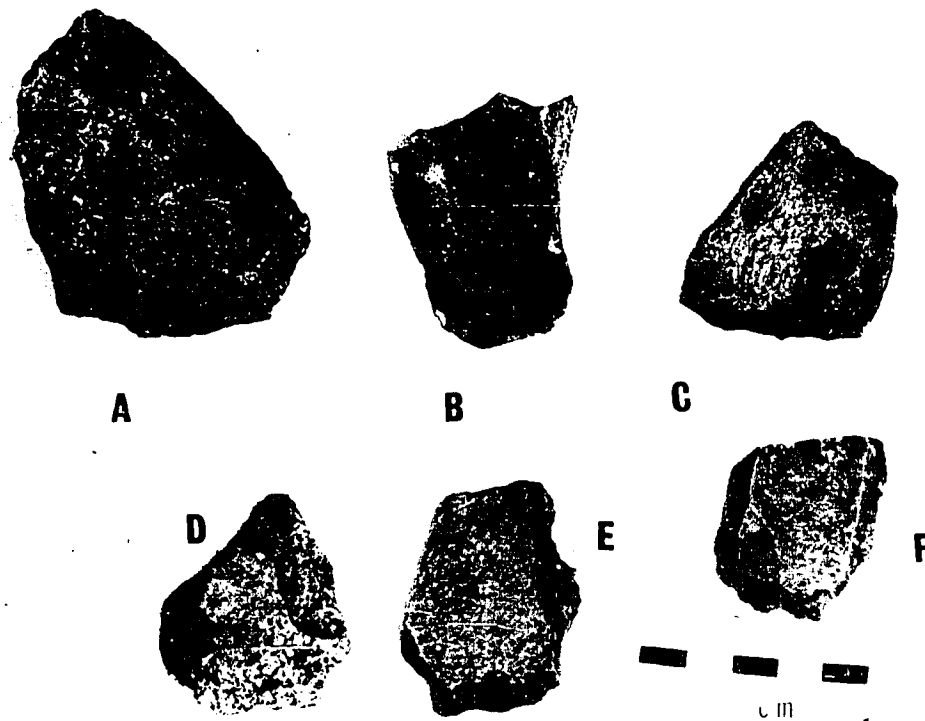


Fig. 13. Period unknown, scrapers from Rio Santiago area.

- 2 unifacially flaked scrapers, chert
- 1 unifacially flaked weathered chert scraper
- 35 chert flakes
- 1 obsidian flake

RSVP-69-V-24

This open site is located on the former bank of the Rio Antiguo and is now a small rise in the west half of survey square 171. This site was extensively collected and also tested with the bucket augur. No depth of deposit was found. The following cultural materials were found at the site:

- 6 unifacially flaked weathered chert scrapers
- 2 unifacially flaked scrapers, chert
- 1 weathered chert spokeshave
- 1 graver, chert
- 1 weathered chert multipurpose tool (scraper and spokeshave)
- 1 core
- 2 weathered chert wedges
- 119 unutilized weathered chert flakes
- 774 unutilized chert flakes

A large percentage of the rock fragments examined from the site showed evidence of cobble origin.

Typologically, 2 of the scrapers are concave, 5 are straight edged, and 1 is round-nosed (Murray 1969:269).

RSVP-69-VII-74

This is an open site on a promontory in survey square 186. Cultural material was found over an area 150 meters in diameter, encompassing both the eastern slope and the top of the ridge.

The following cultural materials were collected:

- 3 weathered chert oval scrapers, 3-6 cm. in length
- 3 weathered chert straight-edge scrapers, 3-6 cm. in length
- 1 weathered chert concave scraper
- 3 weathered chert spokeshaves, 2-5 cm. long

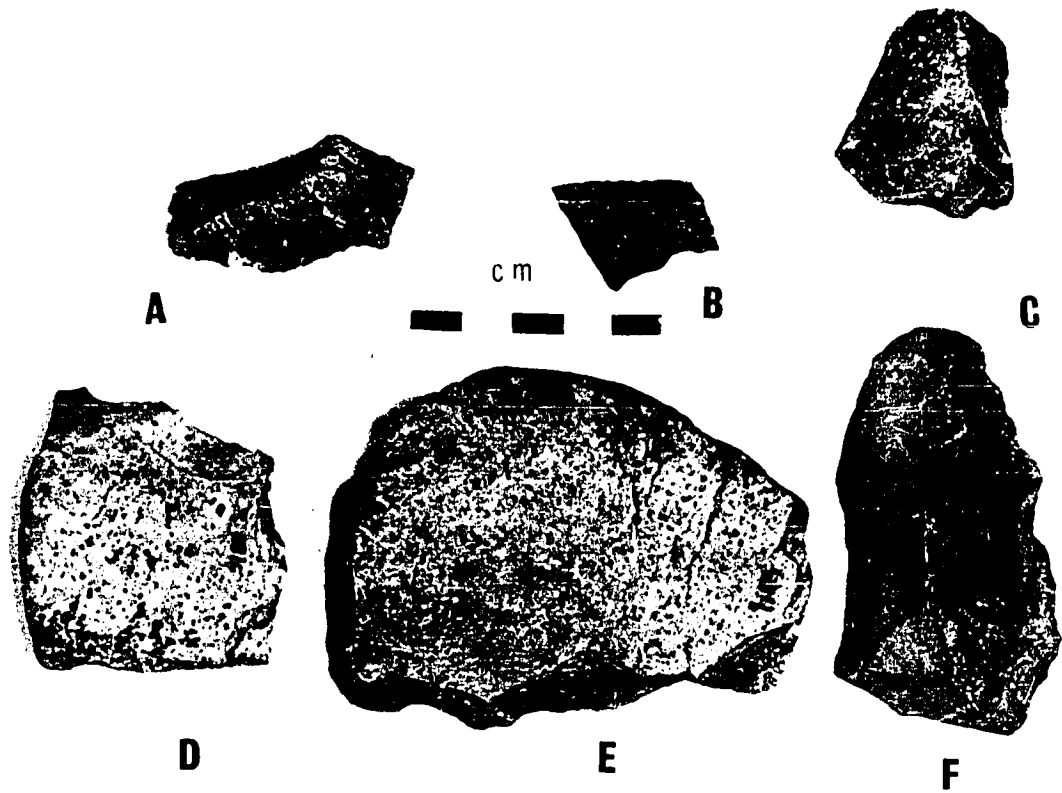


Fig. 14. Period unknown, lithic artifacts from Rio Antiguo area:
A-B and F, knives; C scrapers; and D-E cleavers,

- 1 chert graver
- 1 weathered chert multipurpose tool (straight edge scraper and spokeshave), 2.2 cm. long.
- 1 weathered chert core, 5 cm. in diameter
- 1 chert saw
- 1 fossilized bird or rodent bone
- 46 chert flakes

RSVP-69-V-30

This is an open site on the side of a bluff 30 meters above the Rio Antiguo. It is in the northern half of survey square 188 and east of the road along the old river bottom. The following cultural materials were collected:

- 3 weathered chert straight-edged scrapers
- 1 straight-edged scraper, chert
- 3 concave scrapers, weathered chert, 6 cm. long
- 1 weathered chert spokeshave, 4 cm. long
- 1 chert hammerstone, 6 cm. long and 3 cm. wide
- 201 chert flakes, unutilized
- 20 weathered chert flakes

This discrepancy between the number of chert flakes and weathered chert flakes is not a reflection of reality of distribution but, rather, a reflection of the aesthetic preferences of the collectors.

RSVP-69-V-29

This is an open site located on top of the bluff mentioned under the preceding site number and may very well be an extension of this site rather than a separate area. There was a break in the distribution of material and for this reason two different numbers were assigned. The "river" is about 30 meters below the level of this site. The following cultural materials were collected:

- 1 weathered chert oval scraper, 6 cm. long
- 1 chert knife, 6 cm. long
- 1 weathered chert knife, 6 cm. long
- 1 chert core, 4 cm. in diameter
- 3 unutilized weathered chert flakes
- 2 unutilized obsidian flakes
- 95 unutilized chert flakes

The obsidian flakes are especially interesting. The material is not naturally occurring in the area and indicates external contacts.

RSVP-69-VII-17

This site is located in Area VII just west of two knolls. It is on a high ridge on the edge of the 200 meter cliff. A great deal of lithic material was gathered and a possible milling stone observed. Near the milling stone, a circular formation of stones 3 meters in diameter was observed. It appears to be a possible house or camp site. The following cultural materials were collected:

- 3 weathered chert straight-edged scrapers, 4-5 cm. long
- 1 weathered chert round-nosed scraper, 4 cm. long
- 1 weathered chert multipurpose tool (spokeshave, graver)
3½ cm. long
- 1 weathered chert core, 5 cm. in diameter
- 91 chert flakes (unutilized)
- 9 weathered chert flakes

RSVP-69-VII-64

This open site is directly west of Site 25. It is on a relatively low area and continues up a small hill to the south. Dense secondary growth made surface collection difficult. The following cultural material was found:

- 1 weathered chert straight-edged scraper, 6 cm. long
- 1 round-nosed scraper, jasper, 4.5 cm. long
- 1 weathered chert knife

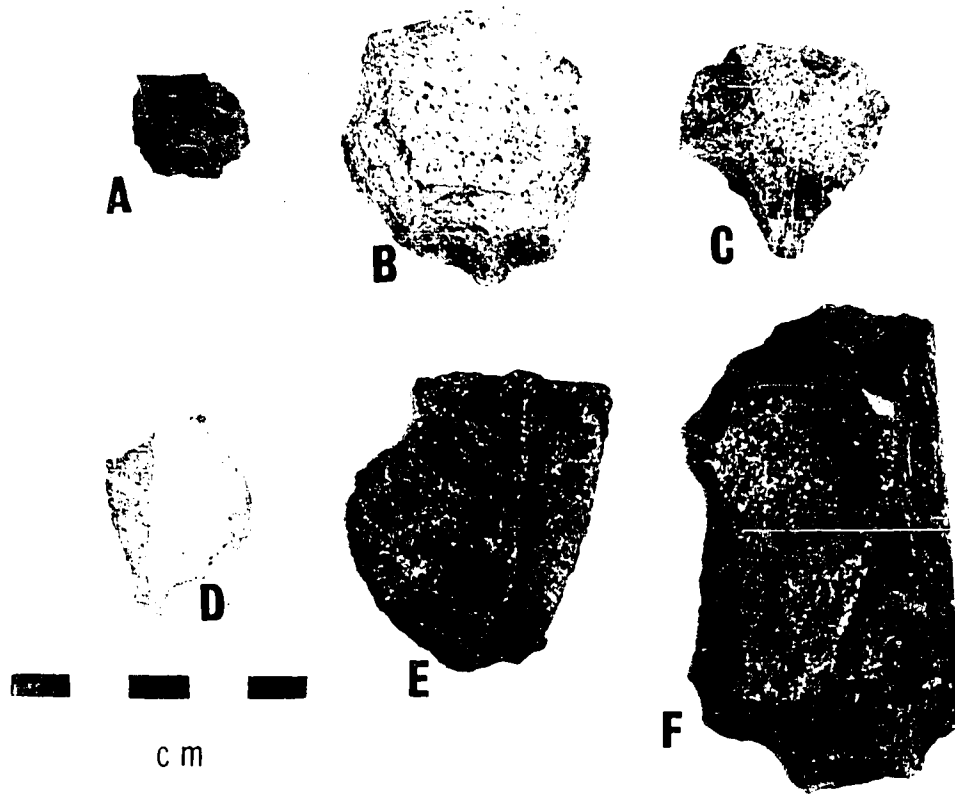


Fig. 15. Period unknown, lithic artifacts from the Rio Antiguo area: A-B and E-F scrapers, C and D gravers.

The knife is a ball-shaped stone, showing many battering marks, and is sharpened along one edge.

One major factor suggesting that both the lake and river sites were occupied when the topographical and ecological situations of this immediate region were quite different from those of the present is that these sites are located in an area which today has no fresh water source and which is uninhabited by the modern population. This is in contrast to the general pattern found throughout the survey area, with farming families occupying the lands close to the Sapoa River and its few year-round tributaries.

The occurrence of these sites with completely lithic assemblages is unique to this area of survey. Similar sites were not found along the Sapoa River or any of its tributaries. This may in part be due to more favorable conditions for surface collection in the Rio Antiguo area and may also reflect the absence of destructive flooding which has probably erased a number of small sites from lower levels of the Sapoa drainage.

Another indication is given by the presence of the chert tools, flakes, and rock fragments in the surface collections. These lithic materials were obtained from river cobbles, cobbles that are not present on the modern-day ground surface, but, on the other hand, probably lie buried beneath the filled river channel. Another less likely explanation is that the cobbles were transported from the Sapoa River.

When the artifacts from these sites are divided by rock type, weathered chert vs. the siliceous materials, it appears

that either 1) these represent one cultural group and one time period, with a selectivity of materials for different tools, or 2) that two different cultural-temporal occupations of the area are represented. The latter interpretation is favored because in two typological categories, cores and scrapers, two quite different patterns of use (in the cores) and potential function (in the scrapers) are present.

It might also be noted that at the time these sites were surface collected during the 1969 season, we did not have a large lithic sample from any ceramic sites and the possibility remained that what we had found were merely specialized activity areas representing other sites.

Excavation at Site 26 during the 1970 season yielded a good sample of lithic materials and the assemblage from there is both typologically and functionally distinct.

THE SAPOA RIVER VALLEY

Survey in the Sapoa River Valley revealed 82 areas of pre-Columbian cultural activity. Despite the fact that the soils in this valley have been classified as being fertile, and that in three places it broadens into low floodplains, overall occupation appeared to have been relatively light.

In observing this area today, it is important to remember that it has been significantly changed, and is continuing to undergo rapid changes, with reference to the ecological setting of perhaps two centuries ago. However, as was noted previously, this is not a case of man cutting through virgin territory, but is another

step in a long series of human disturbances affecting the plant and animal communities since pre-Conquest times.

The changes being wrought today are probably more severe and will have more far-reaching consequences than those of the past. Presently, this area is being converted to cattle country and large tracts are being systematically timbered, burned, and re-planted with fire resistant strains of grasses imported from Africa. M.D. Coe (1960:360) noted:

The subsistence and other economic activities of the present day inhabitants of the region can hardly be indicative of the potential of this environment to the aboriginal population, for today almost everybody is bound up in one way or another with the activities of the cattle haciendas. Fishing is ignored and milpa agriculture is of minor importance. Hunting is pursued, but because of the almost complete destruction of the forest for pasture in most areas, it is often unsuccessful.

The introduction of cattle into the area and the related spread of grassy pastures has caused the formation of a thick grass mat over much of the ground surface which seriously hampers surface observation. Trails, paths, fence rows, and other disturbances were the only places where cultural materials were easily observable. Some areas which appeared to be likely spots, such as small plains overlooking the river, yielded no cultural debris. A similar location, Site 5, was located only as a result of an erosional ditch that washed out numerous potsherds.

SITES ON THE FLOOD PLAIN OR LOW TERRACES

Nine sites were found in this zone. On the plain north of the customs offices at the international boundary, east of the junction of the Cabalceta River and the Sapoa River, and in

the broad valley occupied by the San Dimas colony, the river valley broadens into a wide flat plain subject to annual flooding of 4-5 meters. The soil along the river at this point is exceptionally fertile, especially at the widest expanse of the plain on the Nicaraguan side of the border. Four of these sites are described and discussed here.

RSVP-69-I-84

This site is located in survey square 17 on the west bank of the river. The field had just been plowed prior to survey and the following cultural materials were collected:

- 1 Bocana Incised Bichrome rim (combed variety)
- 1 Leon Punctate bodysherd (chili grater)

Bocana Incised Bichrome is a Zoned Bichrome period type, while Leon Punctate has been assigned to the Early Polychrome period (Norweb 1964:559).

RSVP-69-II-1

This site is located in survey square 48 and consists of 2 alluvial mounds on the plain between the Sapoa River and Los Planes Creek. The northernmost mound, which was tested, is 1 kilometer east of the Pan American Highway and is cut by the main road of the San Dimas Colony. This mound is 175 meters east of where this road crosses the Sapoa River. It is 4 meters high above the floodplain on the south and as one moves to the north it gradually grades into the level of the fields. It is 90 meters long on its east-west axis and 60 meters wide north-south; the northern extent of the mound is impossible to determine because

of agricultural disturbances.

Although referred to for convenience as a "mound," this term is used with some reservation. It appears to be a natural river levee with approximately 110 centimeters of rock and dirt added from the valley floor to get the surface above flood stage level.

This would have been relatively important to insure continued use of the site. Local informants told us that presently, during major rainy season flooding, the waters of the Sapoa River and the creek meet across the fields and only the top of the ridge, essentially the artificial part, remains above water. This represents a rise in the water level of 4 to 5 meters over a substantial area and gives some idea of the impact of the rainy season on those living along the valley floor. It also demonstrates why our knowledge of preceding settlement in the valley is limited to those sites along terraces and safely above the water.

The mound had suffered some damage by human abuse prior to the initiation of excavation activities. The northern end of the mound had been plowed down in conjunction with agricultural activities and a large pit had been dug out in the southern edge of the mound by a Peace Corps volunteer, Andy Koch, Jr. He was no longer in Costa Rica at the time of our work, but communication with him via mail brought this description of his "finds" in the mound:

I dug on top of the ground, after they had plowed up soil. I found two teeth which I presumed to be those of some Indians. I also found pieces of pottery with

the figurines that go on the sides of the pottery. There were several pieces of jade, these were flat pieces, about the size of a quarter, with a hole in the jade. There was also a piece of jade, round like a marble with a hole through this piece. I found a piece of jade that was almost like glass, practically clear, this was engraved with a bird like figure on it.

A second ridge at this locale is 130 meters south of the first and is 4 meters high and 20 meters in diameter. The landowner informed us that no aboriginal material had ever been found associated with this mound and field examination revealed nothing. The top of the mound was bored into with a bucket augur and produced negative results.

In testing at the first mound, four 2 meter square pits were laid out and designated A, B, C, and D.

Squares A and B were begun first and excavated in 20 centimeter units for the first level, which brought us into contact with a fairly evenly distributed rock "pavement" at the base of the level.

Beneath the single-stone deep layer of rocks, Level 2 in each square was excavated in a 30 centimeter unit. In Square A, the artifact count continued to be fairly high in the upper part of the level, decreasing toward the bottom. This level in Square B was almost devoid of cultural material.

At this point, a decision was made to continue excavation in only Square A and cultural material was obtained to a depth of 110 centimeters. Below this depth, excavation was continued in order to determine the nature of the mound and to explore the possibility that earlier occupation levels had been covered over

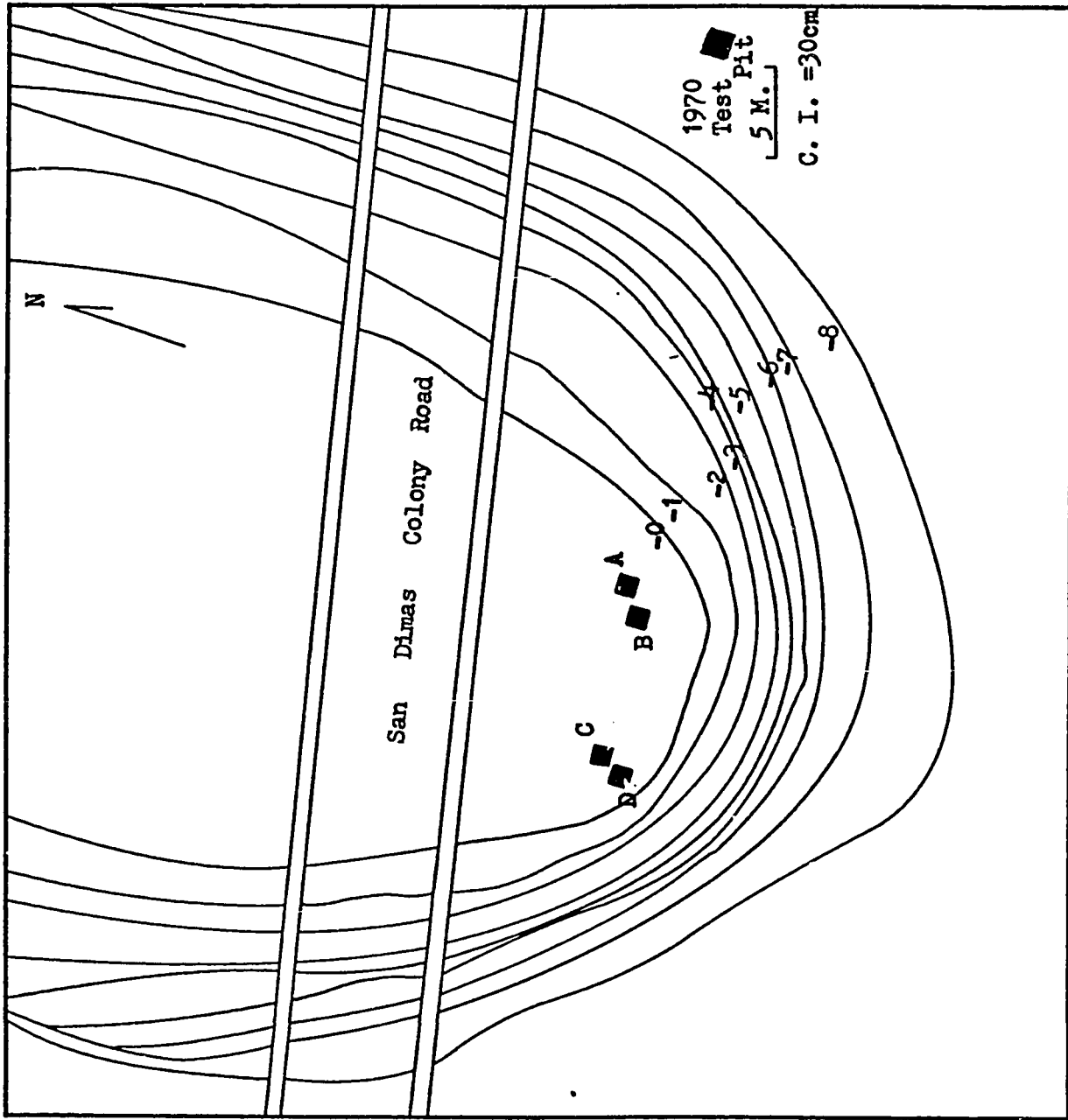


Fig. 16. Excavated area at Site 1.

by the silting of the river. None were found and excavation was terminated at a depth of 2.0 meters.

Meanwhile, Squares C and D were begun 10 meters to the west. The same rock "pavement" was uncovered at the base of Level 1 in Square C and in the northeast $\frac{1}{4}$ of Square D. A decision was made to excavate Square D only to the extent necessary to define the edge of the rock-covered area; this basically encompassed the eastern $\frac{1}{2}$ of the square. Excavation in these squares was terminated at the level of the rocks (20 centimeters below surface) with the exception of one area of high rock concentration along the common boundary of the two squares which was designated a Feature 1, mapped, and removed. This designation was based on the possibility that a grave was located beneath the rock capping, but none was found. This feature was excavated to a depth of 60 centimeters.

All material from this site was screened through $\frac{1}{2}$ " mesh screen. A more detailed description of the excavation procedure is given in the survey report (Georgeson and Kristensen 1969:115-126). A total of 2,942 body sherds and 210 rimsherds were excavated at the site. Soil conditions had been very destructive to sherd surfaces and the only recognizable decorative elements were either incised or applique sherds.

Additional work was carried out at Site 1 during 1970 when the surface of the mound was recollected for lithic implements and a 2 x 2 meter test square was put down on the floodplain to the southeast of the mound. The original purpose of this pit was to recover evidence on the depositional history of the valley floor and

it was presumed that no cultural material would be present and that whatever might be encountered would be the result of washing and scouring and useless for analytical purposes. The excavation was initially carried to a depth of 2 meters, the depth to which we had tested in top of the mound in 1969. Beyond this, excavation was done in 20 centimeter units to a depth of 3.6 meters. These arbitrary units corresponded to the natural alternation between alluvial deposits and black cultural layers that were subsequently found.

DIAGNOSTIC ARTIFACTS

CERAMICS

Notched Sherds

These distinctive artifacts were found in the river valley area at Sites 6, 10, 19, 49, 26, and 67 as well as at Site 1. They are distinguished by their circular or rectangular form and lateral notches. They are usually less than .8 centimeters thick, and are reworked. Two or 4 notches are found paired on the sides. Three of these notched sherds were found at Site 1. No sherds of this type were found in the test pit in 1970.

Palmares Incised (Middle Polychrome)

From a total of 27 incised sherds recovered from excavation, 14 were definitely identified as being the type Palmares Incised as defined by Baudez (1967:127). A detailed comparison between the sherds found at Site 1 and Baudez's description can be found in the 1969 survey report (Georgeson and Kristensen 1969:160-161).

No sherds of this type were found in the test pit excavated during the 1970 season.

Effigy Handles

Three complete effigy handles and 5 fragments were found (Fig. 22). One of the complete pieces had 3 raised ridges over its surface, while the other 2 generally resemble fish-heads and have applique lumps as facial features. One of the fragments also represents a fish-head. All 4 fish-heads were found in Feature 1. Both the fish-heads and the ridged handles are styles previously unreported. None were found in the 1970 testing.

1970 Season Test Pit

The levels from surface to 2 meters in depth show an assemblage corresponding to materials excavated from the mound proper in 1969. This was roughly what was expected, since we had tested Square A in the mound to approximately this depth without finding additional cultural material. However, beginning at the 2.2 to 2.4 meter level, the succeeding materials are all from the Early Polychrome period.

The Leon Punctate (Norweb 1964:559) chili graters can be exactly defined, while I prefer to simply assign the applique pieces in the level 2.6 to 2.8 meters to the Ciruelas phase, since I do not feel that the relationship of particular applique motifs to particular ceramic types is as definite as Baudez does. The Cervantes Incised and Punctate type (level 2.8 to 3.0 meters) was defined by Baudez (1967:109). The cream on red rim sherd from level 3.0 to 3.2 meters and the black on red body sherd from level 3.2 to 3.4 meters appear in neither Baudez's nor Norweb's

ceramic classification, but on the basis of general similarities may either be assigned to the Linear Decorated phase, a subdivision that is sometimes made at the beginning of the Early Polychrome period (Baudez 1967:188) or may possibly represent a minor Zoned Bichrome occupation. However, without any of the characteristically Zoned and incised ceramics from this latter time period present, this is very difficult to determine.

LITHIC MATERIAL

Manos and Mano Fragments

A total of 21 mano or mano fragments were surface collected at the site and 17 were excavated. With the exception of the whole mano found in the wall of Square A, Level II, all came from the two cleared areas of rock paving, and the majority were among the rocks in the area designated as Feature 1. Of special note is the side-notched fragment, which not only was originally designed to fit over the edge of the metate, but shows signs of having been re-utilized on its bulbed-end as a pestle (Fig. 17). The other manos appear to be slightly altered cobbles taken from the Sapoa River. This pattern of using water-worn pebbles is still practiced in the area today.

Pestles

Four pestles were found at the site as part of the stone "pavement." Three of them were spheroid in shape, had diameters of 4, 5, and 9 centimeters, and showed pounding indentations on their surfaces. The fourth pestle was shaped like a large door-knob and has an indentation on the surface of the "knob" portion. One pestle

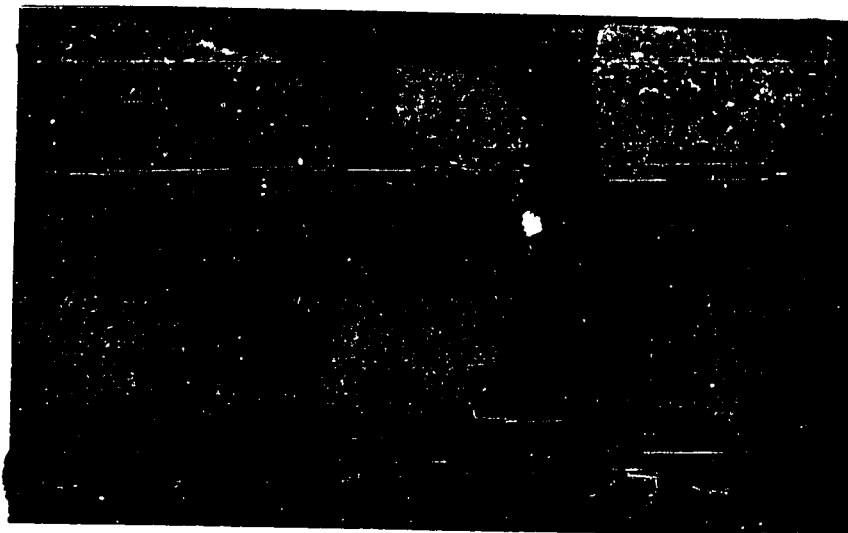


Fig. 17 Middle Polychrome period: Mano and pestle fragments from Site 1, San Dimas Valley.



Fig. 18 Modern use of Sapo River cobble as a mano.

fragment was found at the 2.6-2.8 meter level in the 1970 test pit and 2 were found in the 2.8 to 3.0 meter level.

Mortars

Four definite mortars, with pecked out cups, were found at Site 1, while 8 of 15 of the manos surface collected during the 1970 season showed signs of having been utilized as platforms in conjunction with pestles or hammerstones. In these instances, a small depression approximately 2 centimeters in diameter is formed on one, and sometimes both, sides of the cobble.

Ground Stone

One small ground stone celt was found at the site in 1969, and one fragment was found at the 2.8 to 3.0 meter level in the 1970 test pit.

Lithic Flakes

No lithic implements and only 8 lithic flakes were recovered from this site in the 1969 excavations. One flake is obsidian and the rest are chert.

Adobe Fragments

Adobe fragments were found with relative frequency while excavating Squares A and B, but none were recovered from C and D. All fragments were checked for plant impressions, but none were found.

Jade

One small jade pendant and 2 jade beads were found at Site 1. The pendant was found in a small southern extension of Square C at a depth of 20 centimeters. It has 6 holes drilled through it and

is an abstract form. One of the beads was from the first level of Square A and the other was found in the back-dirt pile.

SKELETAL MATERIAL

A limited amount of skeletal material was recovered during 1969. However, it was in such poor condition that little information could be gained. A badly eroded palate and teeth were found in Square A, Level I and were identified as being definitely human. Two extremely fragmentary long bones were found in Level III, Square B and although they appeared to be a human tibia and fibula, their condition was so poor as to prevent positive identification.

SUMMARY

This site had its main occupation during Middle Polychrome times and there is subtle evidence for a brief Late Polychrome use of a portion of the site. One of the most interesting aspects of this mound is the question of its possible function.

Unlike other sites tested in the area, there is a distinct lack of any type of vessel handles or bases. All 3 handles found were recovered from Feature 1 and these were small. In addition, none of the heavier, thick sherds, which indicate culinary vessels at other sites, were found.

The presence of the rock "pavement," in conjunction with the large number of pestles, manos, and mortars or pounding platforms is probably the most distinctive feature of the site. The general lithic assemblage is much like that described for the Browne Site in California (Greenwood 1969) and the subsistence implications of these are quite important. The importance of this site in the overall subsistence pattern will be discussed at greater length

in a following section. Briefly, none of the artifacts suggest maize utilization. A large percentage of the manos have been re-utilized as pounding implements and no true metates, either whole or fragmented, were found. Instead, the collection of such items as nuts and berries necessitating a mulling type of preparation, seems to have been a primary subsistence activity.

The site also appears to have been utilized on at least one or possibly two occasions for interments. The rock capping with a large number of sherds strewn about it is a typical grave feature for this part of Costa Rica (Stone 1966:34), although in this case their presence may be largely unrelated to the graves. Without knowing the types of material recovered by Mr. Koch, it is not possible to say if that interment is temporally equivalent to the portion of the site we excavated. The limited skeletal material found in our excavations was not associated with any diagnostic material.

RSVP-69-II-6

The road to the west of Site 1 runs 600 meters to the south where it becomes elevated along the east bank of Los Planes Creek. Along this road and along the bank of the creek a large amount of surface material was collected. The west side of the road was in thick, deep grass and could not be satisfactorily examined. However, the landowner stated that it was not uncommon to find sherds and other materials in the fields when they were cleared, and in the process of digging post-holes.

This site is also in survey square 48 and was chosen for

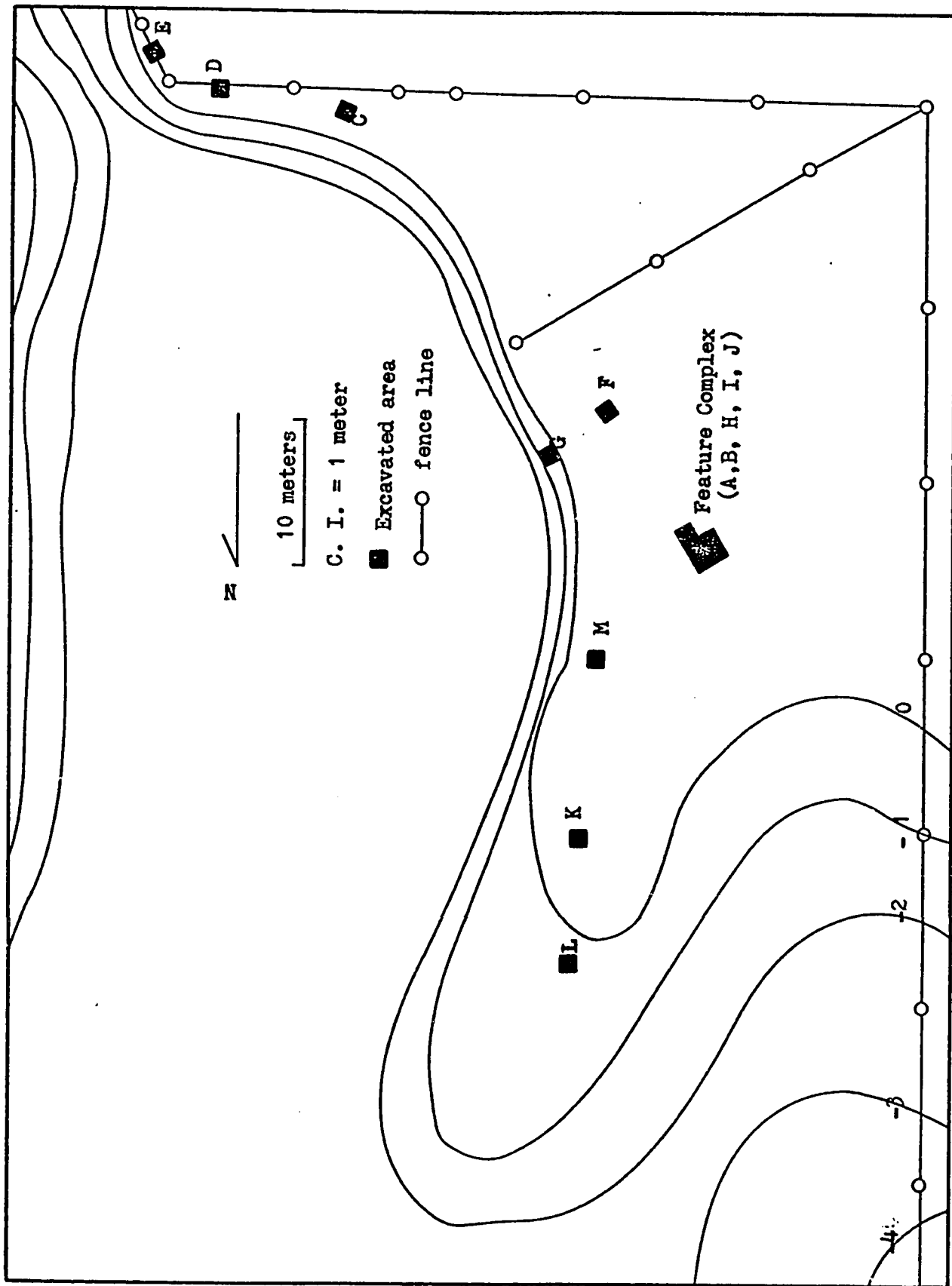


Fig. 19. Excavated area at Site 6.

testing because its ecological location and the abundance of surface collected material suggested that it had been a habitation area. Site 6 is located on a terrace approximately 7 meters above the valley floor and, with Site 1, had the advantage of being slightly above severe flood stages. The terrace is rather narrow between the river and the creek at this point, but broadens to the south.

SURFACE COLLECTION

Grading for the farm lane exposed a long section of this site for surface collection. A portion of the site had also been plowed for agriculture to a depth of 20 centimeters and large stone pieces, such as metate legs and fragments, had been thrown over the edge of the embankment. Erosion of the embankment was also revealing material and this area was thoroughly examined. Surface collection yielded the following cultural materials:

- 3 effigy head handles
- 7 vessel legs
- 1 ceramic figurine fragment
- 3 incised bodysherds
- 12 notched sherds
- 1 stone vessel leg
- 3 metate fragments
- 2 metate legs
- 1 utilized obsidian flake
- 1 utilized chert flake
- 2 utilized rock fragments
- 1 jade pendant fragment

EXCAVATION

A total of 10 1-meter square pits were excavated at this site. In addition, 3 small $\frac{1}{2}$ meter exploratory pits were excavated to delimit the unplowed portion of the site.

Squares B, C, D, and E were spaced along the edge of the

embankment on a narrow strip between the farm lane and the slope to the creek. The best place to have dug would have been in the road itself, but this was impossible. Square A was expanded from Square B when the first outlines of Feature 1 became apparent and these were subsequently joined by Squares H, I, and J to form the group of squares excavated in the feature area. Square G was excavated on the very edge of the embankment to obtain a soil profile, and Squares K, L, and M were those excavated in an attempt to define the boundary of the unplowed area. All squares were excavated in 20 centimeter levels, with the exception of the square complex A, B, H, I, and J. This group of squares and Squares E, K, and F were located in the plowed portion of the site.

The feature complex attained a maximum depth of 48 centimeters and was a series of pits, some overlapping. Edges of other pit profiles were visible in the walls of the excavation. Parts of 4 different pits were uncovered during the process of excavation in this feature. Below, the artifacts from the entire feature complex are listed by combined levels. The following materials were recovered from Level I, the plowed zone:

- 5 punctated sherds
- 33 notched sherds
- 5 incised bodysherds
- 3 applique pieces
- 3 effigy head handle fragments
- 1 pot handle
- 7 ceramic vessel legs
- 2 ceramic balls
- 1 utilized obsidian flake
- 4 unutilized obsidian flakes
- 2 stone vessel legs

The following materials were recovered from Level II

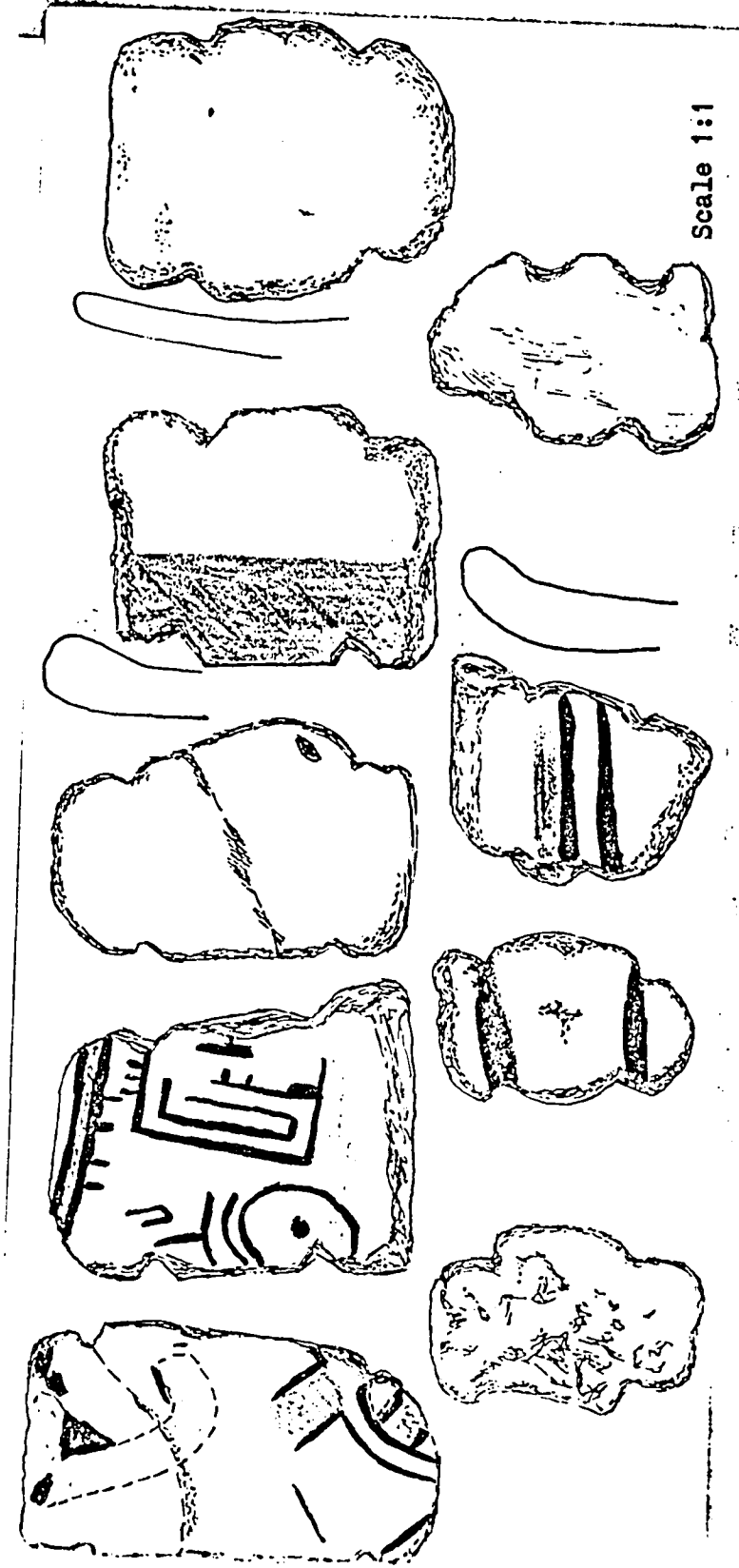


Fig. 20. Middle and Late Polychrome periods: "Notched Sherds"

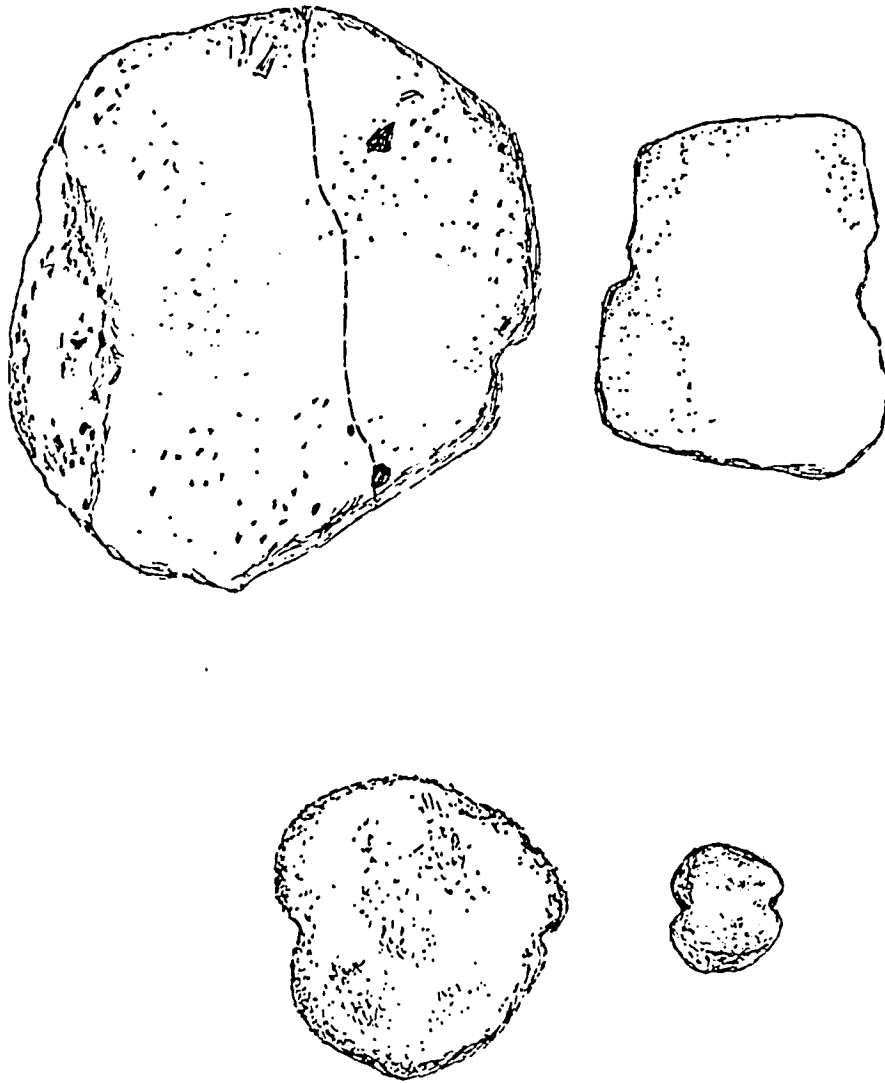


Fig. 21. Middle Polychrome period: "Notched sherds"

(20-40 centimeters):

- 2 punctated sherds
- 20 notched sherds
- 15 ceramic vessel legs
- 1 effigy handle fragment
- 1 Palmares Incised rimsherd
- 4 incised body sherds
- 1 utilized chert flake
- 1 utilized obsidian flake

The following materials were recovered from Level III (40-48 centimeters), consisting of one small section of Square I only:

- 4 notched sherds
- 2 ceramic vessel legs
- 1 utilized obsidian flake
- 1 chert core fragment

A concentration of rocks was found along the boundary between Squares I and J. These were mapped in and then removed. No cultural material was found beneath them. They are not naturally occurring in this position, but their presence is unexplained.

INCISED SHERDS

Thirty incised sherds were found, 13 of them rimsherds. As a group, they are small (4 centimeters in width or less), badly weathered, and contain nothing but straight line incisions. Two rimsherds, 1 from Level I of Square H and the other from Level II of the same square fit together and not only demonstrated the unity of that particular feature but also provided the only definite example of Palmares Incised to be recovered.

HANDLES

Three handles and 4 effigy head handle-fragments were found. Two handles, 1 from the surface collection and the other from Level I (0-20 centimeters) of Square B resemble fish heads with surface details of facial characteristics. Another effigy handle was also

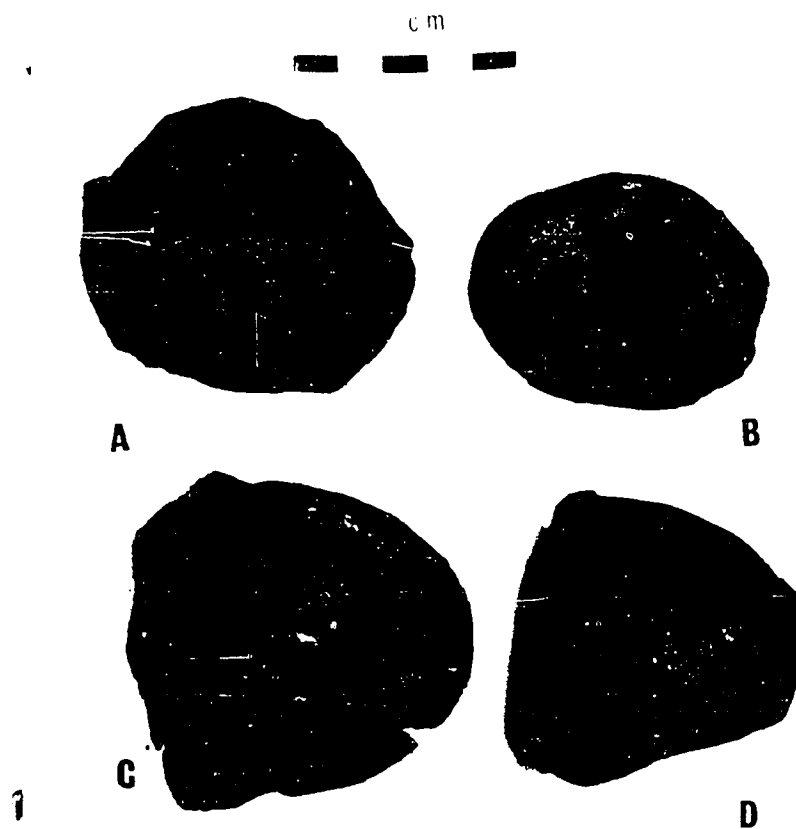


Fig. 22 Middle Polychrome vessel handles, effigy type.

surface collected. The 4 fragments were found in the following distribution:

Level II, Square H: 1
 Level I, Square D: 1
 Level I, Square G: 2

POTTERY BALLS

Eight pellets presumably used as leg rattles on ceramic vessels were recovered. They were distributed as follows:

Level I, Square G: 5
 Level II, Square G: 1
 Level I, Square H: 1
 Level I, Square J: 1

CYLINDRICAL POTTERY STAMP

This stamp was found in Level I of Square D. It is 3.5 centimeters in diameter and 5 centimeters long. The same motif is repeated three times on its circumference. A cylinder stamp from Guatemala with a similar motif was observed in the collection of the Heye Foundation Museum of the American Indian in New York City.

MANO AND METATE FRAGMENTS

One mano fragment was found. Five metate fragments were also recovered, all in the surface collection. Three were legs and 2 were flat or surface pieces. Two different styles of metates are represented by different leg types. Whether this reflects cultural, temporal, or functional differences cannot be determined.

LITHIC FLAKES

A total of 68 lithic flakes was found. Seven flakes, 5 of them obsidian, had been utilized. The high percentage of use in

the 5 out of 17 obsidian flakes recovered probably reflect the lack of any known natural source for this material in the immediate area and its presence as a trade item.

LITHIC IMPLEMENTS

A chert graver 2.5 centimeters long was found in Level II of Square D. This tool also had 1 unifacially worked edge. Two chert scrapers were included in the surface collection. One of these is 3.5 centimeters long and has a working edge 2 centimeters wide. The other is a thumbnail scraper 2 centimeters in width. A chert core fragment 3 centimeters in diameter and in heavily battered condition was found in the 44-48 centimeter level of Feature 1.

JADE

The bottom section of a Nicoya type jade pendant was found during surface collections at the site. It is mottled light green in color and is 2.3 centimeters wide and 0.5 centimeters thick at the bottom.

SUMMARY

In comparison with Site 1, Site 6 is definitely a habitation site. The scattering of sub-surface pits, the larger amount of lithic debris, and the presence of thick sherds of culinary types all point to this interpretation. The presence of a grave adjacent to Square D is a possibility, but Site 1 proved that this is difficult to detect from surface evidence. Artifacts found at the site are indicative of the Palo Blanco phase of the Middle Polychrome Period (A. D. 800 to 1200). The numerous similarities between this

site and Site 1 (fish-head and ridged handles, notched sherds, and Palmares Incised sherds) indicate a cultural-temporal congruence, although the functional aspects of the former are somewhat clearer than those of the latter.

SITES SECURELY ABOVE THE FLOODPLAIN IN THE
MAIN VALLEYS OF THE RIVER

Thirty-nine sites were located on elevated ridges along the river, or in saddles between two ridges. These have the combined advantages of being above flood levels, while still remaining close to essential water supplies. Most are also back slightly from the main routes along the river and thus are inconspicuous to passing travellers. These areas also appear to be favored places for establishing cemeteries, conforming to Baudez and Coe's observation (1962: 372) that they were "...laid out along the ridges and hilltops above the villages..." from Early Polychrome times on.

RSVP-69-II-5

This site is on a steep rise above Los Planes Creek and is in survey square 43. The modern house of Eduardo Chavarria overlooks the plain of the San Dimas Colony from this point and is probably sitting on top of the major portion of the prehistoric occupation zone. The site is secure from lowland flooding and at the same time has a permanent water source.

The land has been completely cleared by the colonist and so retains none of its former appearance. However, along the banks of the creek, small game and many edible wild plants are still found.

This site was tested for 4 days during mid-March 1969 in

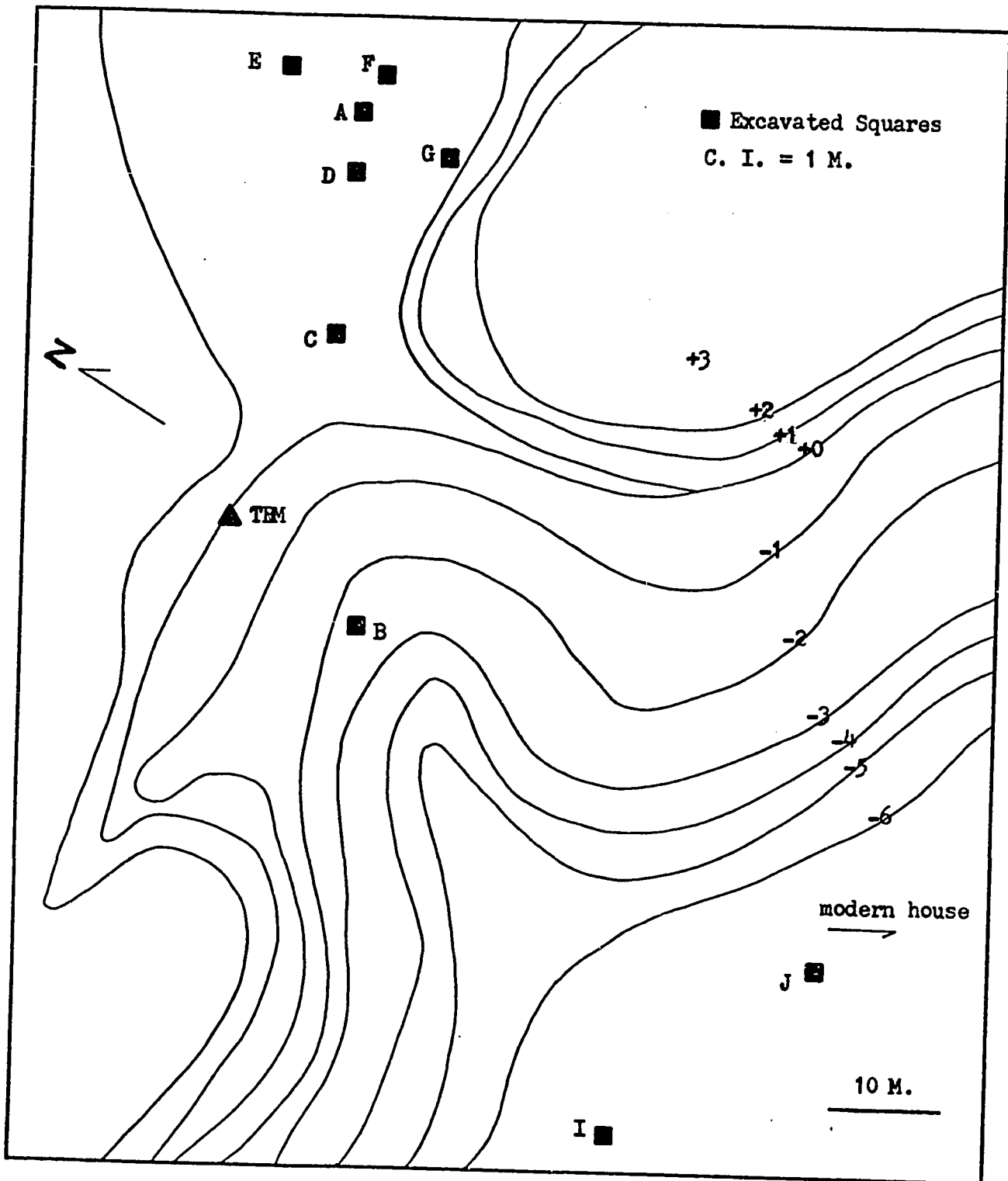


Fig. 23. Excavated area at Site 5.

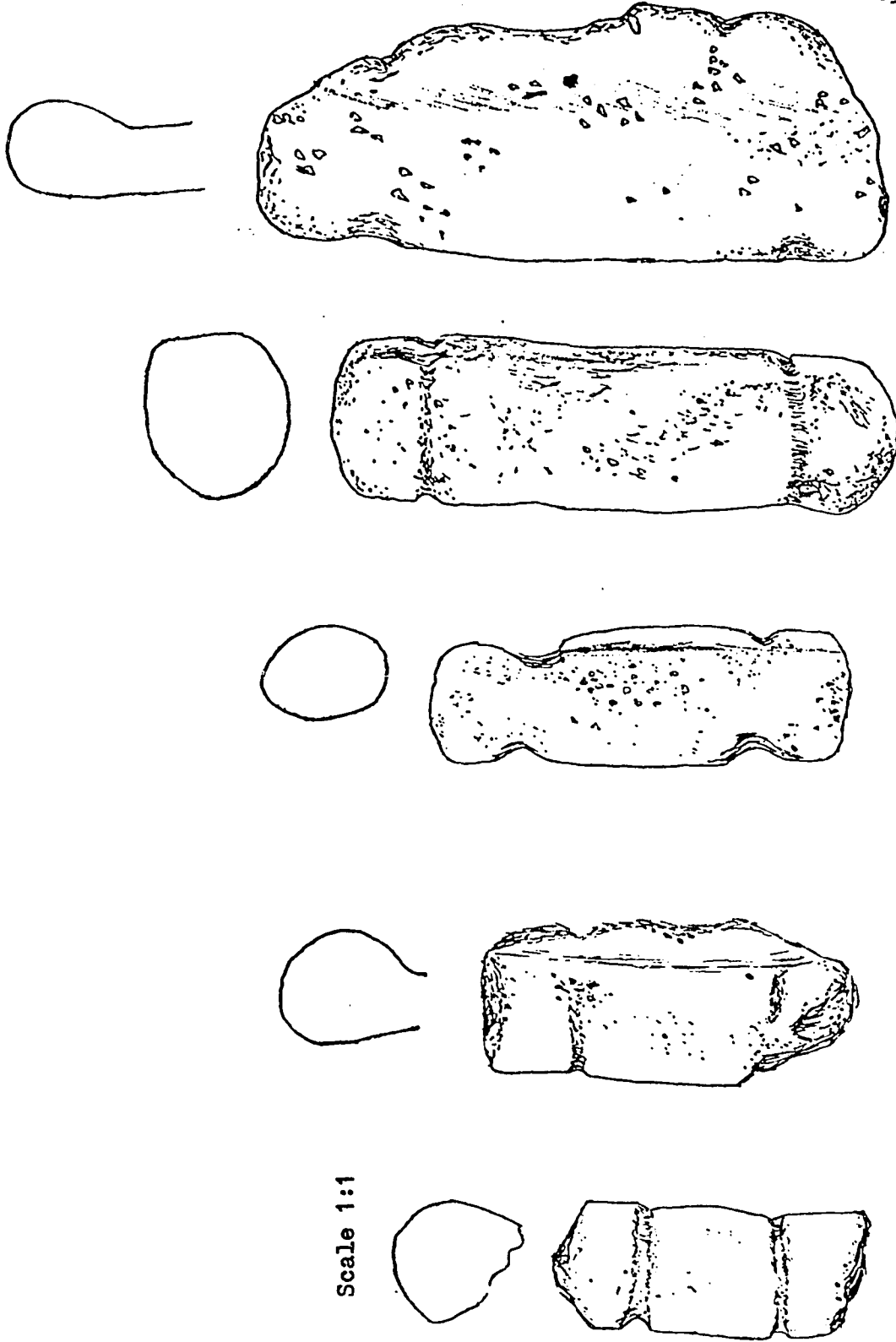


Fig. 24. Zoned Bichrome and Early Polychrome periods: "Notched sherds"

order to determine the temporal placement and to obtain information on the pre-Columbian occupation of this type of setting. A total of 9 1-meter test squares were excavated at the site, 7 being in the saddle between the ridge and the knoll behind the house and the other 2 being at the extreme rear of the flat area occupied by the house. Lack of adequate fencing to prevent animals and small children from falling into the excavations precluded working any closer to the modern dwelling.

Test Squares A, B, C, D, E, F, and G were located in the saddle and were placed in such a way as to minimize the effect of the slightly sloping land surface. With the exception of isolated levels in B, C, and E, all squares were excavated in arbitrary 20 centimeter levels and all excavated materials were screened, although this latter process was somewhat difficult in the lower levels, consisting of extremely compact clay. Excavation details are given in the survey report (McKenzie 1969: 72-82).

Soil conditions at this site had been extremely damaging to the pottery and only occasional red traces remained of what had been slip. Often, whatever decoration was present remained on the soil as the sherd was removed. Therefore, the only decorative diagnostics that can be discussed from this site are those sherds showing incising, a total of 14 out of 505 fragmentary sherds.

Of these decorated sherds, 1 was a chili grater fragment, 1 was Tamino Incised, 6 were Bocana Incised Bichrome (combed), 1 was Garcia Ridged, 3 were Ortiz Engraved, 1 was Morales Incised, and 1 was a double-grooved rim that might be assigned to either the

Schettel Incised or Tamino category; 1 small, solid conical vessel leg was also recovered. With the exception of Garcia Ridged and Morales Incised, all of these types were defined by Baudez (1967). Garcia Ridged was described by Norweb (1964: 559) and Morales Incised is a previously undescribed type.

With the exception of the chili grater fragment, all of these ceramics date to the Zoned Bichrome period. Chili graters are generally indicative of the Early Polychrome period; in this case it may be in a transitional phase, or else other painted representatives of the Early Polychrome period were eliminated from the record by extreme erosion of the pottery. Square J, from which the chili grater was excavated in the surface level, is closest to the modern house, to the water source, and hence was an area that most likely would have been occupied during both Zoned Bichrome and Early Polychrome times.

No lithic materials were recovered in excavations at this site, and no evidence of occupation, such as hearths or house remains, was found.

The relatively light and broad distribution of pottery seems to indicate a short period occupation for this site. The small sized vessels that are indicated by the rim types and the lack of other non-perishable goods suggests that the prehistoric occupants of this area were involved in a type of shifting subsistence and settlement pattern.

RSVP-69-II-44

This site is located in survey square 44 on the north side

of the road running up the east bank of Los Planes Creek. It is on property owned by Daniel Aragon's uncle, on a steep hill north of the road and is best reached by following the fence line. The top of the hill, about 50 meters in diameter, has at least 10 stone-piled graves on top of it. Disturbance at this site appears to be limited to that caused by Mr. Koch, the Peace Corps volunteer. Sherds in possession of the owner indicate that at least some of the graves are from the Middle Polychrome period.

RSVP-69-III-19

Site 19 extends to the left and right of an excellent road running from east to west in survey square 63. The site is limited to the top of a ridge and in most parts is bordered by a drop-off or gully. The Sapoa River is not visible from here and there are several small, intervening ridges. This is a small cemetery, with about 10 of the 30 graves having been opened. The preserved ones consist of low piles of stone. Rocks were not observed in the surrounding area and it is possible that those utilized in grave construction had been brought up from the river. The following cultural materials were collected from the dirt surrounding disturbed graves:

- 1 Murillo Indented-Grooved rimsherd
- 1 Palmares Incised rimsherd
- 1 Papagayo Polychrome rimsherd
- 22 unidentified rimsherds
- 12 undecorated body sherds
- 2 unutilized lithic flakes
- 1 ceramic fish head handle
- 1 unidentified ceramic animal figurine
- 2 hollow ceramic supports
- 4 annular base fragments
- 4 notched sherds

The artifactual remains from this site represent the Middle

and Late Polychrome periods.

RSVP-70-III-95 (Parcel 23)

This site is located on the third ridge east of the creek and just south of the road. This site had never been plowed until the day prior to our survey and any stratigraphy that may have been present in the shallow (10 centimeter) soil was destroyed. An attempt was made to compensate somewhat for this and 6 3-meter square controlled surface collection areas were set out. The following cultural materials were recovered:

- Square A: 36 undecorated bodysherds
5 undecorated rimsherds
5 rocks
1 Bocana Incised Bichrome (combed) bodysherd
- Square B: 4 undecorated bodysherds
1 undecorated rimsherd
- Square C: 18 undecorated bodysherds
5 undecorated rimsherds
2 rocks
1 Schettel Incised rimsherd
- Square D: 11 undecorated bodysherds
2 undecorated rimsherds
- Square E: 37 undecorated bodysherds
4 undecorated rimsherds
1 Rosales Zoned Incised rimsherd
1 Schettel Incised rimsherd
3 rocks
- Square F: 129 undecorated bodysherds
23 undecorated rimsherds
1 Rosales Zoned Incised rimsherd
1 Rosales Zoned Incised bodysherd
1 Tamino Incised rimsherd
12 rocks
3 unutilized chert flakes

Surface collection over the remainder of the site yielded:

103 undecorated bodysherds
 46 undecorated rimsherds
 6 Tamino Incised rimsherds
 1 Rosales Zoned Incised rimsherd
 2 unutilized chert flakes

While this site is obviously from the Zoned Bichrome Period, its most interesting feature is the 2 Schettel Incised (Norweb 1964: 559) rimsherds from Squares C and E. Baudez (1967: 81) subsumed this under his Tamino Incised type. Both he and Norweb defined that type on the basis of either single or multiple incisions (grooves) around the flat-lipped orifice of the vessel. However, the multiple incised examples are distinctive both in the shape of the rim and the broad grooving and it is suggested that the term Tamino be kept for single line examples, since these most closely approximate other Tamino styles, and to preserve Norweb's term "Schettel" to apply to the multiple groove style. Baudez apparently found only 1 multiple grooved rim in his Tempisque work and they are unrepresented in Coe's preliminary reports on his Pacific coastal work in Costa Rica.

South of the San Dimas ITCO Colony, the landform changes. The cliffs bordering the river are close in and there are almost no open bottom lands. Soil, both in the constricted river bottom and on the adjacent bluffs and saddles, is much less fertile than that found in similar locations to the north. The comparatively poor potential of the area is accented by the fact that it is completely uninhabited at the present time, with the exception of remote moonshiners' shacks.

The only partial broadening of the Sapoa River Valley south of San Dimas is at a point where the Sanzapote River, which runs only part of the year, joins the Sapoa. Gentle slopes down to the river and relatively fertile plains appear to have made this a favorable habitation spot. Eleven sites were surveyed, 1 of which is reported below.

RSVP-69-III-49

Site 49 is close to Site 48 and is in the central eastern portion of survey square 78. It is about 100 meters west of the Sapoa River with a promontory to its north; to its south is a road on the north side of Carmen Creek. The areal extent of the site is 200 meters north-south and 80-100 meters east-west. The land is now under cultivation. The following cultural materials were collected:

- 1 Tamino Incised rimsherd
- 1 notched sherd fragment
- 15 undecorated rimsherds
- 42 undecorated bodysherds
- 1 red-slipped, grooved rimsherd (Tamino?)
- 1 quartz fragment
- 2 nutting stones

This site is from the Zoned Bichrome period.

SITES BETWEEN THE RIVER AND THE
BAY OF SALINAS

This area consists of flatlands to the east of the Sapoa River, gradually sweeping up to the flanks of the volcano Orosi, and the rougher volcanic land to the west of the river running to the drop-off to the Bay of Salinas. The following sites are reported from this area:

RSVP-69-V-15

The Las Pilas cemetery, so-called because of 2 abandoned water tanks on an adjacent bluff, is located 2 kilometers south of the town of La Cruz in the Nicaraguan frontier area of Guanacaste Province. It is 3 kilometers west of the Sapoa River, on a volcanic ridge overlooking the Bay of Salinas to the west and the plains at the base of the volcano Orosi to the east. The site has been known to huaqueros for a number of years.

The cemetery consists of approximately 80 pre-Columbian tombs, 65 having been looted. With the exception of 3 graves located on a flat portion of the eastern slope, all tombs were distributed randomly along the top of the 300 meter long ridge.

The graves had been dug either from volcanic rock or from rubble depending on their location. Most appear to have been rectangular in shape, approximately 1 meter wide by $1\frac{1}{2}$ meters long and between 1 and 2 meters in depth. Most of the graves were individual units, although a few are connected by short, sub-surface tunnels. Whether this, and other features of grave construction, represent original dimensions or are the result of looting, or both, was impossible to determine. The graves have no particular orientation in their inter-relationships and in their relationships to cardinal points and prominent geographical features. Undug graves are identified by a concentrated circle of rock approximately 2 meters in diameter at ground level.

The cemetery has produced many ceremonial stools and fine jade specimens and this was probably a principal reason for its

almost complete devastation. A reliable informant, who participated in some of the early "excavation," stated that little pottery was found in any of the graves and that human skeletal material had decomposed rapidly on exposure. Surface collection during the 1969 season revealed the presence of Zoned Bichrome ceramics; for this reason a decision was made to salvage as much data as possible during the 1970 field season.

The "backdirt" was almost always clearly associated with the grave from which it came and this debris, along with loose soil from the bottoms of graves and exposed wall profiles was sifted through a $\frac{1}{4}$ " mesh screen in order to recover diagnostic ceramic materials. Excavation in undisturbed graves was not possible.

Of the 65 graves examined, 40 yielded cultural material. All ceramic material found was from the Zoned Bichrome period, predominantly Bocana Incised Bichrome (both combed and uncombed varieties) and Rosales Zoned Incised (Baudez 1967).

The general scarcity of ceramics is reflected in the total of 619 sherds recovered, 109 of which were diagnostic. In addition, one grave yielded a small pyrite crystal with an anthropomorphic figure carved on one face; another grave's backdirt produced a jade amulet similar to the one illustrated by Hartman (1907: Plate XXXVI, 8); and the jadeite amulet in Fig. 54 was surface collected in the 1969 survey. A number of metate fragments were also recovered.

RSVP-69-V-43

This site is located in survey square 121 and is on the

first hill south of La Cruz. It is approximately 300 meters west of the Pan American Highway and just off the northeast tip of the ridge containing the Las Pilas cemetery. The area is the location of at least a dozen petroglyphs, some of them in good condition. Others are in an advanced state of decay and it may be conjectured that previously there were many more (Fig. 25). A trench dug through the top of the hill while laying a water pipe revealed no cultural materials. Two lithic implements, a core and a knife, were surface collected from the hilltop (Fig. 25). The knife is made of weathered chert and is 8.5 centimeters long, 3.5 centimeters wide, and 1.8 centimeters thick. The core is also of weathered chert and is 7 centimeters in diameter.

RSVP-69-V-55

This site is located in survey squares 173, 174, and 191, stretching along the first ridge of the east bank of the Sapoa River. The site consists of a large cemetery, the graves being marked by circular stone enclosures above ground level. Many of the graves are located along the edge of the bluff. Some of the stone enclosures are more than 1 meter in height and 3 meters in diameter; others are smaller. More than 30 enclosures are associated with the site and very few appear to have been disturbed. No surface cultural materials were found with the graves.

Summary

This area also contains at least 1 isolated petroglyph (Site 35) and 3 small ceramic sites, none with diagnostic

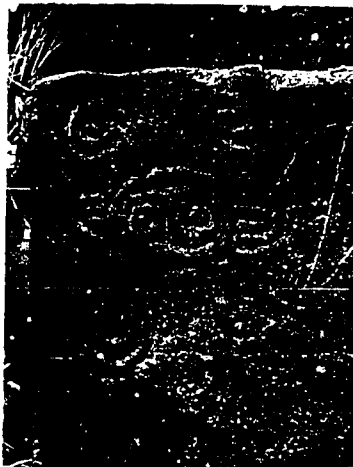
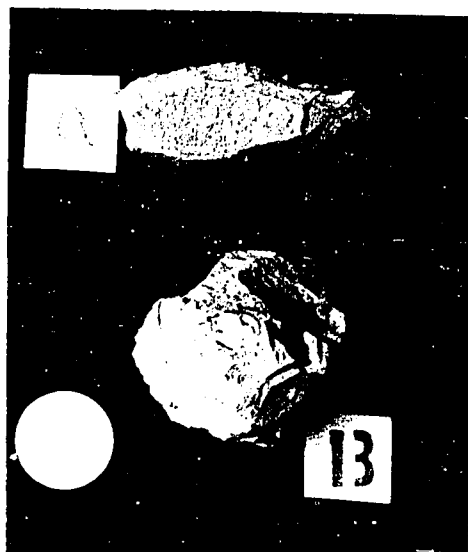


Fig. 25. Site 43: Petroglyph (above) and lithic implements (Below).



material. This concentration of sites around Las Pilas does, however, suggest a focus of activity. The view from Las Pilas to the volcano Orosi is a commanding one and this may have figured in the ceremonial aspects of the society.

The flat-lands along the river in this part of the region have either very little or no soil cover. Also, the cliffs are quite steep and do not allow access to the river in many places. It would appear that this region was only very sparsely settled.

BAY OF SALINAS SITES

The coastal survey was initiated for two main purposes: 1) to provide a western end to, and to complete the link between, the Pacific Ocean and Lake Nicaragua and 2) to see whether the coastal occupation found by Coe farther south was also present here. In the latter case, we had some idea of what we would find, as Flint's nineteenth century map indicated the presence of a number of shell mounds.

This bay had 3 potential major attractions for the prehistoric inhabitants, 2 economical and 1 subsistence. The unique geographical character of the region, with very limited fresh-water run-off in the bay for 6 months of the year, causes a period of very concentrated salinity. This is coupled with, during the same time period, the strong east to west winds blowing off the high cliffs bordering the bay. This creates an excellent condition for rapid evaporation and the situation was possibly very conducive to the production of salt. Salt

manufacture is a modern-day industry of minor importance, and we wanted some measure of comparable prehistoric practices.

In addition to possible salt-making activities, the Murex shells found on the tidal rocks of the bay were a source of purple dye. It was extensively traded in pre-Columbian times and continued to be economically important along the Guanacaste coast until the nineteenth century. Coe found these shells to be very prominently represented in his excavations on the Santa Elena Peninsula. Baudez and Coe (1962: 372) also speculated that population increases during the Middle Polychrome time period were stimulated by expansion of the purple dye trade.

The Bay of Salinas also possesses a great subsistence potential. In addition to large and small fish, green turtles, crabs, and sharks, quantities of edible mollusks are found either in the shallow waters or clinging to the rocks along the shore. The extensive salt flats were probably important for attracting game animals to the coastal region.

While a large population would find a shortage of water during the last few weeks of the dry season, some fresh water is always available. In the days before the entire area was cleared for cattle ranching many creeks that now run dry during the summer months ran all year. Today, grasses cover most of the area with the exception of tree-flanked creeks and rivers. The salt flats are surrounded by low, scrubby, trees and grasses.

With the exception of the concentrated survey that was carried out around Site 26, exploration of the bay region was

accomplished by starting at the base of the cliff below La Cruz and walking one path to the water's edge and another back to the cliffs. Survey was not intensive on the south side of the bay and information from local people indicated that many additional sites will be found upon intensive re-examination of the area.

The area was also important in modern Costa Rican history until quite recently. Before the Pan American Highway was built, Port Soley on the Bay of Salinas was maintained by a government garrison and supplies were brought by boat from Puntarenas and distributed into the La Cruz region from government warehouses. During the 1948 revolution the insurgents destroyed the garrison, and with the beginning of the construction of the highway shortly thereafter, the port fell into its present state of dis-use.

Shell Mounds/Middens on Estuaries and Creeks

RSVP-69-VII-26

This site is the largest in the area, covering approximately 3 acres around the Finca Las Marias, and is composed of an undulating shell midden up to 5 meters in depth. It is slightly less than 1 kilometer from the bay and, to the south of the hacienda buildings, a small creek has eroded away an edge of the shell midden. It was at this place that our initial surface collections were made in 1969; when we returned to the property at the end of the dry season, it had been burned over and the great extent of the midden area was more easily visible. At this time, much of the rest of the area was surface collected. Pot-hunting by local persons had thrown up a large number of sherds

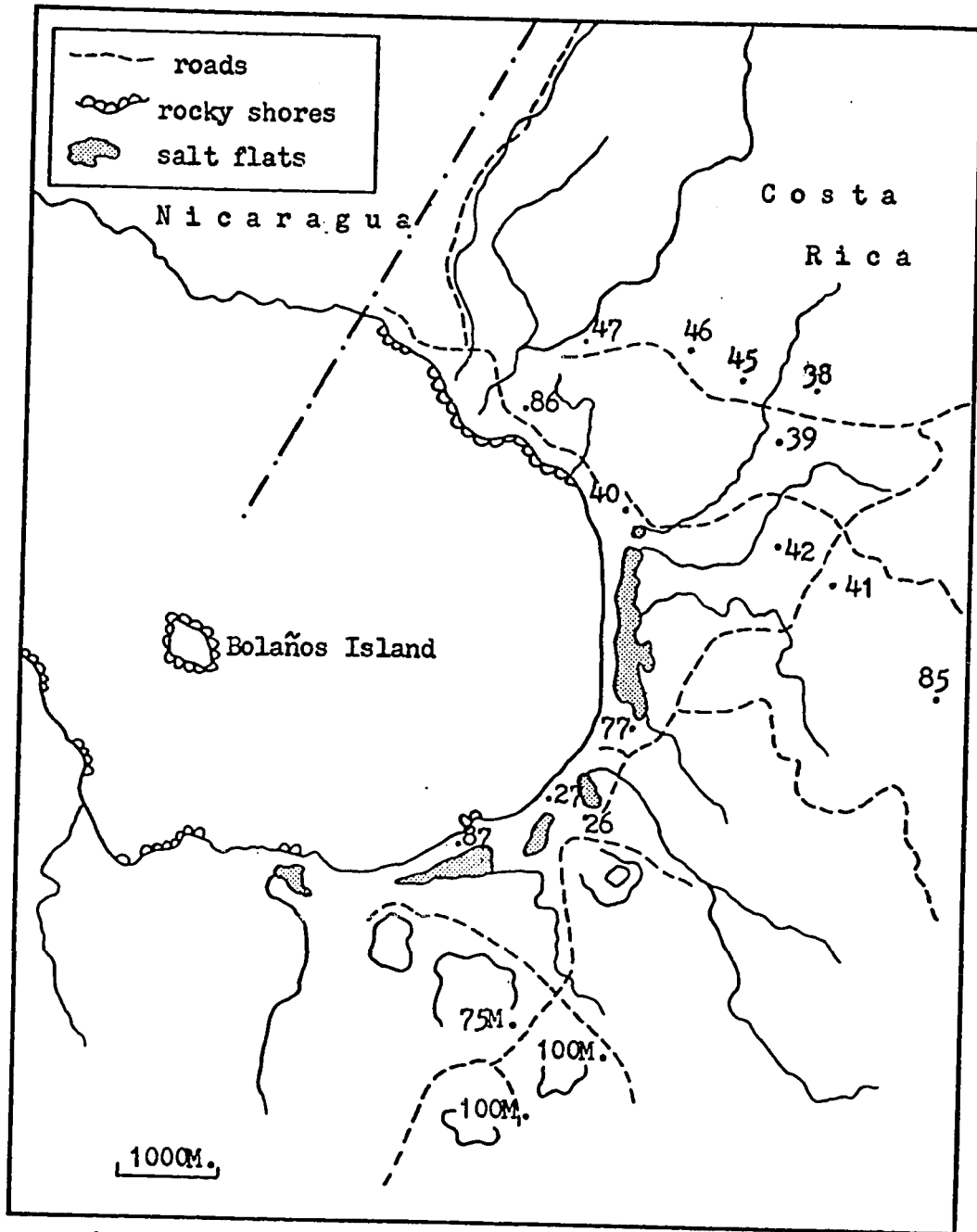


Fig.26 . Location of sites around the Bay of Salinas, Sapoa River Project area.

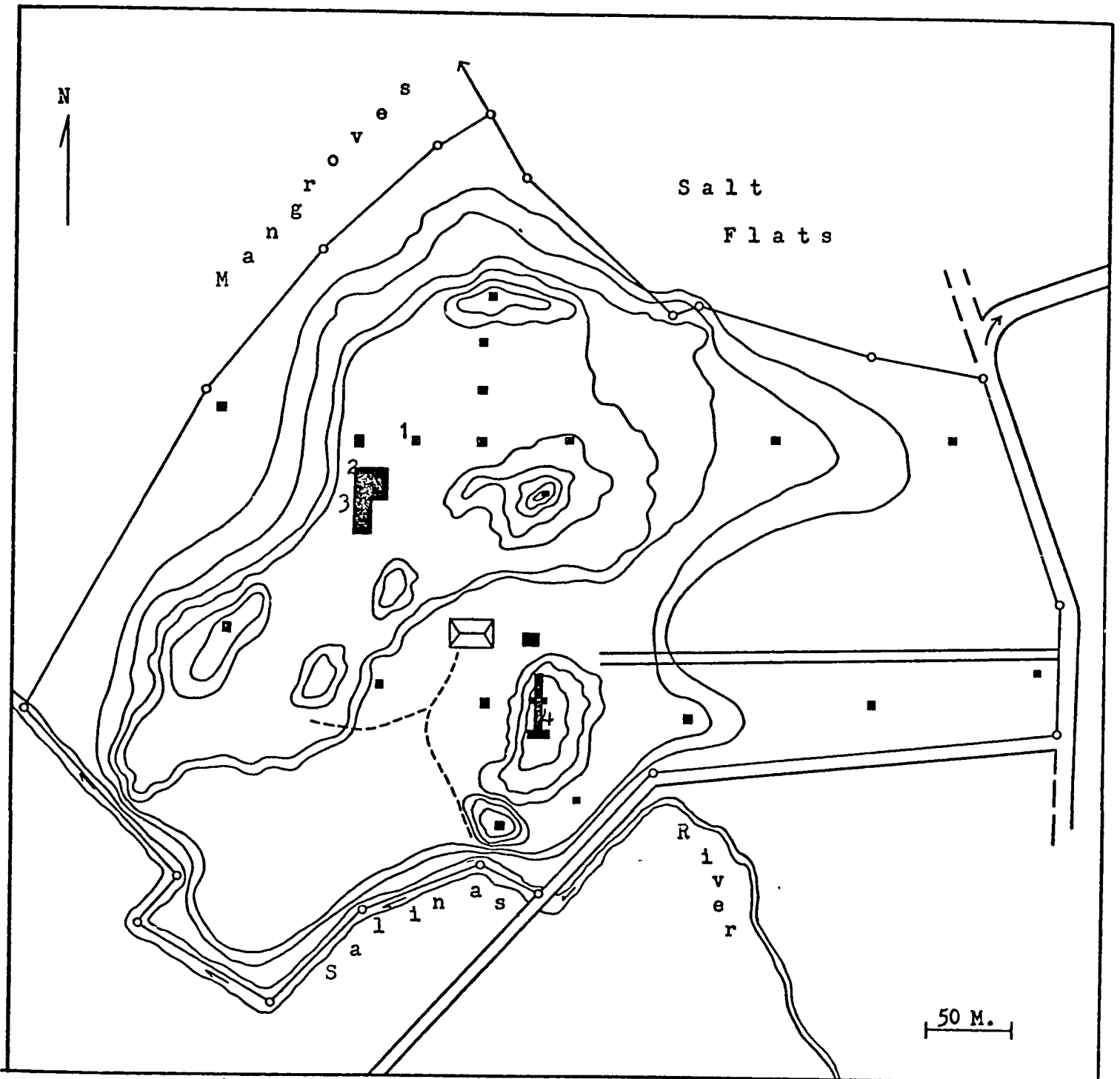


Fig. 27. Las Marias (Site 26). Location of excavation units discussed in text 1) N100 E 18, 2) N6 E0, 3) S7.5 E0 + 1, and 4) N6 + 7 E0 +1.

fragments, giving some indication of the immediate sub-surface stratigraphy at the site. The following materials were surface collected:

- 1 Murillo Applique bodysherd
- 2 Vallejo polychrome rimsherds
- 9 Murillo Indented rimsherds
- 7 Murillo Grooved rimsherds
- 1 Alan Incised-Murillo Indented rimsherd
- 1 Alan Incised rimsherd
- 8 Murillo Punctate bodysherds
- 3 Mora polychrome rimsherds
- 4 Papagayo polychrome rimsherds
- 2 Lunoid polychrome bodysherds
- 1 ridged handle
- 1 fish head handle fragment
- 9 unidentified polychrome rimsherds
- 4 incised bodysherds
- 7 unidentified polychrome bodysherds
- 3 strap handles
- 1 polychrome figurine fragment
- 5 metate fragments
- 3 mano fragments
- 95 undecorated rimsherds
- 17 undecorated bodysherds

Excavation

On May 25 and 26, 1969, a brief exploratory excavation was made at the site, taking advantage of an open pot-hunting pit. Due to very limited time, we were unable to excavate to a sterile level, but dug 110 centimeters in the midden deposit in a 50 by 25 centimeter column. The results of this testing are shown in Fig. 21 .

Test results at the site, both in terms of the ceramic preservation and variation and the quantities of ecological data available in the midden suggested that it would be very profitable to work further at this site and it became the focal point of our efforts in the bay area during the 1970 season.



Fig. 28. Late Polychrome period, various engraved wares.

<u>Natural Depth</u>	<u>Excavated Depth</u>	<u>Diagnostic Pottery</u>
0-20 cm. dark, organic, few shells	0-15 cm.	Murillo Punctate, Vallejo Polychrome
20-30 cm. gray powdery, medium shell concentration	15-35 cm.	Murillo Punctate, Vallejo Polychrome, Lunoid Polychromes,
30-50 cm. gray granular, dense shells	35-50 cm.	Lunoid Polychromes
50-60 cm. light gray, dense shell concentration	50-65 cm.	Murillo Punctate, Vallejo Polychrome, Lunoid Polychromes, notched sherds
60-80 cm. light gray, fine grain, medium shell concentration	65-75 cm.	Vallejo Polychrome, Mombacho Polychrome Incised
80-90 cm. light shell concentration	75-90 cm.	Murillo Punctate, Vallejo Polychrome
90-110 cm.	90-100 cm.	Murillo Punctate
	100-110 cm. very fine powdery gray, light shell concentration, with greatest number at the bottom of the level	Fish-head handle

Fig.29. Results of 1969 test excavation at Las Marias shell midden.

One small mound on the lower and eastern portion of the midden was partially trenched and cleared in an attempt to locate a house or living surface. In addition, a second area was cleared on the western and upper part of the midden and 8 2 by 2 meter test squares and 8 1 by 1 meter test squares were placed in different parts of the site, ranging in depth from 15 centimeters to almost 5 meters below surface.

The site can generally be divided into a higher and lower portion and the arrangement, as at Coe's Chahuite Escondido site (1962: 360), seems to be that of a number of small mounds around a cleared central area on both levels. Excavation in both central portions at Las Marias revealed a thin surface layer of Late Polychrome material. On the upper level of the site this was succeeded by sterile soil, while on the lower level Middle Polychrome period middens were encountered at two different points at depths of 1.6 and 1.0 meters below surface, with sterile soil being beneath these levels.

Selected excavation units from the site will be utilized to give a summary of its temporal occupation and the implications of the large quantity of marine debris recovered. Additional diagnostic material from other excavated units will be introduced and described when they are of particular interpretative importance.

The area S 7.5 E0 + 1 was on the western hill of the site. It was part of a larger area that was cleared at this location in an attempt to locate post-holes or other structural remains. The 1 by 2 meter area was dug by natural levels and a 100% mollusca

collection was made from all levels. Fig. 30 shows the distribution of diagnostic ceramics in the surface level and 4 of the 5 lowest levels. The fifth level's diagnostic material was among that lost by Pan American Airlines, as were 2 other levels of material from this sequence. Two other upper levels contained no diagnostic material, so only the lowest portion of the excavation is considered here, the objective being to illustrate the Early Polychrome component at the site.

There is no developed Late Polychrome level in the sequence. The surface level (Lot 451) is transitional from Middle Polychrome (ca. 1200 A. D.) and both Luncoid polychromes and Mora Polychrome are present in the following period. However, no Murillo ceramics are present and this suggests a time placement prior to the fully developed Late Polychrome.

Lots 720-724 are placed in the Early Polychrome category; 723 and 724 could be placed in an early subdivision of that period that is sometimes made (the Linear Decorated phase), but the characteristics of this period and its temporal boundaries are only very inadequately known. Therefore, I have used the term Early Polychrome to cover the time period A. D. 300 to 800, rather than a split A. D. 300 to 500 (Linear Decorated) and A. D. 500 to 800 (Early Polychrome) that is sometimes made.

In contrast to the changes evident in the decorated ceramics, the simple culinary vessels show no essential change through time, with the typical red-rimmed type appearing in all levels.

The 4 Chavez White-on-Red vessel fragments from Lot 724

<u>Lot</u>	<u>Depth</u>	<u>Ceramic Inventory</u>
451	0-(5-30) cm.	1 Mora Polychrome rimsherd 2 Lunoid Polychrome rimsherds 109 undecorated bodysherds 1 polychrome figurine fragment
720	21-(35-49) cm.	1 Nosara Polychrome rimsherd 3 small, solid vessel legs 2 Carillo Polychrome bodysherds 1 Galo Polychrome bodysherd 55 undecorated bodysherds
721	(35-49)- (50-60) cm.	2 Carillo Polychrome bodysherds 1 small, solid vessel leg 29 undecorated bodysherds
723	(65-75)- (70-80) cm.	1 Nosara Polychrome bodysherd 20 undecorated bodysherds
724	(70-80)- (85-90-93) cm.	2 Cervantes punctate bodysherds 1 Charco black/red bodysherd 4 Chavez White-on-Red bodysherds 81 undecorated bodysherds

Fig.30. Ceramic inventory from Las Marias, Square S7.5 E0 + 1.

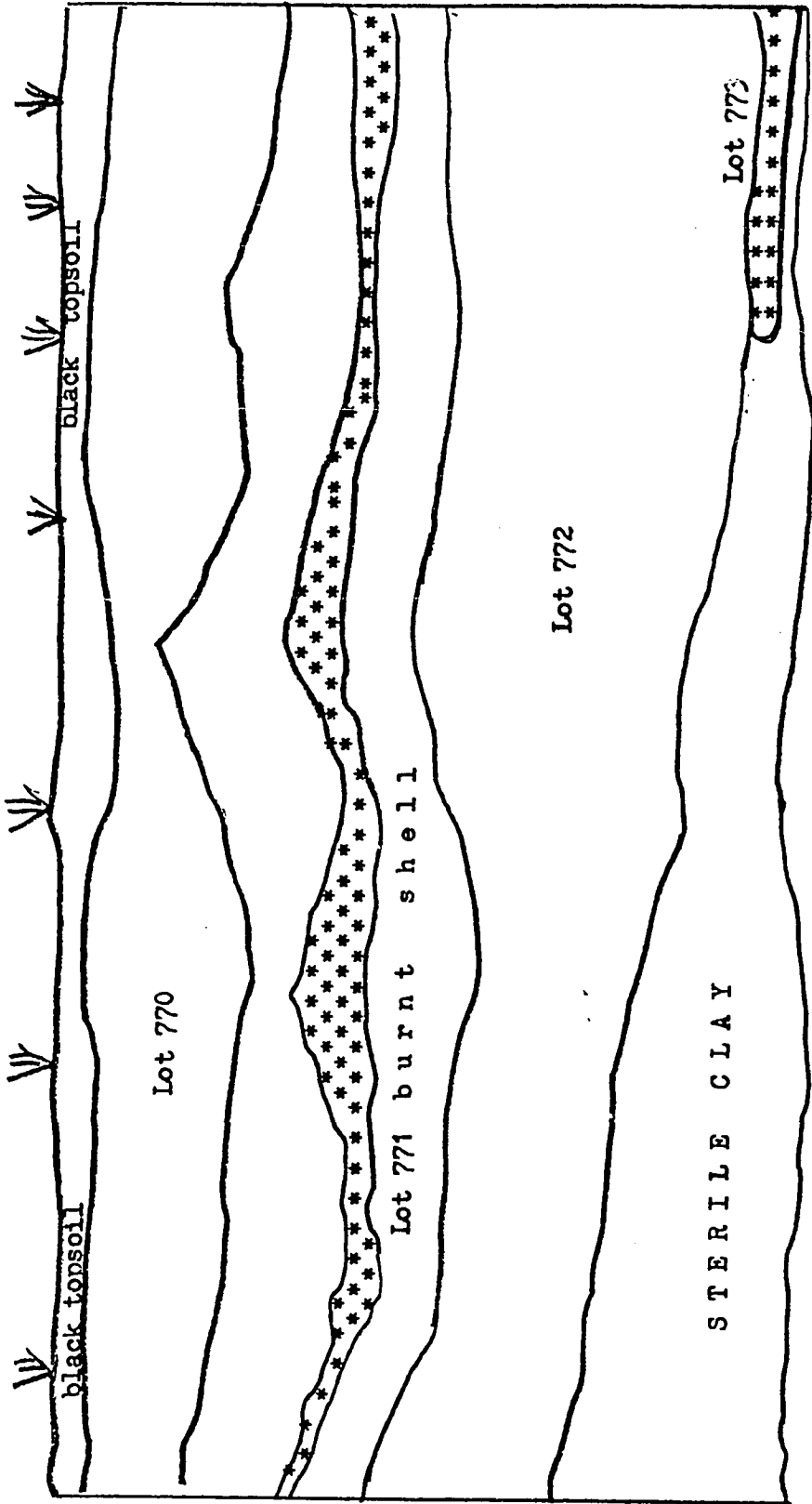


Fig. 31. Profile of west wall of N100 E18, showing heavy shell concentrations (****) and hard clay levels with only scattered shell fragments (unmarked)

are particularly interesting and are discussed in conjunction with material from Square N100 E18.

Square N100 E18 was also located on the upper part of the site and was tested as part of the horizontal distribution study. It was sampled by 2 different means. First, the square was excavated in arbitrary 15 centimeter levels to a depth of 1.05 meters and all diagnostic artifacts were bagged. Second, the west wall of the exposed pit was profiled and diagnostic sherds were removed from the principal cultural levels. The latter step, employed as a cross-check, enabled the arbitrary levels to be internally subdivided on the basis of comparative data. No shell material was saved or counted in situ from this location. The 1.05 meter level represents the sterile, crumbly decayed rock characteristic of the subsurface of the site. Fig. 23 shows the material recovered from this square.

The hard chunky, black surface level represents the thin Late Polychrome component in this section of the site, with some mixing occurring as deep as 45 centimeters. The Lunoid polychrome rimsherd and Vallejo polychrome vessel leg are both indicative of the latter Middle Polychrome-Early Late Polychrome transitional period, while the Murillo Grooved rimsherd is from the fully developed Late Polychrome. All other ceramics in the section are from the Early Polychrome period.

The Uaxactun Unslipped Ware, Cambio Group (Smith and Gifford 1966: 169) ware from Lot 704 is particularly interesting. Joseph W. Ball examined the Las Marias example and expressed the opinion that this was a trade piece rather than a local imitation.

<u>Lot</u>	<u>Depth</u>	<u>Ceramic Inventory</u>
705	0-(15-25) cm.	1 large handle 1 Vallejo Polychrome vessel leg 2 solid vessel legs 1 applique fragment 2 Madeira Polychrome rimsherds
701-702- 770	15-(40-45) cm.	1 Murillo Grooved rimsherd 1 Lunoid Polychrome rimsherd 1 Carillo Polychrome bodysherd 1 Congo Punctate rimsherd 1 Papagayo Polychrome rimsherd 1 Murillo Applique ornamentation 2 solid vessel legs 1 Leon Punctate bodysherd 1 Charco red/black bodysherd 1 Alhambra bodysherd
700-771	30-60 cm.	3 solid vessel legs 3 Charco black/red bodysherds 15 Chavez White-on-Red bodysherds 1 red-painted alligator ware bodysherd 1 Alhambra bodysherd
703-772	50-90 cm.	4 solid vessel legs 18 Alhambra rimsherds 3 Leon Punctate bodysherds 1 applique ornamentation 1 red-painted alligator ware bodysherd
704-773	90-105 cm.	2 solid vessel legs 1 Leon Punctate bodysherd 1 red-painted alligator ware bodysherd 1 Uaxactun Cambio Phase vessel fragment 1 Alhambra rimsherd

Fig. 32. Ceramic Inventory from Las Marias, Square N100 E18.



Fig.33. Early Polychrome period, Carillo Polychrome.



Fig. 33a Early Polychrome period, Leon Punctate "Chili Graters"

Typologically, this ware has a strong resemblance to the commonly called Costa Rica "Alligator Ware," the significant differences being in the distinctive buff surface color, the non-local paste, and the placement of the decorative nodes or "spikes." The alligator ware examples from this location are somewhat different in that they appear to have been painted red between the clusters of surface nodes; other known examples are not painted (Baudez 1967: 171).

Two different styles of line decoration on red-slipped ceramics are seen. One has whitish-orange to light reddish-yellow lines in linear and rectilinear patterns. The lines in this case are uneven along the edges and somewhat eroded. The second style is a clear or creamy white, found in the same general designs and also on vessels with structural ridging on the body.

The former style was designated as Nandaime Ware by Lothrop (1926: 217) and Chavez White-on-Red by Norweb (1964:559); it is unknown in the Tempisque River series described by Baudez. The second style is felt to contrast sharply with the other white line on red styles in the clarity of the design and the overall technical quality shown (see pages 164 to 166).

The presence of chili graters is also indicative of the Early Polychrome and generally corresponding temporal periods in associated regions. The Las Marias types seem to be generally of the type named "Leon Punctate" by Norweb (1964: 559) and were also included under the Nandaime Ware grouping by Lothrop (1926: 219).

Square N6 E0 in Area II, the higher portion of the site to the west, was an extension of earlier attempted excavations in

that area. The initial excavation was halted by the uncovering of a burial group (Faulwell 1970); it was later decided to sink a 3 by 2 meter pit to sterile soil at the western end of the area to examine the cultural stratigraphy at this point. After reaching sterile soil at a depth of 4.5 meters, the north wall of the trench was profiled and a 1 meter square column of mollusca was counted in situ for the entire depth of the deposit. This meter square was then excavated and screened, with all material larger than $\frac{1}{4}$ " square being placed in large gunny sacks and transported to the laboratory for sorting and analysis. The extreme slope of the deposits makes numerical descriptions of depth somewhat ineffective, so the following diagnostic materials are presented in terms of the Lot numbers, indicated on the profile of the pit (Fig. 34).

Lot	Diagnostic Material
1084	1 Papagayo polychrome rimsherd 1 Papagayo polychrome bodysherd 1 Murillo Grooved-Indented rimsherd 1 Murillo Grooved rimsherd
1085	6 Mora polychrome bodysherds 1 3 ridged vessel handle 23 Papagayo polychrome bodysherds 1 Papagayo polychrome rimsherd 1 small, solid conical vessel leg
1087	1 medium solid, conical vessel leg 6 untyped Early Polychrome bodysherds
1086	2 Carillo polychrome bodysherds 1 medium sized, solid conical vessel leg

This sequence shows the complete progression from Early to Middle to Late Polychrome at the site. This was the result of testing out over the lip of the original hill line and finding an

area where the Middle Polychrome materials had been pushed out over the edge.

The 3 ridged handle (Fig.22,A) is common to the area and was also found in Middle Polychrome contexts at Sites 1 and 6 in the San Dimas Valley. Because of the limited sample of each type, the unnamed Early Polychrome sherds in Lot 1087 are identified only by period designation.

In summary, Lots 1087 and 1086 form the Early Polychrome component, Lot 1085 the Middle Polychrome component, and Lot 1084 the Late Polychrome component.

Square N6 + 7 E0 + 1 is a 2 by 2 meter unit on the southern end of the main trench on the lower portion of the site. It was excavated in natural levels, and although extensive mollusca sampling was done in the trench, no samples were taken from this exact area. The diagnostic material, all from the Late Polychrome period, is shown in Fig. 36 .

House Remains

While no actual remains of houses, such as post-holes, wall trenches, or adobe or stone construction were found at Las Marias, approximately 50 adobe fragments showing the impressions of branches from 2 to 6 centimeters in diameter were recovered. From these it might be inferred that housing was of a semi-permanent wattle and daub construction.

Physical Development of the Site

While house remains were not present, the site itself does seem to have undergone some artificial alteration and development.



Fig. 35 Late Polychrome period, adobe fragments, Las Marias (Site 26).

Lot	<u>360</u>	<u>550</u>	<u>551</u>	<u>552</u>	<u>806</u>
Depth	0-)	(3-21)	(20-40)	(40-50)	(50-70)
cm.	3-10)	(10-26)	(30-40)	(40-58)	

HANDLES

Strap:					
Large	1	6	3	4	1
Medium	3	4	2	3	-
Small	-	1	-	-	-
Brushed	-	-	1	-	-
Noded	1	1	-	-	-
Fish Head	1	1	3	3	1
Circular	-	-	1	2	1

VESSEL LEGS

Small, solid, conical	1	-	-	-	-
Medium, solid, conical	-	-	1	-	-
Medium, hollow (with rattle)	-	-	1	-	1

POLYCHROMES

Papagayo	-	-	1	5	-
Bramadero	-	6	-	-	-
Mora	1	1	1	-	-
Lunoid					
Rimsherds	3	12	6	7	-
Dolphin head legs	-	2	-	2	-
Tapir head leg	-	1	-	-	-
Human head leg	-	-	1	-	-
Unidentified	-	1	-	-	-

INCISED-ENGRAVED

Castillo Engraved	1	-	-	-	-
Alan Engraved	1	2	5	4	-
Fine parallel-lined	1	-	-	-	-

MURILLO

noded, hollow, leg	1	-	-	-	-
Red: Rimsherds					
Punctate-Grooved	1	-	-	-	-
Punctate (Indented)	1	-	1	4	-
Applique strip bodysherd	3	3	-	-	-
Hollow Vessel leg	-	-	-	1	-
Shrimp head adorno	-	1	1	-	-
Brown:					
Grooved Punctate rim	1	2	-	-	-
Punctate circle	-	1	-	-	-
Grooved vessel frag- ments	-	3	1	3	-

-Continued-

(continued)	Lot	<u>360</u>	<u>550</u>	<u>551</u>	<u>552</u>	<u>806</u>
	Depth	(0-	(3-21)	(20-40)	(40-50)	(50-70)
	Cm.	(3-10)	(10-26)	(30-40)	(40-58)	
Black:						
Punctate rimsherds		1	4	1	2	-
Punctate flared rimsherds		1	1	-	1	1
Applique hand		1	-	-	-	-
Punctate applique animal figure		-	2	-	-	-
Adorno head		-	1	1	-	-
Applique strip bodysherd		-	2	-	-	-
<u>OTHER</u>						
Mushroom effigy (black)		-	1	-	-	-
Ear plug (black)		1	-	-	-	-
Weathered, grooved-punctate		-	1	-	-	-
Weathered adorno head		-	1	1	-	-

Fig. 36 Ceramic inventory, Las Marias, Square N100 E 18.

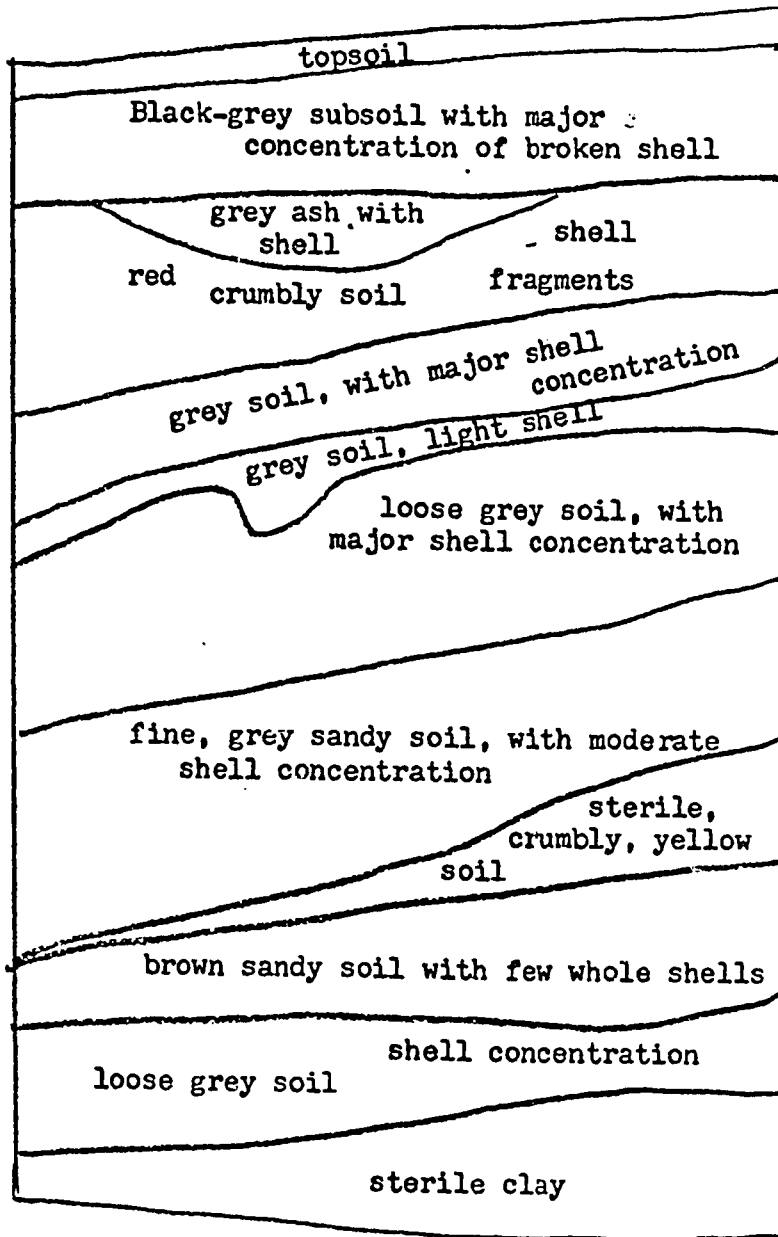


Fig. 37. Profile of N17 W1, representative of trench through Late Polychrome component on lower level of site.

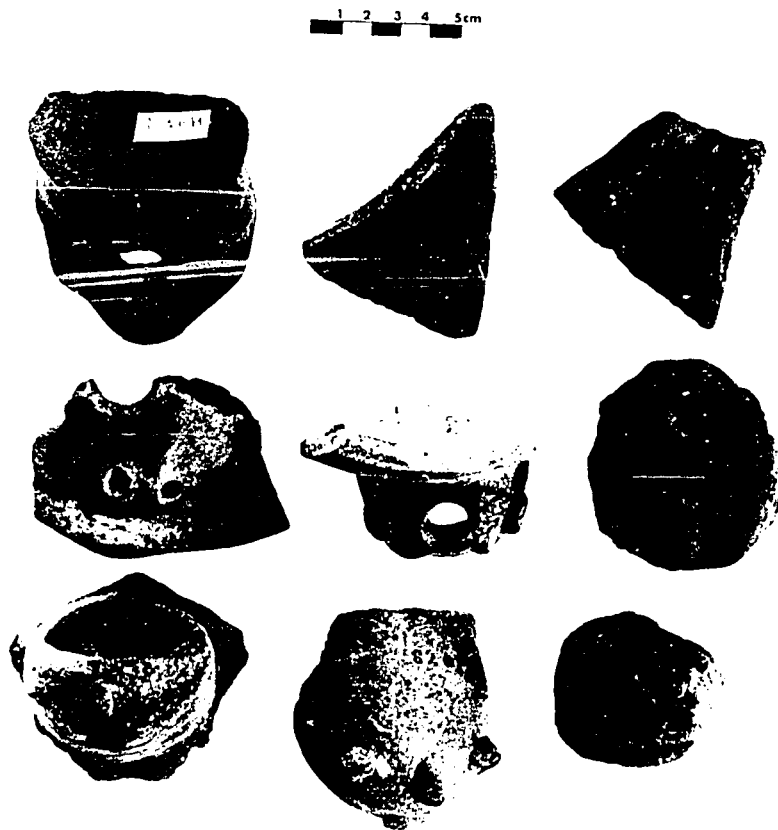


Fig.38. Middle and Late Polychrome vessel handles, effigy style.



Fig. 39. Late Polychrome period, stone bowl fragments and lithic artifacts, Las Marias (Site 26).



Fig. 40. Late Polychrome period, tripod vessel supports.

A common feature of the site is levels of almost sterile clay, with scattered shell and sherd fragments, interspersed with the heavy shell and ceramic-bearing levels. Such a level forms the bottom of the trench from which Square N6 + 7 E0 + 1 was reported. As shown in the profile of Square N6 E0 (Area II) a number of such levels were present at that location. In a deep pit excavated at the south end of the long, main trench, these levels are quite thin, level, and occur as alternating series with thin, black organic bands to a depth of almost 5 meters. Correlated with what the local family told us about the spring floods, these appear to be a depositional phenomena and in this case the large amount of debris deposited on the southern bank of the site during Late Polychrome times had effectively influenced the course of the creek.

On the upper levels of the site, in Squares N6 E0 and N100 E18, these levels are of a greater and quite irregular thickness. Rather than being level, they follow more or less the contour of the slope they are on and are much too high to have been deposited by flooding. The hard-packed nature of the clay seems to rule out any possible aeolian deposition, and it appears that these levels were made artificially by man. In general, these semi-sterile layers separate gross temporal divisions (Early, Middle, and Late Polychrome) and their purpose may have been to prepare the surface of the site for habitation during successive occupation periods.

SITES ON SALT FLATS OR SALITRES

The salt flats in the area are typically within .5 kilometers of the sea, with their close to sea level elevation causing inundation

during high tides. The open parts of the salt flat, being as large as 3 to 4 hectares in size, vary from a dry, hard condition to one that is very slippery and muddy when wet.

The flats themselves support no vegetation, but there is abundant xerophytic growth on the hills and surrounding low mounds. Karolik and Yancey (1970: 82) listed a number of the more common plants. In addition, mangroves are generally found surrounding the flats and are especially abundant on the sections opening toward the ocean.

At the present time the salt flats are covered by sea water only during a combination of high tides and heavy rains during October and November. Fresh water inundation occurs on a temporary basis during the rainy season onset or following infrequent dry season cloudbursts. The major period of inundation is sufficient to essentially double the submerged area, as indicated by mangrove knees extending a considerable distance into the scrub-covered flat to the east of the salitre proper.

Dry season fauna around the flat include lizards, crabs, parrots, hawks, snakes, and squirrels. However, the rainy season, of which we were able to observe only the first 2 weeks, must have a profound effect upon the local ecology.

There are 6 major salt flats around the edge of the Bay of Salinas, all having pre-Columbian manifestations around them in the form of sherds on the surface of low ridges or mounds. Whether or not the presence of the salt flats was a determining factor in the settlement here by the aboriginal peoples is quite indefinite and will be discussed in more detail later.

RSVP-70-VIII-87

This site consists of a series of ridges surrounding the salt flat in survey square 183. The site of Las Marias is essentially bounded by this salt flat to the west and the salt flat Site 63 to the northeast. Only the eastern edge of the first flat was surveyed in 1969 and this led to one major mound on that side being designated separately as Site 27.

This salt flat area was tested during the 1970 season by placing test pits on ridges along the southern half of the flat (Fig. 41). As can be seen from the diagram, the northern or bay end of the flat is bounded by mangroves and no cultural material was observed.

Surface collection at the site was limited, since sherd decorations erode rapidly in the saline climate; two halves of a broken ground stone celt and a chert scraper were collected in the general area of Test Pit 1. The results of work in this area are discussed in more detail by Karolik and Yancey (1970) and only Test Pits 1 and 6 have been selected here as representative of the area. The same conditions that prevail on the surface in terms of sherd preservation are also influential to a depth of more than 1 meter. It was only at the base of the deposits, or in a rare stroke of luck in the upper levels that decoration was preserved.

Test Pit 1 was laid out as a 2 by 2 meter square on a low ridge and was approximately 42 meters from the edge of the salt flat. A concentrated level of pottery was encountered at a depth of 35-80 centimeters and a 1 by 2 meter strip was added on the

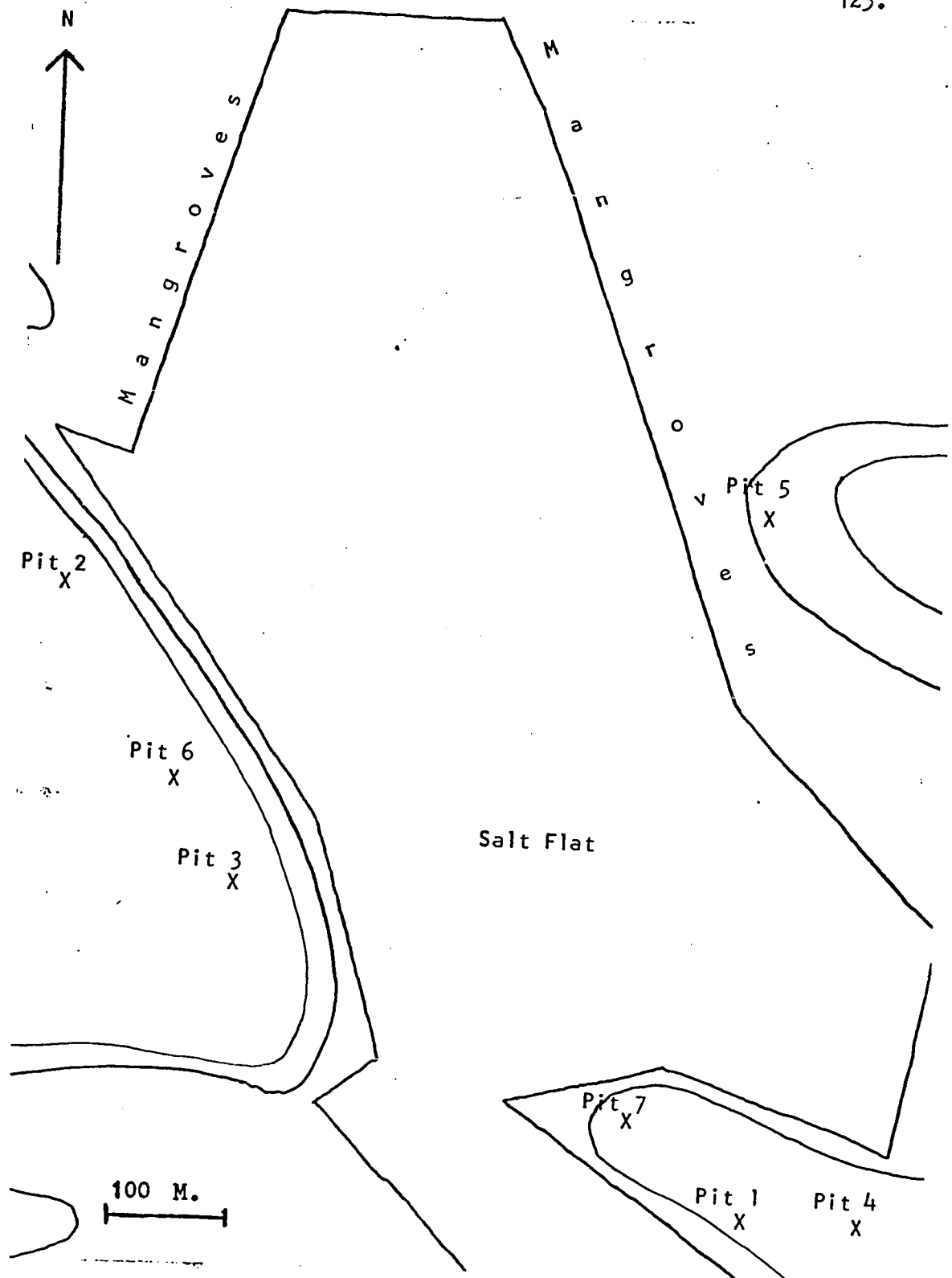


Fig. 41. Location of Tested Areas at Site 87.

north and west sides of the original square in an attempt to increase the sample from the layer. Below the depth of 80 centimeters, only the original excavation was continued and at 110 centimeters a layer of hard-packed red and white soil was reached; the southern portion of this level was soft and ash-like and contained a small quantity of mollusca. Excavation was continued to a depth of 160 centimeters, where small pebbles indicating sterile soil appeared and excavation was terminated (Fig. 42).

Test Pit 6 was originally laid out as a 1 by 2 meter trench on a ridge 32 meters from the edge of the salt flat, but was expanded to 2 by 2 meters when the location began to look promising. The first level with substantial shell content encountered at the midden began at 135 centimeters. The mollusca content increased appreciably in the level 170-185 centimeters, where 6 bags were collected. The final level, from 185-225 centimeters was dug on a day at the beginning of the rainy season and the square was not actually completed because of water retention in the bottom. A large enough area was bailed to reach the yellow, pebbly sterile layer and to attempt to obtain diagnostic ceramics before terminating work at this location (Fig. 43).

The limited amount of material available for analysis after the effects of the soil on the sherds is apparent from the Figures. However, the available data does present an adequate sketch to discuss the temporal occupation of the site.

The Pit 1 area appears to have had the major part of its occupation during the Middle Polychrome period, while Pit 6 appears

	0-35	15-30	35-50	50-70	60-80	90-105	110-125	125-140	140-160
<u>HANDLES</u>									
Cervantes Punctate	1	1	-	-	1	-	-	-	-
Large strap	1	-	-	1	-	-	-	-	-
Round	-	-	-	1	-	-	-	-	-
<u>VESSEL LEGS</u>									
Circular	-	1	-	1	-	-	-	-	-
<u>POLYCHROMES</u>									
Mora	-	2	-	-	-	-	-	-	-
Papagayo	-	-	-	-	1	-	3	-	1
<u>LITHICS</u>									
Ground stone adze fragment	-	-	-	-	-	-	-	-	-
reutilized as nutting stone	1	-	-	-	-	-	-	-	-
Metate fragment	-	1	-	-	-	-	-	-	-
Nutting stone	-	-	-	-	-	-	-	-	1

Fig. 42. Artifact inventory from Site 87, Pit 1.

Depth (cm.) 0-25 25-40 40-55 55-70 70-85 85-105 105-140 140-155 155-170 170-185 185-205

HANDLES

Large strap	-	-	-	-	-	-	-	-	-	-	-	-
Round	-	1	5	3	-	-	1	-	-	-	-	-
Circular	-	-	-	1	-	-	-	-	-	-	-	-

VESSEL LEGS

Small, solid conical	-	1	-	-	-	-	-	1	-	-	-	-
Medium, solid conical	-	-	1	-	-	-	-	-	-	-	-	-
Medium, solid squat	-	-	-	1	-	-	-	-	-	-	-	-
Medium, hollow conical	-	-	-	-	3	-	-	-	-	-	-	-
Circular	-	-	-	-	-	-	-	-	-	-	-	-
Small, hollow conical	-	-	-	-	1	-	-	-	-	-	-	-
Round, flat bottom, solid	-	-	-	-	-	-	1	-	-	-	-	-
Large hollow, conical	1	-	-	-	-	-	-	-	1	-	-	-

POLYCHROMES (unidentified)

	-	-	-	-	-	-	-	-	-	-	-	-
--	---	---	---	---	---	---	---	---	---	---	---	---

INCISED (unidentified)

	1	-	-	-	-	-	-	-	-	-	-	-
--	---	---	---	---	---	---	---	---	---	---	---	---

CHILL GRATER

	-	-	-	-	-	-	1	-	-	-	-	-
--	---	---	---	---	---	---	---	---	---	---	---	---

LITHICS

Crude knife	-	1	-	-	-	-	-	-	-	-	-	-
Nutting stone	-	-	-	-	-	-	-	1	-	-	-	-
Chert chopper, scraper	-	-	-	-	-	-	-	1	-	-	-	-

OTHER

Effigy head adornment	-	-	-	-	-	-	-	-	-	-	-	-
Punctate rimsherd	-	-	1	-	-	-	-	-	-	-	-	-
Red-rimmed culinary ware	-	-	-	-	-	-	-	-	-	-	-	-
Shell-tempered wall plaster	-	-	-	x	-	-	x	x	x	x	x	x

Fig. 43. Artifact inventory from Site 87, Pit 6.

to be largely limited to the Early Polychrome. This is shown in the contrast between the strap handles and round handles, the predominance of polychrome sherds at the former and various types of conical vessel supports at the latter, and the presence of red-lipped culinary vessels at Pit 6. These are simply indicated as being present, since complete sherd counts were not kept from all levels. The chili grater fragment from the 140-155 centimeter level of Pit 6 is also indicative of the Early Polychrome period.

The 2 incised rimsherds from Pit 6 may be Palmares Incised of the Middle Polychrome period, but the surfaces were eroded to the extent that positive identification could not be made.

The extremely friable shell-tempered material from Pit 6 is unique from sites tested in the project area. Most fragments were 1.2 to 1.8 centimeters thick and were smooth on one side. Although the lack of comparative samples makes identification somewhat difficult, it is thought that this is wall plaster.

No Murillo types indicative of the Late Polychrome period were found, although the surface levels are most subject to deterioration and thus, in the chance absence of Murillo, polychromes that might also indicate this period are unidentifiable. Lack of any Late Polychrome types in any of the other test excavations at the salt flat or in any of the surface collections suggests that this area was not occupied during that time. However, we cannot make a definite assertion on this point.

Sites on Promontories Around the BayRSVP-69-VII-62

This site, known locally as "El Jobo," is located in survey square 197. The site is on Punta Descartes and is 4.2 land miles from the Finca Las Marias. Two areas of cultural activity were present. Ceramic, lithic and shell fragments are found eroding at the base of a hill approximately 75 meters in height. On top of this hill are extensive evidences of cultural activity, with sherds, metate fragments, and middens of marine shell. Disturbances by local persons looking for grave sites showed that in some places these cultural deposits were extremely shallow, while others reached depths of up to 40 centimeters. At the bottom of the hill and to the southeast is a large salt flat that may have been one of the original reasons for the occupation of this area.

Excavation

The hill-top portion of this site was tested on May 24 and 25, 1969. Two one meter squares, labelled A and B, were dug to sterile rock bases of 35 and 30 centimeters respectively, having been excavated in 10 centimeter levels (Fig. 44). These squares were placed where pot-hunting had revealed some potential depth and the presence of diagnostic materials. A random sampling of the shell debris was kept from each level. No natural stratigraphy was observed and the designated levels were arbitrarily assigned.

The presence of Murillo ceramics throughout the deposits indicated that this site was a single component limited to the Late Polychrome period (A.D. 1200-1520). This analysis is supported by

Depth (cm.)	Surface	<u>Pit A</u>			<u>Pit B</u>		
		0-10	10-20	20-35	0-10	10-20	20-30
<u>HANDLES</u>							
Large strap	2	-	-	-	1	1	-
Medium strap	3	1	-	-	2	1	-
Small strap	-	-	-	2	-	-	-
Fish head	-	-	-	-	-	1	-
<u>POLYCHROMES</u>							
Bramadero	1	-	-	-	-	1	-
Papagayo	-	-	1	-	-	-	-
Mora	-	-	-	-	-	1	-
Lunioid							
Rimsherds	-	-	1	6	1	4	2
Dolphin effigy leg	1	-	-	-	-	-	-
<u>INCISED-ENGRAVED</u>							
Alan Engraved	2	-	-	-	-	-	-
Belen	-	-	-	-	-	1	-
<u>MURILLO</u>							
Grooved-indentd rimsherd	-	-	1	-	1	-	-
Indented applique strip	1	-	2	3	1	2	2
Applique decoration	-	-	-	1	-	-	-
Grooved rimsherd	-	-	-	1	-	-	-
Indented rimsherd	-	-	-	1	-	-	-
Mutli-strip applique	-	-	-	-	1	-	-
Applique head	-	-	-	1	-	-	-
<u>OTHER</u>							
Adorno head	-	-	-	-	-	-	1
Labret-Ear Plug	-	-	2	1	-	-	1
Metate leg fragments	-	-	4	-	-	-	-

Fig. 44. Artifact inventory, Site 62.

the surface collection from other disturbed areas yielding only Late Polychrome materials.

Mora polychrome is generally considered to be a Middle Polychrome type, but has frequently been found in association with Murillo ceramics.

Survey of RSVP-70-85

Site 85 is located on a level spot about 100 meters in altitude, below the crest of the first ridge in from the bay on Don Luis Morice's land between La Cruz and Las Marias. It is well situated for the subsistence pattern I suggest was practiced; to the northwest the bay reaches its easternmost point and is at the most only 2 kilometers from the site. Directly west it is about the same distance, not only making a large area of bay readily accessible but also catching the cooling land-to-sea breezes from two sides.

Water would have been no problem at the time of habitation of Site 85 as a creek curves around the base of the presumably inhabited hilltop. There is also a spring waterfall in the canyon cut, between 25 and 35 meters deep. Although it ran dry in early May this year, the spring would have been a dependable year-round water source in a wetter climate, as is suggested for this area during indigenous habitation.

The surface yield of small nutting and/or grinding implements was quite low, but excavation will yield significantly higher numbers of mano pounders, nutting stones, and flat grinding platforms, as indicated by the number of in situ nutting holes (Fig. 45).

Several other boulders have rolled, partly hiding other holes, and a large flat stone by one of the potted "graves" was badly weathered but appears to have been modified by man.

In contrast, the surface collection at Site 85 yielded high numbers of metate legs and fragments. Compared with 5 collected in survey of Las Marias last year, the 9 metate legs from Site 85 is a very high number. This might be explained later if it could be shown that, in this area of Central America, the metate had a higher cultural than functional significance. Notable at Site 85 is that only 3 showed no sign of pounding, and that 6 were picked up in surface collection near looted graves.

There is a large amount of shell material present on the surface in specific areas of the site and concentration was high in huaquero holes and tree-root disturbances. None is visible in the cut of the creek, however. A representative sample of the different types of shell at hand was taken. This is, of course, a very superficial sampling, giving only an idea of the percentage representation. Of the 46 pelecypods listed as present at Las Marias (including very poorly represented species), 20 or 44% were gathered at Site 85. Of 41 listed gastropods, 21 or 51% were represented.

Present on the site are also what appear to be graves in the style mentioned by Baudez (1963:49), with flat stone coverings and round, pillar-like grave markers. There are graves of this type both on Site 85 itself and on the hill directly to the south-east where 8 or 10 grave markers are immediately obvious.



Fig. 45. Grinding positions, Site 85, Bay of Salinas.



Salinas River Sites

This area is technically south of the survey limits but as a relatively major drainage source into the Bay and a region where sites were known by a local informant, the decision was made to conduct a brief survey there. The river valley is generally quite narrow, although there are numerous terraces of suitable slope and soil to have allowed small fields. At present lack of water is a problem during the dry season and towards its conclusion the few inhabitants are forced to rely on wells adjacent to the river bed. Three sites were originally designated during the survey, but it appears that the latter 2 were really areas of the same site locale and thus have been combined for analytical purposes. These 2 are described below.

RSVP-69-65

Driving approximately 10 kilometers south from La Cruz on the Pan American Highway, a house sits back from the right-hand side of the road adjacent to a corral. To the north of the house and behind the corral, a trail leads over the edge to the river valley; upon reaching the bottom, it follows along the river bottom in a southerly direction. Site 65 is reached by following this trail and is to the north of and in front of the first house encountered.

RSVP-69-66&67

This site is about 5 minutes' walk south of Site 65 and is located in a small field bordering a creek to the west of the site. There appears to have been a small casita at the site, represented by an accumulation of surface stones and olla handle fragments.

Most of the cultural debris is centered here, although the general ground surface from there to the banks of the creek also has a moderate concentration. This small field is separated by a slight depression from a similar field farther south. Inspection of this latter area yielded no additional material. The following cultural remains were surface collected from the site:

- 58 rimsherds
- 2 ceramic ornament fragments
- 52 undecorated bodysherds
- 4 ceramic support fragments
- 2 metate fragments
- 1 mano fragment
- 1 incised bodysherd
- 1 punctate bodysherd

Excavation

This site was tested on May 26, 1969. One test square, 70 centimeters by 1.0 meter, was excavated to a sterile bed-rock depth of 80 centimeters. Following excavation, these natural levels, based on soil color and texture and relative shell concentration were defined:

- 0-20 cm.: dark black, organic; no shell
- 20-35 cm.: dark grey, loose friable; light shell concentration
- 35-50 cm.: dark grey, granular; minimal shell concentration
- 50-80 cm.: light grey, powdery; minimal shell concentration
- bedrock

For purposes of excavation, arbitrary controls were employed and the test area was removed in 10 centimeter levels. The excavated levels and corresponding cultural material recovered are shown in Fig. 46 .

The site was occupied primarily during the Middle Polychrome period. The limited representation of Vallejo Polychrome and

Depth (cm.)	0-10	10-20	20-30	30-40	40-50	50-60	60-70
<u>HANDLES</u>							
Large strap	4	1	1	3	9	-	-
Medium strap	2	2	1	2	1	3	-
Medium loop	1	-	-	-	-	-	-
<u>VESSEL LEGS</u>							
Hollow conical	-	-	1	-	-	-	-
Small solid conical	-	-	-	-	2	1	-
Crude human effigy	-	-	1	-	-	-	-
<u>POLYCHROMES</u>							
Mora	-	3	-	-	1	1	1
Papagayo	-	1	4	3	-	-	-
Vallejo	1	-	2	-	-	-	-
Bramadero	3	-	-	-	-	-	-
Carillo	-	-	-	-	-	-	1
Lunoid rimsherds	2	2	-	-	1	-	-
<u>INCISED-ENGRAVED</u>							
Palmares	-	-	-	1	1	-	-
Alan	-	-	-	1	-	-	-
<u>BRUSHED</u>							
	-	-	2	-	-	-	-
<u>MURILLO</u>							
Red indented noded rimsherd	1	-	-	-	-	-	-
Black indented flared rimsherd	1	-	-	-	-	-	-
Indented applique hand	1	-	1	-	-	-	-
Indented applique strip	3	-	-	-	-	-	-

Fig. 46. Ceramic inventory, Site 67.

various Murillo styles shows some continuity into Late Polychrome and the Carillo polychrome a possible succession from the end of the Early Polychrome period.

Of particular interest at this site was the presence of a considerable amount of marine mollusca in the deposit. Although the site is some 7 kilometers from the coast, approximately 50% of the species represented at the coastal shell midden of Las Marias were present at Site 67.

CHAPTER IV.

CERAMIC ANALYSIS AND CULTURAL CHRONOLOGY

The ceramic typology utilized in the preceding section was formulated by Baudez and Coe (1962) and greatly amplified by Baudez (1967). Since much of Baudez's nomenclature was either used in its original form, or was only slightly modified in the present analysis, it might be well to quote from his methodological discussion (1967: 3-5) (translation from the French by Professor Donald Murray, Beloit College):

...in the typological method which we will use, the unit of classification is the type, whose definition results from the combination of several attributes...

The primary function of types is to indicate a single moment in evolution. Its duration must be relatively short and its "life" must be capable of translation into a Gauss curve which will express its popularity over the course of time: emergence (or birth), growth, maximum or optimum popularity, decline, and extinction...

Among the attributes which enter into the definition of a type of ceramic ware (qualities and components of the paste, surface treatment, shapes, decorations, etc.) there are certain ones whose combination is peculiar to each type and which play a privileged role; these are the attributes which permit identification of the type and which are indispensable to its definition...

The first step in the construction and definition of typology is to single out those criteria which have to be, first of all, pertinent from the chronological point of view ...Our typology must not only aid us to attain the goals we have set for ourselves, but, beyond that, it must be capable of being used profitably by searchers who will later on work

in the same region or in neighboring regions; in certain cases it has seemed useful to us to create certain types which, although they have had very little importance for our work, seemed to us to be likely to have some importance in the work of others.

The closing lines of the quote are perhaps the most applicable to the current study, since Baudez's typology has not been so much employed as it has been adapted.

His areal sequence was in general stronger in the earlier periods and weaker in the latter than was the case in the Sapoa River area. The Zoned Bichrome period data were largely complementary, while Baudez appears to have had a larger sample from the Early and Middle Polychrome periods. Our Late Polychrome sample, primarily from the Las Marias shell midden, is considerably larger than his and served as a basis for an elaboration not only of the Murillo ceramic type description but also for the Late Polychrome period in general.

Some of A. H. Norweb's typology was employed, based on his preliminary report published in 1964. His analysis was conducted by the type-variety system (Gifford 1960; Smith, Willey, and Gifford 1960) but examination of notes and collections at the Peabody Museum at Harvard indicated that perhaps as much as 90 percent of his sample remained unexamined and his typology must be considered as tentative. However, it does agree in general with Coe and Baudez's material and gives a clearer picture of some ceramic types that appear to be arriving from

the north and hence were poorly represented in collections from the Tempisque and Santa Elena sites.

Based on available sources, a summary of the ceramics of the Greater Nicoya subarea follows, with particular emphasis on the Guanacaste region of Costa Rica. A major contrast between the classification employed here and the one utilized by Baudez is the degree of "lumping" of types in the former and the degree of "splitting" them in the latter. To a large extent, the former was probably a necessity before a re-combination of sub-types could take place. During a visit with Baudez in Honduras in 1969, he mentioned that he felt now that he had created too many different types and that his inclination would be to reduce the number. This is the tack that the current study has taken and is reflected in the use of 21 of Baudez's decorated types compared to 41 that he utilized. In some cases, types were not at all present in the Sapoa River area; in others actual combination of types took place. This total also does not reflect an additional 20 types allocated by Baudez to various plain and culinary wares.

The latter category of ceramics was not a focal point of this study. A simple visual inspection of culinary wares as they came through the laboratory showed that the Sapoa River region participated in the general red-rimmed olla-shaped tradition that marks the entire cultural sequence and it was felt that unless this area of analysis could be related to a

specific cultural or behavioral area, such as a house or living platform, that little would be gained from detailed mechanical analyses such as Baudez carried out.

Plain body sherds were tabulated in the field laboratory and the large percentage of them were then backfilled into the excavation. A representative sample of undecorated sherds was retained from different portions of the site for possible further study. Of 32,974 sherds, the total processed, 30,156 or 91 percent were in the undecorated category.

The objectives of the research were more oriented toward movements of motifs that are limited to decorative styles. Although the fact that many of the culinary wares tend to persist across temporal boundaries (Baudez 1967: 188) is important and interesting in itself, it did not lend itself to the present research objectives. With the extreme volcanism in the area, it is likely that a wide and distinct variety of clays were employed by the pre-Columbian potters and that an eventual careful study of different ceramics and natural sources might prove very beneficial in terms of pinpointing local trade patterns. However, this was not a part of the current research.

I have also attempted to refrain from the naming of new types unless there was a large sample that dictated such an action. In addition to the few new types that were created, there were a number of modal styles present that are not published in other sources. However, these have not been included as new

"types."

In addition to this material from the Sapoa River area, Coe's material from Tamarindo Bay and Chahuite Escondido on the Santa Elena Peninsula is currently undergoing analysis by Mrs. Jeanne Sweeney of the University of Pennsylvania. Norweb's material, which as mentioned previously may be as much as 90 percent unanalyzed, is not being worked on at present, but may eventually involve the efforts of a third individual. Without a knowledge of the content of these other major areal collections, it is difficult to know if minor styles in the Sapoa River zone are simply that, localized minor styles, or whether they are but pale reflections of types predominant in other regions.

This writer has a strong preference that a regional typology based on the three collections should be established and that even applying provisional names to a portion of the material may add to the literature nomenclature difficult to change or eradicate at a later time. This had already happened with some types that have become standard references for the area without their nature being understood on any more than a preliminary basis.

Therefore, the present analysis has been limited to either types that are known and established as being present throughout a greater part of the general region or types that are dominant enough in the history of the Sapoa River area to warrant specific mention. Other modal styles have been analyzed

and cataloged as such and withheld for comparison with other collections and, hopefully, the eventual formulation of a comprehensive regional sequence.

Radiocarbon Dates

Since the primary use of ceramics in this study has been to place types, locations of occurrence, and exterior stylistic intrusions in a temporal context for processual purposes, the method by which this temporal framework was established should be summarized.

A total of 18 radiocarbon dates were obtained that are pertinent to the area; 2 of these have been discarded because of laboratory contamination and none came from sites in the Sapoa River project area. Three of the dates are supported by cross-checking samples from the same sample source and 5 dates are from single readings. One cross-checked date is from the Zoned Bichrome period, a second from Norweb's Early Polychrome, and the third from Late Polychrome contexts. The dates are summarized in Fig. 47.

Zoned Bichrome Period

Dates 1-4 (Fig. 47) have set the limits on this period as being from B. C. 300 to A. D. 300. The Zoned Bichrome period as defined by Coe and Baudez (1961) and related manifestations in southern Central America have recently been discussed at length by Haberland (1968). The latter discussed the Zoned

<u>Site</u>	<u>Sample</u>	<u>Date</u>	<u>Cultural Period</u>
Ortega	GsY-100	1) 259 [±] 99 B. C.	Zoned Bichrome
		2) 206 [±] 95/98 B. C.	Zoned Bichrome
Ortega	Yale	3) 260 [±] 70 B. C.	Zoned Bichrome
Chahuite Escondido	Y-810	4) 90 [±] 200 A. D.	Zoned Bichrome
Tamarindo	Y-811	5) 565 [±] 90 A. D.	Early Polychrome
Santa Isabel B	Y-1124	6) 572 [±] 110 A. D.	Early Polychrome
	Y-1122	7) 582 [±] 70 A. D.	Early Polychrome
	Y-1125	8) 792 [±] 120 A. D.	Early Polychrome
Tamarindo	Y-815	9) 970 [±] 70 A. D.	Middle Polychrome
	Hv-2688	10) 970 [±] 60 A. D.	Middle Polychrome
	Hv-2690	11) 675 [±] 50 A. D.	Middle Polychrome
	Hv-2691	12) 660 [±] 50 A. D.	Middle Polychrome
Chahuite Escondido	Y-816	13) 1120 [±] 70 A. D.	Late Polychrome
La Bocana	GsY-98	14) 1484 [±] 85 A. D.	Late Polychrome
	GsY-99	15) 1408 [±] 85 A. D.	Late Polychrome
	Hv-2692	16) 1414-1475 A. D.	Late Polychrome

Fig. 47. Radiocarbon Dates From the Greater Nicoya Subarea.

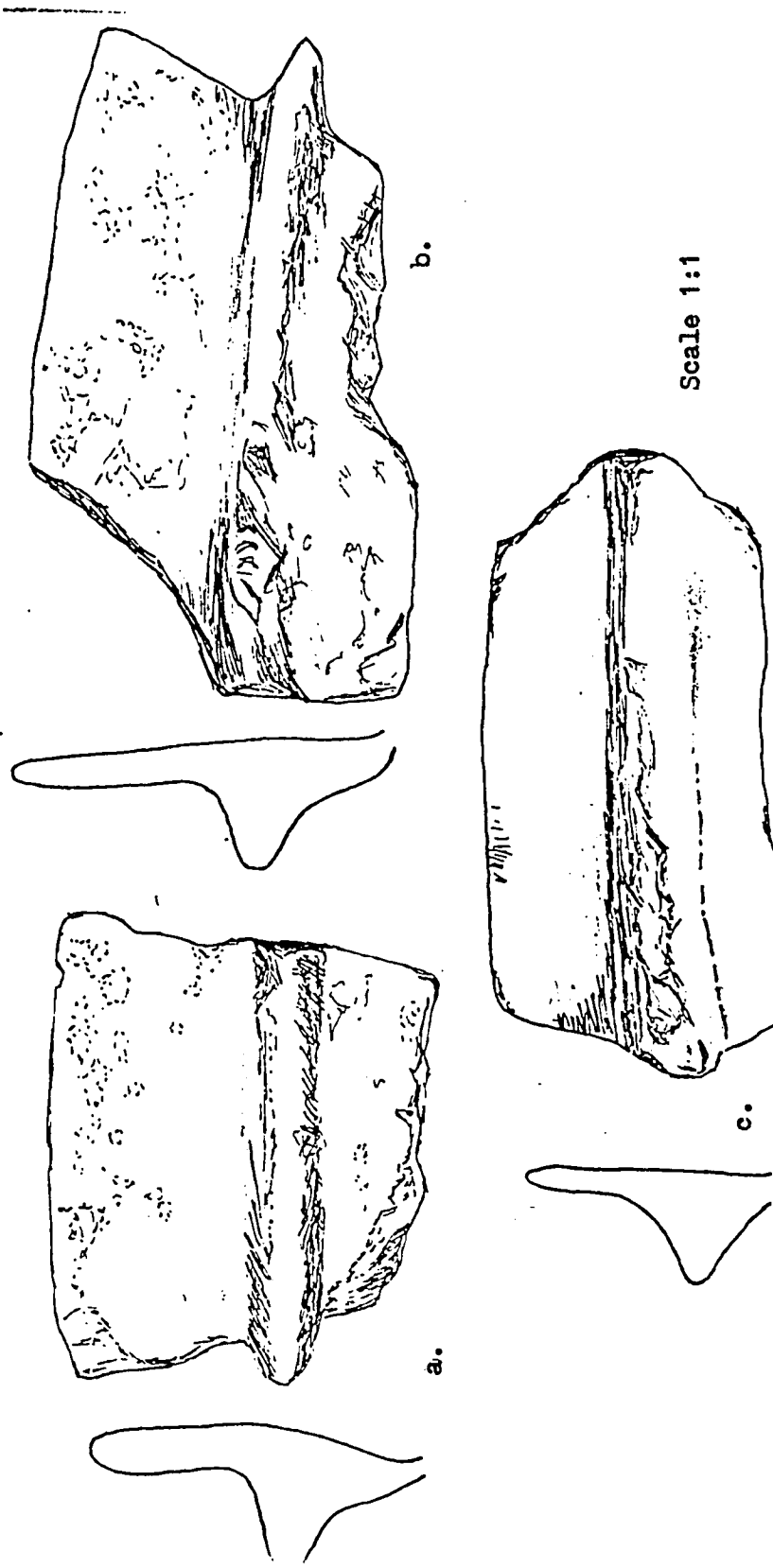


Fig. 48. Zoned Bichrome period, Paso Caballo Waxy Ware, Sierra Group.

Bichrome Catalina phase in the Tempisque drainage and stated (1968: 231) "The present author cannot suppress the suspicion that more than one phase is represented in Catalina." However, he did not attempt a re-organization and the lack of other than Late Formative Zoned Bichrome materials anywhere in northern Costa Rica has successfully prevented a deepening of the areal chronology that might necessitate an earlier Formative phase.

However, with the recovery of examples of Norweb's Schettel Incised (1964: 559) in the Sapoa River area, a tentative division of the Zoned Bichrome period may be proposed. Figure 50 shows the presence or absence of various Zoned Bichrome period ceramics at different sites in northern Guanacaste Province.

Schettel Incised (Fig. 49) is characterized by everted, flaring rims with multiple concentric grooves around the circumference of the vessel. This type has been found in both the Conchas phase at La Victoria, Guatemala and the Chorrera phase at Valdivia (Coe 1960: 376-77) and as part of the Los Barrancos assemblage in northwestern British Guiana (Lathrap 1964: 353).

Other than the relative position of being associated with the earliest Zoned Bichrome phase in the Isthmus of Rivas, Norweb's Schettel Incised material is undated. Coe (1960: 367) assigned a guess-date of 700 B. C. to between B. C. 300 and 150 to the Conchas II phase, to which the comparative Conchas Orange

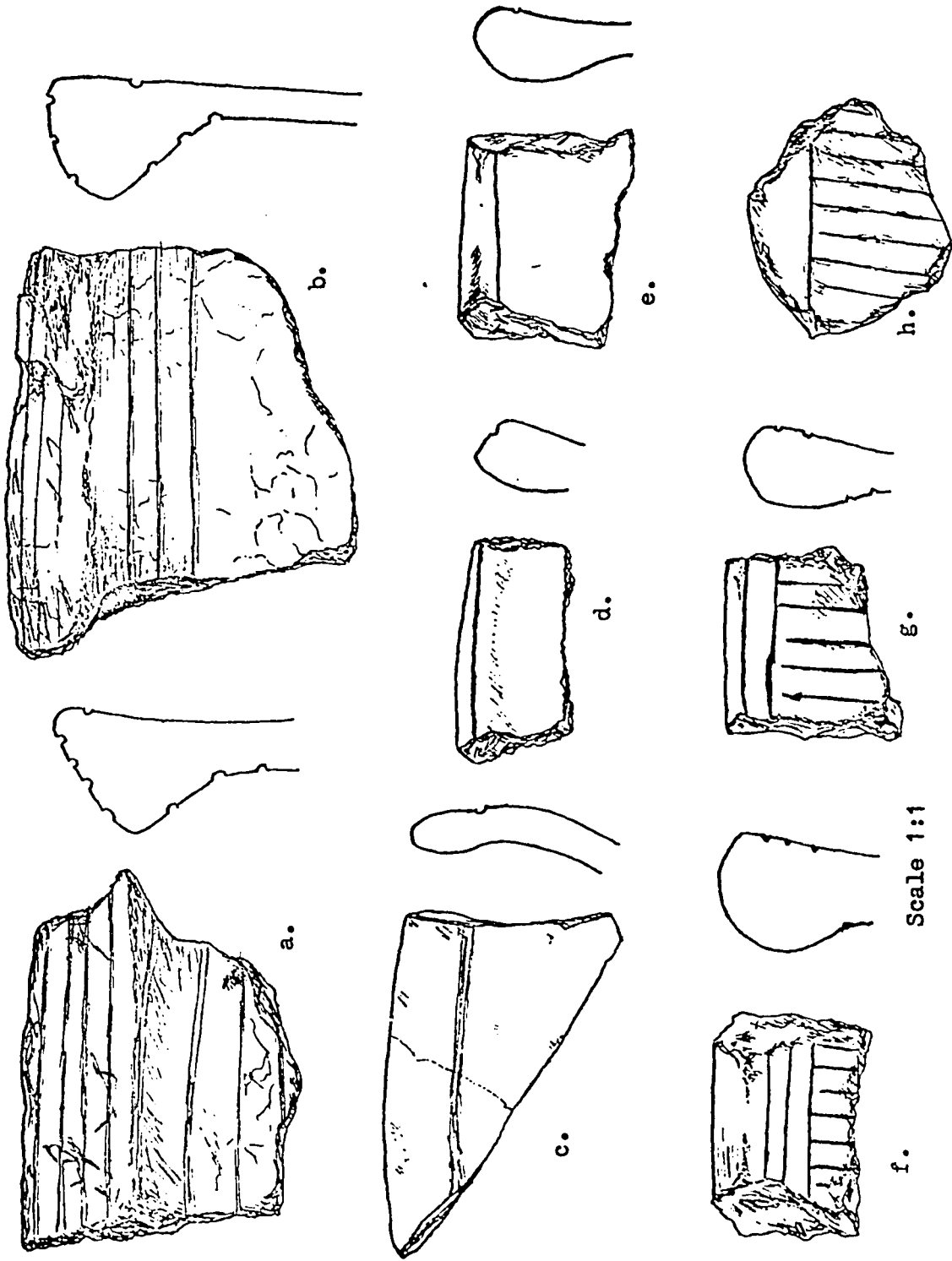


Fig. 49. Zoned Bichrome ceramics: a-b Schettel Incised, c-e Tamino Incised, f-h Bocana Incised Bichrome (combed variety).

and Ocos Gray Types are limited. This date was supported by comparative evidence of dated materials from Chiapa de Corzo and other Mesoamerican sites. Coe and Flannery (1967: 68) published a date of 790 B. C. for the Conchas I phase and it thus appears that the relative position of Conchas II is more or less correct. In addition, guess-dates have been "verified" by obsidian hydration dating (Evans and Meggers 1960).

With the exception of one possible example, Schettel Incised is not present in any of Baudez's dated phases and it is therefore felt that its presence is indicative of a temporal period prior to the B. C. 300 to A. D. 300 framework currently in force for the Zoned Bichrome period. Lathrap dated Los Barrancos at approximately 500 B. C. (1964: 359), within Coe's suggested span; the Chorrera phase in Ecuador is dated from 500 B. C. back to at least 1500 B. C. Based on this it would seem that, at this still very limited state of knowledge, the flared everted, grooved rim style represented in northern Costa Rica by Schettel Incised may have resulted from a northward diffusion into the Intermediate Area and Mesoamerica. This type then almost surely antedates the known Zoned Bichrome range.

Bocana Incised Bichrome is the most widely spread of all Zoned Bichrome types; some sources do not indicate statistical differences between the combed and uncombed varieties, so it was impossible to determine whether this difference in decorative technique had any temporal significance. Bocana is prominent

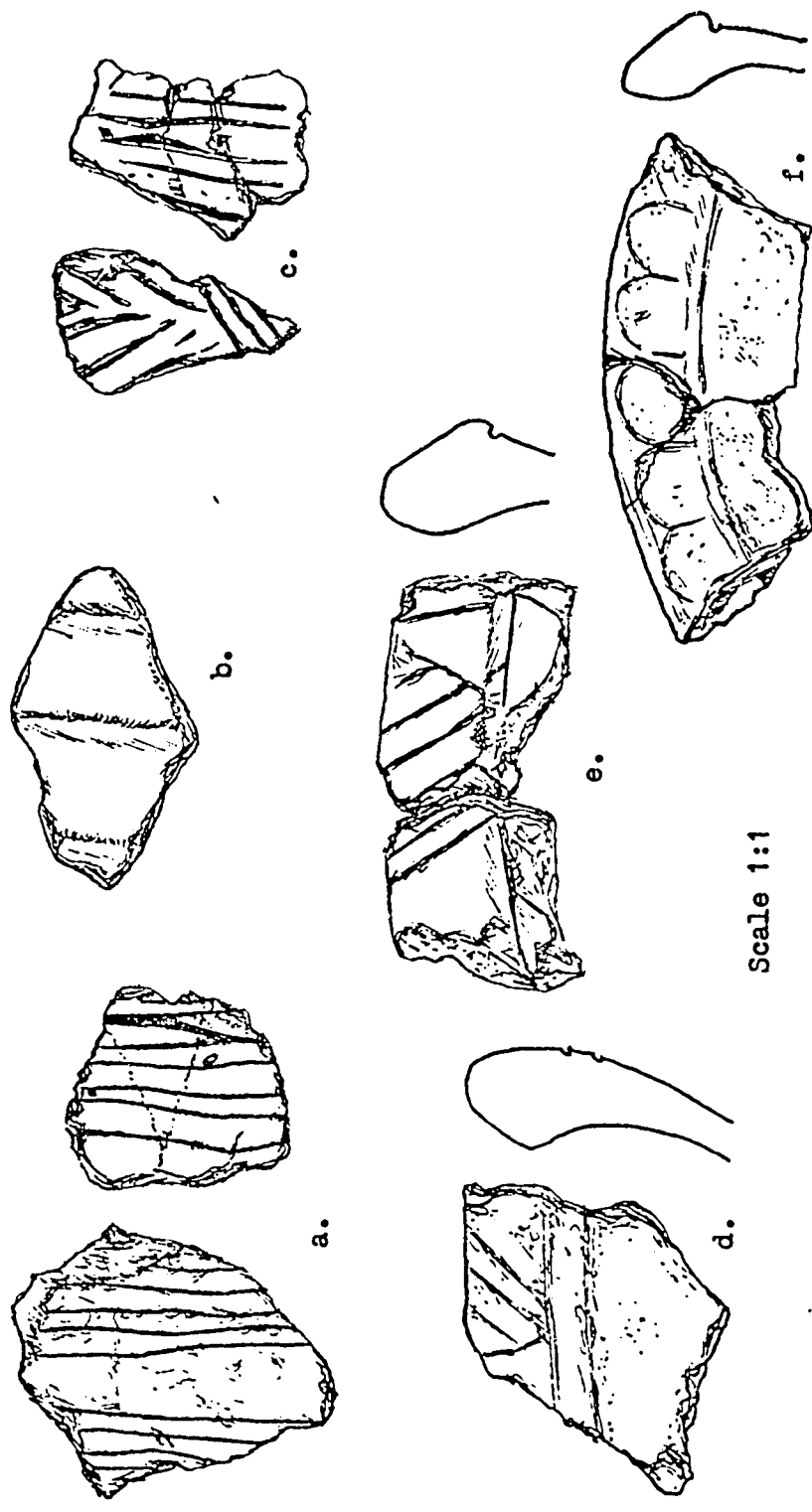


Fig. 51. Zoned Bichrome ceramics: a Bocana Incised Bichrome (uncombed variety), b Garcia Ridged, c Mojica Impressed, and d-f Ortiz Engraved.

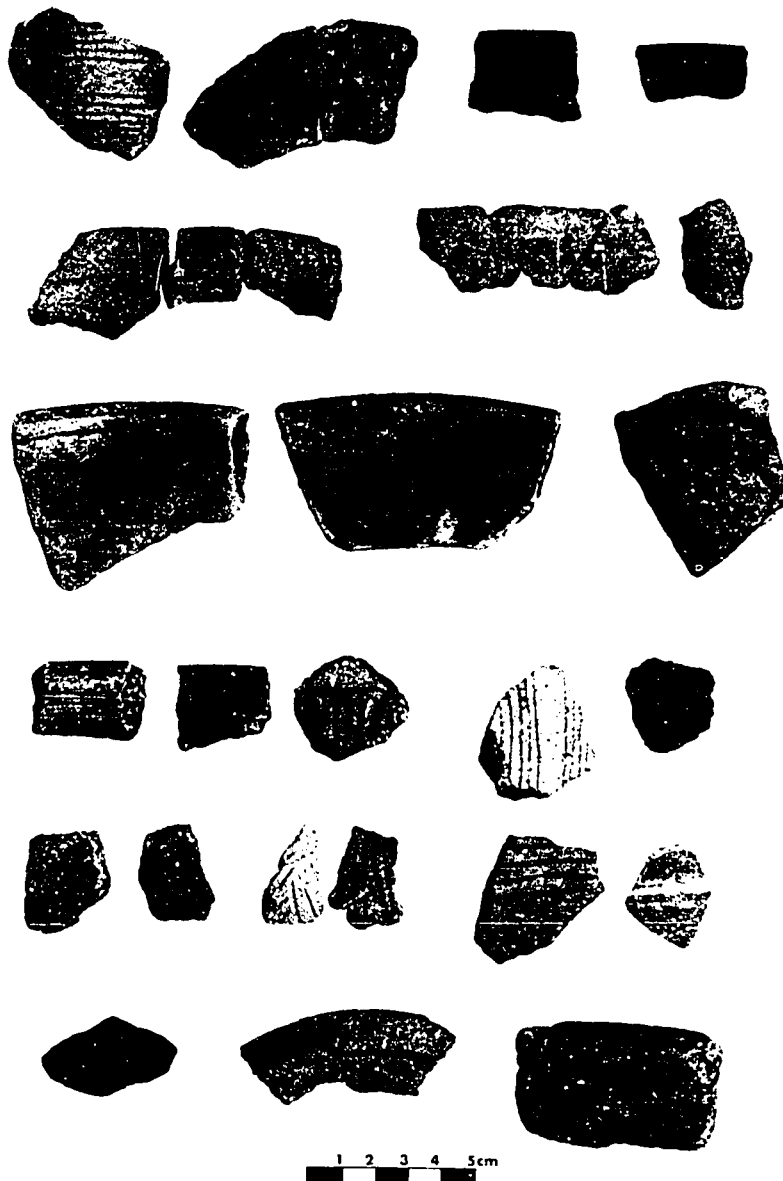
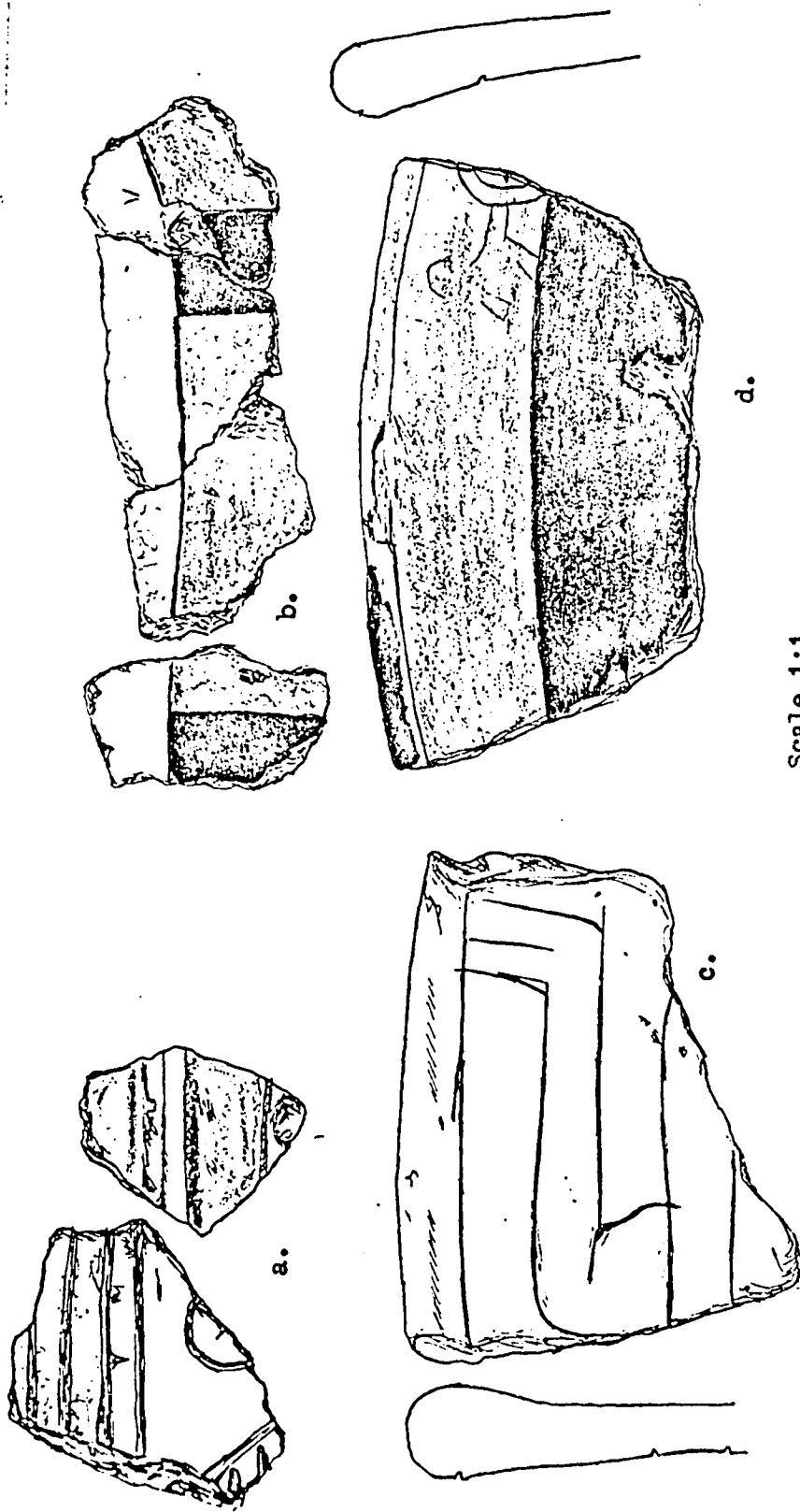


Fig. 52. Zoned Bichrome period. Diria Incised, Tamino Incised, Ortiz Engraved, Rosales Zoned Incised, Bocana Incised Bichrome (combed and uncombed varieties), Mojica Impressed, Toya Incised Trichrome, and Garcia Ridged.

at the beginning of Baudez's Catalina phase (1967: 186), has a decline and re-emergence within the phase, and essentially disappears from the scene by its termination. Diria Incised is also present in its largest quantity early in the phase and declines as it progresses.

Guacimo Incised Bichrome, Guinea Incised, and Tamino Incised made their initial appearance slightly after the beginning of the Catalina phase (Baudez 1967:186), as did the minor type Congo Punctate. As mentioned earlier, Baudez lumped his apparently singular example of Schettel Incised in the Tamino Incised category and it is suggested that a separation should be made. While the practice of a single incised line on the interior upper portion of the rim is also present in Tamino and may indicate some vague relationship between the two types, it is felt that the decorative technique of prominent grooving around a distinctively flared rim in Schettel, especially in view of the broad distribution of this characteristic type throughout the Middle and Late Mesoamerican Formative warrants separate status.

In the middle part of the Zoned Bichrome period, Rosales Incised Bichrome, originally termed "Rosales Zoned Engraved" (Coe and Baudez 1961:508), assumed the same all-pervasive position that Bocana Incised Bichrome had held at its outset. It is represented by a total of only 4 sherds at La Guinea, while 75 examples came from the site of Ortega. It is significantly



Scale 1:1

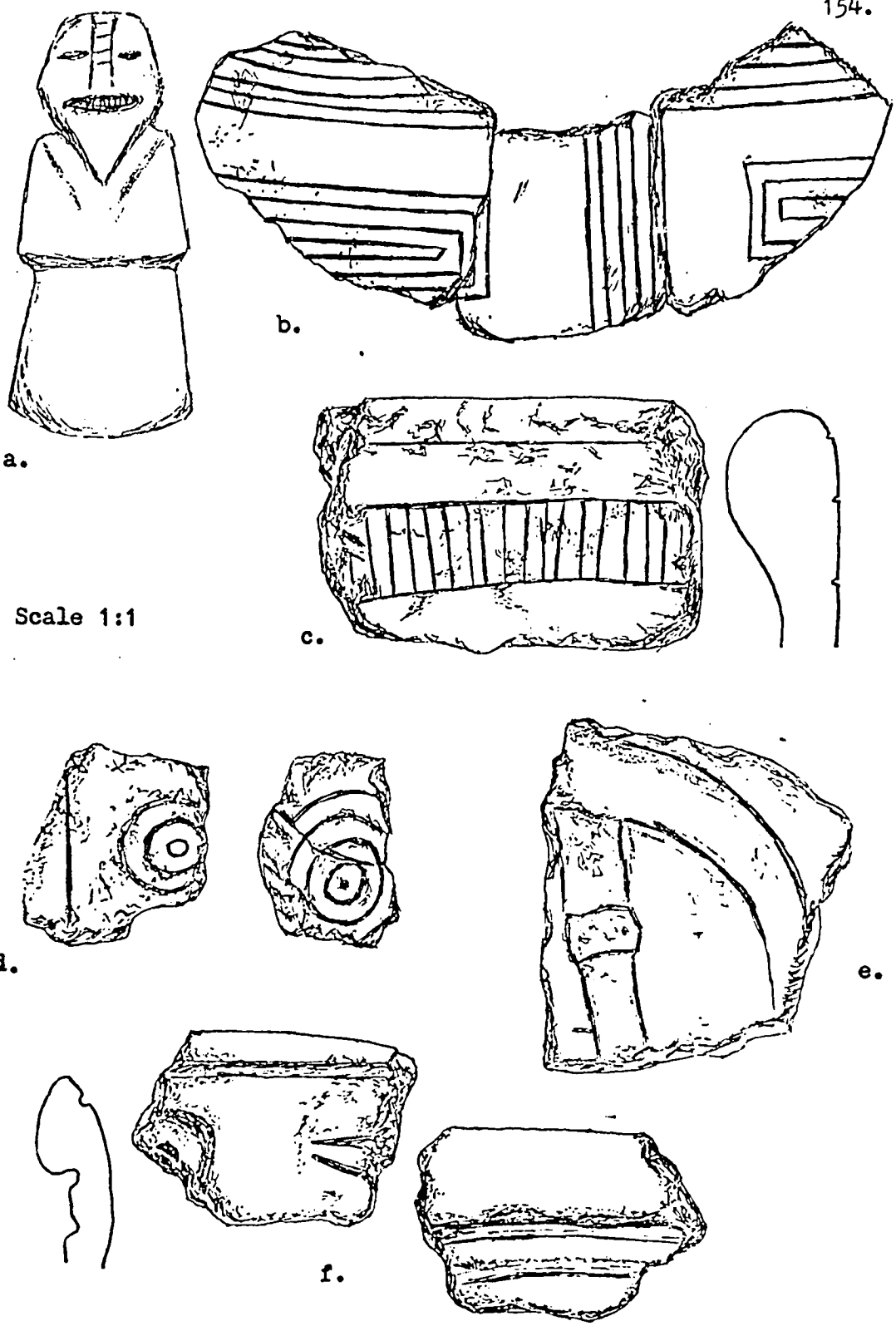
Fig. 53. Zoned Bichrome period: a, Toya Trichrome; b-d, Rosales Zoned Bichrome.

absent from La Bocana, seriated as being chronologically earlier than Ortega (Baudéz 1967:186). It is associated with Schettel Incised only at Site 95, this being a shallow site that had not been unplowed until the day before it was surveyed and tested in 1970. Had we reached the site earlier, we might have seen a definite stratigraphic separation of the two segments of the Zoned Bichrome period that are being proposed here.

Together with Rosales Incised Bichrome, Ballena Incised and Toya Incised also appear in mid-period. The minor types Huila Zoned Punctate, Buchon Punctate, and Pozon Channelled also were present for the first time.

To the extent that Norweb's material from the Isthmus of Rivas was analyzed, he reported Schettel Incised from only two sites near Rivas, in the area of Puerto San Jorge on Lake Nicaragua. Site Ri-3 was located 200 meters southwest of the main pier and was in a pasture. A few sherds were found on the surface and one mound was present which looked distinctly artificial. Another apparently artificial mound was located on adjacent property belonging to the American Evangelical Mission. The pasture is rolling and slopes rather sharply towards the lake. Preliminary sherd analyses were available from Pit 3, a 3 x 3 meter pit oriented to the cardinal points on a slight slope to the northeast of the lake shore, and Pit 5, a 3 x 3 meter pit on top of an artificial mound 2.5 meters high and 10 meters in diameter on the property of the Church of the Nazarene.

Pit 3 showed the general co-existence of Schettel Incised



a.

b.

c.

d.

e.

f.

Scale 1:1

Fig. 54. Zoned Bichrome period: a, jade amulet; b Diria Incised; c-f unidentified.

and Rosales Zoned Engraved (apparently referred to as La Virgen Incised by Norweb in his notes) throughout the sequence, with the former being absent from the surface level and the latter from the top two levels. Pit 5, although slightly suspect from having been excavated in arbitrary levels through an artificial mound, seemed to show a general shift from Schettel Incised to Rosaled Engraved (La Virgen) through the sequence. The former is present throughout the 11 25 centimeter levels, while the latter is absent, with a single exception, for the bottom 4 levels.

Site Ri-5 was located approximately 3 kilometers north of Puerto San Jorge and runs in a narrow strip 1 kilometer inland from the lake shore. One pit from this site, Pit 4, a 3 x 3 meter square placed on level ground, is discussed here. Both Schettel Incised and Rosales Engraved were very lightly represented (3 sherds of the former, 6 of the latter) so the data might best be considered inconclusive, although once again Rosales Engraved (La Virgen) is seen to be slightly more dominant and distributed stratigraphically later.

In Ri-5, Pit 4, and in Ri-3, Pit 3, the high incidence of polychrome sherds other than the Nandaime types (Fig. 55) raises some suspicion as to whether these may possibly have been disturbed contexts. This is difficult to say without re-analyzing the material completely, which I was not able to do during my short visit to the Peabody Museum, and without cross-checking with data from other excavations at the same sites. I was also unable to accomplish this, but it should be borne in mind as a possibility. Strangely, Ri-3,

Level*	Ri-3			Pit 5			Ri-5		
	Pit 3						Pit 4		
	S	R	P	S	R	P	S	R	P
1	0	0	32	3	4	1	0	0	15
2	1	0	66	2	0	2	0	0	92
3	4	1	64	4	3	1	0	1	77
4	7	9	57	3	1	1	1	1	47
5	3	10	6	7	7	0	0	0	31
6	7	5	3	2	3	0	2	2	14
7	10	17	6	8	6	0	0	2	12
8				6	0	0			
9				3	1	0			
10				2	0	0			
11				1	0	0			

S = Schettel Incised
R = Rosales Incised Bichrome
P = Miscellaneous Polychromes

*all levels were in 25 centimeter units

Fig. 55. Ceramic distribution of Schettel Incised and Rosales Zoned Bichrome in Isthmus of Rivas sites tested by Norweb.

Pit 5, which might be considered the most likely to have mixed stratigraphy, shows a very low "Miscellaneous Polychrome" count. In Pit 5, the Nandaime Polychromes and Tola-Urcuyo White-on-Reds (Tola also referred to as Chavez White-On-Red in Norweb's laboratory notes) assigned to the succeeding Early Polychrome phase by Norweb (1964:554) are properly limited to the upper portion of the sequence.

Bocana Incised Bichrome, a consistent feature of the Costa Rican Zoned Bichrome sites, is apparently absent from the Isthmus of Rivas area, although this may simply reflect variances in nomenclature or selective analysis of only a small portion of the excavated sample. I did not notice any sherds of this type while inspecting the available portions of Norweb's collection. Despite this absence, the temporal priority of Schettel Incised over Rosales Engraved observed to the south seems to be supported by the Rivas data. Norweb (1964:554) combined the two in what he termed the Aviles phase preceding the following Zoned Bichrome San Jorge phase. Based on the other supporting data, it appears that a further subdivision of the Aviles phase may eventually be necessary. The rather curious limitation of the Schattel Incised type to the Lake Nicaragua shore is discussed subsequently.

Ortiz Engraved was described by Norweb (1961:60) as "Bowls with everted rims, crude engraving emphasizing hatched triangles." While he placed it in the Early Polychrome period, it is associated with Zoned Bichrome in the Sapoa River area. The type is apparently unknown farther south.

The ceramic decorative motifs of the period resemble the

general Nuclear American Late Formative, with a considerable amount of local elaboration. This type of culture contact has been characterized as "Fusion with emergence of new traits which have no obvious antecedents in the trait-units of the receiving culture (Willey et al 1955:22).'" While we cannot for the present be sure about antecedents, there is local elaboration compared to other Zoned Bichrome assemblages. Haberland (personal communication) expressed the opinion that the San Dimas Zoned Bichrome material contained a large number of motifs that he had not observed in other collections from the area.

Baudez, in discussing the external relationships of pottery from this period in the Tempisque sites also noted (1967:206-207) a number of general resemblances:

Usulután Ware designates a type of bichrome ceramics that was very widespread in Central America at the end of the Preclassic and beginning of the Classic period. Characteristically, its decoration is made up of groups of 3 to 5 lines, often wavy and appearing on a clear or beige and orangish (negative painted) background; the lines are graced with a comb or multiple brush. Although no negative painted sherd appears in the CATALINA material, the use of a comb to decorate pottery of bichrome types from this phase (Charco, Cobano, Las Palmas, Zelaya...) is characteristic. Elsewhere, in Nicaragua, Norweb found several sherds with negative painting from this period similar to Usulután Ware in phase III of the Yarumela sequence (Canby 1951). From the same country, the Ulua Bichrome and Playa de Los Muertos (Strong, Kidder, and Paul 1938) types can be compared to CATALINA, CHOMBO or MONTE FRESCO. The first because of the abundance of the Usulután type; the second by the presence of a red and black zoned on beige trichrome reminiscent of Toya Incised Trichrome and by an edge decorated with black vertical lines on a red background, similar to Zelaya Bichrome. Finally, puncture zones delimited by an incised stroke, constituting the characteristic decoration on our Hulla type, are also characteristic of the period. The connections between the Zoned Bichrome phases and the

Archaic Period at Copan (Longyear 1952) are not so close; one might cite, however, similar decorations of Zelaya Bichrome and "Burnished ware" of this period, consisting of groups of parallel lines arranged on the jar necks.

In El Salvador, the assemblage of poorly-designated Cerro Zapote ceramics (Lothrop 1927) is characterized by the presence of Usulután Ware and therefore undoubtedly contemporary with the CATALINA phase.

In the Quiche region of the highlands of Guatemala, Lothrop (1936) discovered a zoned bichrome type called Utatlan Ware. This type is quite similar to Rosales Incised Bichrome and was later assigned by Wauchope to the BALAM phase of the Zaq'ualpa sequence. In the same area the presence of Usulután Ware in the CHUKUMUK phase (which, moreover, included some Zoned bichrome pottery) (Lothrop 1933) and of the Utatlan type in the material of the PROVIDENCIA phase at Kaminaljuyu, permits an association in time of these two phases with our earliest period. The same is true in the Peten CHICANEL phase at Uaactun which also included Usulután type pottery, some vessels with puncture decoration and some with red parallel lines on clear brown and black on red.

In Mexico, on the Yucatan peninsula, the type described by Brainerd (1958:50) as Flaky Dichrome included some ceramics with an incised bichrome decoration and others decorated with punctured zones. Brainerd was of the point of view that, in terms of style, this type belonged to the Ancient Regional Period. In addition, bichrome in zones is characteristic of the following phases: CERRO DE LAS MESAS lower I (Drucker 1943), TRES ZAPOTES middle B (Weiant 1943), ZACATENCO late and TICOMAN (Vaillant 1930), TLATILCO (Porter 1953), the TANCOL complex of the Panuco region (Ekholm 1944, MacNeish 1954), etc.

The same mode of decoration permits us to establish connections with some regions located to the south. In the Chiriqui Province of Panama, Scarified Ware (MacCurdy 1911) which is characterized by alternation of red painted zones and others filled with incised parallel strokes, is very close to Bocana Incised Bichrome. Stirling described some bichrome sherds from Barriles, with the painted surfaces being delimited by an incised stroke. Linne published similar examples (1929:36) from Trigana, Colombia as well as sherds with punctured zones. The same type is characteristic of phase III at the Cupica site on the Colombian Pacific Coast (Reichel-Dolmatoff 1961), of the Juan Pablo, Ocucaje and Proto-Nazca styles of the south Peruvian coast (Strong 1957) of the PUCARA phase of the Titicaca basin (Kidder 1943), etc.

Turning to the south, a number of additional comparisons can be noted. Bushnell (1965: 172) illustrated a Zoned incised red and black on buff vessel of the Formative Paracas style of south coastal Peru (B. C. 700 to 300).

Linares de Sapir (1968: 85) agreed with Baudez's (1963: 46) assignment of Scarified Ware to the period B. C. 300 to A. D. 300 and stated (1968: 89) that

There is little doubt in my mind that his Variete Non Peignee of the Bocana Incise Bicrome in the Catalina Phase of the Zoned Bichrome Period (Baudez 1967, pl. 19 C, E, I, J) is similar to Scarified Ware, especially to the Zone Scarified variety of Haberland (1962: 384-85). The decoration in both varieties consists of slipped surface alternating with zones of individually made, irregularly spaced parallel incisions. In spite of the above similarities, Scarified Ware lacks the two colors, the dentate rocker stamping, the fork punctations, and the use of multiple brush to produce black lines...

In contrast (1968:90) she saw no "...close similarities between the pottery types of the Aviles and the San Jorge Phases (Norweb 1961: 12) and the Scarified Wares of Chiriqui."

In eastern Costa Rica, Kennedy's work (1969: 358) in the Reventazon River+Valley of the Atlantic watershed has yielded sites dating between B. C. 300 and A. D. 400, but apparently with few ceramic similarities to Pacific coastal material. The pottery has rocker-stamping decorations, as well as red-on-buff painting and some decorative applique.

Carlos Aguilar's work (1970) at Guayabo produced an early period of undetermined time depth, but ceramically similar to

Kennedy's in that the assemblage bore little resemblance to the northern Guanacaste material.

Turning to the north, what seems to be evidence of indirect trade contact with the lowland Maya area at this time is indicated by 4 Paso Caballo Waxy Ware Sierra Group (Smith and Gifford 1966: 167) vessel fragments (Fig. 48) from graves at the Las Pilas cemetery. Baudez (1967: 110) identified this type as "Lavaderos a rebords lateraux" and placed it in the Linear Decorated phase, but association with Zoned Bichrome materials at the Las Pilas cemetery seems to indicate an earlier placement in the Sapoa River area. This and the occurrence of Schettel Incised at San Dimas seem to be the most definite examples of outside contact at this time.

Schettel Incised, as we noted earlier, has a wide distribution ranging from Guatemala to Ecuador at this time, although inadequate dating throughout this area makes the designation of a direction of diffusion very difficult. This is especially true between Guatemala and Ecuador; however, this writer feels that dispersals and movements of people and their cultural traits at this time were closely tied to subsistence practices and that the appearance of this type in Costa Rica represents its arrival from the south.

The Linear Decorated Period

Regarding the Linear Decorated Period, Baudez (1967: 207-08) wrote:

...the points of comparison with foreign cultures are more scarce than during the preceding period,

partially because CIRUELAS is not as well defined as was CATALINA, but also because during this time period throughout the area, the relative unity of the ceramic assemblage during the Preclassic gave way to regional specialization.

However, certain CIRUELAS ceramic traits permit the connection of this period with the Proto-Classic and Ancient Classic periods in Mesoamerica.

If our distinction between trichrome and bichrome has any validity, Lopez is the earliest type which can be called polychrome; as mentioned previously, its decoration consisted of motifs painted in black and edged with white on a red background. The oldest polychrome of the Valley of Mexico appears in the ZATENCO and TICOMAN phases (Vaillant 1930) and was assigned the name San Martin Polychrome by Tolstoy (1958). Although having different colors, it is very similar to Lopez, to the extent that the motifs, painted in red on beige, are bordered by a white line. We think that the origin of the white edging on painted motifs decorative technique must be sought in Mexico; in fact at ZATENCO, San Martin is contemporary with zoned bichrome, whereas in Costa Rica, Lopez follows the incised bichrome types. The lateral edges on the Lavaderos and Guinea bowls certainly are of northern origin. They appear in the Fifth century in the first part of the Ancient Classic period, at Zacualpa in the BALAM phase (317-633 A. D.) at Uxactun in CHICANEL and MATZANEL (Late Preclassic and Protoclassic) and at this site they continue to decorate the pottery of the TZAKOL phase (Ancient Classic 278-593 A. D.).

In Panama, the Santa Maria complex of the Giron site (Parita Bay) may be contemporary with CIRUELAS (Willey and Stoddard 1954). In fact the first two varieties of Santa Maria Polychrome, associated with black-on-red bichromes analogous to Charco, motifs are painted in black on beige on the neck or upper part of the vessel, the rest being red-slipped. (Willey and Stoddard 1954: Fig. 89 k-m. See also Lothrop 1942: 126; Black Line Geometric Ware, Fig. 234-35.)

While the widespread examples of Tola Trichrome provide evidence for the spread of regional unity during this time period,

there are a limited number of instances of external contacts. Most of these are Mayoid polychromes and adorno heads that have their greatest stylistic similarities with the eastern Honduran area around Lake Yajoa, and there is 1 example of specific trade from the Uaxactun area (Fig. 66).

Although this is the peak of the expansion of Teotihuacan in Central Mexico, there are no known examples of its influence in northern Guanacaste. The Chavez White-on-Red type may have been a part of the southern diffusion from the west coast of Mexico early in the period, but this cannot be determined on the basis of present information.

No radiocarbon dates are available for this period, although Baudez (1967: 207) estimated its span from A. D. 300 to 500. This period marks a cessation of the widespread regionalism that marked the preceding Formative and local ceramic practices evolve into the origination of a strong areal tradition.

In terms of the areal tradition, and without dependable radiocarbon dates showing the clustering of ceramic types in certain relationships, there seems to be little reason to separate this period from the succeeding Early Polychrome one.

Early Polychrome Period

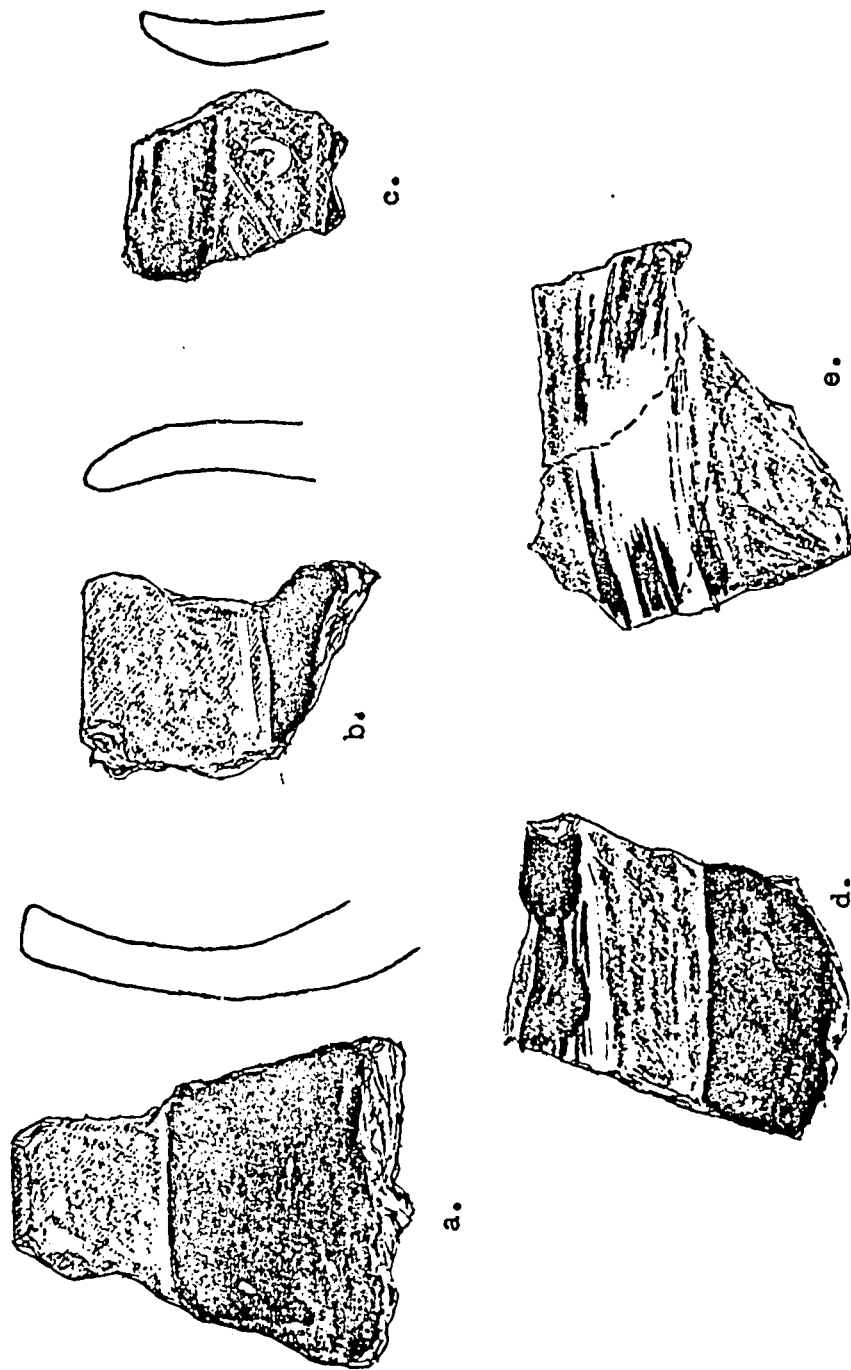
The elimination of the Linear Decorated Period as a separate entity results in a time span of 500 years (A. D. 300 to 800). This may eventually prove to be too large a unit of time to deal with in terms of cultural history, but at the moment no sound basis

for subdivision exists.

The range of radiocarbon dates for the period supports a span from A. D. 465 to 900. The dates Y-1124 and Y-1122 give a date approximately in the middle of the period, while a single date Y-1125 is weighted towards its end. Again, until clusters of dates can be obtained, more precise time lines cannot be drawn.

Haberland (1968: 234) has designated Tola Trichrome (Fig. 56) as a horizon marker of the early part of the period, while Baudez has assigned it the name Lopez Polychrome (1967:99-101) and little historical importance, the type being poorly represented in the Tempisque River area. The appellation Tola seems to have historical precedent (Norweb 1964: 559) and should be the standardized reference. The type is present in limited amounts in the Early Polychrome component at Las Marias and San Dimas, while its general absence from the Tempisque drainage (although possibly an artifact of research) strengthens the northern weighting assigned to the type by Haberland (1968: 232). Norweb's (1964: 559) type "Mosca Black-on Red: Similar to Tola Trichrome but without white paint" is simply Tola on which the fugitive white paint has weathered away.

Another prominent horizon marker of this period is a series of red bowl-shaped vessels with a variety of white or orange rectilinear designs. This type is not found in Baudez's Tempisque sites and Norweb's (1964: 559) Chavez White-on-Red will be employed. He defined it as "Red-slipped with wide white or orange linear designs on bowls or sometimes grater plates..."



Scale 1:1

Fig. 56 Early Polychrome ceramics: Tola Trichrome

Again, this style is represented in Early Polychrome components both in the San Dimas Valley and at the Las Marias shell midden. Based especially on analysis from the latter site, it appears that important technological and probably cultural differences are concealed under one "lumped" term.

The White-on-Red ceramics (Fig. 57) are well fired and of high technical quality. The white design is an actual paint, well applied with a high degree of adherence to the vessel and sharply defined edges. Some ridging occurs on vessels and the designs, as mentioned above, are rectilinear and quite geometric.

By contrast, the Orange-on-Red ceramics show a much lower level of technical sophistication, the red slip is cracked and flakey, and the orange design is a clay wash rather than an actual paint. It has not adhered well to the vessel and in some cases is semi-fugitive. The design elements are generally rectilinear, but lines are bending rather than straight and edges are not well-defined. The range of decorative colors in this category is wide, and some poorly made and decorated vessels have a wash closer to real white than to orange.

While the two types are obviously part of the same stylistic milieu, the differences are substantial enough to warrant separation for analytical purposes. It is proposed that the term "Chavez White-on-Red" be limited to the finer material, while "Alhambra Lined-on-Red" be applied to the more crudely decorated wares.

Both types have close affinities with published examples

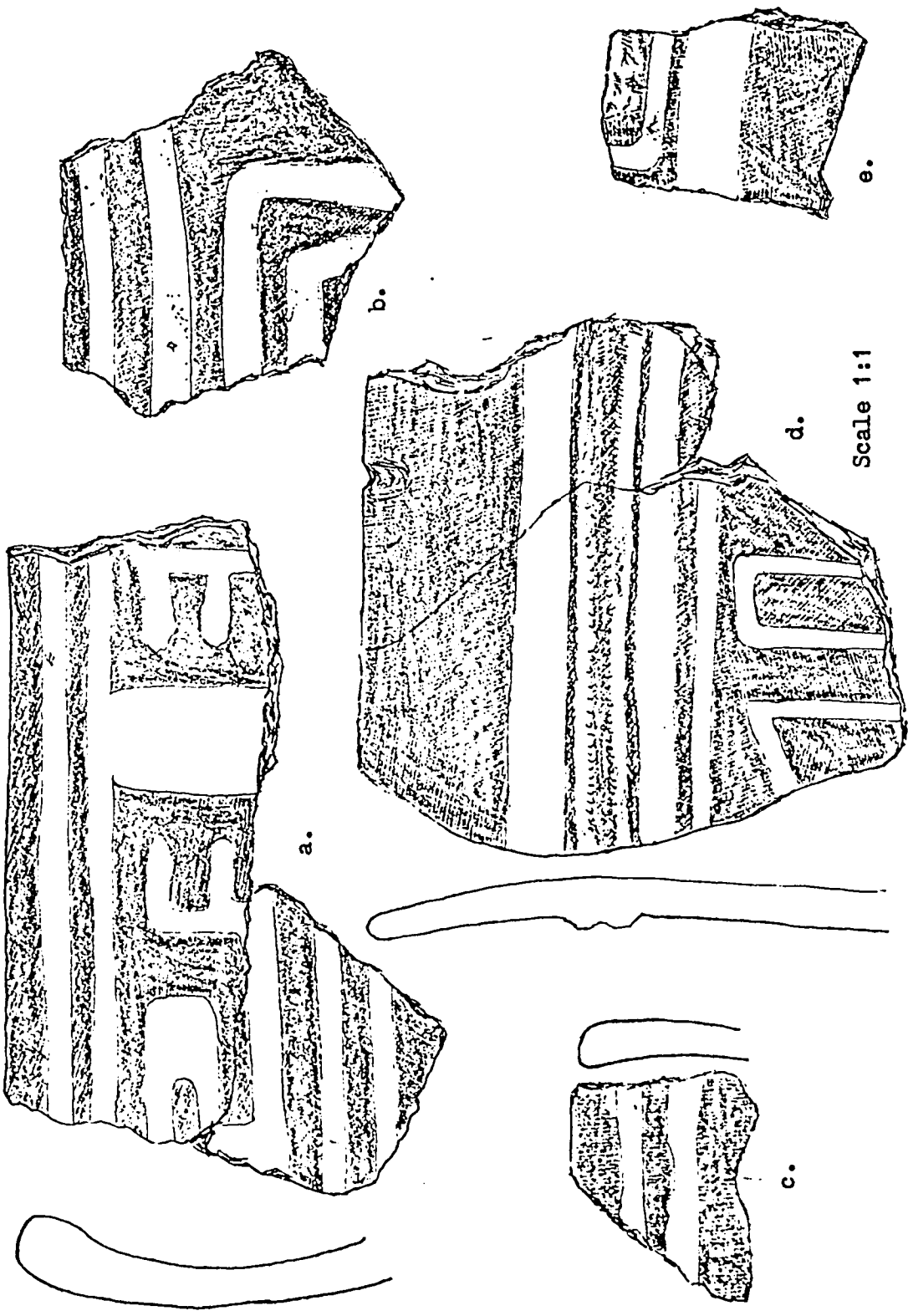
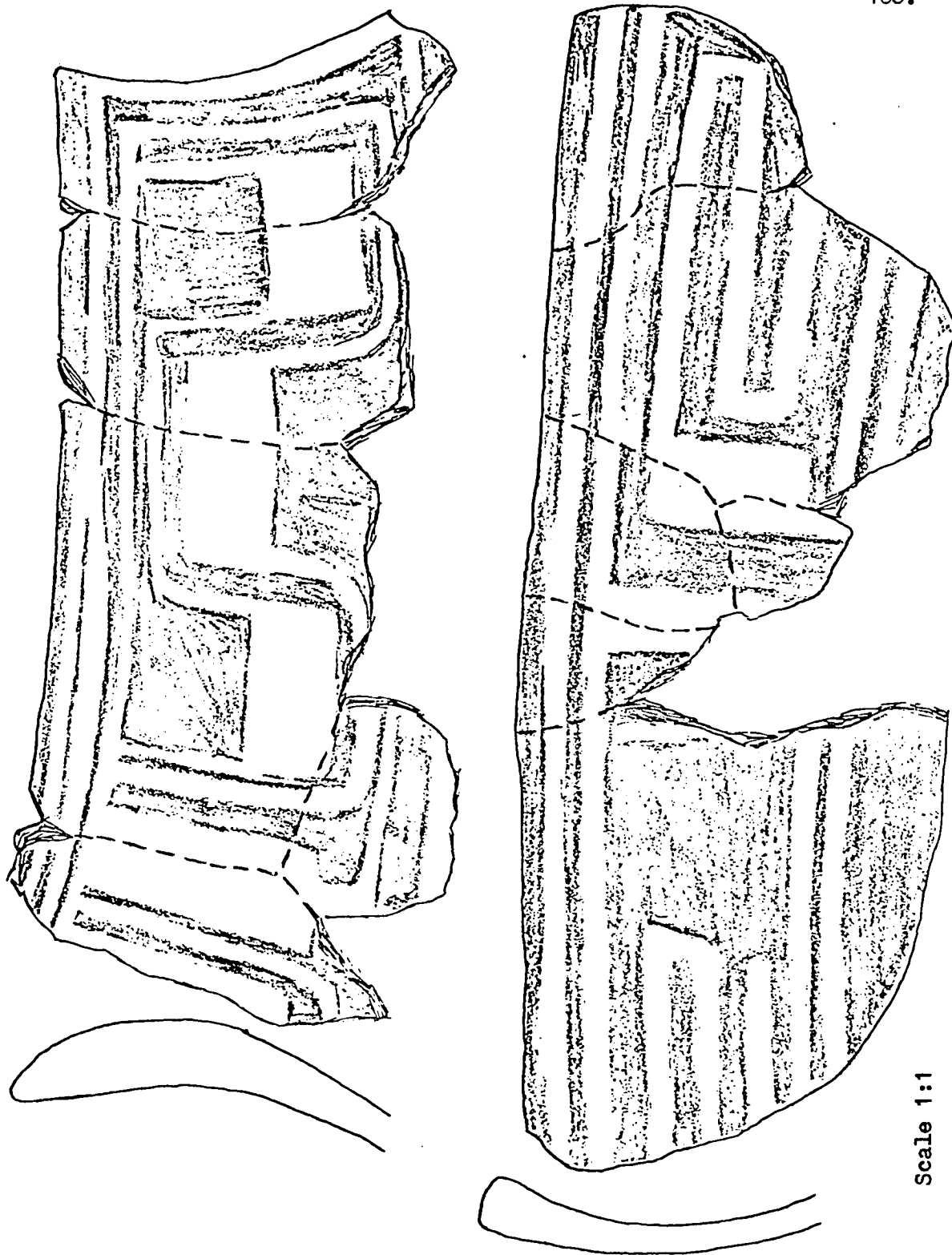


Fig. 57. Early Polychrome ceramics; a, b, and d Chavez White-on-Red; c and e Alhambra Lined.



Scale 1:1

Fig. 58. Early Polychrome ceramics: Chavez White-on-Red vessel fragments.



Fig. 59. Early Polychrome period, Chavez
 White-on-Red and Alhambra Lined on Red
 (above); Tola Trichrome (below).

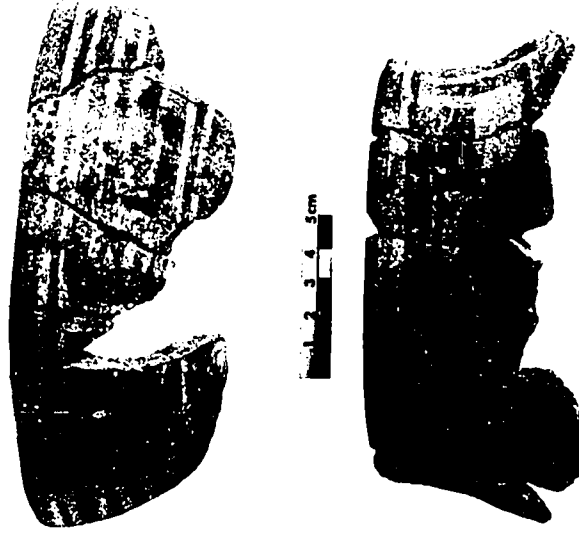


Fig. 60. Early Polychrome period, Chavez
 White-on-Red vessel fragments

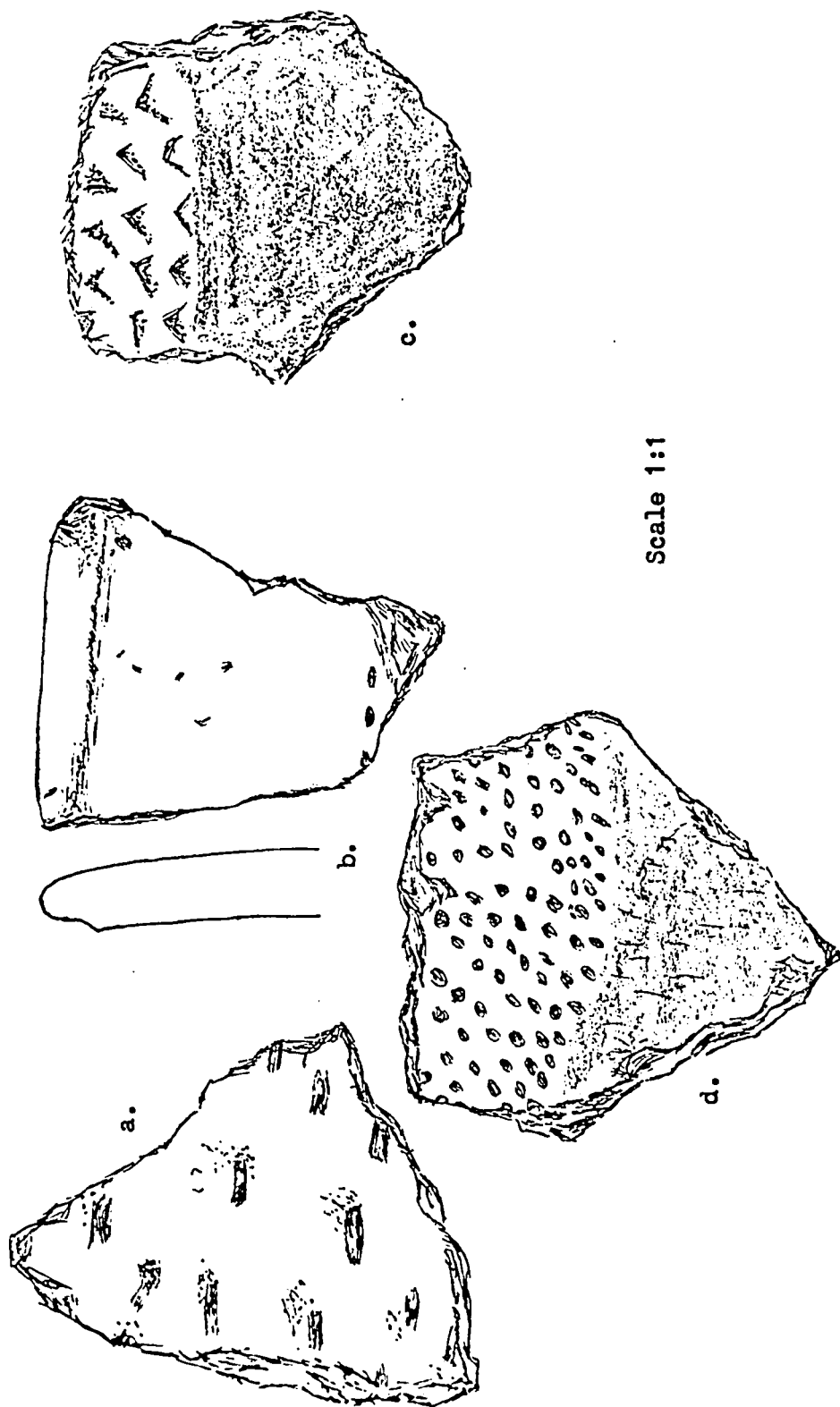


Fig. 61. Early Polychrome ceramics. Leon Punctate "Chili Graters".

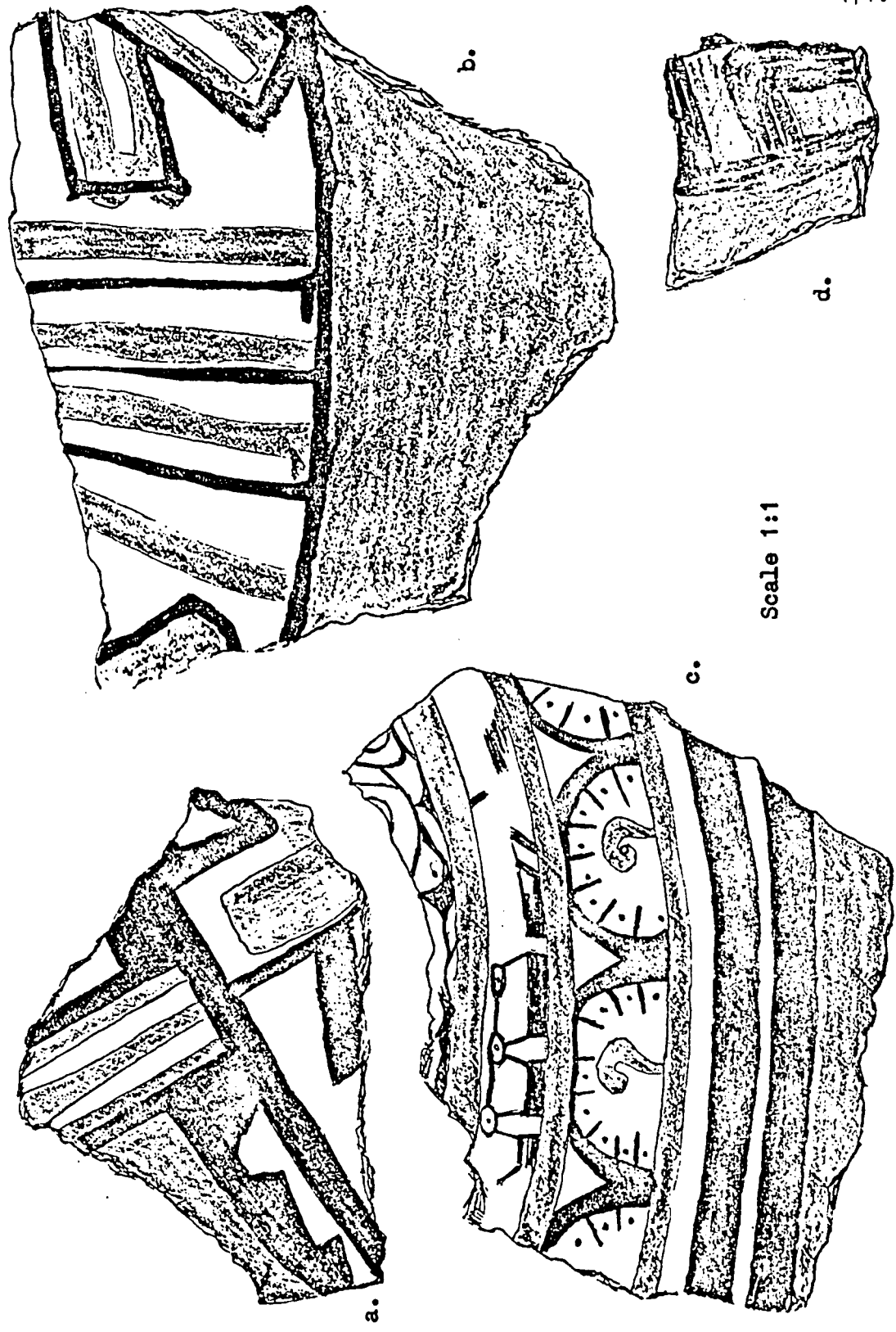
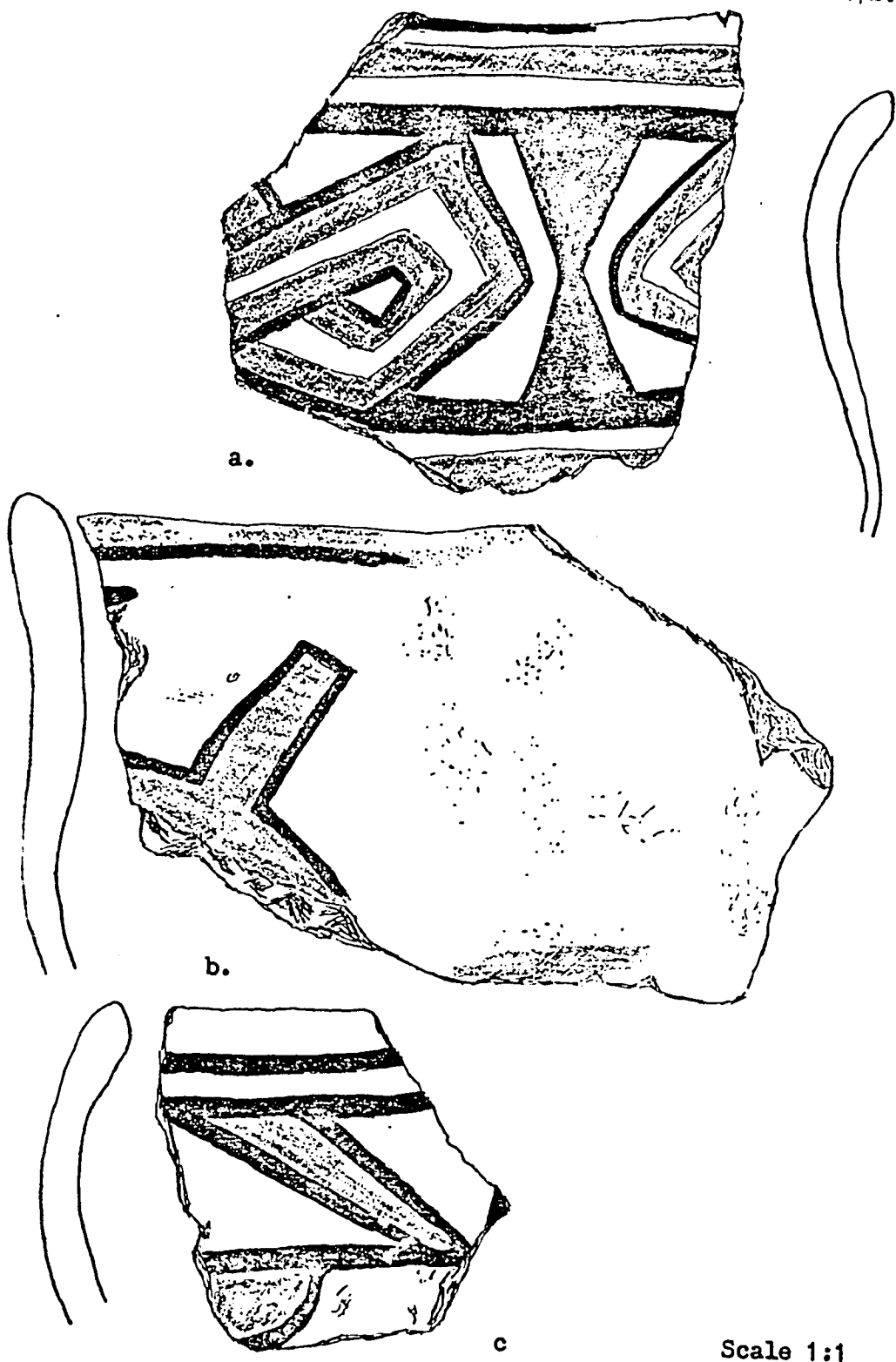


Fig. 62. Early Polychrome period, Carillo Polychrome.



Scale 1:1

Fig. 62 (continued), Early Polychrome period, Carillo Polychrome.

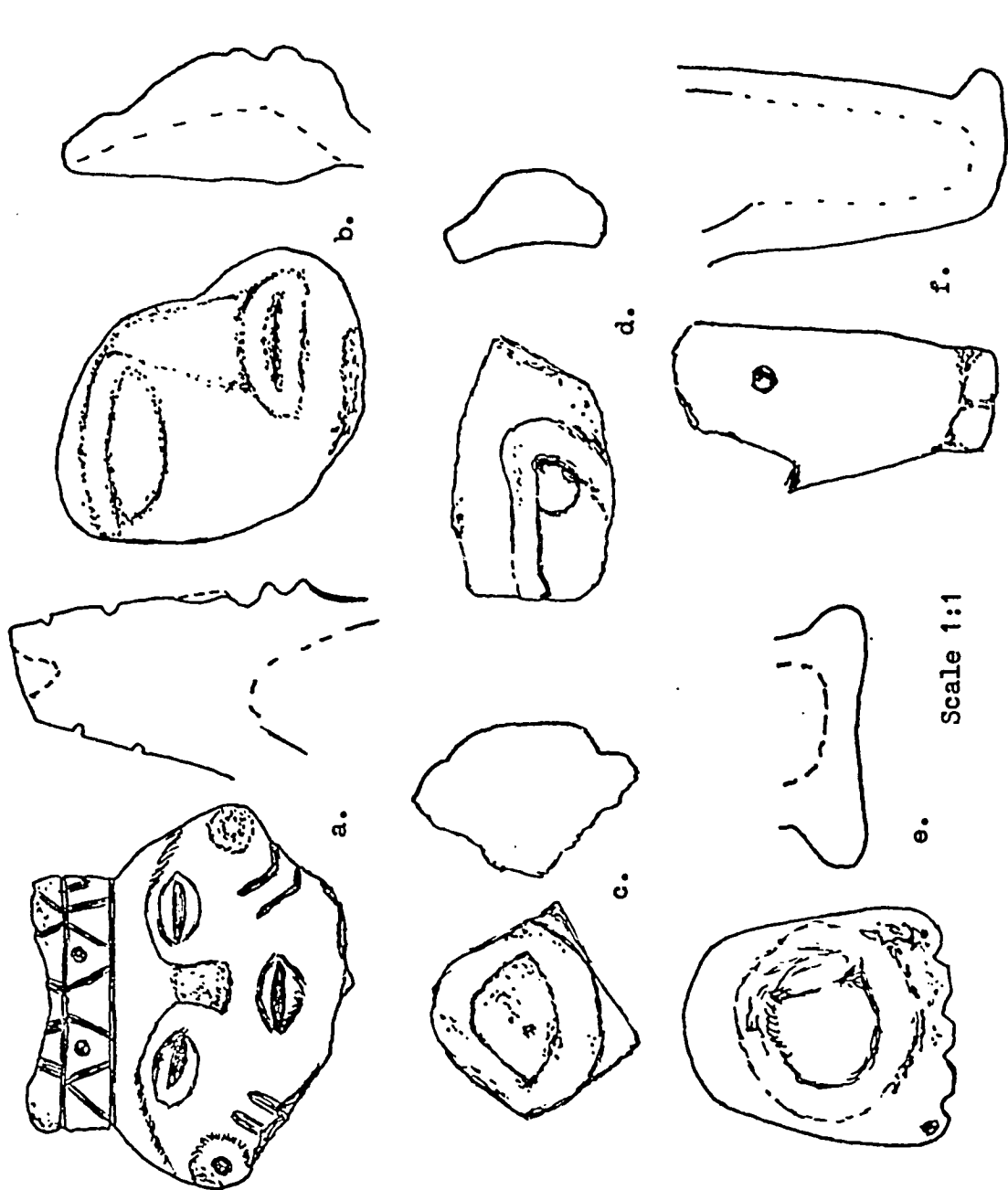


Fig. 63. Figurine fragments: a, Early Polychrome period; b-f, Zoned Bichrome period.



Fig. 64. Early Polychrome period. Adorno or figurine fragment;
detail of Fig. 63,a.



Fig. 65. Zoned Bichrome, Early Polychrome, and Middle Polychrome figurine fragments.

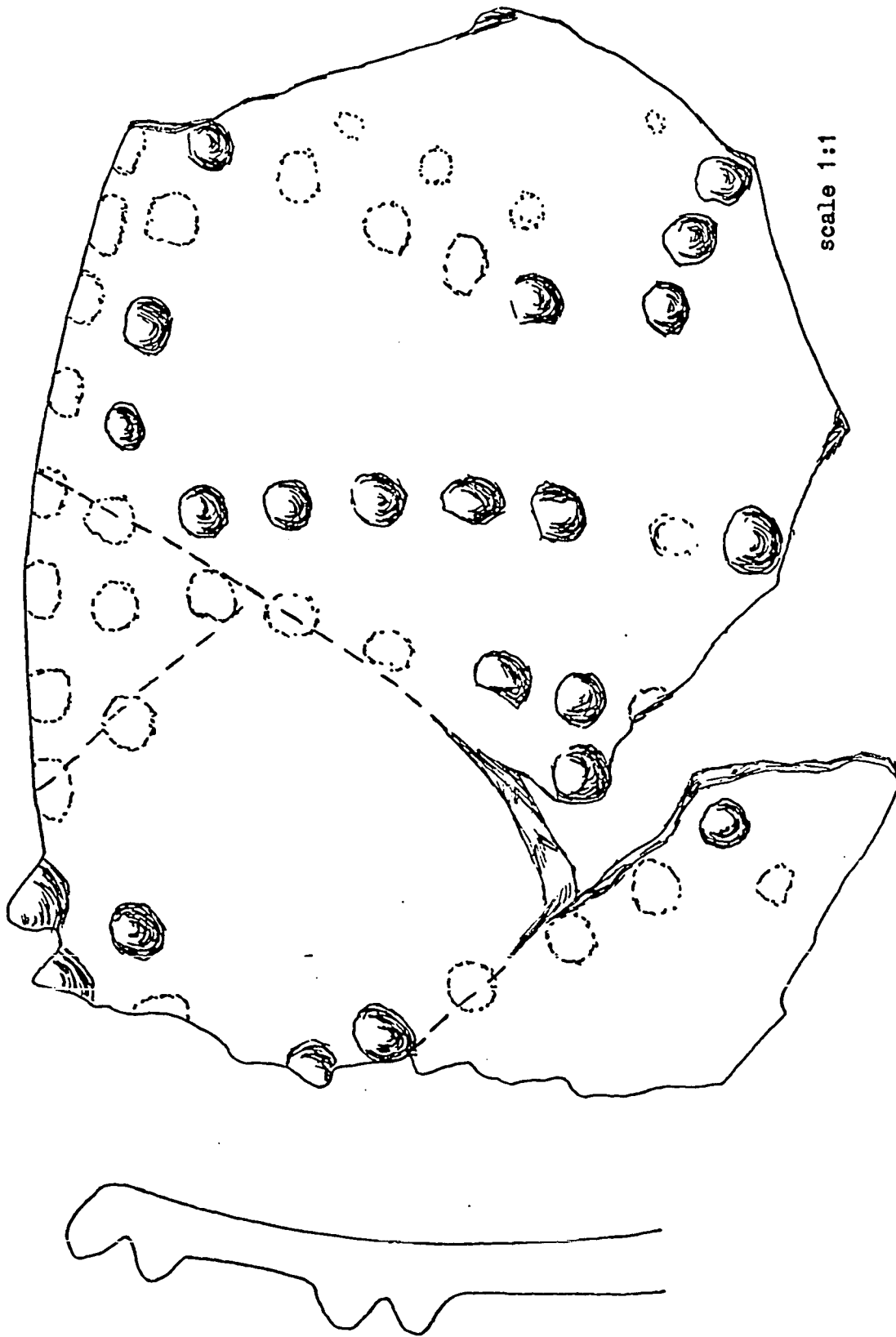


Fig.66. Early Polychrome ceramic: Uaxactun Unslipped Ware, Cambio Group.

of Lothrop's (1926) "Nandaime Ware" but the emphasis on rectilinear design is distinctive. Coe (1962: 267) mentioned a "White-on-Red at beginning of Phase (Santa Elena) but dies out," but did not illustrate it, suggesting (1962: 268) that it may show direct contact with Ecuador. None of the published sources (Coe 1960; Estrada, Meggers, and Evans 1965; Evans and Meggers 1966) illustrated material similar to Chavez, Alhamra or Nandaime and further evaluation of contact must await publication of this material.

Whether or not the speculations on specific external contacts are eventually borne out, it is interesting to note that throughout the Greater Nicoya subarea the White-on-Red wares show an early introduction and then die out, never to reappear.

In more minor types, Baudez's (1967: 117) Carillo Polychrome (Fig. 62) and Norweb's (1964: 559) Leon Punctate (Fig. 61) and Potosi Applique are also present in the Sapoa River area.

Middle Polychrome Period

Baudez (1967: 209) placed this period from A. D. 800 to 1200. This range is supported by radiocarbon dates Hv-2688 and Y-815, while 3 others assigned to this period by Haberland (personal communication) fall outside the upper end of the range. Hv-2690 and Hv-2691, in the lower range of their deviation, could be considered "Late Middle Polychrome," while Hv-2689 is firmly in the Late Polychrome time range. Again, clusters of dates from single contexts are needed in order to resolve these variations.

Detailed differences between the Tempisque River, Sapoa

River, and southern Nicaragua cultural areas will be analyzed at greater length in a following section, but it should be pointed out here that variations in dates can also be possibly attributed to cultural differences within the Greater Nicoya area. For the time being, Baudez's A. D. 800 to 1200 boundaries seem reasonable and should continue to be used.

The Middle Polychrome period is only slightly represented in the Sapoa River area. Sites 1 and 6 in the San Dimas Valley are assigned to this period on the basis of Palmares Incised (Baudez 1967: 127); Mora Polychrome (Baudez 1967: 133), Fig. 67 and 68; and Sacasa Striated (Norweb 1964: 559). The presence of this component at the Las Marias shell midden is indicated by Mora Polychrome; Castillo Engraved (Norweb 1964: 560), Fig. 106; and Papagayo Polychrome (Baudez 1967: 142), Fig. 69 and 70, a horizon marker of Middle Polychrome in both the Tempisque and Nicaraguan areas.

Mora Polychrome is also present in Site 87 on the salt flat and at Site 67 on the Salinas River, indicating a widely dispersed settlement during this time, but one in contrast to Coe's statement (1962: 362) describing the Doscientos phase at Chahuite Escondido "The succeeding...phase is clearly the major occupation... when the bulk of the shell mounds were accumulated."

In describing the ceramic evidence for contact during this period, Baudez (1967: 209) noted:

Mora Polychrome offers several analogies to the painted ceramic ware of the Late Classic period in

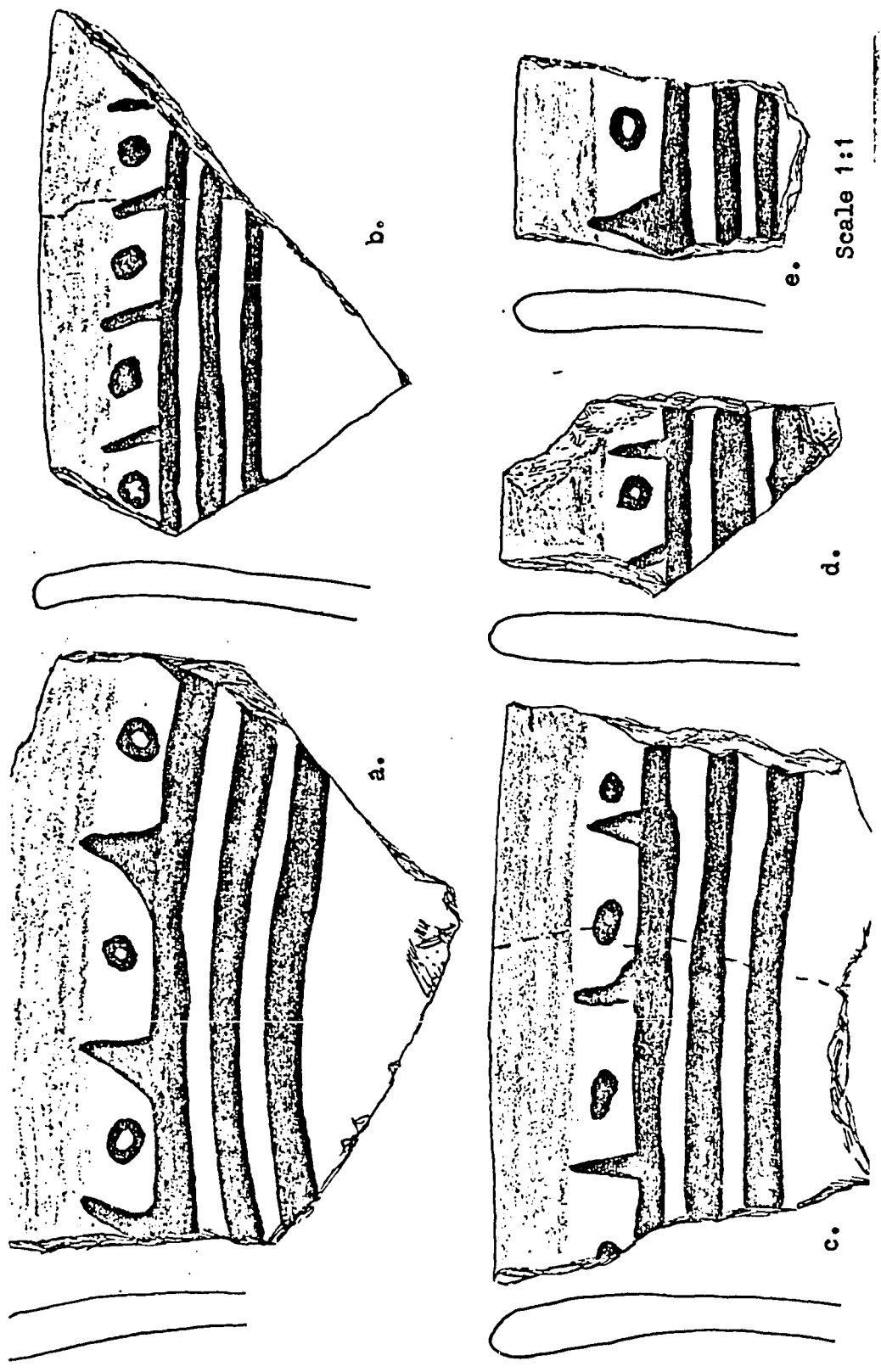
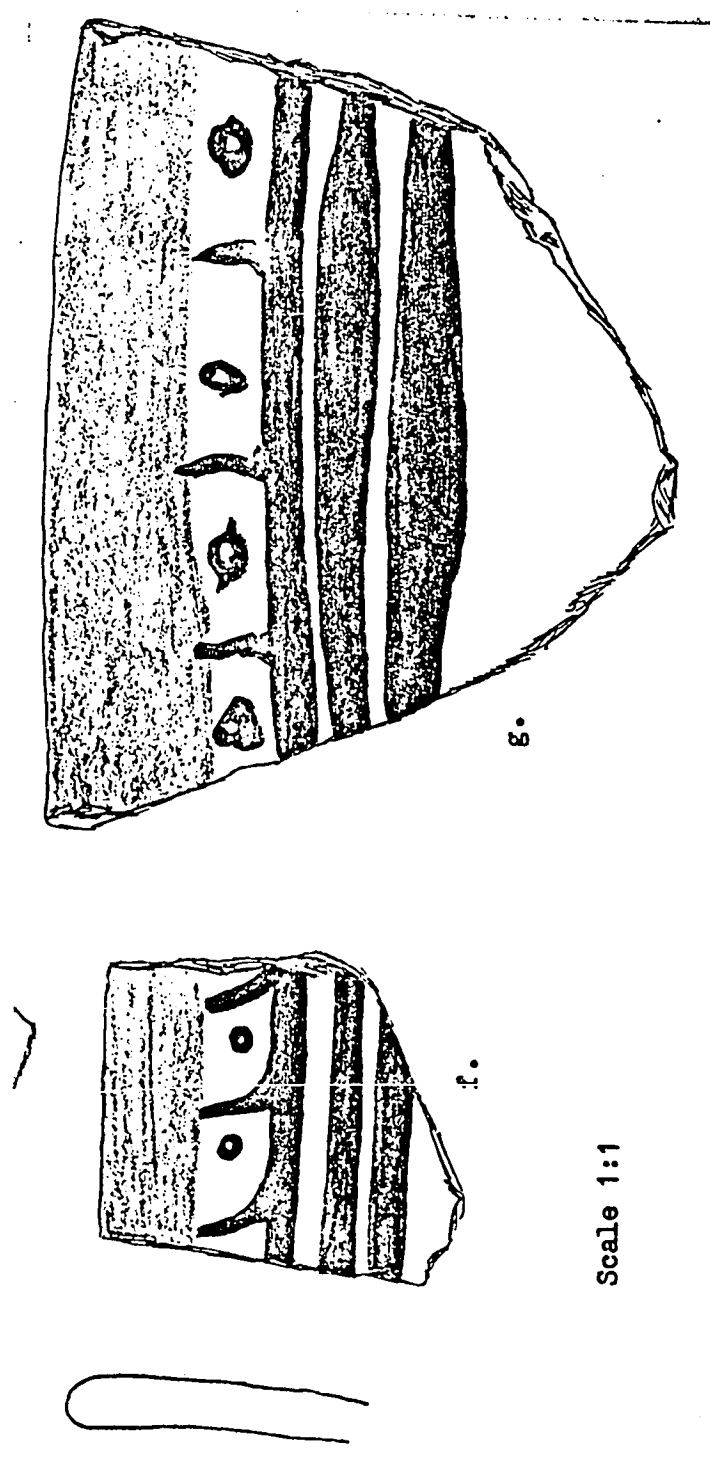


Fig. 67. Middle Polychrome ceramics: Mora Polychrome (interior).



Scale 1:1

Fig. 67. (continued) *Mora Polychrome* (interior).

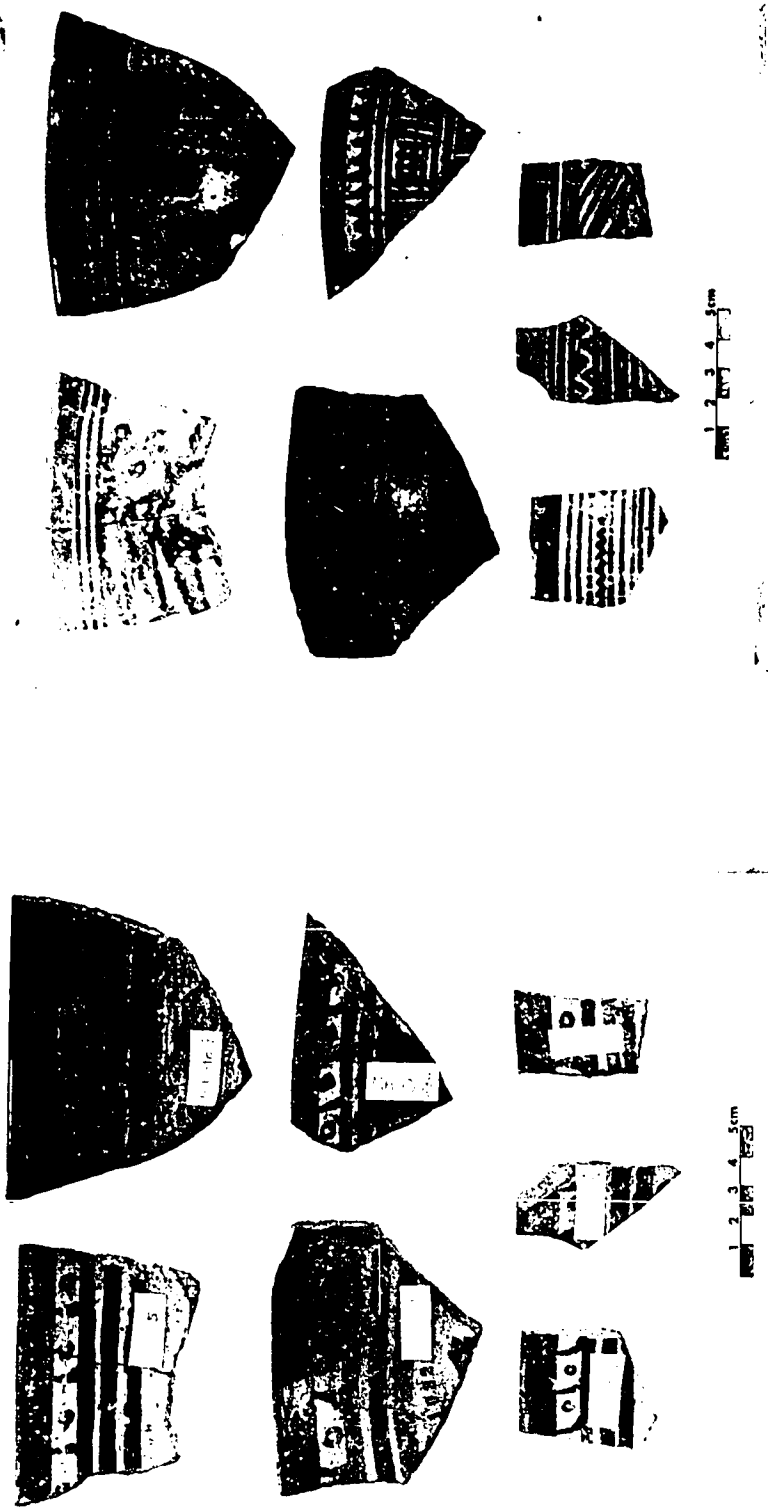


Fig. 68. Middle Polychrome period, Mora Polychrome interiors and exteriors.

the Maya region:

- the "Kan" sign (See Smith 1955, fig. 9,o; 37, 10 etc. and in this work, pl. 39, a);
- the seated person (pl. 39, c) comparable to certain realistic motifs of Copador polychrome from Copan (Longyear 1952; Lothrop 1926: pl. XXVI, z);
- the horizontal dots and points decorative motif, very close to those ornamenting the interior of Copador Polychrome bowls (Longyear 1952: fig. 76,c).

Papagayo polychrome was exported in Mesoamerica over long distances: Lothrop pointed to the presence of this type in Salvador (1927) and in the Auiche region of Guatemala (Lothrop 1936: 92). At Copan (Honduras), a zoomorphic Papagayo vase (Closely related to one illustrated by Lothrop (1926: fig. 22) was discovered in tomb X of the site, accompanied by several sherds of Tohil Plumbate pottery (Saville 1916 and Longyear 1952: 43). At Zaculeu (highlands of Guatemala) a tripod Papagayo bowl was associated with tomb XV with two polychrome bowls with zoomorphic feet and two Tohil Plumbate jars (Woodbury and Trik 1953: vol. I, pp. 194-95, fig. 99 and vol. II, fig. 265, r). At Tazumal (Salvador), Boggs found fragments of Plumbate and Mixtecan "incense burners" associated with potsherds of what seem to be Papagayo or Jicote (Boggs and Longyear 1944: 66, fig. 30, jj; pl. XIV, B, 7. See pl. 51, d in this publication). This ceramic assemblage was attributed by Boggs to the late construction period of Tazumal (1000-1200 A. C.). The association of Papagayo polychrome and Tohil Plumbate in Costa Rica seems to have been confirmed in 1962 at the site of Nacascolo, on the Pacific Coast. If one is to believe the evidence of a farmer, the discoverer, a Plumbate vase was found associated in the same tomb with several Papagayo vases and others (belonging to a type absent in our sequence) analogous to "Chocolate Ware" pottery described by Lothrop (1926: fig. 119, and pl. CIII, a,b). While passing through San Jose shortly after this discovery, we were able to study these pieces; the Plumbate vase is pear-shaped with tripod feet and analogous to one shown in Shephard (1948: Fig. 10, m,n). One of the Papagayo zoomorphic jars reproduces exactly a Plumbate form (Shephard 1948: 14, f).

In the proximity of the San Salvador museum (El Salvador), a tripod bowl was discovered that seems to be Birmania polychrome (Boggs 1944). This vessel was found at the same level and near a

tomb containing, notably, a Tohil Plumbate vase.

These different cases of association of Tohil Plumbate and some Papagayo and Birmania type examples permits us to correlate our "Middle Polychrome" period with the Ancient Post-Classic period of Mesoamerica (eleventh and twelfth centuries), with Tohil Plumbate being one of the characteristic types together with X Fine Orange, one of whose forms is common to Papagayo and Jicote Polychrome (Smith 1958). The "Middle Polychrome" period must have ended by the year 1200, corresponding to the end of the Toltec period in Mesoamerica.

While the primary cultural influence in the area during this time is definitely Mayoid, the extent of this contact should not be overestimated. Extremely few actual Mayan trade vessels have actually been found, and the analogous decorative motifs have been acquired, it would appear, through intermediary sources.

Even though Baudez is most probably correct, the case for Papagayo and Tohil Plumbate association at Nacascolo should be looked at carefully. Baudez and Coe (1966: 443) themselves cautioned against evidence based on questionable material; in the Nacascolo case there is a special problem with context, as I am told that the site is a midden (Haberland, personal communication) and tomb associations are often most difficult to assess in such situations. The weight of evidence of the north-traded Papagayo association with Plumbate reinforces Baudez's interpretation of the find, but it would be best to have additional evidence of association with south-traded Plumbate to balance this out. The possible association of Tohil with Jicote rather than Papagayo polychrome in Salvador (Jicote polychrome being associated with the "Late Polychrome" period) is one example of possible chronological differences in

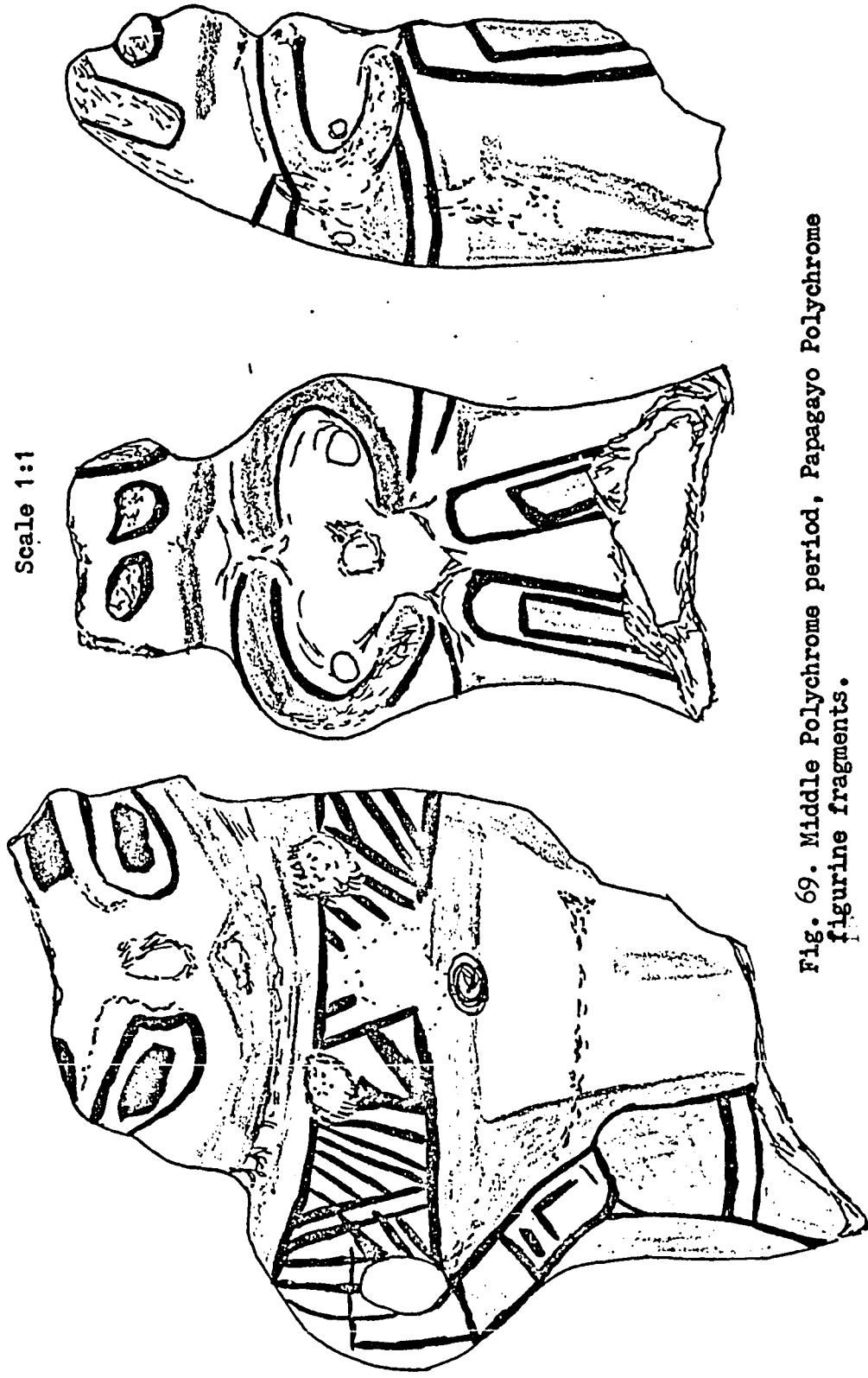
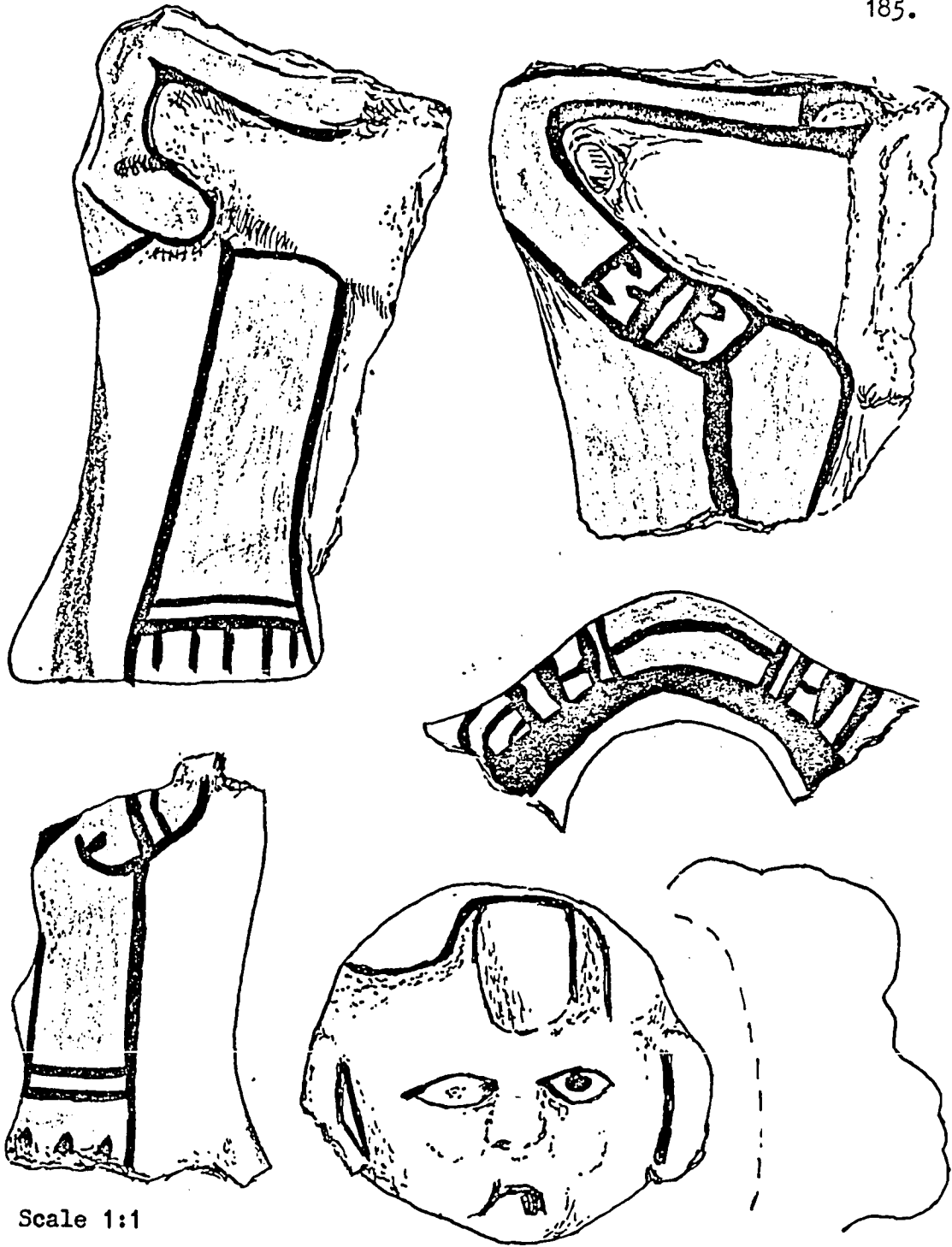


Fig. 69. Middle Polychrome period, Papagayo Polychrome figurine fragments.



Scale 1:1

Fig. 69.-Middle Polychrome period, Papgayo Polychrome figurine fragments.



Fig. 70 Middle Polychrome period, Papagayo Polychrome

northern versus southern associations. At present, Tohil Plumbate has not been identified from any excavation in northern Guanacaste.

While Papagayo polychrome was widely traded to the north, it is interesting to note that Mora Polychrome is apparently absent north of the present international boundary between Costa Rica and Nicaragua. Aguilar (1970: 4) and Kennedy (1969: 358) both reported finding small amounts of Mora on the Atlantic watershed and it is also known from the central highlands (Stone 1958). Aguilar also reported finding a small amount of Birmania polychrome at the Guayabo site.

As in the preceding two periods, there was no apparent influence from the Central Mexican highlands during the Middle Polychrome period, although events there at this time were to cause widespread changes that are reflected in the following period. There are also no discernable contacts with Panama or northern South America.

Late Polychrome Period

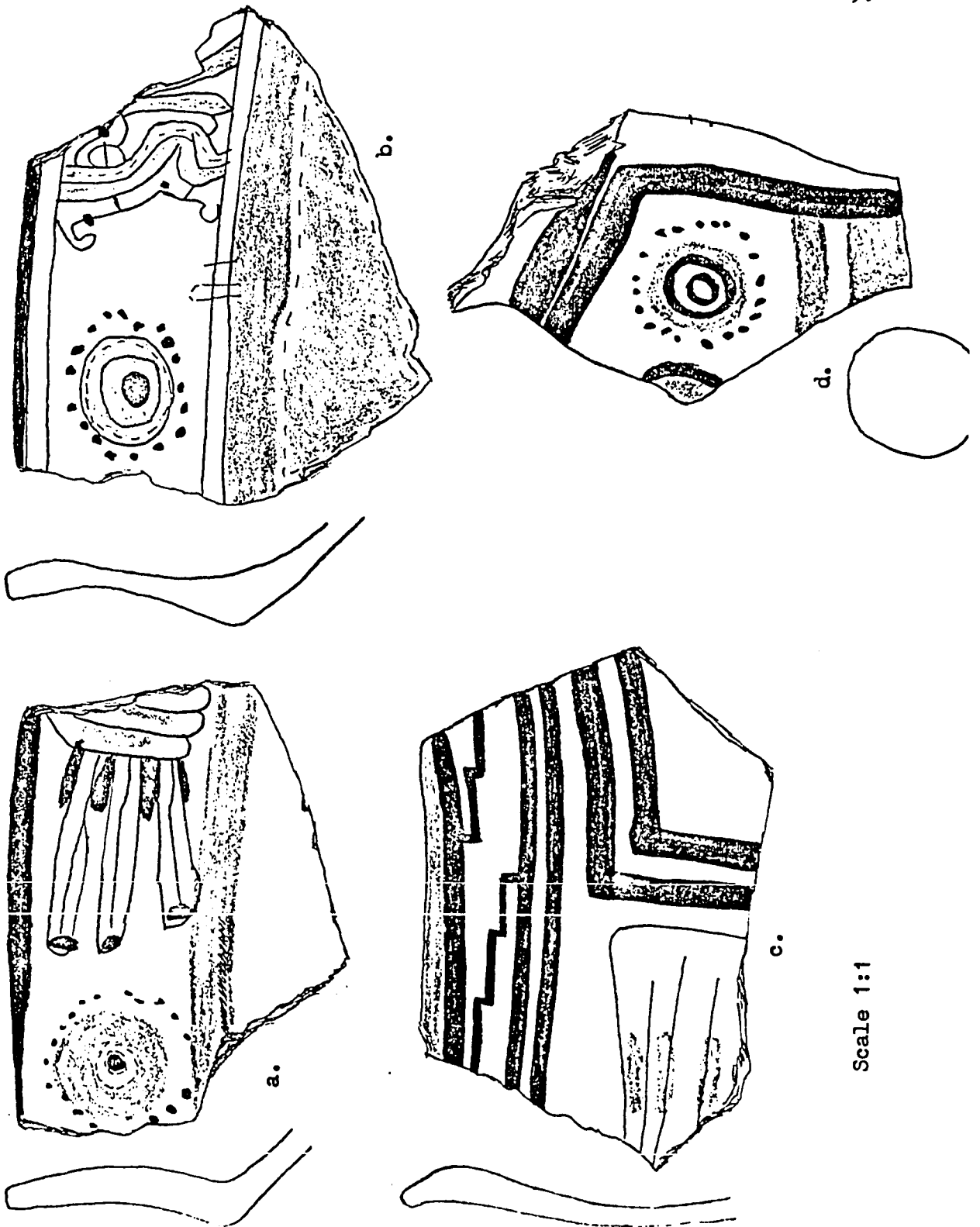
The time span A. D. 1200 to 1600 given this period by Baudez (1967: 210) is supported by 3 individual radiocarbon dates, 1 each assignable to the beginning, middle, and end. This period is perhaps the least understood in the Greater Nicoya area; it is poorly represented in the Tempisque River sites, present to an unknown degree at Chahuite Escondido, unknown at Tamarindo Bay, has a limited distribution on the Isthmus of Rivas, is represented by the unique Luna Polychrome styles on Ometepe Island, and is best seen in the Late Polychrome component at the Las Marias site.



Fig. 71 Late Polychrome period, Mombacho Polychrome Incised.



Fig. 72 Late Polychrome period, Vallejo Polychrome.



Scale 1:1

Fig. 73. Late Polychrome ceramics: Mombacho Polychrome Incised.



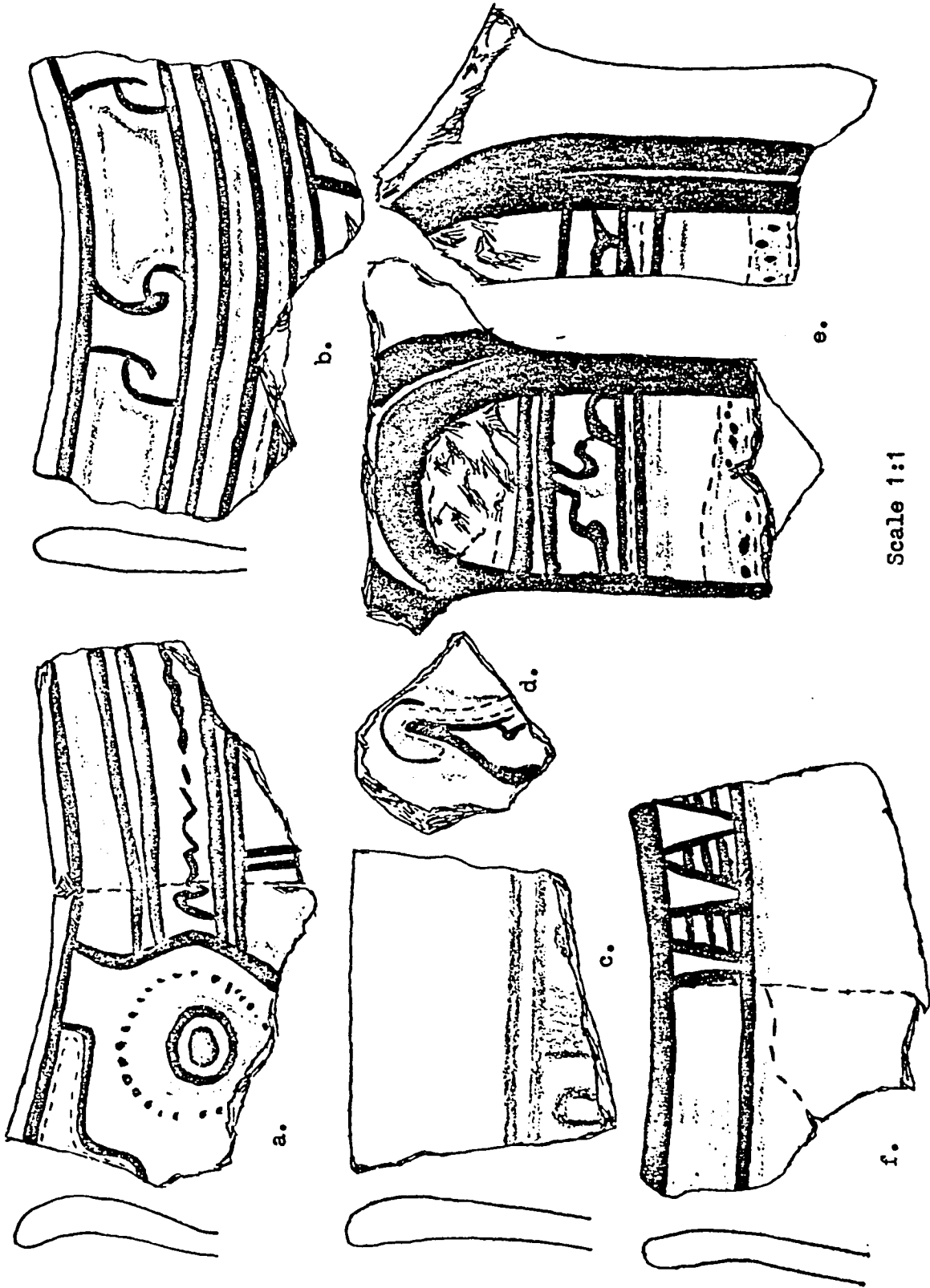
Fig. 74 Late Polychrome period, Mombacho Polychrome Incised,
detail from Fig. 73, b.

In the general concern with Late Formative and other phases in the region (Coe and Baudez 1961; Haberland 1968), this late period has been largely ignored, even though it seems to present one of the most complex and interesting pictures of areal fragmentation in the regional sequence. Baudez and Coe's (1962: 369) division of this period into La Cruz A and La Cruz B appears to still be a very useful break and nominally to be especially important since, to date, major manifestations of the northern Costa Rica Late Polychrome period have been found only in the vicinity of the town of that name.

La Cruz B Phase

The major ceramic types of this phase are: Vallejo Polychrome, Castillo Engraved, Bramadero Polychrome, Las Marias Polychrome, Lunoid Polychromes, Alan Engraved, and some Murillo varieties. Castillo Engraved was assigned to the Middle Polychrome period by Norweb (1964: 560) but in the Las Marias assemblage is associated with the earliest part of the Late period and could be considered a transitional type. Castillo Engraved, as defined by Norweb, seems to be very similar to, if not identical to, the Palmares Incised type defined by Baudez. Vallejo Polychrome, with its characteristic bluish paint, was described by Norweb (1964: 560) as part of the Late Polychrome assemblage and its placement in the La Cruz B phase by Coe (1962: 362) is confirmed by the Las Marias data.

Bramadero Polychrome: Bramadero Polychrome represents a late period localized development out of the preceding Middle Polychrome



Scale 1:1

Fig. 75. Late Polychrome ceramics: Vallejo Polychrome

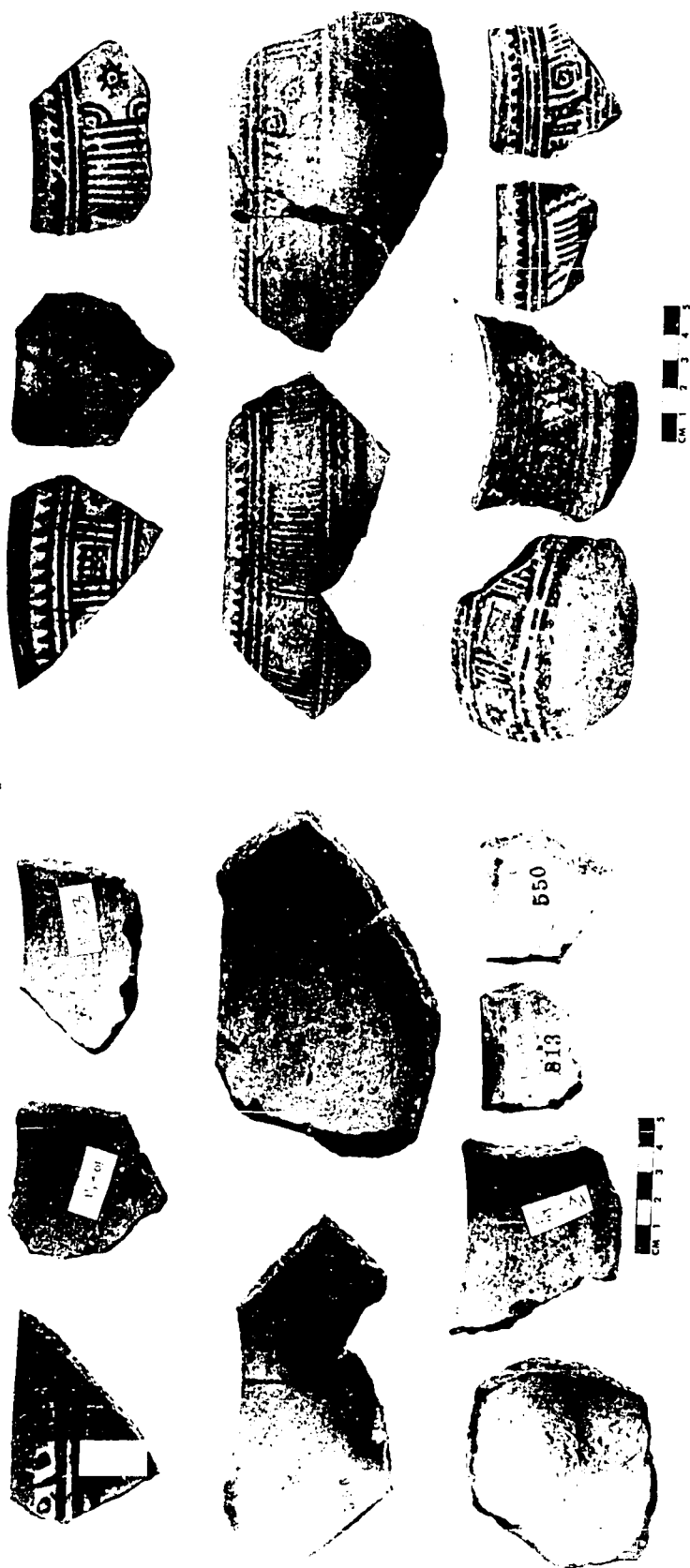
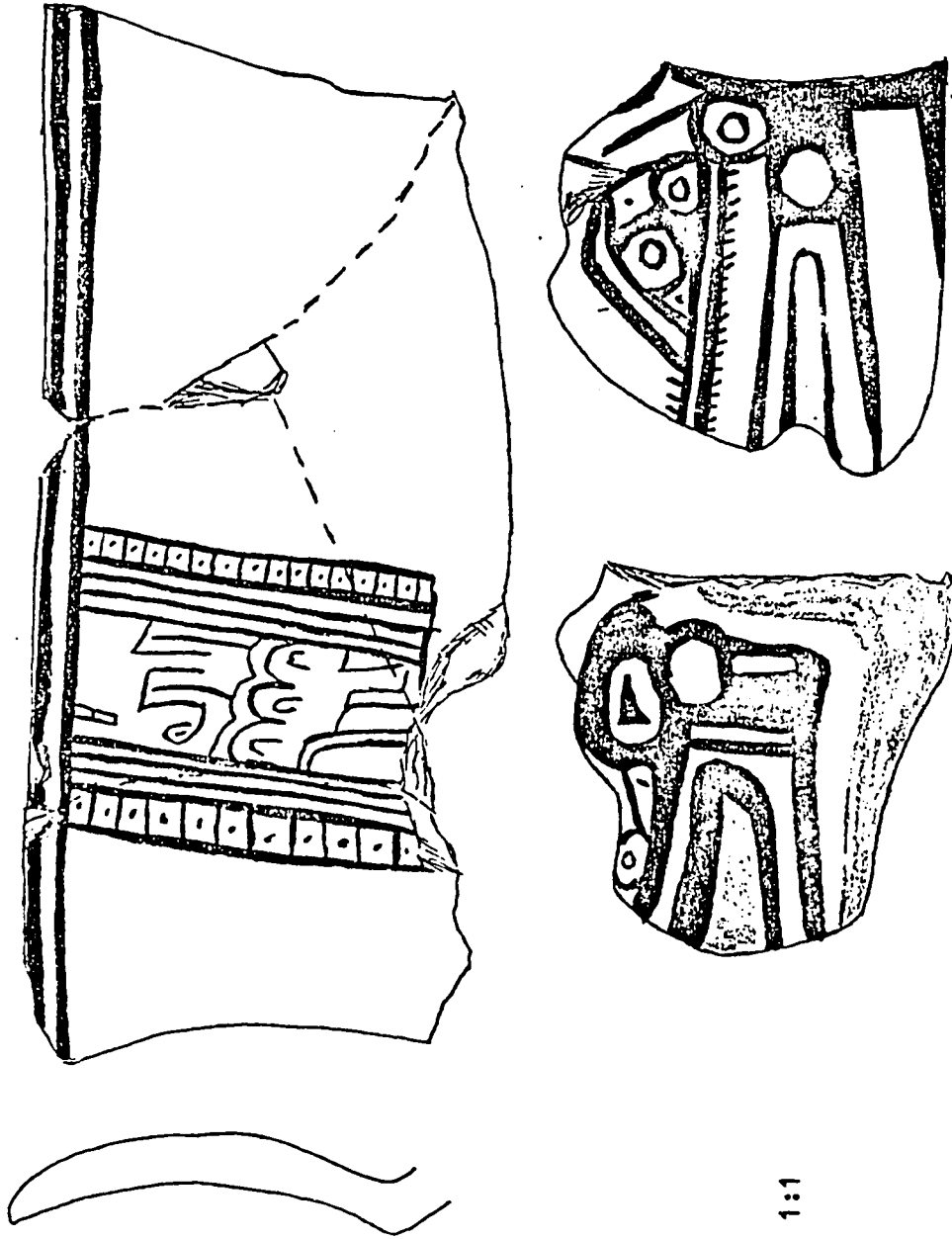


Fig. 76 Late Polychrome period, Bramadero Polychrome, interiors and exteriors.

Mora type. The decorative motifs stay basically the same, while the slip changes from orange to creamy white and vessel shapes change from large, straight-sided bowls to medium-sized incurving rim ones. Surface decoration is black and red. Another major change is the elimination of the interior decoration characteristic of Mora, especially in the form of squares and dots. The type is present at Las Marias and at El Jobo, but so far has not been reported from other sites in the area; in view of the other comparative data, it can be presumed that the type is prominent in the Late Polychrome phase at Chahuite Escondido (Fig. 76).

Las Marias Polychrome: This type is characterized by relatively flat-bottomed bowls with slightly outflaring rims set on tripod legs. The legs are effigies in the form of human, turtle, tapir, bird, and most commonly, dolphin heads; the hollow legs often contain clay pellets serving as rattles. The vessels are white-slipped and deep red and black are utilized for decoration. Red is most commonly employed on the top of the heads of the effigies, around their nasal areas, in a decorative panel from the point of the leg attachment upward to the rim of the vessel and in a red band around the upper exterior rim. All other decorative elements are in black and strips of small squares with black dots in the center are common (Fig. 77-79).

Lunoid Polychromes: Luna Ware, in its traditional decorative styles as shown by Lothrop (1926: Plate XCII) with the white, varnish-like finish, is not present in the Sapoa River area, but a wide variety of polychromes of a "Lunoid" type are. Although



Scale 1:1

Fig. 77. Late Polychrome period, Las Marias Polychrome.

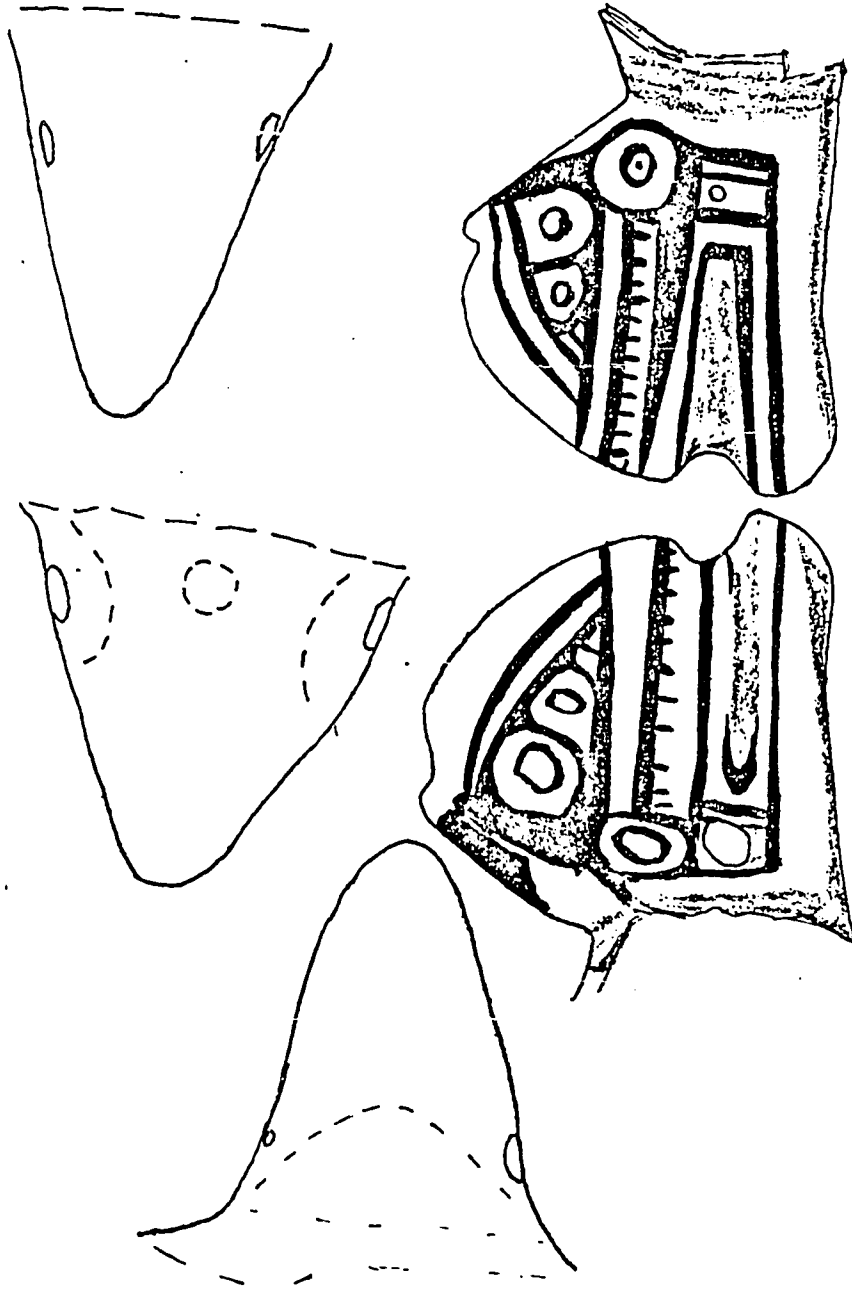


Fig. 78. Late Polychrome period, Las Marias Polychrome, tripod supports. Scale 1:1

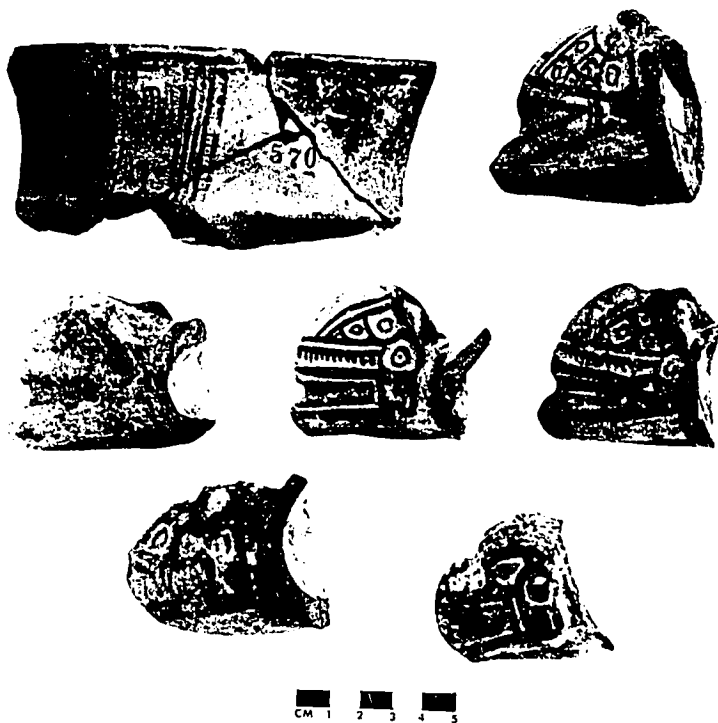


Fig. 79. Late Polychrome period, Las Marias Polychrome.



Fig. 80. Late Polychrome period, Lunoid Polychromes.

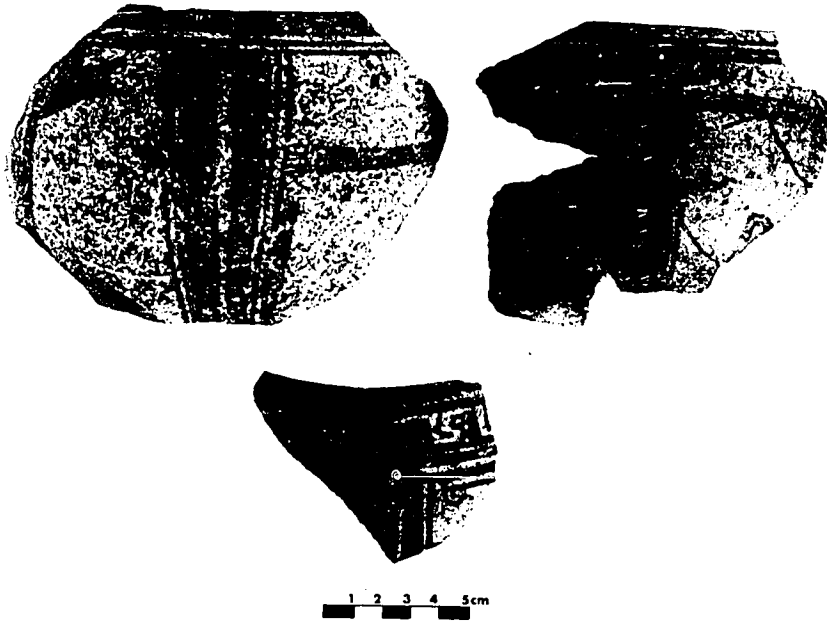


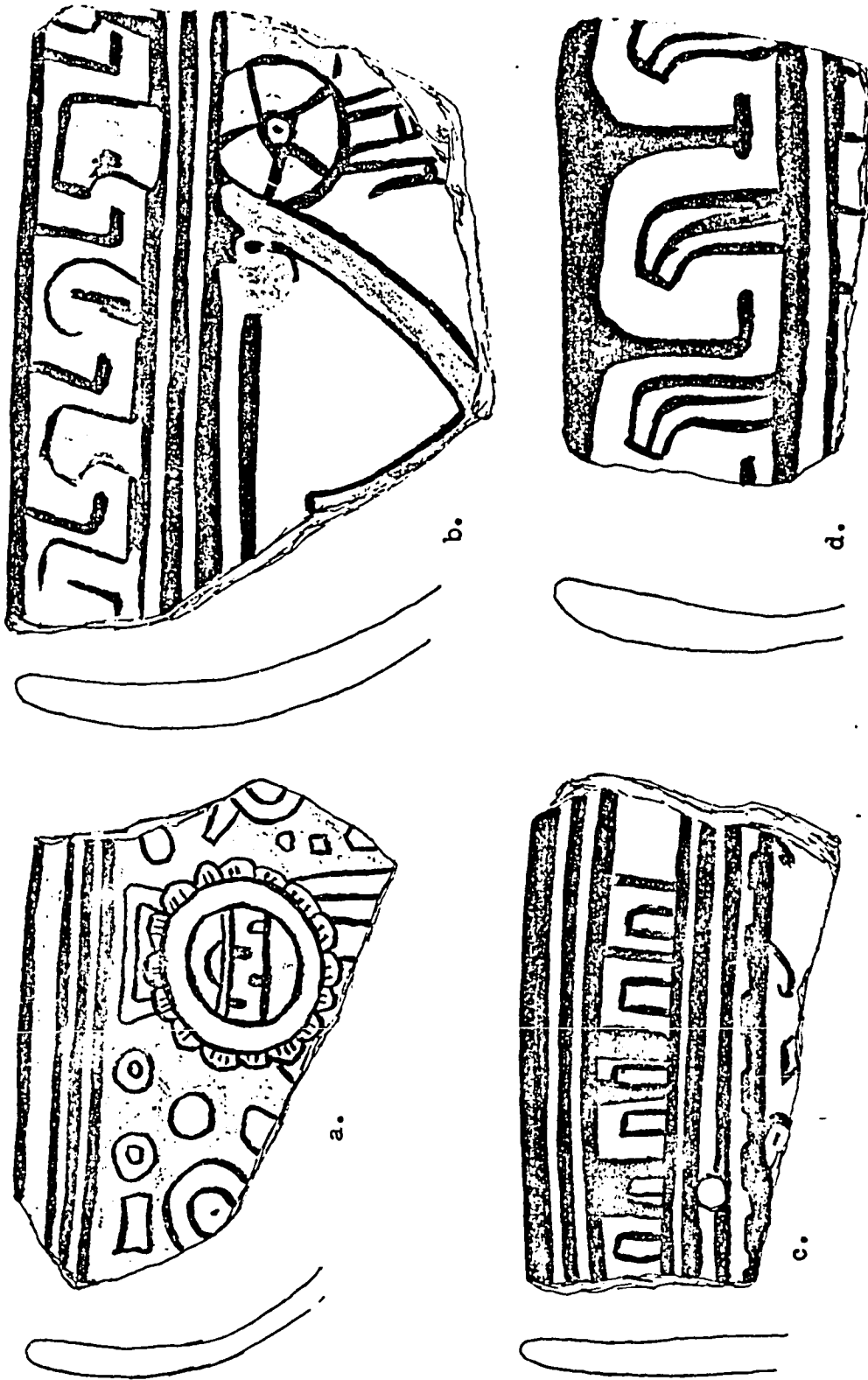
Fig. 81. Late Polychrome period, Lunoid Polychrome exteriors (above) and interiors (below).





Fig.82. Late Polychrome period, Lunoid Polychrome interiors (above) and exteriors (below).





Scale 1:1

Fig. 83. Late Polychrome ceramics, interiors, Lunoid Polychrome.

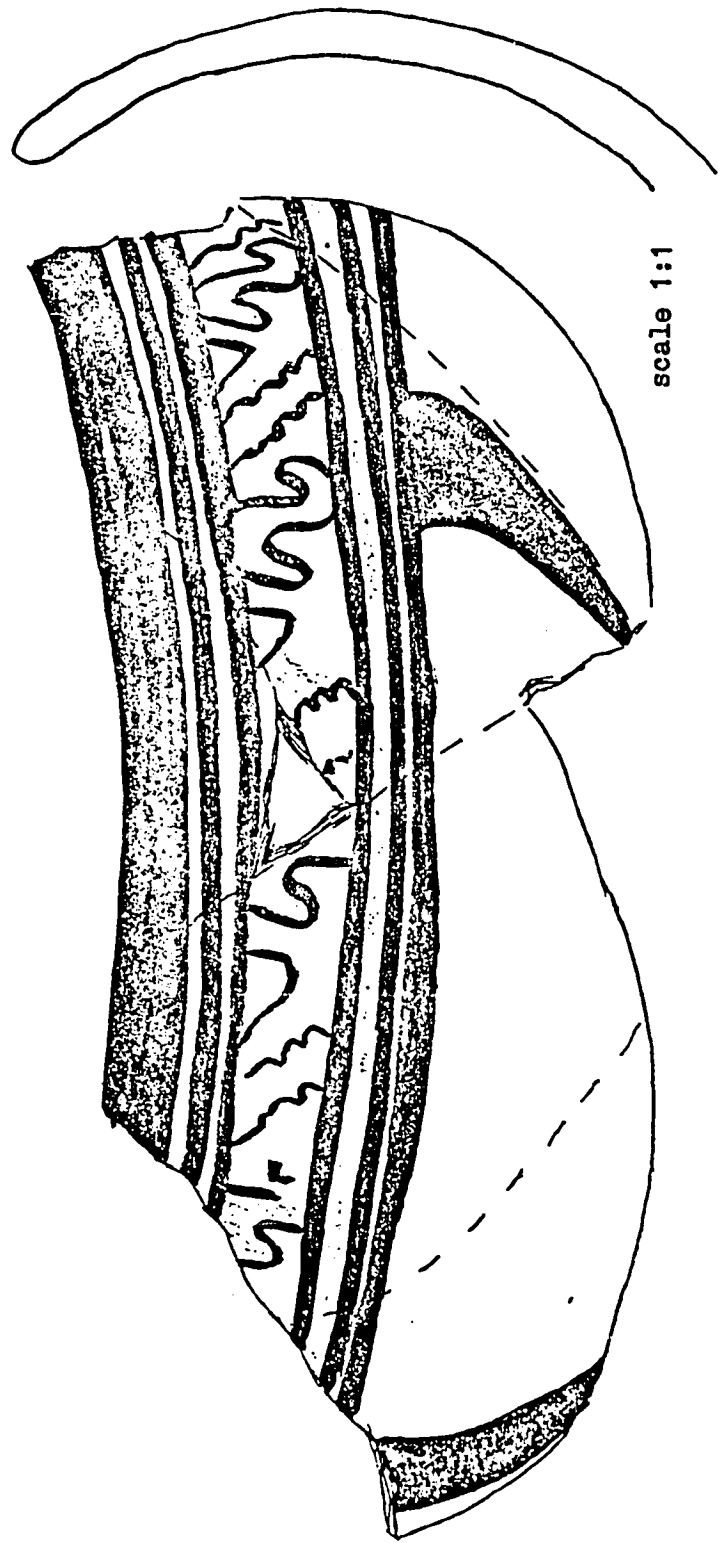


Fig. 84 Late Polychrome period: Luncid Polychrome; interlocking step design, Black-banded style.



a.



b.



c.

Fig. 85. Late Polychrome period vessel fragments: a and c Lunoid Polychrome, b Mombacho Polychrome Incised.

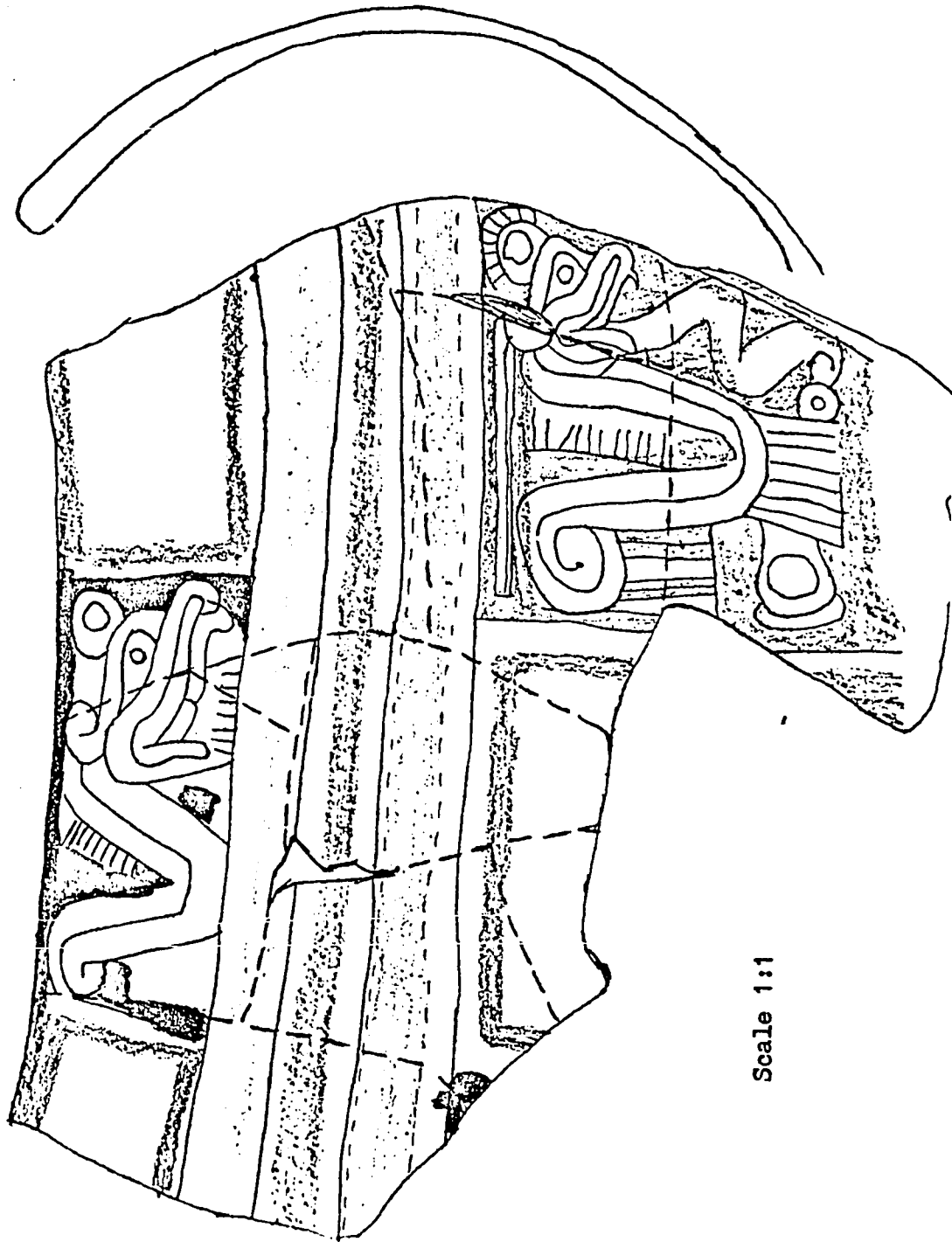


Fig. 86. Late Polychrome period: Mombacho Polychrome Incised.

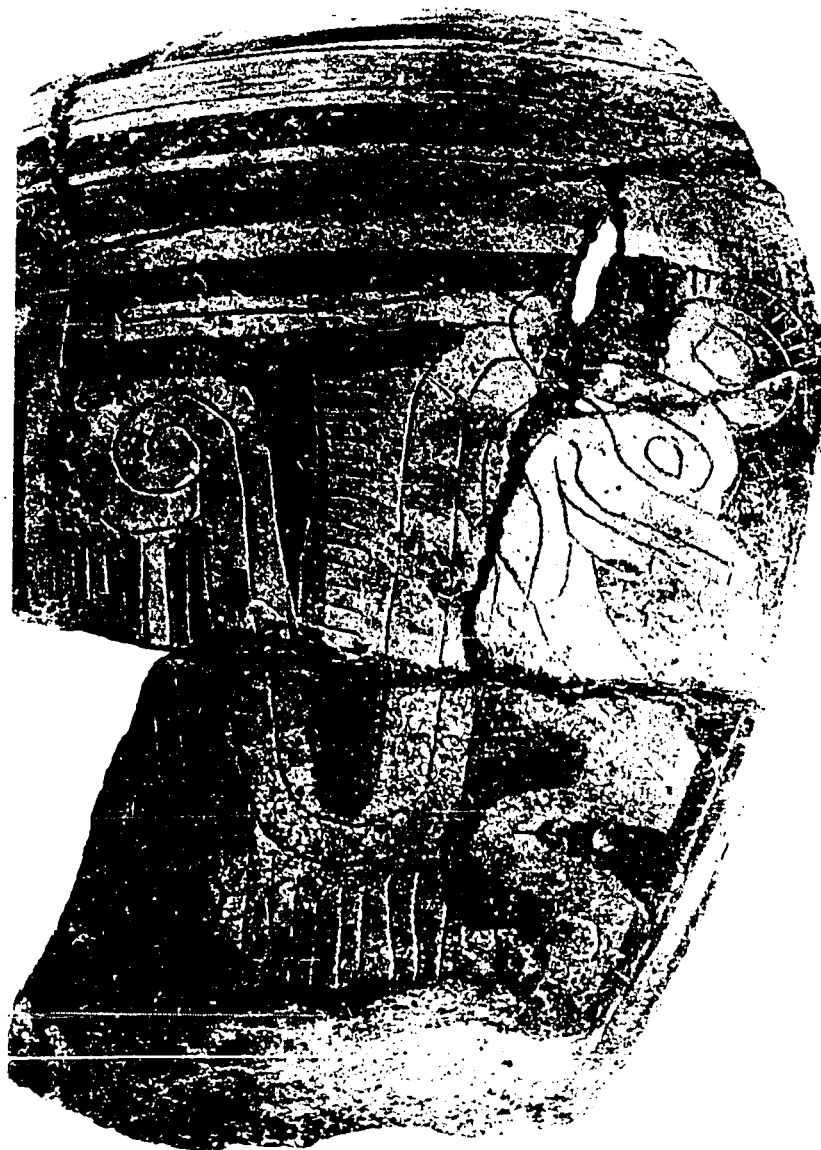
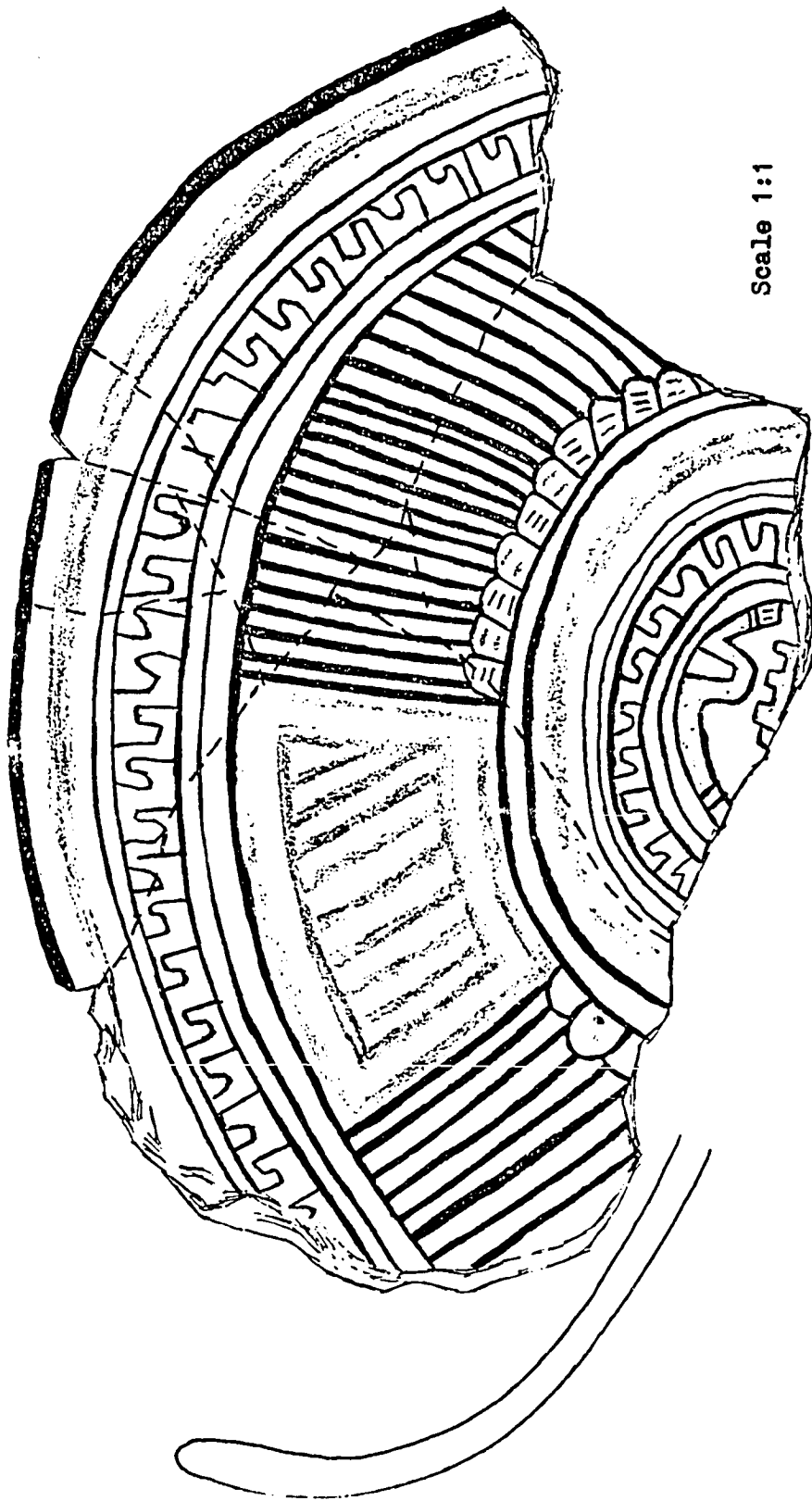


Fig. 87. Late Polychrome period, Mombacho Polychrome
Incised, detail from vessel in Fig. 85, b.

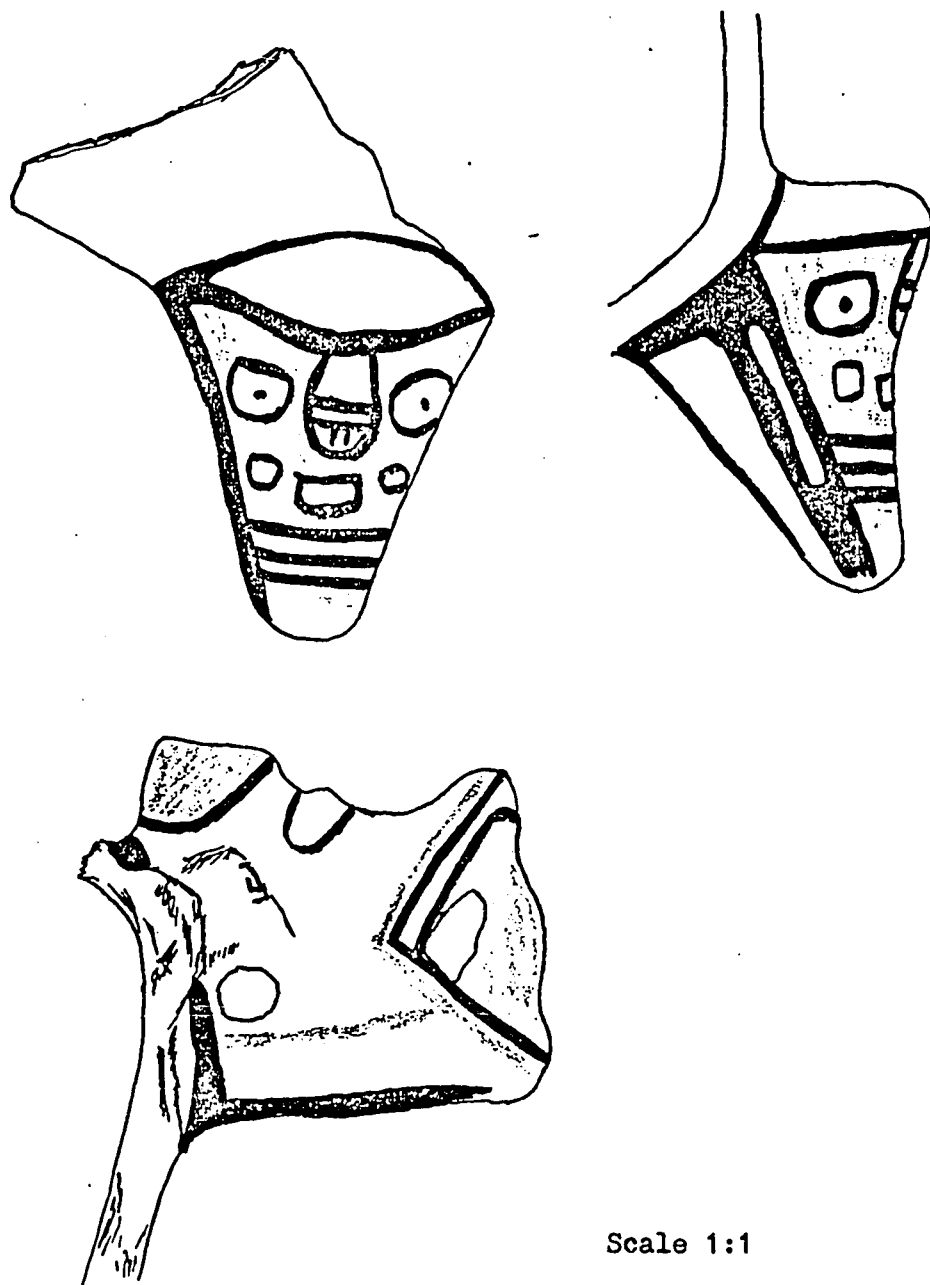


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Fig. 87. Late Polychrome period: Lunoild Polychrome vessel fragment, interior; Black-banded style.



Fig. 88. Late Polychrome period: Lunioid Polychrome vessel fragment.



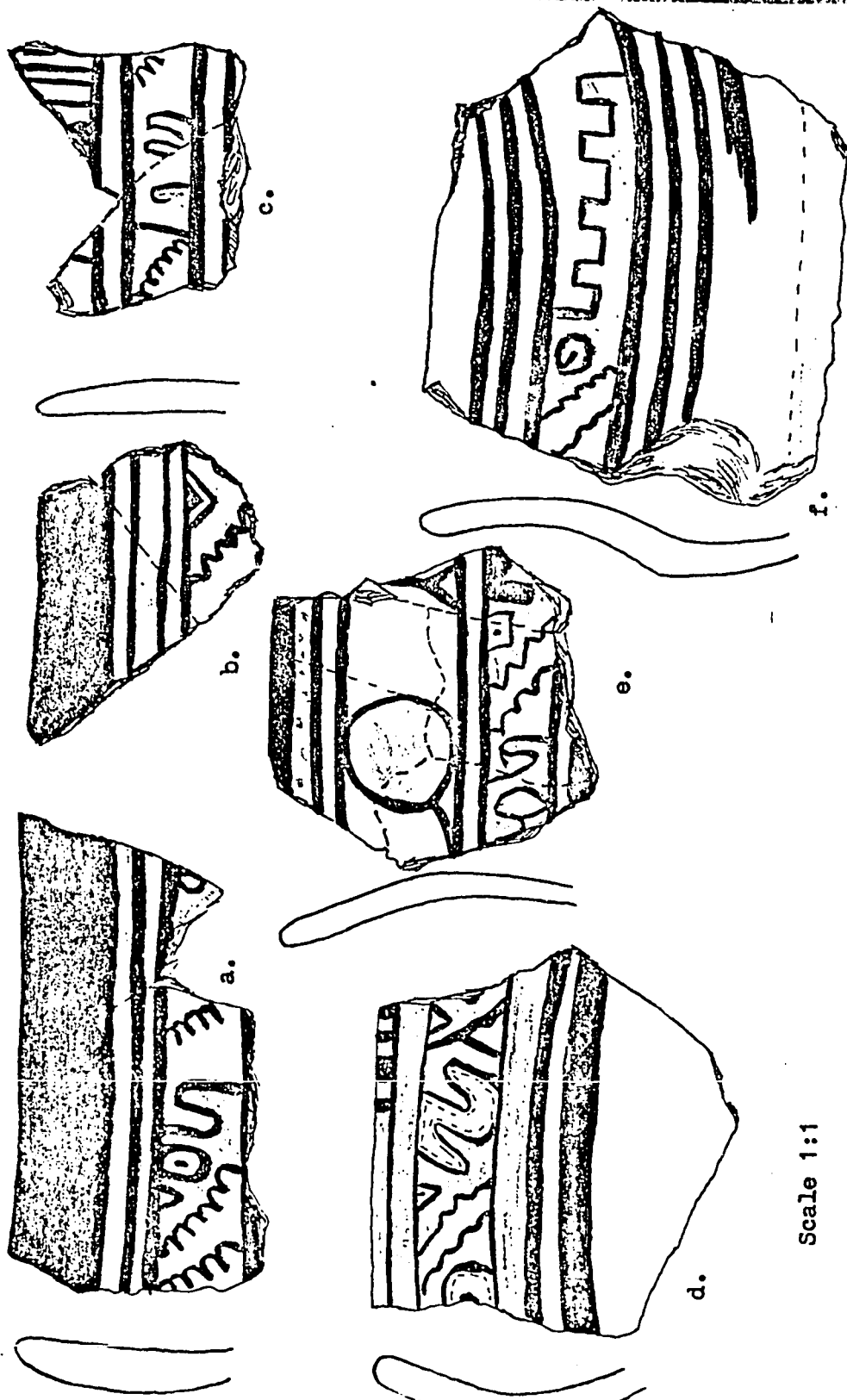
Scale 1:1

Fig. 89. Late Polychrome ceramics. Lunoid Polychrome tripod vessel supports.

Lothrop included all of these under his "Luna Ware" label, Haberland (personal communication) has indicated a preference for keeping the varnished style represented by the above plate illustration separate. In terms of the general decoration and finish differences, this seems to be a desirable distinction. For the time being, it is assumed that the "Lunoid" types are a hinterland reflection of the introduction of this unique type to Ometepe Island in the Late Polychrome period. Vessels are largely bowl-shaped with inflaring rims, although some are more straight-sided and set on tripod legs. Exteriors of the bowl forms are characterized by a thick black band around the external rim, with occasional vertical bands crossing the bottom of the vessel. All vessels are white-slipped, with an endless variety of complex decorative elements, many of them representing stick-figure animals, being added in black, red, and orange (Fig. 81-82).

A number of polychrome types that cannot easily be placed in the Lunoid category also have the characteristic black-banding on the exterior and it is presumed that these belong to the same overall ceramic family (Fig. 90).

The introduction of the interlocking step red-and-black design is also related to the black-banded rim tradition and on some examples shows motif similarities with Bramadero Polychrome. What appears to be happening here, following a period of participation in a wide areal ceramic tradition, is the local interpretation and elaboration of a particular group of motifs.



Scale 1:1

Fig.90. Late Polychrome ceramics: Lunoid Polychromes, interlocking step design; a, b, and e Black-banded rim style.

The crude incising, more correctly called engraving, that is characteristic of the Middle Polychrome Palmares and Belen types (Baudez 1967) seems to indicate that during that period's great artistic expression in polychromes, engraved wares greatly declined in importance.

This situation changes somewhat in the Late Polychrome period and although the wide variety of engraved motifs have no overwhelming aesthetic recommendations and are restricted mostly to hanging triangles, the clarity of the engraving and the care with which it is applied is a clear improvement. Almost all incised types are found on black-slipped bowls.

Alan Engraved: Alan Engraved is found on globular jars and decoration consists of 1 or 2 incised lines around the exterior of the rim with hanging triangles; in some cases, they also point upwards. The triangles either are filled with slanting lines running all in one direction or are cross-hatched. Designs are limited to these types of geometric forms and there are no curved lines or life-style figures represented (Fig. 22).

Murillo Applique: The appearance of this distinctive grooved, indented pottery is the hallmark of the full Late Polychrome period. This type is not described from any other area than the Tempisque River, where Baudez had a very limited sample (11 decorated sherds) from La Bocana and Site BOC 1 (Baudez 1967: 165); Coe (1962: 362) also noted that this type was present at Chahuite Escondido.

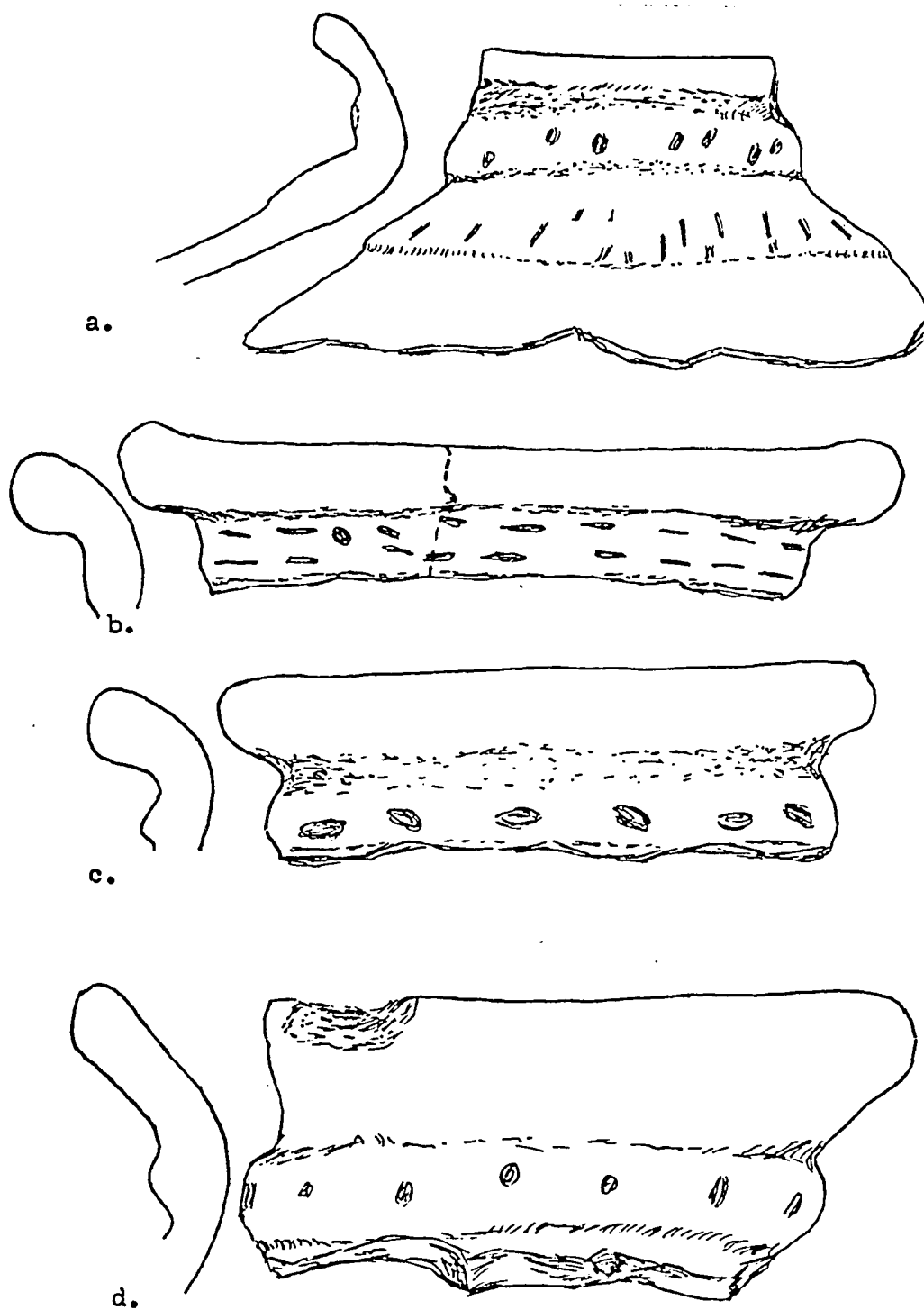
Murillo types occur with both black and red surface finish, but because of his limited sample, Baudez separated the two, calling

the black-brown colored sherds "Murillo" and the red-surfaced ones "Toro." The large sample from Las Marias allows us to state that although some motifs may be limited to either black or red and that in general the red style is limited to relatively massive vessels, the vast majority of modes are interchangeable and Toro should be subsumed under Murillo.

Murillo is divisible into 10 decorative groups: Black-Brown Surface: I) Multiple row indented rim; II) Low everted indented rim; III) Tall everted indented rim; IV) Grooved, indented, bulging profile rim; V) Grooved-indentd, non-bulging profile rim; VI) Grooved-indentd noded bulging profile rim; VII) Grooved-rim; Red Surface: VIII) Indented applique strip rim; IX) Grooved-indentd, bulging profile rim; and X) Indented-grooved rim. These variations are defined solely in terms of rim profile variation. Murillo applique indented strips and adornos also occur on vessel bodies (Fig. 98 and 99), but a lack of whole vessels makes correlation between the two decorative zones impossible at the present time.

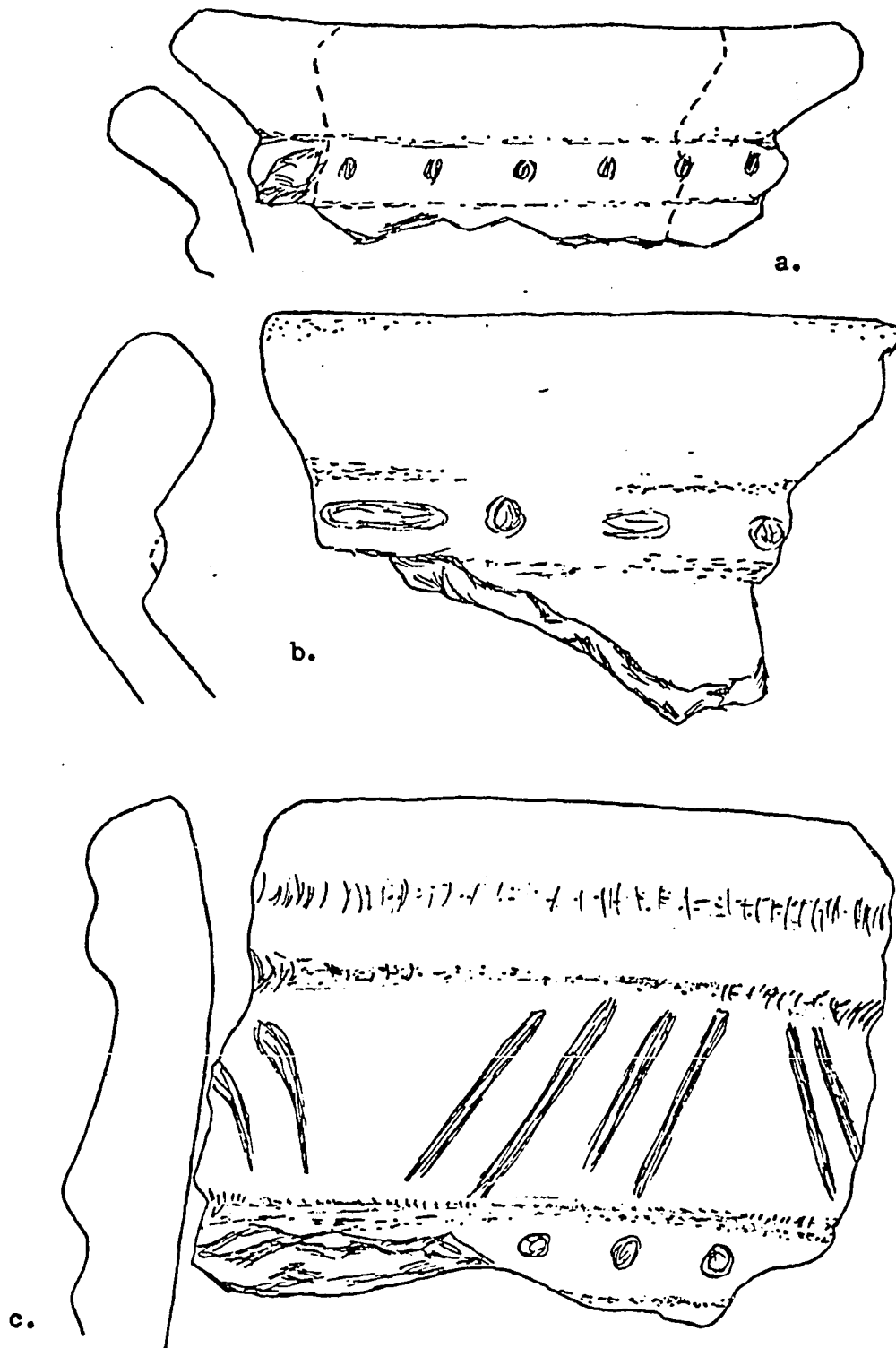
Although the range of varieties is present throughout the Late Polychrome period, rims with indentations but no grooves are more prominent in La Cruz B, while La Cruz A is characterized by an increase in the grooved groups. Both grooves and indentations were formed in the clay before the vessel was slipped and fired.

Group II, Low Everted Indented Rim: This variety occurs only in black and brown surfaces. The rims occur on globular vessels and the indented applique strip was placed in the "U" formed by the outflaring rim and the shoulder. Fourteen modally



Scale 1:1

Fig. 91. Late Polychrome period, Murillo Applique: a-c, Group II; and d, Group III.



Scale 1:1

Fig. 92. Late Polychrome period, Murillo Applique: a, Group III; b, Group VIII; and c, Group IX.

different rim varieties are included in this group.

Group III, Tall Everted Indented Rim: This variety is identical to Group II, with the exception of a wider angle between the up-flaring rim and the vessel shoulder. Ten modally different rim varieties are included in this group. Although the only 3 whole Murillo vessels known are round-bottomed, the possibility exists that Groups II and III are bases rather than rims.

Group VIII, Indented Applique Strip Rim: This group occurs only in red and is represented by 12 modally different rim varieties. These rims come from very large globular vessels and have a bulbous rim profile with the indented applique strip placed at the base of the exterior bulb profile.

La Cruz A Phase

With the exception of Vallejo Polychrome, the types from La Cruz B continue into this terminal part of the phase, although they decrease in importance while Morice Engraved and Murillo Groups IV, VII, and IX become more prominent. The decrease in polychromes is contrasted with the increased technical quality and design elaboration of the Murillo Grooved types.

Morice Engraved: The type occurs only in black ware at Las Marias and is not reported from sites other than on Ometepe Island, where it is coeval with Luna Polychrome (Haberland, personal communication). It appears to be limited to shallow, relatively straight-sided bowls of the Las Marias polychrome form, although it apparently never occurs with tripods. The design is characterized by a single or double thin-line engraving around the exterior of

the rim with small pendant triangles. The triangles are filled with single or multiple slanting lines.

Murillo Group IV, Grooved-Indented, Bulging Rim Profile:

This group occurs in black-brown and is characterized by an outward slanting lip from the rim of the vessel on which grooves have been made, usually in clusters of 3 or 4 leaning in opposing directions. Beneath the lip, the indented applique strip has been applied. The group is composed of 17 modally different rim varieties.

Murillo Group IX, Grooved-Indented, Bulging Profile Rim:

This group, in terms of design elements, is closely allied to Group IV, but occurs only in red. The rims tend to be thicker and to have more bulbous lips and apparently come from larger vessels than do their black-brown counterparts. Sixteen modally different rim varieties make up this group.

Murillo Group VII, Grooved Rim: This group occurs only in black-brown and is composed of globular-shaped jars with incurving shoulders that form a restricted orifice. This group consists of 8 modally different varieties, some of which appear to come from either miniature or spouted vessels.

Murillo is somewhat an enigmatic type, since it appears on the scene as a developed type with no apparent source, having been completely absent from the Middle Polychrome period. Its very limited distribution in northwestern Costa Rica and its absence from the Isthmus of Rivas, Ometepe Island, and essential absence from the Tempisque drainage suggest a stylistic intrusion, but as yet, no source from the north or the south has been identified.

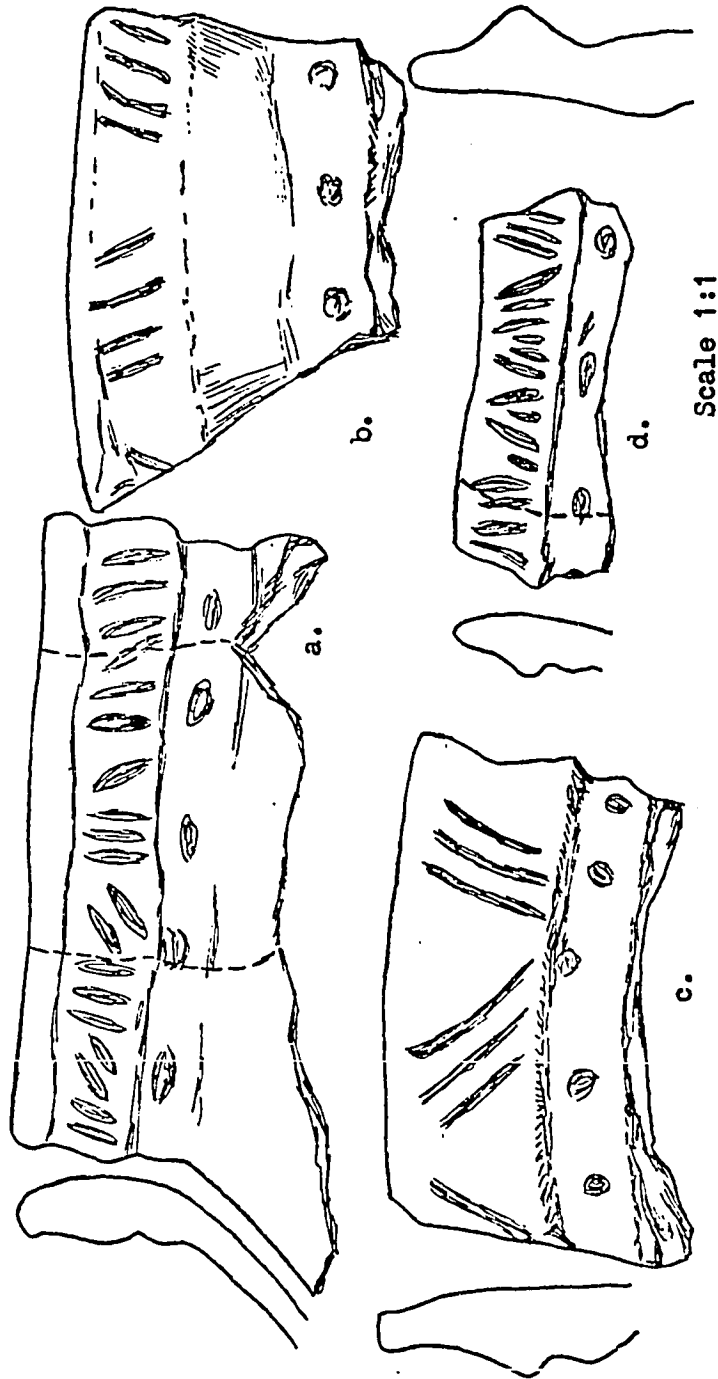


Fig. 93. Late Polychrome ceramics: Murillo Applique, Group IV.

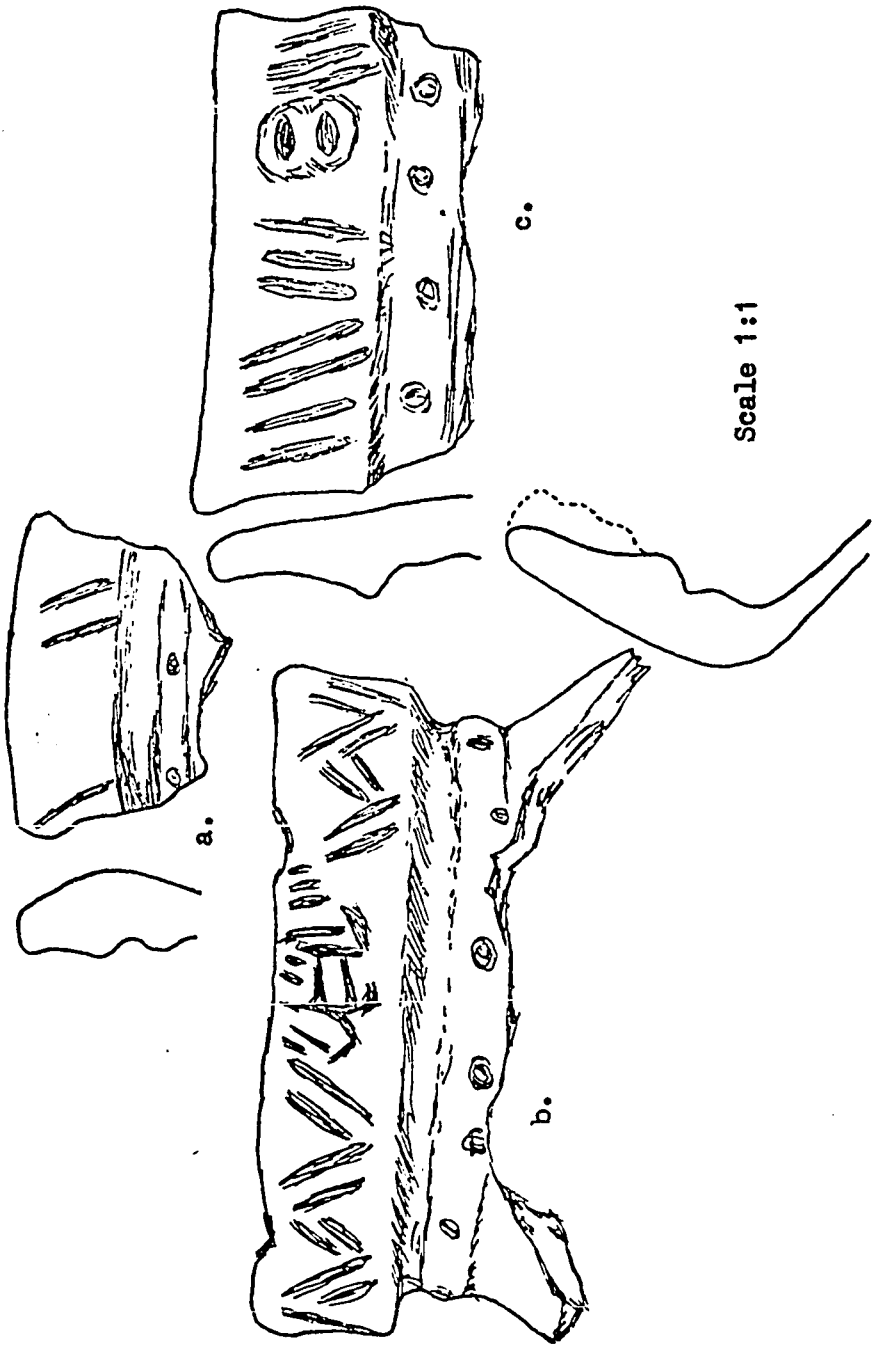


Fig. 94. Late Polychrome ceramics: a Murillo Applique Group V, b-c Murillo Applique Group VI.

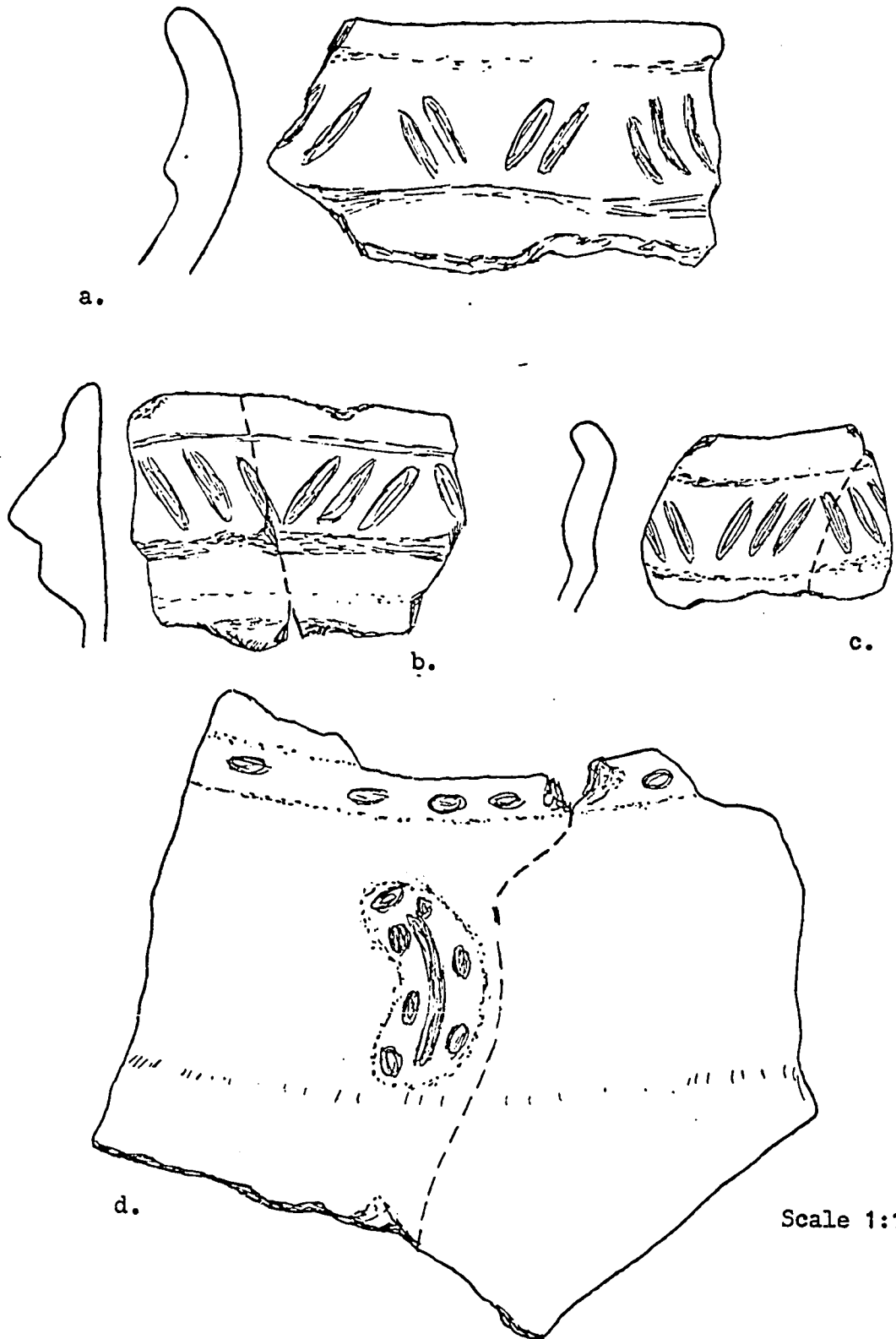
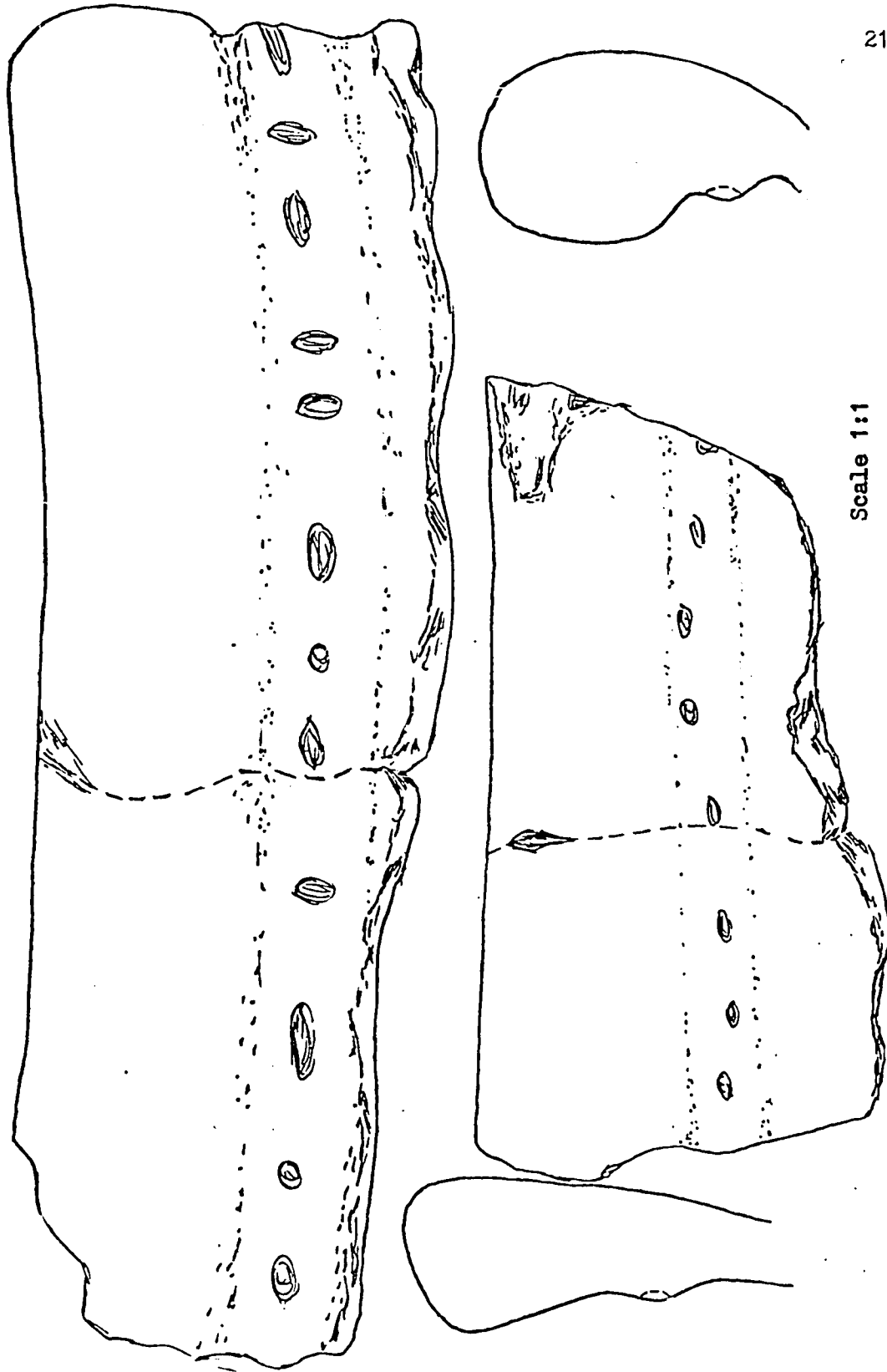
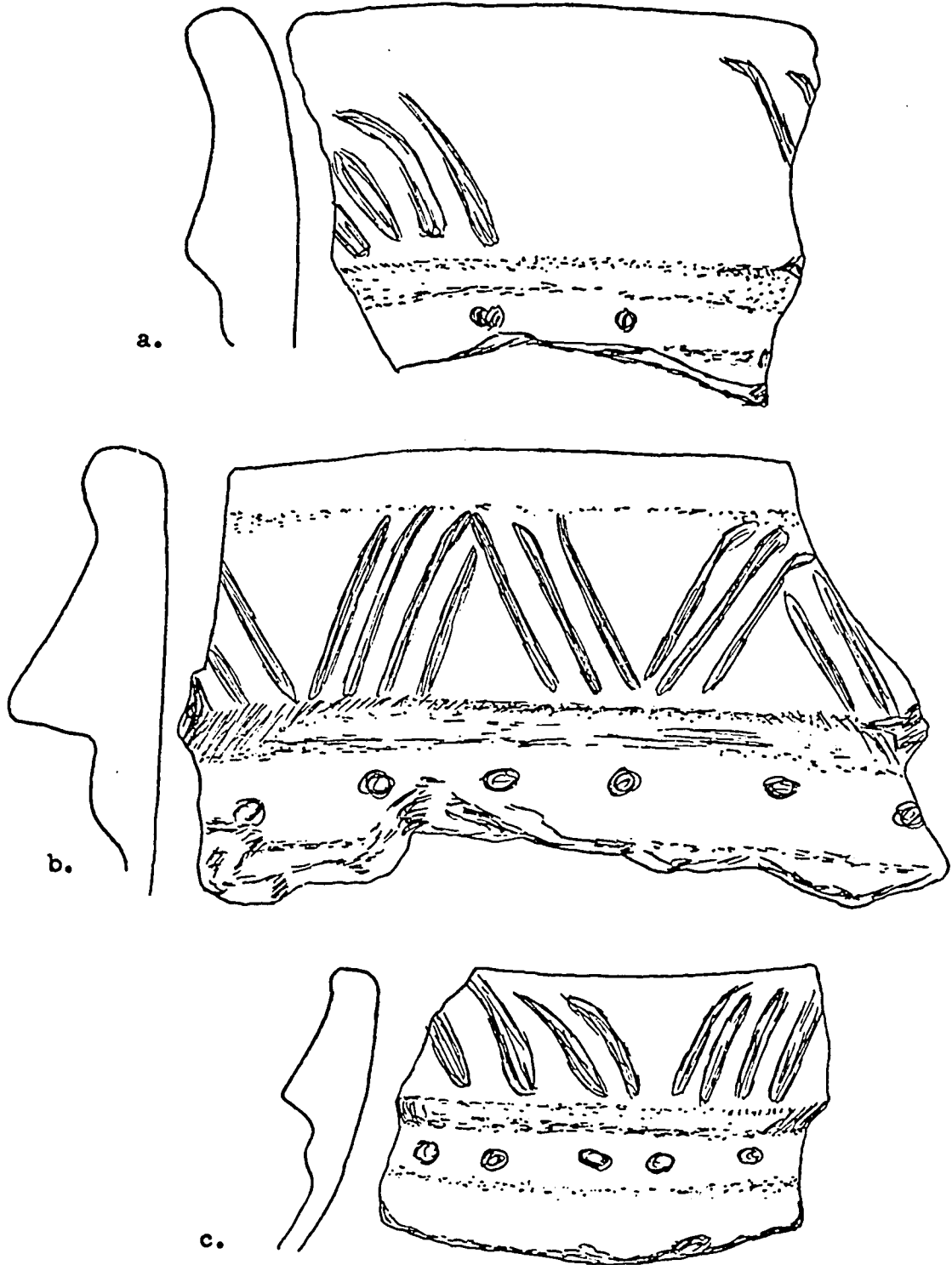


Fig. 95. Late Polychrome period, Murillo Applique: a-c, Group VII and d, applique punctated strips on large bodysherd.



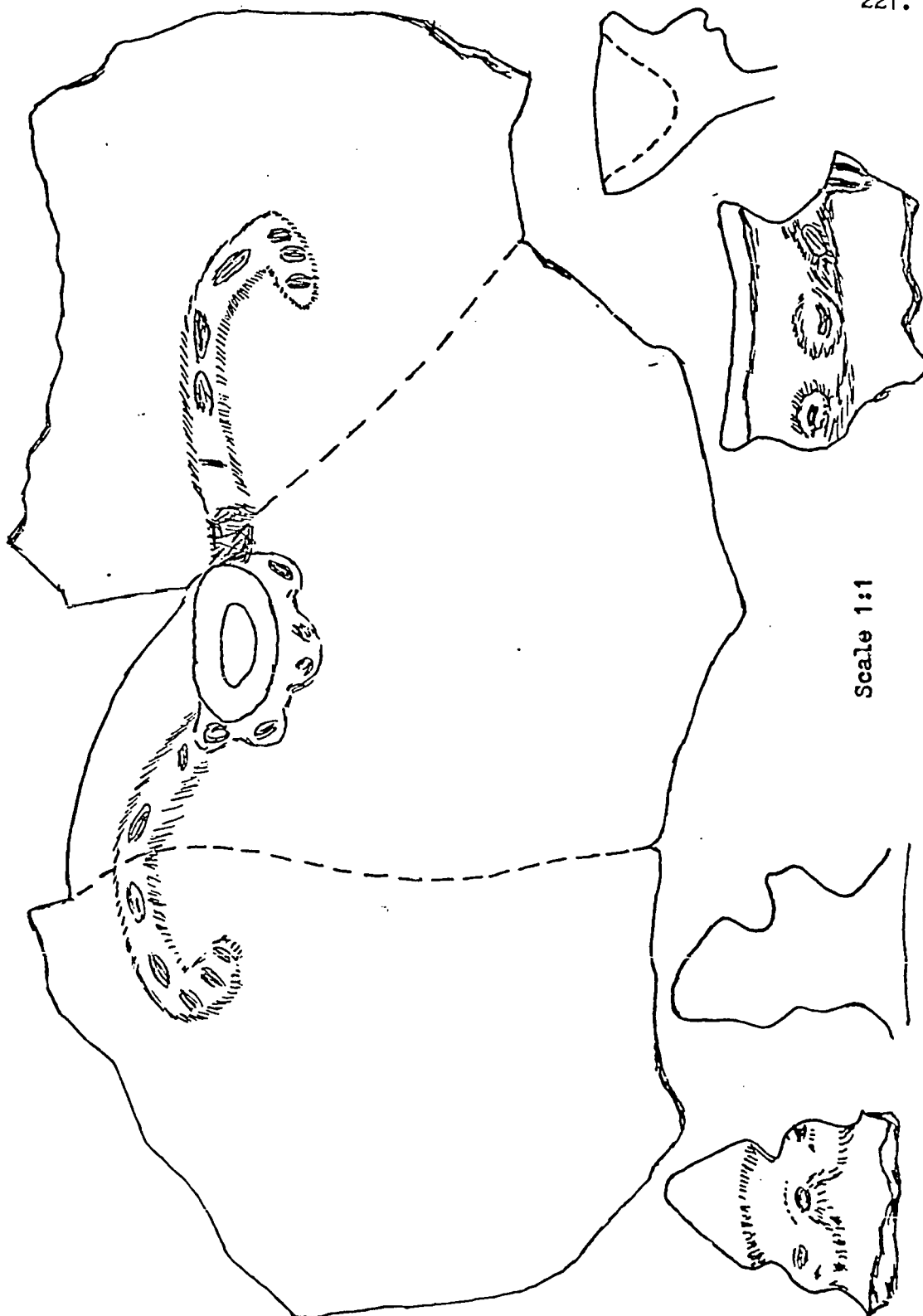
Scale 1:1

Fig. 96. Late Polychrome period, Murillo Applique: Group VIII.



Scale 1:1

Fig. 97. Late Polychrome period, Murillo Applique: a-b, Group IX and c, Group X.



Scale 1:1

Fig. 98. Late Polychrome period, Murillo Applique: Adornos.



Fig.99. Late Polychrome period: Murillo Applique bottle fragment, figurine, and adornos.

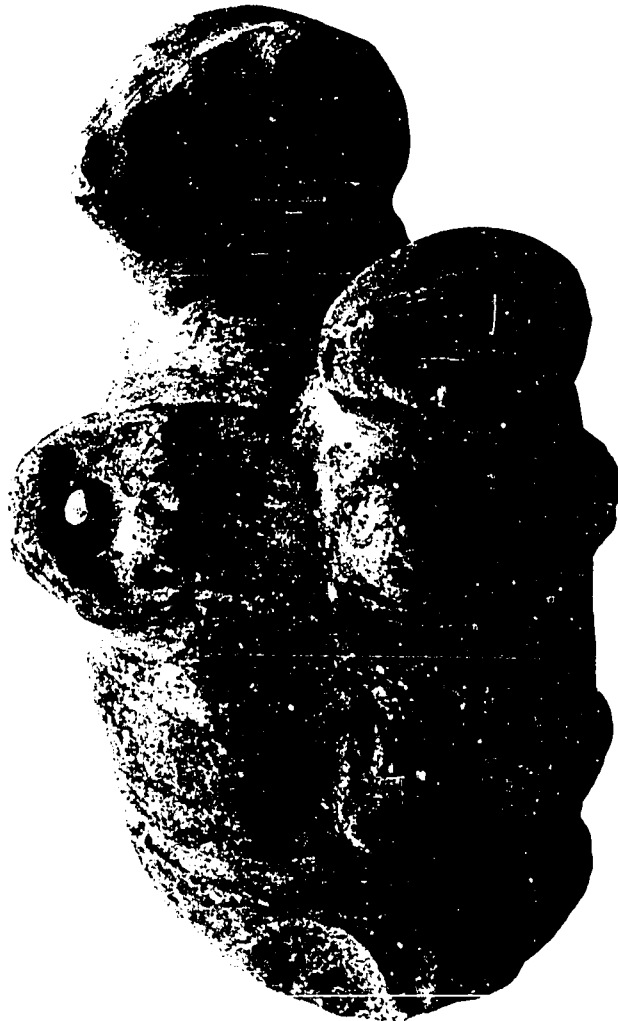


Fig. 100 Late Polychrome period: Murillo Applique figurine; detail from Fig. 99 .

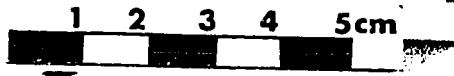
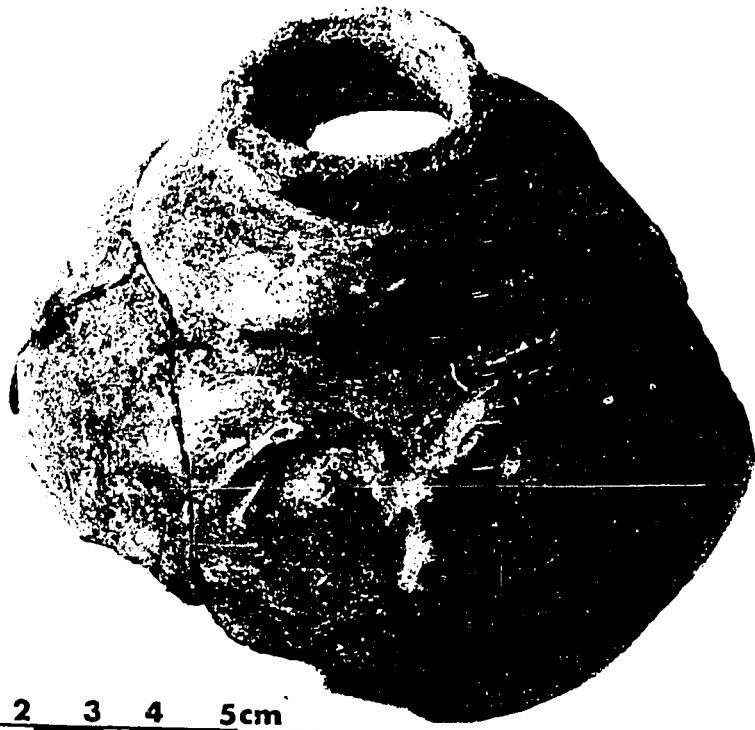


Fig.101 Late Polychrome period, Murillo Applique bottle fragment, detail from Fig. 99 .

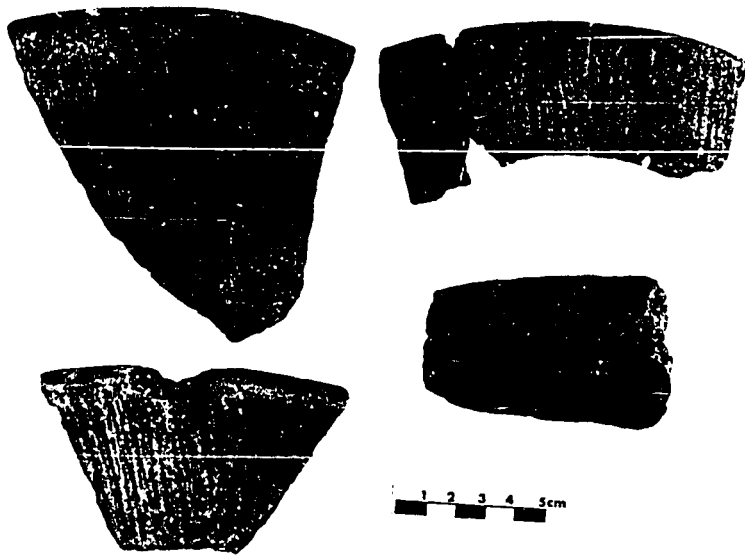


Fig. 102 Late Polychrome period, Brushed Ware.

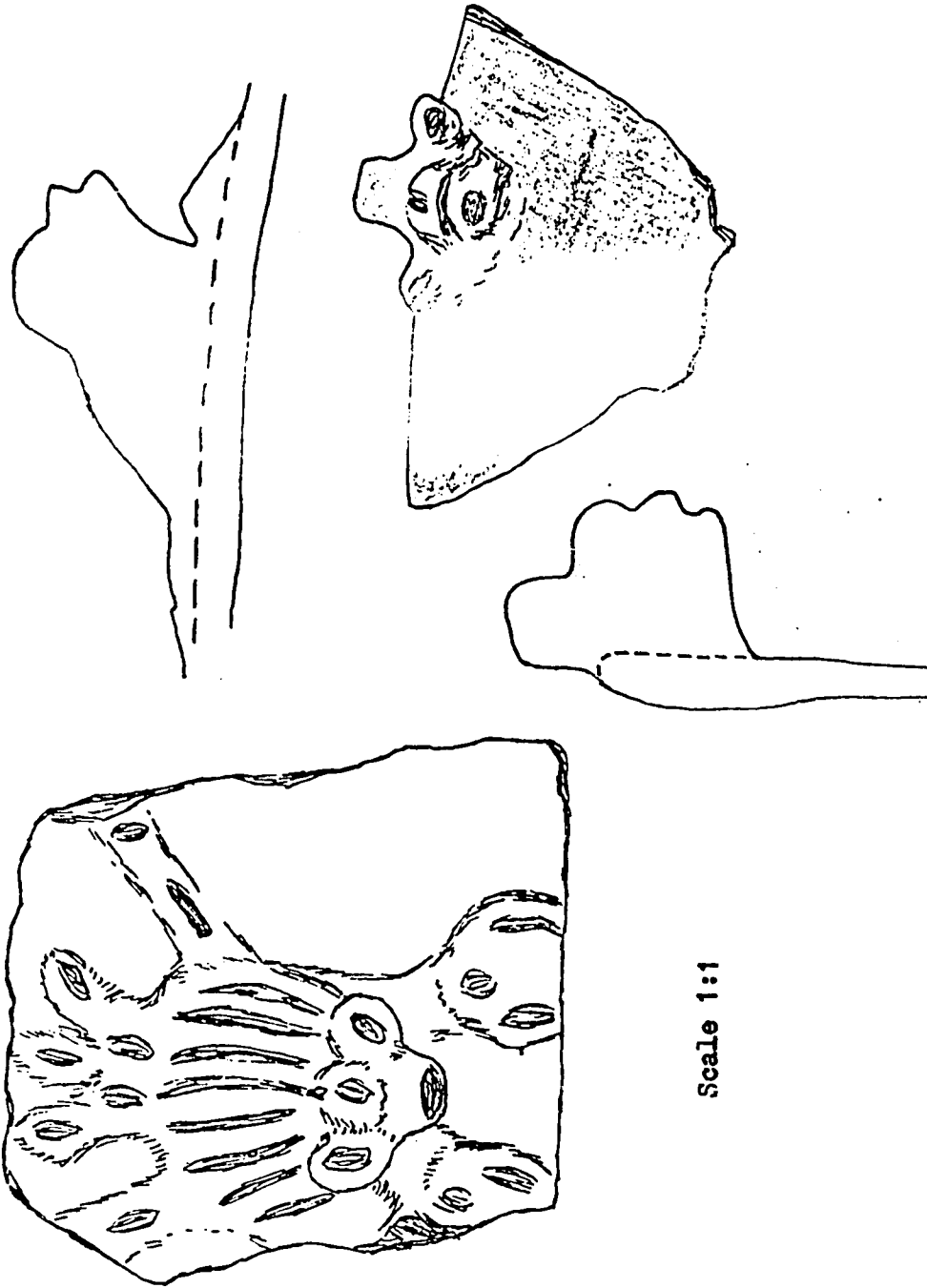
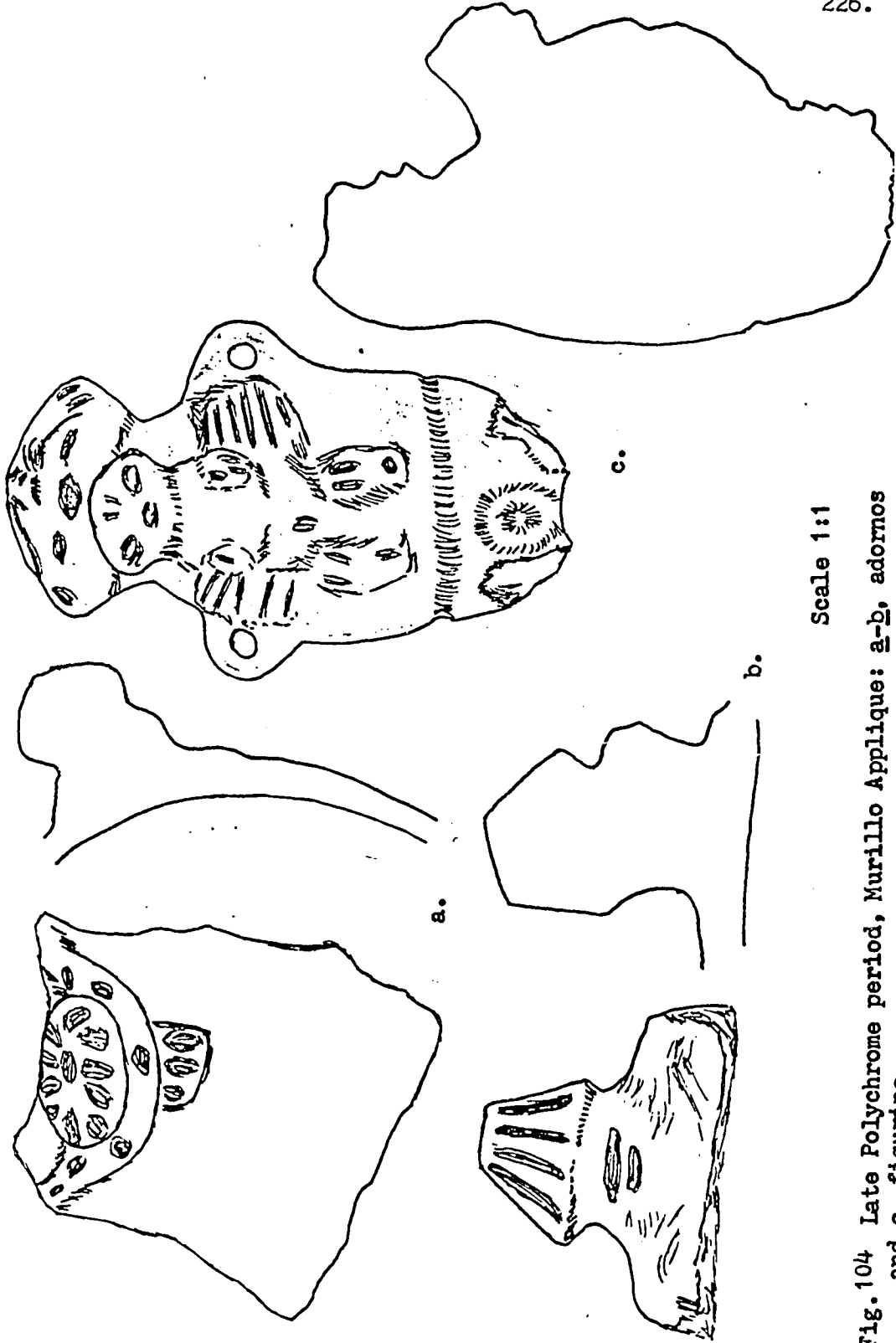


Fig. 103 Late Polychrome period, Murillo Applique: adornos.



Scale 1:1

Fig. 104 Late Polychrome period, Murillo Applique: a-b, adornos and c, figurine.



Fig. 105 Late Polychrome period, pottery drum fragments and mushroom effigy.

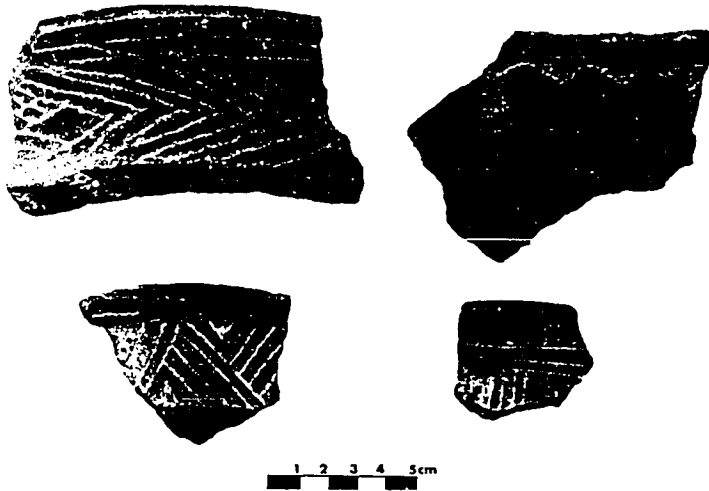
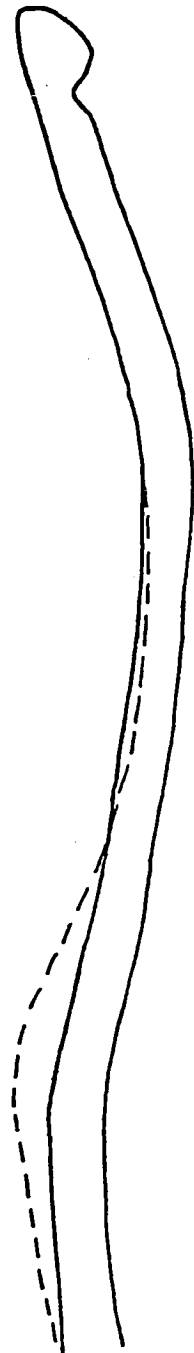
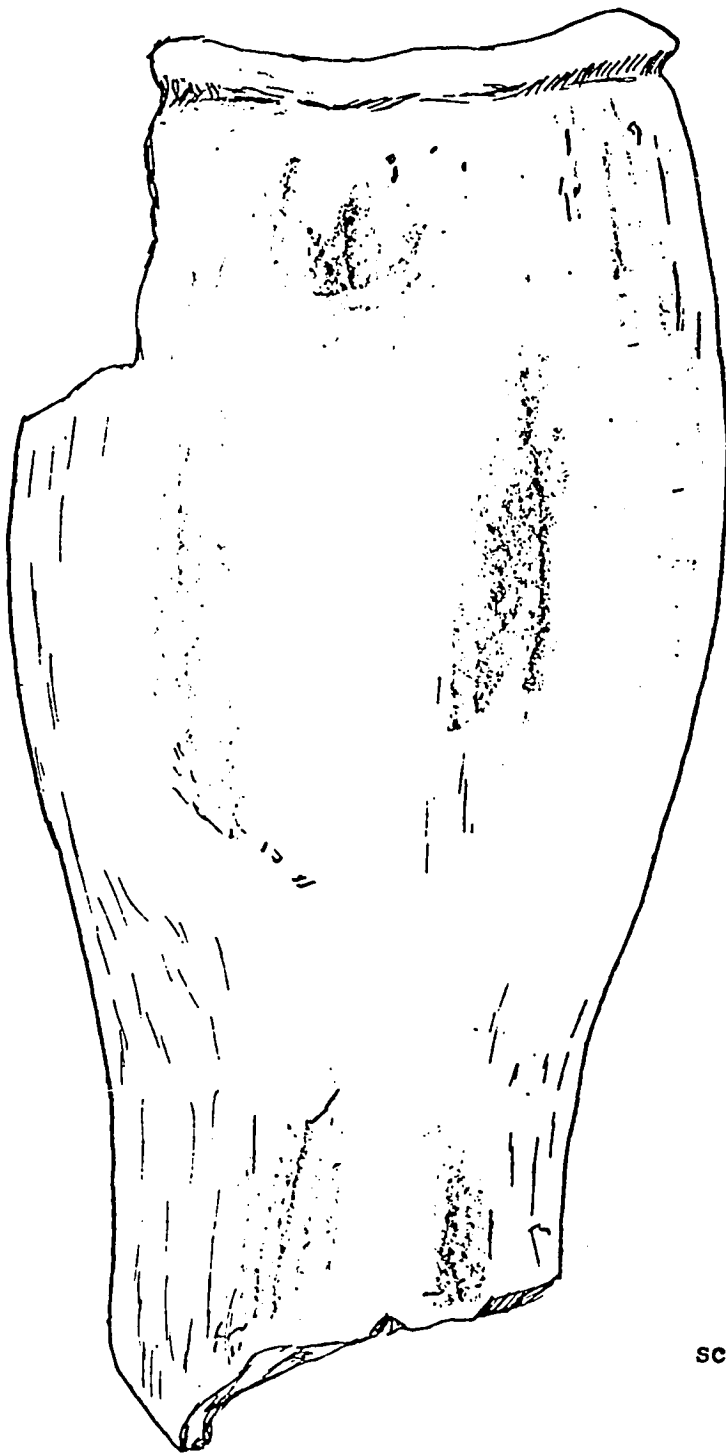
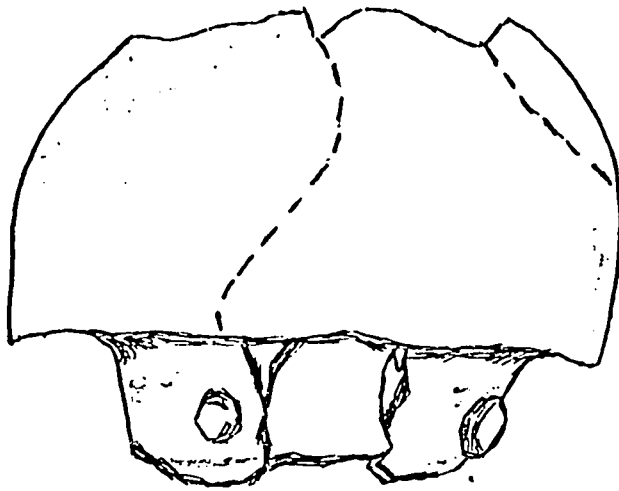


Fig. 106 Late Polychrome period, Castillo Engraved.

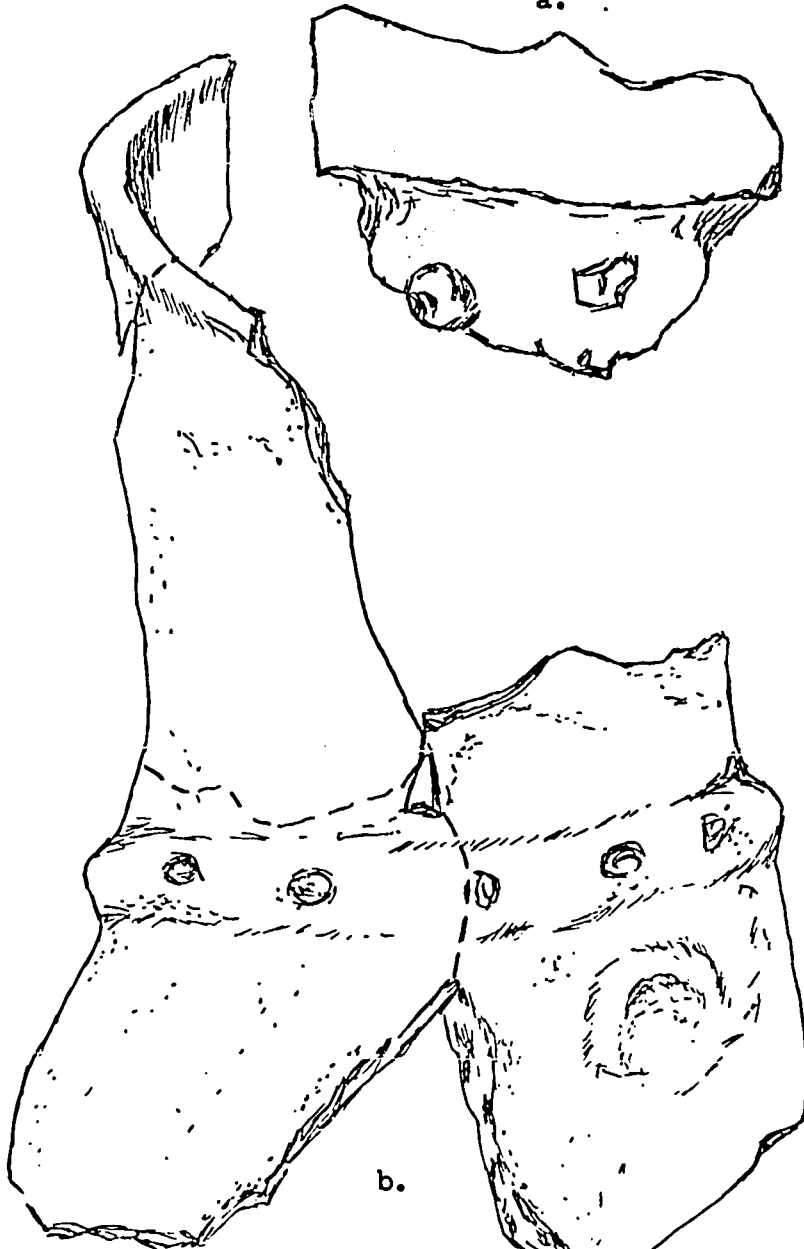
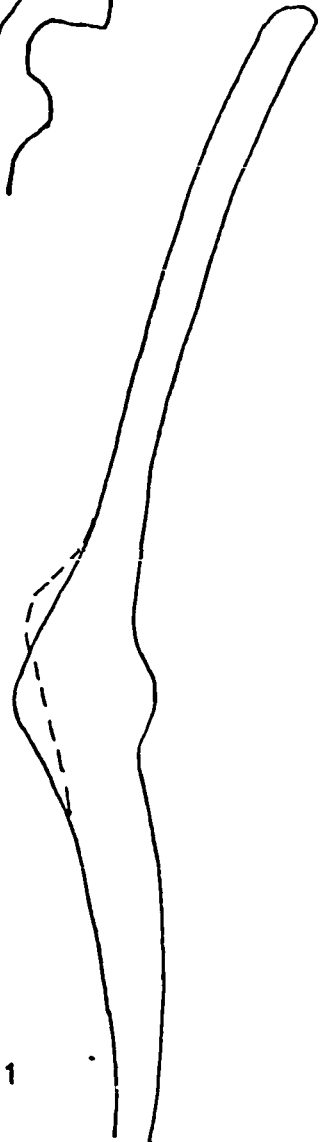


scale 1:1

Fig. 107 Late Polychrome period; pottery drum fragment.



a.



b.

Fig. 103. Late Polychrome ceramics: a mushroom effigy, b Pottery drum fragment

Scale 1:1

Baudez (1967: 210), in describing his limited Late Polychrome material, wrote:

We have so few bits of information on the BEBEDERO phase that comparisons which we can make with foreign phases are rare and hazardous. Jicote polychrome appears to be a late variety of Papagayo Polychrome. We have found nothing to compare with Murillo Applique in Mesoamerica and its origins should be sought south of our zone (See Linne 1929: 81, fig. 17, a). The same is true of Toro Applique, whose handles, rims, edges, and borders, ornamented in relief seem to belong to the Carib tradition. Finally, the few perforated sherds found at BOC 1 are, according to the authors, fragments of incense burners or of receptacles used for steam cooking food or as strainers for draining corn having a wide distribution over the continent, in the north as well as the south (See Linne 1929: 23, Chart I). At Zacualpa (Guatemala) they appeared in the TOHIL phase (1000-1200 A.D.) (Wauchope 1948: 151).

According to M. Coe, the Vallejo Polychrome type represented at La Guinea by a handful of sherds reveals a strong Mesoamerican influence that is more Mexican than Mayan, as exemplified by heads of Ehecatl and earth monsters. The Luna type, on the other hand, has affinities with the south and its motif and style are reminiscent of Amazonian traditions.

The "Late Polychrome" period continued on for some time into the colonial period, with Luna ceramics being found in association with objects of Spanish manufacture.

Ceramic Summary

Ceramically, the Sapoa River area shows the combination of participation in, yet isolation from, broader areal traditions that is to be expected in a cultural frontier that is also a corridor of passage through and across that frontier. The Zoned Bichrome period represents a participation in the general Central American Late

Formative, although there is a local flavor in many local design motifs. In the succeeding Early Polychrome period, Tola Trichrome symbolized the first florescence of local ceramics into a horizon marker covering the Greater Nicoya region. While it does not lead directly into any of the polychromes, it is aesthetically ample evidence of the ability of local potters.

In the Middle Polychrome period, the great burst of polychrome production, both in total quantity of vessels and in the endless variety of decorative motifs and motif combinations marks the artistic peak of Costa Rican pottery. While many of the colors, forms, and motifs are locally inspired, there are also substantial numbers of elements derived from either Mexican or Mayan sources. These are almost entirely resemblances rather than replicas and the impression one gets is of contact maintained mostly through intermediaries. The local horizon markers of Mora and Papagayo Polychrome are widespread in different parts of the region and traded distances beyond, and point to a period of stylistic unity unmatched at any other time.

The Late Polychrome period shows a fragmentation of this regional unity and the apparent development, or at least reinterpretation of a number of local styles. Some external influences are most likely present at this time also, but until external links or local predecessors for both the varnished-type Luna Ware and for Murillo can be found, the direction and impact of these influences cannot be properly assessed.

In terms of their ceramic assemblage, the Sapoa River in

general, and the Bay of Salinas sites specifically, present a picture of backland hamlets rather than of main centers. While the Chicanel-type flanged vessels and the Schettel Incised types show the beginnings of external contacts during the Zoned Bichrome period, these are from the main, central valley. From Early Polychrome times, on, it is hypothesized that many ceramics, especially the polychromes, were traded into the Sapoa River area, rather than being locally manufactured.

This hypothesis is based on the following factors:

- 1) The immediate area lacks any evidence of a developmental ceramic sequence. From the outset of the Early Polychrome period, at least, they shared in a broad areal tradition, with innumerable examples of one and two of a kind potsherds that appear to indicate widespread trade sources rather than a tradition of local manufacture.

- 2) Dependence on trade for such items as ceramics at the indicated level of subsistence in the area is suggested in the models proposed by Beardsley et al (1955). In the Central Based Wandering System, primary interest is usually on subsistence activities, with little craft specialization, elaboration, or involvement in trade networks. The latter generalization is apparently contradicted at Las Marias and may indicate the presence at that time of recognized trade resources whose exploitation did not interfere with fundamental subsistence practices.

In the next higher "Semi-Permanent Sedentary" level, "village or tribal specialization in the manufacture of ceramics, basketry, manioc graters, or similar products occurs, with consequent

regularization of trade relations." The archaeology would suggest that at Las Marias we had an overlapping of the two levels, with the subsistence system and settlement pattern staying at a Central Based Wandering level, while external contacts were stimulated to a higher one.

Economics and Trade

Throughout the history of the Sapoa River and Bay of Salinas area, the subsistence quest appears to have been the overriding factor in the cultural pattern, with a dependence on trade with outside sources to provide ceramics. Having advanced this hypothesis that ceramics were being traded in, we are left with having to identify the export that supported the other half of the commercial cycle. For the moment the data limit us to the suggestion that this was a fairly straight trade relationship, rather than one resulting from political or religious hegemony, but this is by no means certain.

There are 3 commodities, all equally elusive in the archaeological record, that may have been traded.

The first is salt. The extensive salt flats around Salinas Bay, assuming that they were also salt flats at the time of pre-Columbian occupation, would have been exceptionally productive. The combination of seasonal inundation during the rainy season and the high, drying winds during the dry season would have made this technologically possible, and the area is exploited in this manner at the present time. In discussing the Miramar site from Tamarindo Bay, Coe (1962: 364) noted:

The bulk of the pottery is extremely thick and crude, with conical bottoms and straight walls; the decoration on these consists merely of coarse brushing or of impression with a corn cob rolled across the surface...Pending the processing of a radiocarbon date on this site, Miramar and other stations like it can best be interpreted as communities engaged in the extraction of salt from the saline mud on the swamp floor. The crude, bag shaped vessels, with their coarse and crumbly paste and poor firing, could have served as filters through which the salty water might be percolated from the mud. Salinas of this nature are still found in the estuary swamps of the Tamarindo zone today, although other methods of extraction are utilized. These earlier salt-manufacturing communities might have persisted in basically unchanged form right through Early, Middle, and Late Polychrome periods into Colonial times.

The ceramic description from Miramar fits the materials at Site 63 on the Bay of Salinas, a contemporary salt processing site immediately west of the Las Marias shell midden. The deposit at Site 63 is very shallow and covers a number of small mounds around the periphery of the site. It is interesting to note that in excavations at the Las Marias midden not a single sherd of this heavy, coarse type pottery was recovered and identifiable ceramics from other periods were not found. Three interpretations are possible: 1) a highly enforced spatial pattern, preventing the spread of materials to different parts of the site; 2) that Site 63 pre-dates, as a single component, all known levels at the Las Marias midden; and 3) that Site 63 represents a post-Contact economic activity and is relatively recent; the data from the Bay of Salinas seems to favor the latter interpretation.

Salt can also be evaporated in turtle shells and on hardened beds or floors prepared on the land surface, where saline water was

then poured and evaporated. Artifactual data suggests neither of these two practices and while salt was probably produced for local consumption, any function as an important commercial item is questionable.

The second potential commodity is processed shellfish. The problem of separating, in a shell midden, what was consumed locally and what might have been traded is obvious. No shells have yet been found at inland sites in large enough quantity to indicate extensive trade with the coast and in most cases, where we have evidence from other areas, the shells are fleshed out to reduce the transportable weight. While this form of trade may have taken place, the presence of the Sapoa River and the proximity of Lake Nicaragua, both suppliers of other forms of aquatic resources, may have negated its inland importance in this particular instance.

A third, and from the standpoint of ethnographic and archaeological data, most likely trade item was in the utilization of certain shellfish for the extraction of purple dye. The practice was widespread throughout pre-Columbian America, and the Nicoya Peninsula was a major source of the much sought after dye for the Spanish (Gage 1648: 359) where the inhabitants were used as slaves to obtain it. The dye can be secured from the animal in two different ways. The first is by killing the animal and extracting the dye-bearing portion of it; a second, and more economical way, is by stimulating the animal into releasing a small secretion and then returning it to the water to be used again. The first method would be preferable in terms of the archaeological record, while the

latter was probably that employed in its commercial exploitation.

While Purpura Bansa was the most widely utilized specie (Ramsey 1970) for purple dye extraction in the New World, various species of Murex could also be employed and it is these that are most commonly found around the modern-day Bay of Salinas and in the Las Marias midden.

Although specific counts were not kept as part of the shell analysis for the Las Marias site, the large majority of archaeological specimens have a hole in the shell at the point where the muscle would be severed for removal and it must be assumed that at least some of them were killed rather than "milked;" these shellfish are not known to be used as food, so extraction was probably not for culinary purposes.

Again, with significant portions of the record missing, it is difficult to gauge dye exploitation's relative importance in something as complex as an economic cycle, but it is the one item produced by the area that was valuable enough to possibly sustain the balance of trade that we see represented by the polychrome imports.

CHAPTER V

SETTLEMENT PATTERNS AND SUBSISTENCE PRACTICES

Figure 109 presents a schematic summary of the culture history of the Sapoa River area, both as a local unit with which I am specifically concerned, and as a part of the larger Greater Nicoya zone. The organizational models for "Culture Contact" and "Community Pattern" were taken from the seminars by Willey et al (1955) and Beardsley et al (1955). A scarcity of some types of data has made assignments of periods to a particular modular subsection tenuous at times, but overall they have been quite applicable.

In terms of culture contact, we are concerned with the material culture as a starting point. A number of questions are related to the material culture inventory: 1) what native material is being traded out and to where? 2) what trade items are coming in and from what sources? and 3) what is the manner of contact? Some contact evaluation is also possible in terms of the non-material culture, but most of this data is limited to the proto-historic period. A good deal of areal data on culture contact phenomena was gathered by Baudez (1967) in connection with his work in the Tempisque River drainage, and has been cited in the ceramic analysis section.

Community patterning appears to be strongly linked to subsistence practices and broadening of the subsistence base through time. The presence of trade ware materials at certain points of the chronological sequence also indicates that the

<u>CULTURE CONTACT</u>	<u>PERIOD</u>	<u>COMMUNITY PATTERN</u>
B4. Fusion with emergence of new traits which have no obvious antecedents in the trait-units of the receiving culture.	Zoned Bichrome (B. C. 600-A. D. 300)	Restricted Wandering
B1. Adoption of the trait-unit without modification and without fusion of the introduced trait-unit with corresponding elements in the receiving culture.	Early Polychrome (A. D. 300-800)	Transition from Restricted Wandering to Central Based Wandering
B2. Trait-unit intrusions with dominance by receiving culture.	Middle Polychrome (A. D. 800-1200)	Central Based Wandering with sedentary aspect; in Nicaragua: Semi-permanent sedentary or may skip this level.
A3. Site unit intrusion. Fusion with dominance of the intruding culture. also	Late Polychrome (A. D. 1200-1520)	Central Based Wandering In Nicaragua: Simple Nuclear Centered
B1. Trait-unit intrusion without modification or fusion		

Fig. 109 Schematic summary of Sapoa River Valley area culture history.

local community structuring was an important influence on the area's ability to establish and to maintain outside contacts.

Preceramic Period

The suspicion and working hypothesis continues that the lithic sites surface collected south of La Cruz during the 1969 season probably represent a temporal period from 5,000 to 7,000 years ago (Murray 1969:259), but the lack of a firm geological data and absence of deposits in stratigraphic contexts rules out firmer assumptions.

One "fluted" point has been found in northwestern Guanacaste province (Swauger and Mayer-Oakes 1952:264), but its antiquity has been challenged on technological bases, as well as being without context (Aveleyra 1964:388).

Early Formative (B.C. 200⁰ to 600)

There are no known Early Formative materials in the Greater Nicoya area. While Olmec figures (Coe 1965:747) from Guanacaste province have been illustrated and both Easby (1968) and Balser (1969:59-61) have suggested other Olmec contacts in terms of style, jade-working techniques, and material, there is no actual evidence of Olmec settlements. Balser (1969:59) noted that this Olmec influence appears to be largely limited to the Atlantic Watershed and is not prominent in Guanacaste. Easby (1968:94) felt somewhat differently, stating "Trading was established in Middle Preclassic times between the Olmec area and the Pacific coast, from Guerrero to Costa Rica and across to northeastern Honduras."

From northeastern Honduras, a southern thrust into the Linea

Vieja region of northeastern Costa Rica, where many of the Olmecoid traits appear, might be easily conjectured. However, at the present time insufficient evidence exists to support any dispersal hypothesis. The looting of innumerable tombs in countless cemeteries has destroyed the context of most jade finds and none have been found in the less common midden and village site excavations.

Interested archaeologists, geologists, and mercenary treasure hunters have searched with varying degrees of intensity for the native jade sources. None have been found to date, but their eventual discovery, and the hopefully associated trade or exploitative settlements will do much to clarify the picture of external trade during the Early Formative.

Zoned Bichrome Period (B.C. 600 to A.D. 300)

As noted in the preceding ceramic section, the various Zoned Bichrome period sites that have been either surface collected or tested offer a wide variety of ceramic assemblages for this period. It is quite possible that these are divisible along some time line, but the temporal knowledge to do so is currently lacking. The apparent shallowness of the Costa Rican Formative is, I feel, more a problem of chronological assessment and identification than it is a problem of lack of sites. However, until this problem is solved, the firm prehistory of the Sapoa River must be assigned a beginning of approximately 600 B.C.

At this time the area was populated by a relatively dispersed population, living in what has been classified as a "Restricted

Wandering" community pattern. This was defined (Beardsley et al 1955:136) as:

Communities that wander about within a territory that they define as theirs and defend against trespass, or on which they have exclusive rights to food resources of certain kinds. Movement within the territory may be erratic or may follow a seasonal round, depending on the kind of wild food resources utilized.

This description fits the widely scattered, thinly deposited, and areally small sites known throughout the northern Guanacaste region from this period. The differences in ceramic assemblages between the Tempisque River, Tamarindo Bay, Sapoa River, and southern Nicaragua areas suggests exclusive locales of control with limited trade relationships. In Nicaragua, many fewer sites are known than in Costa Rica; the available data suggests that population at this time was concentrated along the inland shore of Lake Nicaragua, with the Pacific coast being basically uninhabited.

In the Sapoa research area, settlement appears to have been almost entirely along the Sapoa River and its major tributaries. Only one small site was found near the Bay of Salinas and the period is not represented stratigraphically at any of the four sites tested there. In the Tempisque drainage this is also true, with Baudez (1967:299) having found his Catalina phase sites along the river or its Bebedero River and Cañas River tributaries, while Coe's Chombo phase at Chahuite Escondido and Monte Fresco phase at Matapalo are both quite close to the ocean (Baudez and Coe 1962:367). Norweb's isthmian sites are also located close to water (1964:557), but near Lake Nicaragua on the eastern edge of the

isthmus rather than on the ocean side. G. R. Willey (personal communication) stated that his party had surveyed intensively for shell middens and sites around the bay of San Juan del Sur, but had found nothing.

The material culture assignable to this period conflicts with the modular definition:

The bulk of an adult's property is composed of food-getting utensils---bow and arrow, spear, basket, digging stick, axe, etc.... Status differences are minimal or absent. Personal property is rarely inherited; instead it is frequently destroyed at the death of the owner. (Beardsley et al 1955:137).

In contrast, we find organized cemeteries, jade amulets, ceremonial metates that may not be metates at all, and a variety of well-executed ceramics. This apparently bespeaks a group of artisans skilled in at least three different media and a relatively sophisticated spiritual perception.

The Spanish work metate applies to a flat, usually slightly concave surface on which maize is ground and was used at an early time (Hartman 1907:39) to describe three and four-legged platforms, some ornamented and others plain, compact and buttressed, and so far as is known, almost exclusively from mortuary contexts. Despite the fact that Hartman (1907:39) remarked that these items were being sold from looted graves by the Padre Velasco for utilitarian purposes in the Nicoya region, there is considerable reason to doubt that this was their pre-Columbian function. It must be remembered that the indigenous population had been almost completely eliminated by the Spanish and what Hartman observed was a European, rather than native, pattern.

Alternate functional interpretations are available from a number of sources. Lothrop (1926:291) observed:

The identification as stools is not absolutely accurate, for many specimens show evidences of grinding upon the upper surface. However, in Costa Rica, as well as in the West Indies, chiefs were wont to sit upon low stools, and as these objects sometimes were made of pottery (which could not have been used for grinding), their primary purpose may well have been as stools. Furthermore, it is probably that all the metates of this and other regions were employed as stools. The wooden seat in fig. 183 is comparable with the stone metate and with wooden stools of the West Indies, South America, and Yucatan.

Norweb (1961:28) was apparently echoing Lothrop when he stated:

The high concentration of metates in northwest Costa Rica does not necessarily mean a greater dependence on maize here than in Pacific Nicaragua. The fact that metates, some of them elaborately carved, were commonest in the same regions where the burial cult was present, and, in addition, were a standard grave offering, may indicate a special ceremonial purpose for these artifacts, although many show signs of use. The possibility even exists that these may have been ceremonial seats rather than metates.

In addition to the three and four-legged rectangular forms, circular stone stools were also described by Lothrop (1926:291):

Stone stools...consist of a round plate encircled by a ridge and supported on a tall pedestal. A series of small heads often depends from the edge of the plate. The base is pierced by slits, triangles, and diamonds, etc. Sometimes it consists of a series of Atlantean figures, a form reflected in the pottery. Such stools are found with unbroken distribution and of indistinguishable types from the Highlands of Costa Rica to the Province of Chiriqui.

Lothrop (1926:291, fig. 183) illustrated a wooden stool from the Cave of Cucinizna (near Teustepe), Nicaragua that is descriptively identical to the common four-legged, unornamented metate from Costa Rica. Oviedo (Book 42, Chapter 13) recorded

the use of such a stool in the house of the cacique Agateyte at Tecoatega: "...and as a pillow he had a small four-legged bench, somewhat concave, which they call duho, and of a very handsome wood, skilfully carved, at the head."

The hesitancy expressed by both Lothrop and Norweb in assigning the "metates" a ceremonial function as a stool was based on the presence of wear patterns on the upper surfaces of "some" specimens. There appear to be two possible explanations, one technological and the other functional. Technologically, one of the things an artisan would be concerned with in finishing a stone seat would be that the surface was smoothed. Hence, the abrasion marks may simply be a result of the manufacturing process. Functionally, the concave surface of the ornamented, legged metates is a design feature and not an artifact of use. In general, the horizontal surfaces are less than five centimeters thick and would permit only a short life as a utilitarian item. There is also the possibility that some of the chairs may have had a dual function and been employed for grinding certain ceremonial foods.

Under extended use, grinding tools of the familiar "trough" type metate result. Not only is this troughing a remnant of usage, but it also increased the efficiency of the metate, since the steep sides prevented the spreading of the kernels and partially ground meal along the grinding axis and being lost over the unrimmed edge. In this respect, it is interesting to note that most Costa Rican metates are unrimmed. Those that are rimmed are generally so small (see Lothrop 1963, plates 24 and 25) as to have an inefficient



Fig. 110 Carved stool fragments and figurine, probably Early Polychrome; lower right re-used as pestle.



Fig. 111 Early Polychrome period, detail from Fig.110.

sized grinding surface of less than 40 by 25 centimeters in area. By contrast, those grinding surface illustrated by Hartman (1907) from eastern Costa Rica and mentioned by Stone (1957:16) from Central Honduras refer to larger, undecorated and unlegged slab-like implements. Stone noted that both the decorated and slab-like varieties were found at the site of Las Vegas in the Comayagua region of Honduras, but that the woman they observed using a "metate" borrowed from the site had elected a slab-like kind.

The small surface areas for grinding on most rimmed metates from Costa Rica suggests that if these were indeed used for grinding rather than headrests or the like, that it was probably for processing nuts, berries, pigments, or ceremonial foods rather than for maize.

While "some" metates may show signs of wear on the upper surface, almost no completely spent specimens are known. Those recovered from mortuary contexts do not show extensive wear (relative to the moderately soft volcanic composition of the stone), and as mentioned previously no complete metates of the ornamental types have been found, in any degree of utilization, from non-mortuary contexts.

The designation of the ornamented metates as ceremonial stools or chairs rather than as subsistence indicators of maize dominance fits well the other indications of Circum-Caribbean influence in the area. The Arawak (Rouse 1948:528; plates 88, 89), Caribbean lowland tribes in general (Kirchoff 1948:224), and Guayupe (Kirchoff 1948:387-388) are all described as utilizing

ceremonial stools similar to Costa Rican "metates," with carved ornamentation, four or three legs, an effigy animal head, and often a tail. More generalized descriptions of wooden and stone four and three-legged stools, such as given by Kirchnoff (1948:222) are numerous for the Circum-Caribbean region. Rowe (1946:224) also noted that in Inca culture:

The only kind of chair (TIYANA, "seat") was restricted to high officials to whom the privilege had been granted by the Emperor. Cobo describes it as a low seat, about two palms long and one palm high, with a slightly concave top. It was carved out of a single piece of wood, in the shape of an animal with short legs, lowered head, and raised tail.

Rowe did not illustrate one of these seats, but their resemblance to the West Indian types must have been at least approximate, for he noted that "The Spaniards borrowed the West Indian word duho to designate this type of seat" (1946:224 fn.).

A large amount of data that might have been brought to bear on this area has been lost through the extensive looting of cemeteries through the past century. One of the few carefully recorded cemetery excavations was reported by Hartman (1907) from Las Guacas on the southern Nicoya peninsula.

No manos were found associated with "metates" in any of the more than 16 graves excavated by Hartman and this seems to cast further doubt on their inclusion as grinding implements for the "other world." In addition, to correlate with other Circum-Caribbean traits observed for this area, it is interesting to note that both the Arawak (Rouse 1948:532) and the Carib (Rouse 1948:559) buried their chiefs with their ceremonial stools.

The possibility that ornamented ceremonial stools-metates may have been introduced into Costa Rica and other parts of Central America from the Circum-Caribbean area is increased by the fact that their initial introduction, so far as is known at present, coincided with the Early Polychrome period (A.D. 300 to 800) (Stone n.d.:3) and with the introduction of Polychrome pottery. This decorative technique is also thought to have been introduced via the Atlantic coast (Coe 1962:177; Zucchi 1970). By contrast, no such artifacts are known from the Central Mexican region.

While it must be assumed that workshop centers and some larger communities existed during this period, we must, for the present, attribute our lack of knowledge about them to the infancy of scientific research in the region and the elusiveness of the archaeological record. As Meggers and Evans (1959: 195) noted:

The intense rainfall in the Amazon...reduces the archaeological evidence to objects of stone or pottery. Post-holes, matting, thatching, and other details of house construction are so quickly destroyed by decay that unless the posts are burned (apparently an extremely rare situation) there is absolutely no evidence of such features. Proof of this factor is easily obtained by digging on the site of a former caboclo house where the exact position is known. If over 5 years have passed, the area has passed into secondary growth, posts and postholes have disappeared, all decayed vegetable matter has been leached out or washed away and except for areas darkened with charcoal or ashes there is no sign of occupation other than occasional broken artifacts.

The same temporary nature of house evidence was studied in a modern example (Rydberg 1970) in the San Dimas area of the Sapoa River valley and can probably be attributed to the archaeological

record as well. Building an elaborate house, or a more permanent one, serves no use in the tropics, where the open-air, breeze-catching structure has definite advantages. In the modern rural population, houses are strikingly similar and status and wealth are differentiated by the variety and quality of a man's garden and the cut of the clothing on his family's backs. Excavations in Zoned Bichrome sites have not been extensive enough to permit the possible delineation of social or activity areas; filling this gap should be another early goal of future research.

Subsistence Data

Subsistence data on the period is very scanty. None of the known sites appears to have been involved in marine exploitation, despite the geographical proximity of Chahuic Escondido and Matapalo to the sea. At La Bocana, Baudez (1967:22) reported the finding of a circular metate fragment and a mano fragment in the surface level, 1 mano fragment in the 0 - 20 centimeter level, another in the 20-40 centimeter level, and a third in the 40-60 centimeter level (total depth of excavation was 180 centimeters). One of the manos is illustrated in Baudez's Plate 53 (1967:399) and has a cup-like pecked depression on the illustrated surface. Coe and Baudez (1961:513) stated:

Neither extensive midden heaps nor burials were encountered. The only important refuse deposit encountered was in La Bocana cave. It was composed primarily of fish bones, with mammal and bird bones in small quantities. A few bivalve mollusks also occurred.

At Ortega, Baudez (1967:25) recovered 1 mano fragment from level 3; 1 mano fragment and 1 metate leg fragment from level 4;

1 mano fragment, 2 metate leg fragments, and 1 polished stone celt fragment from level 5; and 1 mano fragment from level 6 (total depth of excavation was 130 centimeters. Two of these manos are also illustrated in Plate 53, 1 being somewhat circular and the other oval.

At La Guinea, Pit MNOP (Baudez 1967: 33) 1 metate leg fragment was recovered from a Zoned Bichrome level at a depth of 320-340 centimeters (total depth of excavation was 380 centimeters).

Baudez (1963: 47) stated that "Agriculture was probably the main source of food but fishing and hunting remained important. Simple three-legged metates are common, and some elaborate ones have been found in Veraguas. The stone industry consists of pebble tools and polished celts." While this may be true in general for the Lower Central American area he was describing, evidence from his own excavations in the Tempisque area does little to support it. There is no contrary data to suggest another pattern and the one apparent certainty is that people of this period were not dependent on coastal resources.

For the Chombo phase at Chahuite Escondido, Coe and Baudez (1961: 506) stated that:

Sherds were abundant throughout all deposits, especially in Cut 1 which appeared to represent a refuse heap composed almost entirely of shell, with many broken fish, mammal, and amphibian bones...It was quite obvious that the shellmounds themselves were completely the result of occupations during the last two phases, and that the strata which could be assigned to the first two phases were essentially flat layers of debris.

They continued (1961: 508) "Artifacts other than pottery are rare.

No figurines, metates, or manos have yet been identified. Apparently there was no emphasis on the collection of mollusks."

In the Monte Fresco phase at Matapalo, Coe and Baudez (1961: 508) reported that, except for pottery "There are few other artifacts...There is a single specimen of a finely polished stone celt...from which half is missing."

In summary, Coe and Baudez (1961: 514) wrote:

All three of these (phases) are fully ceramic, probably representing the remains of people with maize agriculture. Fishing and hunting were of some importance, the latter carried out without the benefit of stone projectile points. The gathering of mollusks on the coast, so significant in later times, was of no consequence in this period.

In describing the Isthmus of Rivas Norweb (1964: 558) stated:

The fact remains that these cultures of the Zoned Bichrome period were far from primitive. There is no evidence of incipient cultivation, a not surprising fact in view of the relatively late position of our sequences in comparison to those of Peru and Mesoamerica where these developmental levels occur considerably earlier. Instead, manos, metates, and sedentary village communities indicate a stable society based on effective maize cultivation, a way of life which continued to exist into historic times.

Norweb apparently ignored the fact that it is local ecological and cultural conditions and climatic factors, rather than the level of development in Peru and Mesoamerica, that permits a shift from hunting and gathering to efficient cultivation. In addition, the very preliminary nature of both of his reports (1961;1964) on research in the Rivas area and a lack

of statistical counts of subsistence related artifacts makes his assessment of the role of agriculture, especially maize agriculture, difficult to evaluate at this time. Though the rich soils of the Isthmus and subsequent subsistence practices intuitively suggest that he may be correct, a number of viable alternatives and lack of definite data suggest that his assumption should be followed with caution.

Actual data from the Sapoa River area is equally sparse. The numerous, small single component sites from the period suggest dispersed settlements, possibly resulting from a subsistence pattern that was not conducive to clustered populations. Again, artifacts that would give some clue are absent and remain limited to ceramics. The only metates found were associated with the tombs at the Las Pilas cemetery and were probably non-functional. The lake and river were probably exploited, but archaeological preservation is inadequate to check this.

In the general conceptual framework of Mesoamerican research, where cultural progress or achievement has come to be equated with evidence of "efficient cultivation" and maize agriculture in particular, the lack of firm data for either contrasts sharply with the fine incised ceramics, jade amulets, and ceremonial "metates" that are the cultural remains. The question, obviously, is not whether subsistence agriculture (and especially maize) were or were not present in pre-Columbian times, but to what extent they were important. If, as has been suggested previously, the presence of so-called "metates" is not conjunctive with maize agriculture,

then we may perceive a much more generalized subsistence pattern. However, as already summarized, the details of this pattern are lacking for the Zoned Bichrome period.

Early Polychrome Period (A. D. 300 to 500)

The onset of this period marks a shift both in local settlement patterns and the nature of external contacts. Coastal occupation became important from the standpoint of marine resource exploitation, and shell middens first appeared on the cultural landscape in Guanacaste Province.

In conjunction with coastal settlement, a more sedentary pattern of life developed for at least part of the population. Without speculation on the cause and effect relationship, the more stable community life evidenced at this time seemed to allow the development of an areal trade network. This is evidenced by the wide distribution of Tola Polychrome (Haberland 1968: 232) and the intensification of external contacts. Related to the expansion of trade relationships, the area began to show evidence of its geographical function as a cultural corridor.

Whebell (1969: 2) stated that "The present corridor hypothesis derives from three realistic postulates:" The first (1969: 2) was that "The earth's surface is highly irregular as respects physical surface..." and that (1969: 3):

From the first postulate, concerning the irregularity of the earth's surface, it follows that the attractiveness of some areas for human settlement may be much greater than that of others, and will therefore, to the extent that technology,

accessibility, and knowledge permit, be selected early for the development of settlement. It follows also, that, for movement between two points, routes of least effort will be more or less obvious in the natural landscape. This applies, too, to technical innovation, which characteristically commences at one or a few points of discovery or invention and spreads, with or without the actual migration of people, in directions and at rates strongly conditioned by the routes and quality of transportation, i. e., by the total accessibility of receptive areas.

The corridor concept has been little utilized in anthropological interpretation, but provides an important organizing model for explaining changes in the Sapoa River area at this time. Whebell's model was originally proposed for the industrial area of southern Ontario and therefore has had to be modified here for the prehistoric situation.

Man had first passed through the Central American area at least 10,000 years prior to the beginning of the Early Polychrome period, but at this time the Central American isthmus functioned more as a path of expansion than as a corridor of sustained contact. While travel through the area was initially a north to south proposition, it was probably not too long before "two-way" traffic developed and the basic long range trade routes prominent in later times were established. Crucent and Rouse (1969: 46) have radiocarbon dates of 2190[±]130 B. C. 2450[±]170 B. C., and 2610[±]80 B. C. for Hispaniola that seem to indicate an early and substantial knowledge of seafaring technology.

While the more spectacular debate over Transpacific migration had a large public and professional following for many years, our knowledge of contacts between major segments of the New

World has developed on a quieter and less controversial periphery.

Whereas Chard (1950) inveighed against Pacific coastal sea trade between Mesoamerica and South America on the basis of lack of archaeological data and the known difficulties of navigation, a decade later Coe (1960) summarized data from Ecuador and Guatemala which seemingly satisfied the first objection. He was less successful in wrestling with the argument of navigation hazards, but as long as men are currently sailing the oceans of the world in craft as small as row-boats under almost all types of conditions, I think we are safe in presuming the competence of prehistoric peoples in these skills as well. This is not to say that such trips were commonplace and that contact was either extensive or intensive. There seems to have been little economic or social incentive to make the trip; in terms of firm, remunerative purpose, it resembled going to the moon, I would suppose. Nonetheless, sailors were capable of undertaking the journey when they chose to.

As Whebell noted, movement between two or more points will follow routes available in the natural landscape. By Early Polychrome times three probable routes, or patterns, of travel through or around the Intermediate Area had probably formed.

The first is by direct water contact between Middle America and South America via the Azuero Peninsula of Panama (Coe 1960: 385), with contacts in other Central American areas probably limited to accidental or emergency beachings. G. Reichel-Dolmatoff (1965: 114-115) has hypothesized that "The entire shaft tomb-figurine complex of the Cauca Valley and the Central Cordillera

(of Colombia) may well have been derived from Western Mexico (Nayarit-Jalisco-Colima), where radiocarbon dates of approximately 250 A. D. have been obtained..." and this may represent this kind of contact. Coe (1960: 384) also felt that the resemblances between La Victoria and Valdivia were the result of direct maritime contact.

Lothrop (1961) outlined the extreme difficulties of a second travel possibility, that being overland through the Central American area. While a certain amount of wandering throughout the zone probably took place, this manner is long, slow, and tedious when the objective is known and more efficient modes of travel are available.

A third alternative is at present best supported by scattered archaeological data from the Greater Nicoya area and also meets some of the hazards of navigation in one of the most treacherous offshore areas, that being the northern Costa Rica Pacific coast. This area is an intersection of both major ocean currents and major wind patterns; in a chance meeting in May 1969 with a group of Americans sailing from San Francisco to New York via the Panama Canal, they told me that far and away the worst weather they had encountered on the trip was in the region west of San Juan del Sur, Nicaragua. The rapid shifting of the winds had made navigation extremely difficult and at times almost impossible. Coe (1960: 385) summarized additional data on the problems of open water navigation on the Pacific coast.

To avoid this, a pattern that may have started in the preceding Zoned Bichrome period was developed combining open-

ocean and inland water travel. The most likely route would have been down the Pacific coast as far as the Bay of Fonseca, overland to Lake Managua and down the interior shores of it and Lake Nicaragua, down the Sapoa River to a short overland portage at the headwaters of the Tempisque River; from there, down the Tempisque to its mouth in the Gulf of Nicoya and from there by open water either directly to South America or to a lay-over on the Azuero Peninsula. Chira Island in the Gulf of Nicoya was known as a trade center at the time of Spanish contact (Oviedo 1851-55 Bk. 42).

While the existence of such a route obviously needs to be subjected to large amounts of additional research, practical considerations, as well as the apparent limited occurrence in Central America to the presence of Schettel Incised along this proposed route suggest its early presence.

Such trade was probably facilitated through a merchant class or ethnic group that oversaw the transfer of goods along the route. Such a system would have speeded the movement of goods and would also have reduced the effect of cultural filters (Coe 1960: 384), since the goods would never really enter into the cultural milieu of the area through which they were passing.

As previously mentioned, this period shows some changes in settlement pattern. La Bocana is not occupied, Ortega is occupied only in the early part, while La Guinea is occupied throughout. At both Chanuite Escondido and at Matapalo, the Early Polychrome period is limited to its later manifestations, or what Baudez and Coe (1962: 369) referred to as Early Polychrome B. Within this

framework, La Guinea is representative of Early Polychrome A.

In the Sapoa River area, there appears to be a much reduced population in the river valley during this period. However, this may to some extent simply represent a shift from incised to painted ceramics, with the later faring very poorly in terms of preservation. There are numerous sites that were surface collected that yielded no diagnostic material and may well belong to this period.

The Bay of Salinas underwent population growth during this period, with components being found in basal levels at both Site 87 and on the western portion of the Las Marias shell midden (Site 26). Again, there are probably additional sites, but lack of testing or poor surface preservation makes them difficult to find.

In Nicaragua, Norweb (1964: 558) noted only that villages seemed to be larger and more numerous.

Subsistence Patterns

At La Guinea, a metate fragment was found in the 280-300 centimeter level, while a metate leg was recovered from 320-340 centimeters (total range of Early Polychrome period was 280-390 centimeters). At the Bolson cemetery (Baudez 1967: 40) a small tripod metate and mano were found in Grave 3 from this period. Of the 12 graves at the site, this was the only one with subsistence type burial furniture. The individual involved was an adult, but the sex could not be determined.

In summarizing the Early Polychrome B phase, Baudez and Coe (1962: 368) noted "Also new are polychrome figurines, carved metates, pottery roller stamps, ear spools, and many other traits."

They (1962: 363) also reported that this was the major occupation at Matapalo, lacking the succeeding Middle Polychrome and Late Polychrome phases.

While the addition of shellfish to the diet may not occur until the latter part of the period at some sites (Baudez 1967: 47-48), on the Bay of Salinas this apparently took place from the beginning.

Exploitation of inter-tidal sandy beaches and sand flats to a depth of 10 meters for large mollusks occurred primarily during the dry season (December to May). During the rainy season, when higher water levels in the bay flooded the inter-tidal flats, small gastropods and oysters were gathered from the rocky headlands. Exploitation of the salt flat-estuary-mangrove system was never intense (Taschek 1971).

In terms of the combination of the so-called Linear Decorated and Early Polychrome phases into one period, the most important ecological-subsistence indicator is certainly this marine addition to the diet. At the inland sites there apparently was no such change.

Other artifactual evidence of alterations in the subsistence pattern come from the occurrence of tripod chili graters (Fig. 33a) and so-called "nutting stones." The former are a broad group of ceramic types called "Leon Punctate" by Norweb (1964: 559) and occur in Early Polychrome contexts in Nicaragua and northern Costa Rica, but are absent in the Tempisque drainage. In the San Dimas area, they occurred in Early Polychrome components in the San Dimas Colony proper and around the Bay of Salinas as well. In

all cases, their occurrence seems to be limited to the Early Polychrome phases.

"Nutting stones" (Fig. 114) appeared first in this phase, but became much more prevalent in succeeding times. They occur both in portable and non-portable (Fig. 45) types, the former at Sites 1, 6, 26, 62, 67, 87, and in occasional random surface collections. Non-portable stones are limited to Site 85, where milling bins similar to those known from California (Baumhoff 1963) are found in the exposed lava flows.

The portable mortars are most often made from flat river cobbles and may be pitted on either a single side, or on both. Often, there is a lateral notch on both sides, perhaps to allow the slab to be pinned down and to prevent movement or sliding when the pestle struck.

Pestles were made from small, fist-sized cobbles, from broken fragments of polished stone celts, and from the bulbed ends of broken manos (Fig. 114). It is interesting to note that while these bulbs are found utilized as pestles, the complete manos are never found in domestic contexts. In a few instances, broken fragments of metate legs were also put into service. In one instance, a mortar and pestle were found together in situ at Las Marias, but in other cases the various implements were found scattered throughout the midden debris.

While these nutting stones become much more prevalent in the Middle and Late Polychrome periods in the Sapoa River area, they are apparently unknown in other parts of Greater Nicoya and are

absent from Ometepe Island (Wolfgang Haberland, personal communication). Their appearance in this period either indicates a growing importance in the economy of various nuts and berries, or a technological shift from wooden mullers to stone ones.

A local informant stated that prior to the time the bay lowlands were timbered for pasture 30 years ago, practically every tree produced an edible fruit, nut, or berry at some time of the year and the same is true of much of the remaining natural vegetation along the river. Thus, the native vegetation would offer a number of food resources that would need to be pounded or cracked prior to human consumption. However, the item of primary importance is suspected to have been acorns of the oak specie Quercus Oleoides. The tree is present in large numbers in the area and is also unique among Central American oaks in that its range spans the entire Pacific coastal zone (J. Robert Hunter, personal communication) from Mexico to Costa Rica.

The use of acorns on the California coast is a well known pattern (Baumhoff 1963) and their consumption by prehistoric Indians in Mexico was mentioned both by A. F. Bandelier in his journals (n. d.) and by Flannery (1968: 70). As Euell Gibbons (1962: 10) wrote:

If we consider the whole sweep of his existence on earth, it seems likely that mankind has consumed more millions of tons of acorns than he has of the cereal grains, which made their appearance only during the comparatively recent development of agriculture.

Despite the temporally and geographically wide-spread use of acorns, they are difficult to identify archaeologically, especially under the poor preservation conditions granted by the tropics. For

the present, we can only attempt to relate a functional interpretation of the artifacts with our knowledge of the ecological potential of the area; no precise estimate of percentage importance is possible.

During the Early Polychrome period, we see an apparent expansion of the subsistence base and the addition of new commodities such as chili peppers, marine mollusca, and a variety of nuts and berries with a hypothesized predominance of acorns. In following the pattern suggested for the preceding Zoned Bichrome period in the Sapoa Valley area, this seems to be the expansion of a gathering-collecting base, rather than of a sedentary-agricultural one.

While the base was not agricultural, it was more than likely sedentary for at least a part of the population. Gathering and collecting often call to mind a seasonal round of migrating from location to location as various crops ripen. However, in the Sapoa River area, the location of sites close to aquatic resources provided a dependable though variable protein supply on a year long basis, with seasonal fluctuation of vegetal resources. Acorns, harvested in March and April, can be stored for up to 6 months by simply burying them in the ground.

Thus, while much of the subsistence base still needed to be "collected" or "gathered" the abundant nature of these resources provided a dependability contributing to sedentary villages equal or superior to that based on cultivation of an annual crop such as maize.

Middle Polychrome Period (A. D. 800 to 1200)

The Middle Polychrome period not only marks an increase in the population of the area, but also shows a corresponding rise in the frequency and clarity of the archaeological data. The regional integration begun in the preceding period reached its highest level, and ceramic products of the Greater Nicoya region became part of a far-flung trade network.

The community pattern in the population centers completed the shift to Central Based Wandering or Sedentary Gatherer status, the former being defined by Beardsley et al (1955: 138) as "A community that spends part of each year wandering and the rest at a settlement or 'central base,' to which it may or may not consistently return in subsequent years." The Sedentary Gatherer aspect of this pattern has been proposed as applicable to the preceding period as well and would be defined as: A subsistence dependence still based on gathering and collecting of natural foodstuffs, the latter of which occur in sufficient seasonal and quantitative abundance to allow sedentary living by the majority of persons resident in a village at any given time.

In summary, the archaeological evidence seems to closely parallel the modular description for this level of settlement:

A half-wandering, half-sedentary community pattern representing an adjustment to one of three different types of subsistence resources: 1) a storable or preservable wild food harvest, such as acorns or mesquite beans; 2) a locally abundant food, such as shellfish; and 3) incipient agriculture producing a small harvest (Beardsley et al 1955: 138).

This period, as might be expected, shows a number of changes in the occupation of known sites. In the Tempisque drainage, La Guinea is the only excavated site that continued to be occupied. However, survey revealed a number of sites also assignable to this period and along the Tempisque the broadest expansion of population occurred at this time (Baudez 1967: 212). Baudez and Coe (1962: 369) stated:

Sites of this period are found throughout the area. The three phases defined thus far are bound together by the abundantly represented types Mora Polychrome and Papagayo Polychrome; wherever their points of manufacture, they were widely traded not only throughout Guanacaste but also up into the highlands. Other pottery types appear to have been rather specialized locally.

In the Tamarindo region, the period is absent from the Matapalo site, but was found as the single component at the Huerta del Aguacate site, consisting of 2 low shell mounds north of the San Andres River. The ceramic assemblage was characterized by an abundant presence of Mora Polychrome, while Papagayo was less common than at Chahuite Escondido. Non-ceramic artifacts included bone tools, ground stone celts, a single stone projectile point, columellae chisels, and large bivalve shells utilized as hoes (Coe 1962: 364).

At Chahuite Escondido, the Middle Polychrome period is represented by the Doscientos phase, which Coe (1962: 362) called "...clearly the major occupation...when the bulk of the shell mounds were accumulated." In conjunction with this, he noted that both Mora Polychrome and Papagayo Polychrome were the major ceramic types

found.

This contrasts to some extent, at least quantitatively, with subsequent data provided to Baudez by Coe. Citing personal communications, Baudez (1967) noted that Mora, while appearing in all its varieties at the Tamarindo site, was rare at Chahuite Escondido. Of other Middle Polychrome ceramics, Palmares Incised (30 decorated sherds at La Guinea) was found in small amounts at Chahuite Escondido; Belen Incised (51 decorated sherds at La Guinea) was rare at Chahuite Escondido; Papagayo is present in both areas in apparently large but unquantified amounts; Galo Polychrome is abundant in the Tamarindo region, but rare in Santa Elena; Birmania Polychrome is also abundant at Tamarindo, but apparently absent at Santa Elena; and Cabuyal Polychrome is present in small quantities at both sites.

The picture at Las Marias is strikingly similar to that at Chahuite Escondido, with representation of a variety of Middle Polychrome types and a maximization of the visual archaeological record through extensive exploitation of marine mollusca.

Coe's (1962: 360) description of Chahuite Escondido as "...nine shell mounds (midden---f.w.l) arranged around a sort of plaza," closely parallels the physical layout at Las Marias. Coe, with limited time and manpower, was forced to limit testing to (1962: 360) "A cut down into the largest of the mounds and three further cuts into the plaza itself."

At Las Marias, with the benefit of almost an entire season, 8 student workers, and from 2 to 4 local workers, we were able to

conduct extensive testing over the entire site. What we found was that the site had horizontal temporal distribution as well as vertical, with the Early Polychrome and Middle Polychrome components occurring on the western and northern edges, with a shallow overlying Late Polychrome component in some places. As we moved to the southern and eastern sectors, the lone component was purely Late Polychrome, with some Mora, Papagayo and Castillo Engraved from the preceding period. It is of course pure conjecture, but a similar situation seems equally plausible for Chahuite Escondido.

While we still know very little about the area as a whole, there seems to be little evidence to support statements that Middle Polychrome represents the population peak (Baudez and Coe 1962: 372; Baudez 1967: 212). There is no archaeological data that would either suggest or explain a decline in the population of the Sapoa River area following this period. As will be shown in the following discussion of the Late Polychrome period, the fragmentation of the regional pattern may have confused the record with an upsurge of localized traditions.

For the Middle Polychrome period, a proliferation of sites, the widespread increase and intensification of marine mollusca exploitation, and widespread findings of regional ceramic styles reflect an obvious increase in population, but there is no reason to suspect that this increase did not continue into the succeeding period.

In Nicaragua, Norweb (1964:558) commented that "Aboriginal population reached its peak during this period with frequent,

heavily occupied sites, some as large as a square kilometer." The only references in the literature that I could find to a 1 kilometer square site was to Matapalo (Coe 1962:266) and this referred to the Early Polychrome B Matapalo phase; as mentioned earlier, there is no Middle Polychrome component at the site. In contrast, the tested Middle Polychrome manifestation in the area, Huerta del Aguacate, consisted of only 2 low shell mounds. The second kilometer square site was of Middle Polychrome association and was reported by Norweb (1961:27). However, in remembering the case of Las Marias, without more thorough testing than was undertaken by Norweb, we cannot be sure that the entire kilometer square area does indeed date to the Middle Polychrome period.

There are no radical changes in, or additions to, the subsistence pattern during this time period. The great increase in mollusca gathering has already been mentioned and chili graters drop from the sequence. The archaeological picture is of an intensification of the existing patterns, rather than new adaptations.

One new subsistence artifact is introduced into the assemblage at this time, however, being descriptively called "notched sherds." (Fig. 112). Similar items have been pictured and briefly described by Coe (1961), Baudez (1967), and Lothrop (1926) on the basis of limited finds. Their discovery in the Sapoa River area in some quantities, and presence in Norweb's material from Nicaragua (1961:57, e), and with four rather than the previously known two lateral notches, suggested the need for a more detailed functional analysis than had been undertaken.



Fig. 112. Early, Middle, and Late Polychrome periods: "Notched sherds"

"Notched sherds" had previously been referred to as "net sinkers," but had never been found in large enough quantities to justify this functional interpretation. Detailed analysis of over 100 such "notched sherds" from the Sapoa area has permitted a new functional perspective. When divided into groups according to the lateral width between the notches, the sherds fall into 3 moderately distinct categories, suggesting that they may have been used as some sort of gauge. Contemporary use of a similar implement to properly space the weave in fishing nets has been reported from Oregon (personal communication, Bradley Hertel); and from Lake Izabal, Guatemala (personal communications, Joe Ball). By comparison, it is thus suspected that the Costa Rican examples represent the making of fish nets.

Late Polychrome Period (A.D. 1200 to ca.1520)

The Late Polychrome Protohistoric period in the Sapoa River area reflects a number of local and regional changes. While sites such as Las Marias and probably Chahuite Escondido continued to have a Sedentary Gatherer pattern of organization, the southern Nicaraguan area along the inland shore of the lake advanced to a Simple Nuclear Centered level. The latter form was defined by Beardsley et al (1955:141) as:

A permanent (*The term "permanent" denotes potentiality rather than realization, since a center may be destroyed or abandoned because of conquest, epidemic, or other non-subsistence failures) center, with or without satellites. The center may be a self-supporting town, or a market or ceremonial place that serves as a focus for surrounding villages or hamlets. The center is not strikingly differentiated in content from its satellites except when its character is primarily ceremonial.

In southern Nicaragua, this change is apparently brought about by arrival of the Nicaraos around A.D. 1400 (Lothrop 1926:8) and the introduction of cacao (Bergman 1969:65) and possible concurrent increase in emphasis on maize. From the ethnohistoric and archaeological data, it appears that this was largely a meshing of northern managerial and commercial expertise onto the local base with little change in the underlying strata in the subsequent century leading to the Spanish arrival.

The strong regional system of the preceding period is fragmented, a number of localized patterns developed and there is an especially distinct contrast between southern Nicaragua and northern Costa Rica. While there is apparently an attempt to carry on the known patterns of life, artifactually there are distinct evidences of foreign influences moving in. Luna Ware, thought by Wolfgang Haberland (personal communication) to come from east of Lake Nicaragua, is suddenly dominant on Ometepe Island, while in northern Costa Rica the Lunoid polychromes and especially Murillo varieties mark new introductions.

While this period is perhaps the least known archaeologically, in terms of the entire Greater Nicoya area, it is the period described by the early Spanish travellers and their descriptions can be combined to yield a composite picture.

Ethnographic Data

As noted previously, Stone (1966:211) has advanced the hypothesis that Corobici, a South American Chibchan language, was the mother tongue of the Nicoya peninsula and perhaps of the Chara

and Pocosi Islands in the Gulf of Nicoya, as well as southwestern Nicaragua. In relation to this, Johnson (1948:55-56) stated:

In early Spanish times the Corobici lived along the southern shores of Lake Nicaragua between the Rio Frio and the Cordillera Volcanica...Doris Stone (correspondence) quotes the statement by Oviedo y Valdes to the effect that the Corobici inhabited the Chara and Pocosi Islands in the Golfo de Nicoya, and she is led to suspect that the Nicoya peninsula was once Corobici territory. This suspicion is not based upon records made during the Conquest or later, for it is recorded that this territory was occupied by the Orotina during and subsequent to the 16th century. In this case Oviedo's statement refers only to the Islands.

As Johnson also pointed out (1948:56) "The delimitation of the habitat of the prehistoric Corobici depends upon the discovery, on the peninsula and elsewhere, of cultural material which may be identified as the product of Corobici industry."

According to Stone (1966:212), two Mexican tongues were dominant on the Nicoya peninsula at contact. Chorotega Mangué was spoken in Nicoya, Orotina, and Orosi, while Nicarao was dominant on the Santa Elena peninsula, at Bagaces, and as a cultural divider between the Corobici and Chorotega-Mangué on the eastern shore of the Gulf of Nicoya.

In addition to its importance in northern Guanacaste, "Corobici extended from Costa Rica into the Solentiname Islands and may have been the original tongue of the Isthmus of Rivas and Ometepe Island" (Stone 1966:213). By the time of the conquest, however, the most important language was "...Mangué, the speech of the Chorotega. It was used in part of the province of Nagrando, Masaya, Nindri, Meteare, Nagarote, Mabiti, and Subtiaba, as well

as Nicoya, Costa Rica, and a small enclave by Rio de los Mangues" (Stone 1966:213).

In terms of settlement pattern it was observed that:

The Nicoya Peninsula was the first place toward the north where many houses were grouped within sight of one another and not fortified. Here and in Pacific Nicaragua were towns with squares, ritual centers, dwelling quarters, market places, planted trees. They were associated with the Chorotega and the Nicarao. The Nicarao plan seems to have a more elaborate living area for the chief and the ranking people and special quarters for goldsmiths, a detail lacking in Chorotega sites (Stone 1966:215, after Fernandez de Oviedo, 1851-55, 2:109-11; Lopez de Gomara, 1941, 2:216).

The first single-family houses appear in the Chorotega and Nicarao settlements. They were rectangular, wood, and cane, grass-covered constructions without floors. The Nicaraos in particular had kitchens, storage buildings, council houses which also served as dormitories for unmarried men. A raised mound base distinguished the chief's house from the other dwellings (Stone 1966:217, after Peralta, 1883, p.6; Fernandez de Oviedo, 1851-55, 3:99).

In reading these contact descriptions of the types of dwellings utilized by the prehistoric inhabitants, the generally impermanent design is apparent. No actual house remains have been found in the Sapoa River area to date and as previously mentioned a detailed investigation of a recently abandoned house south of San Dimas Colony (Rydberg 1970) suggests that none will be found, due to extremely poor factors of preservation.

Stone also summarized a large amount of subsistence data in her 1966 article in the Handbook of Middle American Indians; the parts relevant to northern Costa Rica and southern Nicaragua follow:

The digging stick was universal---and sometimes served as a war implement. In Nicoya and Chira Island spades were made by tying a mother-of-pearl shell to a stick with fine twisted cotton thread (Stone 1966:218, after Fernandez de Oviedo, 1851-55, 1:607; 3:110). Extensive agriculture was practiced in Panama, southeastern Costa Rica, parts of the Nicoya Peninsula, and Pacific Nicaragua (Stone 1966:218, after Fernandez de Oviedo, 1851-55, 1:335; 3:133).

The Nicarao introduced it (cacao) from Mexico and monopolized its cultivation in Pacific Nicaragua where they irrigated and shaded it with "Madera negra" (Gliricidia maculata H.B.&K.) (Stone 1966:218, after Fernandez de Oviedo, 1851-55, 1:315; 4:61; 1:317-18). The harvest lasted from February through April, the beans being dried. The Nicarao also had pole beans and grew a 40-day maize by means of daily irrigation in the dry season (Stone 1966:218, after Fernandez de Oviedo, 1851-55, 1:276,285; 4:36, 105). Cultivated plots and gardens throughout lower Central America contained varied plants and trees. These plots were fenced in Panama and among the Nicarao. Sweet and hot peppers received great care, particularly in Panama and Pacific Nicaragua (Stone 1966:219, after Fernandez de Oviedo, 1851-55, 1:317; 1:275).

Radell (1969:48-49) noted that "A great variety of tropical fruit trees were also cultivated by the Indians. The Spanish conquerors were so impressed by the abundance of fruit throughout Nicaragua that they referred to Nicaragua as 'Mohammed's Paradise'" (after Oviedo, 1851-55, 4:12).

A drug plant was used in Veraguas and in Pacific Nicaragua by the Nicarao (Stone 1966:219, after Colon, 1947, pp.285, 296-97; Fernandez de Oviedo, 1851-55, 1:206-07). Fernandez de Oviedo, identifying the Nicaraguan plant with one in Venezuela and Peru, calls it coca and says it was raised in many places. The identification of this plant with coca is confirmed by Las Casas (Stone 1966:219). A plant called "dactos" (Lemnaireocereus griseus Haworth, Britton, and Rose) which was wild in Venezuela was also grown by the Nicarao who seem to have been the only people in Central America to do so (Stone 1966:219, after Fernandez de Oviedo, 1851-55, 1:311-12).

The Mexican tribes introduced the tortilla or thin maize cake into Central America, at least as far as the Nicoya Peninsula on the Pacific (Stone 1966:220, after Fernandez de Oviedo, 1851-55, 1:266-67, 270).

In southern Nicaragua the combination of more intensive maize agriculture than in Costa Rica and the addition of cacao may have facilitated the concentration of larger numbers of people, while in Nicoya cacao was apparently less important. Bergmann (1969:96) designated the Isthmus of Rivas as a "secondary cacao district," while noting "scattered plantings" in the southwestern portion of the Nicoya Peninsula.

Bergmann (1969:95) noted:

Oviedo related that it was the Nahuatl-speaking Nicarao groups who introduced cacao to Nicaragua, and that the "native" Chorotegans did not previously have it, nor did they cultivate it after the arrival of the Nicarao. Production apparently was sufficient only for local needs...

Sauer, however, noted that "...a cultigen variety of cacao called pentagone...seems to coincide roughly with the old Chorotegan land" (1950:539). With the previously illustrated difficulty in delimiting pre-Columbian boundaries, additional research is needed to settle this question.

Regarding the local religions, Lothrop (1926:65) stated:

Turning now to the pantheons in Nicaragua, we find that that of the Nicarao shows affiliations with Mexico, while the others are isolated and certainly not of Mexican origin. We must note that the great gods of the Aztec are not present in Nicaragua, although the name Ocholobos, a Spanish corruption of Huitzilopochtli, is applied to the sanctuaries. On the other hand several of the lesser Aztec gods are found, which serves to emphasize the fact that the Aztec borrowed many of the gods of their neighbors ...most of the (available) material deals with the Nicarao.

He also commented that the Nicarao and the Aztec appear to have shared a similar calendrical system (1926:74).

Archaeological Data

Relatively few Late Polychrome sites have been either surveyed or tested, partially because of the Formative Period orientation of investigators active in the area.

The period is found in Norweb's (1964:555) Las Lajas phase at Santa Isabel A, on Ometepe Island; at Chahuite Escondido on the Santa Elena Peninsula; at La Guinea and 6 surface collected sites in the Tempisque drainage; and at Sites 19, 23, 26, 62, and 67 in the Sapoa River zone.

The areal fragmentation previously mentioned for this period is demonstrated by the limited occurrence of Luna ware on Ometepe Island and of Murillo varieties in northern Costa Rican sites; the latter also occurs in limited amounts in the Tempisque region, but the main concentration is definitely to the north.

Specific subsistence data is available only from Las Marias, with general support from information from the La Cruz phase at Chahuite Escondido. Analysis of the mollusca material from this phase at Las Marias (Taschek: 1971) indicated year-round occupation of the site and seasonal exploitation of shellfish in the bay. The species composition of the mound did not change through time, while cyclical changes in frequencies of shellfish in various ecological assemblages (inter-tidal rocky shore, sandy coast and mud flat, shallow shelf, and estuary systems) are best explained by seasonal patterns of collecting. In addition to the archaeological specimens, a comparative study of modern mollusca populations was undertaken (Karp 1970), and little change was found to have taken place.



Fig. 113. Late Polychrome period, volcanic tuff net-sinkers (above),
ground stone adze fragments (below).

The pattern of seasonal alternation between the inter-tidal flats and the rocky shore was apparently intensified during the Late occupation of the site. Analysis of the size distribution of selected common species throughout the site seems to suggest that an exaggeration of the seasonal pattern resulted from an exploitation level beyond the carrying capacity of the bay.

Hunting seems to have been of little importance at Las Marias, with small reptile (iguana and snake) bones comprising the largest percentage; there is also a distinct possibility that many of these bones are intrusive into the midden through burrowing after the cessation of human occupation. Few animal bones were present; large mammals, such as deer and monkey, were particularly scarce.

Nutting stones are a prominent feature of the midden and notched sherds also appear throughout the late period deposits. A limited number of pumice net-weights and crudely chipped lithic knives and scrapers were also found.

Evidence from this period suggests, for the first time in the area, a population pressure on the available food resources. In addition to the overlap in the seasonal cycle for mollusca collection, shown by the diminishing size of the collected individuals, the great increase in nutting stones shows additional dependence on these resources. The almost total lack of animal bone in the midden deposit possibly indicates that almost all game had been hunted out of the area and the lack of cutting and slicing implements often associated with hunting activities is another avenue of support for this supposition.



Fig.114 Late Polychrome period: Mortars and pestles.

The implications of this projected subsistence crisis are seen in the skeletal remains of a 6 year old female, found in association with terminal Murillo Grooved ceramics. The skeletal material was inspected by Professor Thor Lemin of Norway and he reported that the individual had died of chronic infectuous diseases resulting from intermittent periods of starvation. However, the starvation was rather of quantity than of quality, as the remains showed no signs of vitamin deficiency as such. This picture, according to him, is what one would expect of a highly adapted population that simply rose numerically above the carrying capacity of their area.

Ten additional burials were found at Las Marias, 8 of which are assignable to the Late Polychrome period. Coe (1962:362) also noted finding a series of burials accompanied by La Cruz B vessels at Chahuite Escondido. These late burials are interesting because they represent simple interments in garbage heaps rather than the carefully prepared graves of the preceding periods. Whether this represents a change in burial practices, or is simply a reflection of the limited work that has been done in occupation sites cannot be decided on the basis of the present data.

Coe (1962:358) hypothesized that:

...the nature of the deeply indented coastline, with broad bays, estuaries, and rivers running through the alluviated valleys would seem to have offered an inviting prospect to early farmers who yet retained an interest in older patterns of fishing and the collection of mollusks...

However, this hypothesis is not borne out by the evidence from this area. Initial occupation was concentrated inland along the

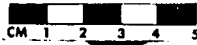


Fig. 115 Late Polychrome period. Skulls 8 (below) and 11 (above) from Las Marias (Site 26).



Fig. 115 continued, side view; note occipital deformation.

river valleys and intensification of marine exploitation occurred only in Middle and Late Polychrome times.

The middens from this period show the exploitation of the beaches and estuaries, and the forests, with a supporting yet apparently minor emphasis on maize agriculture in particular. Arboraculture and tuber crops were probably also important. Coe (1962:360) discussed the subsistence potential of the area as a "mixed economy," but his other interpretations show that he tended to place the relative importance of agriculture (maize) higher on the scale.

Population

Population estimates are very difficult, if not impossible, to assemble from data such as is available from the Sapoa River area. As Streuver (1971:12-14) has pointed out, minimal requirements for population estimates are sufficient house floor excavations to assess household sizes, and tight enough chronological control to permit synchronic tabulations. Neither situation is present in the Sapoa Valley area: no houses, living surfaces, or other household cultural features that might reflect population size have been found, while temporal periods are still on the order of 300 to 400 years each. It would also appear that overall survey and testing in the northern Costa Rica area is still too incomplete to give an accurate reflection of occupational distributions during various cultural phases.

We can say, with some certainty I think, that total population shows a gradual increase from Zoned Bichrome to Late

Polychrome times, with no serious interruptions or regressions so far as is presently known. To get some crude idea of what population might have been in the latter period, or what might have been the general carrying capacity of the land, we can resort to two different avenues of inference: 1) the modern populations (where known) of the parts of the research area, and 2) the projected carrying capacity of an archaeological site we occupied during the spring of 1970.

In 1962-63, the population of the San Dimas Colony was approximately 125 persons, distributed in 16 households over 6.25 square kilometers, or an average of 20 persons/kilometer, and 8 persons/household. By 1970, both the area of the Colony and the number of inhabitants had doubled, with the relative averages remaining the same. It must be remembered that many of the families in the colony are dependent upon cattle rather than agriculture, and that much of the cash income is derived from jobs held away from home. Families that are entirely dependent on local agriculture tend to have smaller households and to be very marginally subsistent.

In pre-Columbian times, this area was occupied predominantly during the Zoned Bichrome period, for which 11 sites have been identified and either surface collected or tested. At the present, we do not know if these were permanent or seasonal occupations. Allowing for sites that may have been either washed away or missed in survey, I would estimate that the present occupation of the area represents the upper limits of population attained during pre-

Columbian times. Soil conditions and insect problems limit the amount of area that can be successfully cultivated by hand and slash and burn technology, while exploitation of the river-bank area for iguana, the river itself for fish, and surrounding trees for various fruits such as mango is relatively intensive.

The area between San Dimas and La Cruz, a highway distance of approximately 15 kilometers, is sparsely populated and no figures are available. The town of La Cruz has from 1,500 to 2,000 inhabitants, almost all of whom are dependent on an economic base other than agriculture for support. Almost all foodstuffs are traded into the town, which supports a large lumber mill, is the center of the areal cattle industry, and being the closest town to the international border is the home and hub for many civil servants. There is no natural water supply and that utilized in town is either pumped in by pipe or carried by hand from the river, about 4 kilometers away.

The 10 or so square kilometers around the Bay of Salinas have been almost entirely given over to cattle. There is some extraction of salt from salt flats, and one family living near the store at Port Soley fishes for part of its subsistence. A number of people who work on the cattle ranch live in either San Dimas or other parts of the surrounding area and just as they come into work, so is the food and water for the ranch largely obtained from the outside.

There is very little subsistence farming around the bay and it is thus difficult to estimate the population that such a pattern,

combined with marine gathering and fishing, could support. During the 1970 field season the crew lived adjacent to the Mata family, which oversaw operations at the Finca Las Marias, a small ranch on the bay. Much of the food that they ate while we were there was obtained from outside sources, in the sense that it was pilfered from our stocks. In addition, they raised some platanos, fished occasionally, and exploited the wild fruits that grew along the creek. In other times, they probably ate less well and obtained assistance from the ranch owners, who live in town and own a store. The older males in the family are employed at various odd jobs in the bay region and their income is probably added in part to the subsistence supply.

As the dry season intensified and the adjacent creek shrank more and more, until finally it was no longer a continuous stream but merely a series of large puddles, it became obvious that the supply of fresh water would be one of the main limitations on occupation of the site.

The size of the Mata household was variable, averaging about 10, and our field party ranged from 10 to 14 in number. We upset a closer estimate of the carrying capacity of the creek by importing about 20 gallons of water a week from La Cruz, enough for the drinking needs of the crew. Water that could be boiled for tea and coffee, as well as dishwater, was all obtained from the creek. Water for an adjacent salt-making camp, employing about 20 men, was also obtained from this creek. I would estimate that on a weekly basis, 50 persons were dependent on this one water source.

Taschek (1971: 3) has suggested that faunal remains from the Las Marias midden indicate that "...clearings were infrequent and the forest was essentially a continuous ground cover." Under these conditions, evaporation and run-off would be more gradual and the dessication of the stream late in the dry season less pronounced than it is now. Allowing for reduced evaporation rates and the excess water usage habits of modern dishwashing and laundry, I would suggest that between 75 and 100 persons could have occupied the site during the dry season, although they may have had to resort to tamino and other fruits to help alleviate thirst in certain years.

During the rainy season, the creek expands tremendously. Fresh water is easily available, seasonal plantings may be made in temporary clearings, and the resources of the estuary system are greatly increased, while those of the coast probably declined (Taschek 1971: 25), at least in terms of mollusca collection. Fishing, on the other hand, would have improved. The actual site area at Las Marias continues on the other side of the depression between the house and the road and on the other side of the road. It is assumed that during the rainy season this depression filled and also became an exploitable resource, as would have been the case with the adjacent salt flats. This greatly expanded surface area available for human occupation in the Las Marias site vicinity would have permitted possibly upwards to 200 persons in the immediate site locale at this time of year.

Sites 86 and 62 on the bay also probably represent concentrations of population that are seasonally variable. The

creek adjacent to Site 62 was dry when inspected in June, 1969 and even a sump hole dug 1 meter into the creek bottom produced no water.

Additional testing in the area to define the size of sites in different phases and, most critically, the ability to delimit areas of cultural activity with a household that may be numerically estimated, are prerequisite to developing any further figures on the pre-Columbian population of this area.

Summary

There appear to have been two basic subsistence patterns in the Greater Nicoya area, each reflected in, and archaeologically identifiable by, the population density and inferred social complexity they were capable of supporting. These are the Circum-Caribbean pattern, as summarized by Julian Steward (1948: 2-15), and the Tropical Forest Pattern, as summarized by Robert Lowie (1948: 1-56). Limited archaeological data, as well as the substantial amount of population movement that may have gone on in pre-Columbian and immediately post-Conquest times, has obliterated any areal boundaries that may have existed between patterns, if indeed there ever were any. They are essentially progressive levels of the same system, with different crop emphasis in different ecological zones, and a number of gray areas of complexity and mixing of traits is certainly to be expected as a result of enclaves of one type within the broad region of the other (see Johnson's discussion of the Talamanca (1948: 231) as an example of this).

In the archaeologically known portions of the Greater Nicoya area, the Circum-Caribbean pattern seems to have

predominated in the lower Nicoya peninsula and on the Lake Nicaragua side of the Isthmus of Rivas. Steward (1948:2-3) stated that:

The tribes carried on intensive farming, which outranked hunting, gathering, and fishing in its productiveness and which supported a dense population and large villages. The typical community was a large, compact, planned village of several hundred to several thousand persons. It consisted of pole-and-thatch houses arranged in streets and around plazas, and it was surrounded by a palisade. In the village were temples, special residences for chiefs, and storehouses.

With the exception of the palisades, which seem to have been supplanted by dense stands of fruit trees, this compares accurately with Oviedo's description of Tecoa-tega, Nicaragua (in Lothrop 1926:31-32). Although we have fewer details of the Nicoya area, Chorotegan houses and towns also seem to have been organized around plazas, with a central area for temples and religious mounds.

Steward (1948:4) noted that in comparison to Tropical Forest tribes, farming was much more important among the Circum-Caribbean peoples, possibly because of the need for a more dependable food supply. Maize, sweet manioc, or yuca, beans, sweet potatoes, and peppers were the most common staples, although resource inventories varied from area to area. Lothrop (1926:52) noted the careful cultivation of both cacao and maize among the Nicaraos in Nicaragua and both crops were utilized by the residents of the Nicoya peninsula (Bergmann 1969; Lothrop 1926:82). As noted previously, there is at present a lack of agricultural implements from the Nicoya area, but no controlled excavations have been

reported from areas that appear to have been the population centers,

In contrast, the Sapoa River area is located in a zone of rough coastal foothills geographically between the two areas cited above for the Circum-Caribbean pattern. Limited fresh water sources, low soil fertility, and the instability caused by almost continuous movement through the narrow corridor zone apparently combined to inhibit the development of large communities and population densities. The peoples of this area appear to have continued to practice the Tropical Forest pattern. Lowie (1948: 2-3) noted that:

The distinctive achievement of the area is the domestication and cultivation of tropical root crops---bitter and sweet manioc, sweet potatoes, cara, and arrowroot---of which the poisonous bitter manioc is most important, though it is not known to all tribes. Seed crops are secondary, but virtually all tribes grow several varieties of maize... the Nambicuara follow a seasonally alternating pattern, raising manioc and other crops during the rains, but otherwise practicing a hunting-gathering economy with the usual sexual division of labor...

Referring to the Nambicuara, Levi-Strauss (1948:362-363)

wrote:

The Nambicuara habitat is a savannalike plateau (in Brazil) about 500 to 1,500 feet (150 to 500 m.) above sea level with an arenaceous soil which comes from disintegrating sandstone bedrock. Except for narrow gallery forests along river banks, the region is infertile, having only shrubs and small trees with thorns or thick bark.

In this unproductive environment the Nambicuara have a dual subsistence pattern. They are both seminomadic bush dwellers and incipient farmers. During the dry season, women, accompanied by their children, forage with digging sticks for wild fruits, seeds, and roots, and catch grubs, rats, bats, spiders, snakes, lizards and other small creatures, while men hunt what large

game they can find with bows and arrows and collect wild honey.

When rains come, the Nambicuara settle in temporary villages, and the men open circular gardens in the gallery forest by burning and felling the trees with stone (now steel) axes. They till the soil with pointed sticks and raise both bitter and sweet manioc, several kinds of maize..., beans, gourds, cotton urucu, and a variety of small tobacco...

Continuing his description of general Tropical Forest culture, Lowie (1948) noted:

The aboriginal implements included hafted stone celts for chopping trees, hardwood shovels, and pointed dibbles (p.6)....a fairly long roster of wild species whose fruits (were) widely exploited for food (p.6).... The relative importance and the purpose of hunting vary locally (p. 10)....another household article is a low stool or bench carved from one solid block, frequently in the shape of an animal.... Special decorations appear on the shaman's settee (p.18)....Pottery is general, but by no means universally manufactured, earthenware being widely exported from centers of production (p.25)....In many of the tribes the settlement consists of one or a few communal houses (maloca). Such arrangements imply some form of communism, e.g., the joint use of a fireplace for beer manufacture or of a large trough for grinding maize (p.29)....

As noted previously, no descriptions of the Sapoa River area are available, but the above citations seem to compare favorably with the archaeology and may give some indications of what prehistoric life was like. Bitter manioc is not known from the region and subsistence implements appear to have been made of generally perishable materials. The lack of hunting implements or other evidence in the form of faunal remains, may indicate that the inhabitants found it easier and preferable to obtain their own protein from aquatic sources.

The lack of sophistication in pottery manufacture compares with the previously advanced hypothesis that non-utilitarian wares at Sapoa River sites were traded in from external centers. In addition, all house descriptions for small communal groups in the Tropical Forest pattern present a picture of extremely flimsy and temporary structures and this may explain their archaeological absence.

Although the Nambicuara were much less advanced in their material culture than the Sapoa River peoples, their subsistence pattern model may resemble that practiced in the latter area. The major difference would appear to have been that the potential for coastal exploitation made the dry season foraging a more successful venture and provided for a greater degree of sedentism. The opportunity to also gather a commercial product, the Murex purple dye, would have enhanced and encouraged contact with outside people and encouraged a link, either sought after or imposed, with the surrounding Circum-Caribbean chiefdom level peoples.

CHAPTER VI

GREATER NICOYA AND MESOAMERICA

One of the main objectives of this study was to determine the relationship of the Greater Nicoya region to Mesoamerica. Geographically, the area known as Mesoamerica or Middle America ranges from northern Mexico to southern Guatemala. Culturally, however, these boundaries have fluctuated through time with relationship to internal and external cultural events, ranging so far south as to include the Nicoya peninsula of Costa Rica (Willey 1966:88) and Greater Nicoya. Numerous attempts have been made, employing a variety of criteria, to distinguish a "Mesoamerican culture area" that presents a generalized reflection of the historical cultural geography.

One such attempt was made by Kirchoff (1943), who compiled a list of cultural traits that were either exclusively or typically Mesoamerican or that, while not common, nonetheless existed. While such a listing was of importance for primary inspection, its utility suffered because the presence-absence categories glossed over significant cultural differences.

In another approach, Sanders and Price (1968:9-10) stated that:

In spite of the regional diversity of the various Mesoamerican cultures in the sixteenth century, the area as a whole was characterized by a basic and widespread cultural complex. Most important was a subsistence base of highly developed cereal agriculture, with maize as the staple crop. Beans, squashes, and a great variety of minor crops were also of importance.... Two fundamentally distinct agricultural systems correlate well with

basic geographical divisions. In the tropical lowland areas, slash-and-burn or swidden agriculture was---and is---predominant....Large macro-states and empires, and true cities did not evolve. Rather, the settlement pattern consisted of ceremonial centers or elite residence centers on the one hand, and scattered rural hamlets containing the bulk of the population, on the other....In the arid highlands such intensive techniques of agriculture as irrigation and terracing supported considerably higher population densities....True cities evolved, and a settlement pattern of city-village rather than ceremonial center-hamlet was the rule.

During 1969 and 1970 archaeological research was carried out in the extreme southwestern periphery of this traditionally defined zone. A survey and testing project was concentrated in a 75 square kilometer area encompassing the region along the Sapoa River south from the Nicaraguan border in Costa Rica and westward to, and including, the Bay of Salinas on the Pacific coast. A primary research objective was to determine the extent of Mesoamerican influence.

Michael D. Coe had previously noted (1962:170-71):

Within the subregion...were a number of languages of purely Mesoamerican affiliation. Chorotegan languages belonging to the larger Oto-Manguean family centered in southern Mexico were spoken at the time of the Conquest in a scattered distribution from the Bay of Fonseca down to the Nicoya Peninsula of Costa Rica proper....Both the Nicarao and the Chorotegans stressed that they were not the ancient inhabitants of the region, having arrived not many centuries past from a homeland in Mexico. As confirmation of their own testimony, it should be noted that they were maize farmers, had elaborate markets, wore padded cotton armor, fought with clubs set with small flint blades, practiced human sacrifice and self-mutilation, and had permanent temples. The Nicarao even had the 260-day calendar, the volador ceremony, and a pantheon of Mexican gods. In other words, they were thorough-going Mesoamericans...In the original definition of Mesoamerica as proposed by Kirchoff, the boundaries of that great culture area actually dip down to include Greater Nicoya. Now, this

makes admirable sense when only the ethnographic present is considered, but a question which logically comes to mind is this: If the Chorotegans and the Nicaraos were recent arrivals in the south, was the southern frontier of Mesoamerica in the very distant past exactly where it was in 1522 A.D.? Or was it very much to the north?

Coe continued (1962:176):

There is no question that, given its full time depth and not merely the "ethnographic present," Greater Nicoya was as clearly a part of the Mesoamerican co-tradition as were, let us say, the Guerrero or Huasteca regions of Mexico. It was one of the many fringe areas of Mesoamerica which failed to share in the more spectacular developments such as cities, large scale ceremonial centers, or dated stone monuments. Greater Nicoya had been for many centuries too bound up with Mesoamerican culture to be anything but part of it.

The overall weakness in Coe's assessment was his Kirchoff-like trait list approach to the question of cultural affiliation. To be sure, when he wrote his article in the early 1960's, scientific excavation in the Greater Nicoya area was in its infancy and has grown only slightly since then; sociological and ecological data on which to base other lines of reasoning were not available to him.

We are essentially dealing with two cultural-geographical areas: the Greater Nicoya subarea and the southern peripheral boundary of Mesoamerica. Both of these were largely hypothetical constructs based on little more than contact-period data. Now that information from the region is beginning to accumulate, albeit at a slow rate and in small volume increments, we may re-examine and re-structure these concepts. To begin, let us quickly review the broad spectrum of archaeological data reported from the Greater Nicoya region since 1962 (Baudez 1963; Haberland 1963; Norweb 1964; Haberland 1964; Haberland 1966a; Haberland 1966b; Baudez 1967;

Haberland 1968a; Haberland 1968b; Lange et al 1969; Lange et al 1970; Lange n.d.a; and Lange and Scheidenhelm n.d.)

The excavated material culture can be divided into two major categories: 1) ceramics and 2) non-ceramic subsistence artifacts. No dwelling units or other structures have been reported and luxury items such as gold and jade, well known from other parts of Costa Rica, are not common.

The ceramic data for the area is divided into four major periods and is more complete for the Costa Rica portion of Greater Nicoya than for the Nicaraguan; data from the latter is largely unpublished (Norweb 1961; 1964). Four ceramic periods were designated by Baudez and Coe (1962) and summarized in detail by Baudez (1967), although his data lacked a strong Late Polychrome representation. In addition to adding a more complete example of this period (Lange n.d. b), two other substantial alterations have been made: the initial period has been increased in temporal depth by 300 years and the Linear Decorated Period has been lumped with the Early Polychrome one. The periods are as follows:

1) Zoned Bichrome (B.C. 600 to A.D. 300); 2) Early Polychrome (A.D. 300 to 800); 3) Middle Polychrome (A.D. 800 to 1200); and 4) Late Polychrome (A.D. 1200 to Spanish contact, ca. 1522).

The Zoned Bichrome period is the areal representation of the late Nuclear American Formative that has a common development from Mexico to Peru, with local deviations and elaborations. Fine-lined zoned incising and rocker-stamping are known throughout the area, although various geographical subdivisions of Greater Nicoya

each show localized types. Schettel Incised, as named by Norweb (1964:559), is found during this time period and stylistically similar types are also found at Chiapa de Corzo in Mexico (Coe 1960); La Victoria in Guatemala and Valdivia in Ecuador (Evans and Meggers 1966:251); and at various Barrancoid phase sites in western Venezuela (Lathrap 1964).

Little tradeware has been found associated with this period, although three looted graves at a Zoned Bichrome cemetery (Lange and Scheidenhelm n.d.) in northwestern Guanacaste province, Costa Rica, did yield fragments of Paso Caballo Waxy Ware medial flanged vessels from the Chicanel phase in the Maya lowlands (Joseph W. Ball, personal communication, after Smith and Gifford 1966:169)

In the succeeding Early Polychrome period, vessels of the polychrome decorative style made their first appearance. Recent research in Venezuela by Dr. Alberta Zucchi (1970) has yielded radiocarbon dates from B.C. 1000 to 900 for polychrome ceramics there. This is by far the earliest date for polychrome and supports a hypothesis by Michael D. Coe (1962:177) that this technological achievement did spread from the south to the north. Polychromes first appeared in the Maya lowlands at approximately A.D. 0 to 200 and the short temporal gap before its earliest known occurrence in Greater Nicoya may represent either a data hiatus or an introduction via the Maya rather than direct contact with the south. At present a data gap, possibly in reliable radiocarbon datings, seems the most likely culprit. Nonetheless, Maya contacts appear to have existed, marked by the presence of an unslipped ware of Uaxactun type

(Joseph W. Ball, personal communication) in shell midden debris at the site of Las Marias. Haberland (1968a) has recently prepared a synthesis of these first two periods in the Lower Central American area.

Mayan influence became very strong in the following Middle Polychrome period, as many polychrome ceramics take on a Mayoid caste and occasional fragments of trade vessels continue to appear. This was the peak of regional expansion for Greater Nicoya, exemplified by widespread trade of such diagnostic ceramics as Mora and Papagayo polychromes (Baudez 1967). Although the Maya influence is very strong stylistically in this period, it appears to have arrived through an intermediary filter, since evidence of direct occupation or intensive contacts is lacking.

The pattern of Maya influence is interrupted in the final Late Polychrome period, and probably reflects the delayed impact of the "collapse" and disintegration of Maya social order at home. At times of such internal disorganization, external contacts are among the first relationships to be terminated and it appears that such was the case here. Local imitations of Papagayo polychrome are manufactured for a period of time, but then die out; occasional Mayan motifs occur in incised designs, but major and consistent contact was broken. In place of polychromes, Murillo Applique as named by Baudez (1967:165) became the major pottery type and reflects the introduction of a foreign ceramic tradition, although at present its source cannot be identified.

In place of the lowland Maya influence, we see an apparent

surge of local cultural spheres and, for the first and only time in the culture history of the area, faint evidence of influence from Central Mexican region. This situation was probably the result of immigrations related in historical records (Lothrop 1926:391) and since we are relatively certain that these movements did take place, it is quite strange not to find more definite artifactual evidence of them.

Lothrop (1926:391) advanced the hypothesis that the immigrants were mostly male warriors who married into local groups; furthermore, that pottery-making was a female activity and that the women continued to make pottery in the local tradition with little, if any, alteration. This influence is most readily seen in the Vallejo polychrome type and its related incised variety, Mombacho Polychrome Incised (Norweb 1964:560). The incised designs on the latter most often consist of an earth monster figure and it is interesting to note that the more important members of the Aztec pantheon, such as Tlaloc the god of rain, and Huitzilopochtli the god of war, are conspicuously absent. Another incised design consists of a Mayoid serpent derived from painted forms of the preceding period. Thus, in terms of the areal ceramics, Mexican influence appears to be very late and very limited.

Subsistence data comes from many varied sources; some artifacts are important by their presence, others conspicuous by their absence. There is a distinct lack of manos and metates, or corn grinding implements, from anything resembling a domestic

context. In fact, re-evaluation of available data concerning those mortuary objects commonly designated "metates" suggests that Lothrop may have been correct (1926: 291) when he hypothesized that they were instead ceremonial stools or chairs.

With maize having been used repeatedly (as in Coe 1962: 170-171) to support the hypothesis of Mesoamerican influence in the area, it may be well to re-examine its presence in the region. Maize is found in both the Circum-Caribbean and Tropical Forest patterns, with importance varying according to local conditions. Metates, together with the idea that maize was introduced from Mexico into places like northern Colombia at approximately 1000 B. C. (Reichel-Dolmatoff 1965: 73-74) have been utilized to convey the impression that the metate-maize complex is a Mesoamerican derivative of considerable time depth in the Lower Central American area, beginning with Zoned Bichrome times (Coe and Baudez 1961).

Evidence has been presented that would greatly reduce the number of actual "metates" known from the Greater Nicoya area and place maize utilization in a more proper perspective. As Sanders and Marino (1970: 85-86) have pointed out, it is equally plausible to assume that maize diffused northward through the Andes to the Caribbean shores of Colombia by a few centuries before Christ. Recent pollen core data (Bartlett et al 1969: 389) also shows that agricultural maize was present in the Gatun Basin, Panama from 3100 to 1800 years ago, prior to projected introductions from the north. In this respect, it would be interesting to know the genetic relationship(s) of the 2 maize ears reported found in

association with a burial near the town of Nicoya by Stone (1966: 34).

Notched sherds and net-sinkers are among subsistence implements recovered from northern Nicoya and from the Isthmus of Rivas. The former are re-worked sherds that are notched with 4 opposing lateral notches, 2 on each long side. Ethnographic comparisons show they may have been utilized as gauges for spacings in fish net manufacture. Fishhooks are absent from the archaeological materials from the area and it can be suggested that fishing was limited to netting close to the shore on the bays, in the rivers, in Lake Nicaragua, and in tidal estuaries. Traps and weirs were also probably utilized. There is no record of fish poisoning in the area.

Marine mollusca were exploited with increasing intensity from Early Polychrome times on. Whether they were traded inland or not is difficult to determine from the archaeological record, but no inland accumulations of shell have been found. It is likely, however, that if they were traded that the preservable parts, the shells, were removed and the meat portions dried prior to transport. While various species of Murex are present in the midden and it is presumed that purple dye extraction was an important economic activity, the majority of shell remains represent food resources.

It appears that hunting varied in importance in the area. Some sites have yielded relatively large quantities of faunal remains (Coe 1962: 360), while others have been almost completely devoid of them. Likewise, a few lithic artifacts in the way of

projectile points, knives, scrapers or other tools that might be associated with a hunting economy have been found. This obviously does not rule out the use of bone or wooden projectile points and/or traps that would be much more difficult to define archaeologically.

Arboraculture, again difficult to identify archaeologically, was almost certainly important to the region. A large number of trees are known to produce quantities of fruits, nuts, and berries and we know from contact period descriptions that "tree gardens" were maintained at that time and probably represent a long tradition.

Of particular importance and interest is the possibility that the people of northern Costa Rica were utilizing the oak specie Quercus Oleoides and its acorns as a staple. Artifacts of the type referred to as "nutting stones" in California and there definitely associated with acorn technology (Greenwood 1969) are present in large quantities at some sites and milling bins ground into the natural volcanic bedrock have been identified in 3 locations in the Sapoa River survey area.

A small quantity of ground stone axes possibly represent the meager evidence for shifting cultivation. Some maize, as well as a variety of tropical tubers, were almost certainly grown by this method, with variable levels of importance in the overall dietary pattern in different portions of the Greater Nicoya region.

The general impression one gets from both the ceramic data and from the subsistence information is not that of a Central Mexican pattern. Ethnographic and linguistic data support this impression of a late and relatively light Mexican influence.

Chorobici, a South American Chibchan-related language, was the language thought to have been originally spoken in the area, with late intrusions of first Chorotega-Manguean peoples from the Chiapas region of Mexico and finally the Nahuatl speaking peoples from the Central Mexican plateau approximately 1 century before the arrival of the Spanish.

John F. Bergmann (1969), in an article on the distribution of cacao in pre-Columbian America, noted that it appeared to have been a basically Central Mexican crop, was not cultivated in South America, and hence was not a part of that cultural pattern. In relation to this, it is interesting to note that the development of cacao-growing districts in Nicaragua and Costa Rica is directly linked to the arrival of the Nicarao (Nahua) and that the predecessor cultural groups neither grew it prior to their arrival nor adopted its cultivation following it (Bergmann 1969: 95).

In addition, house types (especially tree houses), penis strings, tattooing, the use of coca, and the habit of drinking to excess were all southern derivations. Other items of material culture from the north related in large part to military apparatus and folding deerskin books introduced in the late pre-Columbian period.

Religiously, the Mexican pantheon seems less important than Coe thought. While the local ethnographic descriptions show comparisons with Central Mexico, these are many times generalized comparisons of the type that may be made between almost any two polytheistic religious systems and are, by contrast, very seldom

parallels of name and function. The absence of principal deities has already been noted and contact period descriptions show that the Central Mexican religious format had either been very shabbily introduced by the immigrants, or if presented in more or less full array, had suffered extensive deterioration in its single century of existence.

Lothrop (1926: 64-65) also made a number of pertinent observations in regard to assigning religious affiliations:

...in regard to human sacrifice, both the Chibcha and the Nahuatl practised two forms, in one of which the heart was extracted, while in the other the victim was killed with spears or arrows... Among both the Aztec and Chibcha it was customary to prepare selected captives for sacrifice, during which period they were regarded as divine, while in each case the sacrifice of children to insure rainfall was considered proper. Indeed, it seems that all the fundamentals of the much better known Aztec sacrificial complex was practised by the Chibcha and other Colombian tribes...there is a constant tendency to associate everything possible with the Aztec, because they are better known than other American tribes, a usage scarcely justified, for the Aztecs appear to have been borrowers, rather than creators, of culture... Turning now to the pantheons in Nicaragua, we find that of the Nicarao shows affiliations with Mexico, while the others are isolated and are certainly not of Mexican origin.

In summary, there is very little Central American influence on the traditionally defined southern periphery of "Mesoamerica." It has been suggested that this contrast resulted from affiliation in the Greater Nicoya area with what has been termed the "Circum-Caribbean" pattern.

In Greater Nicoya, the lack of evidence for significant

Mexican influence shows that any southern boundary of cultural Mesoamerica should be re-drawn to exclude the Nicoya Peninsula and other portions of northern Guanacaste Province, Costa Rica. It is probable that eventually this line may be drawn even farther north, but further research is needed before this can be demonstrated.

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Appendix 1.Undergraduate Student Papers

1969 Field Season:

"Survey of the Northern Rio Sapoa Valley: An Ecological Overview," by Margaret Farmer.

"The Testing of Site RSVP-69-II-5," by Linda McKenzie.

"Test Excavations at Two Sites in the San Dimas Colony," by Thomas Georgeson and Mark Kristensen.

"Report on the Rio Antiguo Locality of the Rio Sapoa Valley," by Thomas Murray.

"A Survey of the Bay of Salinas Region," by Nancy Little.

1970 Field Season:

"A Burial Grouping with a Murillo Grooved Pot and other Skeletal Material from the Las Marias Site," by James Faulwell.

"Las Pilas---A Zoned Bichrome Cemetery Site," by Kristy Scheidenhelm.

"A Study of Modern Shellfish Populations at the Bay of Salinas," by David Karp.

"A Re-Evaluation of Subsistence Patterns in the San Dimas and Bay of Salinas Areas," by Carolyn Kurtz.

"The Testing of Site 87, A Salt Flat Site," by Adele Karolik and Anne Yancey.

"A Geographical-Archaeological Examination of an Abandoned House-Site," by Charles Rydberg.

APPENDIX 2

A list of species from the mixed association along the highway is as follows:

<u>Cordia alliodora</u>	<u>Apeiba Tibourbou</u>
<u>Swietenia humilis</u>	<u>Manilkara Chicle</u>
<u>Dipteroderdron costaricensis</u>	<u>Albizzia adinocephala</u>
<u>Miconia argentea</u>	<u>Sloanea quadrivalvis</u>
<u>Cecropia Peltata</u>	<u>Simaruba amara</u>
<u>Bursera Simaruba</u>	<u>Anona sp.</u>
<u>Guazuma ulmifolia</u>	<u>Godmania aesculifolia</u>
<u>Trichilia sp.</u>	<u>Hymenaea Courbaril</u>
<u>Enterolobium cyclocarpum</u>	<u>Spondias Ciruelas</u>
<u>Tabebuia Chrysantha</u>	

Occasionally on flat areas there is a savanna type vegetation. This appears to occur where there has been an accumulation of very fine particled grumosols. The most typical tree species of this minor association are:

<u>Curatella americana</u>	<u>Quercus cleoides</u>
<u>Byrsonima crassifolia</u>	<u>Crescentia alata</u>

Occasionally a few more species are mixed in with the typical savanna vegetation. These are:

<u>Rehdera trinervis</u>	<u>Swietenia humilis</u>
<u>Spondias Cirouelias</u>	<u>Cochlospermum vitifolium</u>

The flora of the Tropical Moist forest is quite distinct, partly due to climate and partly due to different soils which are derived from other parent material. A list of species recorded from near La Cruz along the 15 kilometers to the frontier is the following:

<u>Swartzia cubensis</u>	<u>Muntingia Calabura</u>
<u>Mastichodendron Tempisque</u>	<u>Cordia sp. (large leaves)</u>
<u>Zanthoxylum sp</u>	<u>Coccoloba laurifolia</u>
<u>Pentaclethra macroloba</u>	<u>Sloanea terniflora</u>
<u>Hura crepitans</u>	<u>Manilkara Chicle</u>
<u>Sterculia apeiala</u>	<u>Lonchocarpus sp.</u>
<u>Didymopanax Morototoni</u>	<u>Ochroma Lagopus</u>
<u>Cordia glabra</u>	<u>Bursera Simaruba</u>
<u>Virola sebifera</u>	<u>Lonchocarpus sp.</u>
<u>Anacardium excelsum</u>	<u>Astronium graveolens</u>
<u>Ficus sp.</u>	<u>Bravaisia integerrima</u>
<u>Licania arborea</u>	<u>Cochlospermum vitifolium</u>
<u>Pseudosamanea guachipeli</u>	<u>Hymenaea Courbaril</u>
<u>Brosimum costaricensis</u>	<u>Sapium sp.</u>
<u>Andira inermis</u>	<u>Diphysa robinoides</u>

Luehea Seemannii
Acrocomia vinifera
Spondias Mombin
Triplaris americana
Bombacopsis quinatum
Bombax Barrigona
Gliricidia sepium
Genipa Caruto

Scheelea rostrata
Cecropia peltata
Castilleja elastica
Curatella americana
Byrsonima crassifolia
Cordia alliodora
Coccoloba sp.
Inga vera

APPENDIX 3

LOCATION	Site#	Time Periods Present					SC	T	Ref.
		ZB	ME	M	L	U			
Fossil Lake and River	17					x	x	I-264,273,275	
	24					x	x	I-261,269	
	25					x	x	I-263,274	
	29					x	x	I-262,272	
	30					x	x	I-262,271	
	31					x	x	I-262,272	
	32					x	x	I-262	
	33					x	x	I-262,273	
	34					x	x	I-263,274	
	53					x	x	I-223	
	54					x	x	I-223	
	64					x	x	I-263,274	
	69					x	x	I-234	
	70					x	x	I-236	
	71					x	x	I-236	
74					x	x	I-261,270		
Sapoa River	1		x	x			x	L-26 I-32,104	
Valley	4					x	x	I-33	
Flood Plain	73					x	x	I-34	
and Low	78					x	x	I-34	
Terraces	83	x				x	x	I-34	
	84	x				x	x	I-35	
Above Flood	5	x					x	L-33 I-35,68	
Plain in	6			x			x	L-32 I-33,129	
Main Valley	7					x	x	I-33	
	11					Modern	x	I-45	
	12					x	x	I-40	
	14					x	x	I-39	
	19			x	x		x	I-39	
	10					x	x	I-37	
	21					x	x	I-44	
	44			x?			x	L-50 I-38	
	72					x	x	I-37	
	79					x	x	I-38	
	80					x	x	I-38	
	81					x	x	I-38	
	82						x	I-34	
	88	x					x	L-13	
	89					x	x	L-18	
	90		x	x	x		x	L-20	
	91					x	x	L-32	
	92	x					x	L-33	

LOCATION	Site#	Time Periods Present					SC	T	Ref.
		ZB	E	M	L	U			
Above Flood	93					x	x	L-34	
Plain in	94					x	x	L-35	
Main Valley	95	x					x	L-35	
(cont.)	96	x					x	L-39	
	97					x	x	L-41	
	98					x	x	L-41	
	99					x	x	L-41	
	100	x					x	L-43	
	101				x		x	L-46	
	102					x	x	L-50	
	103					x	x	L-50	
	104	x					x	L-52	
	105					x	x	L-54	
	106					x	x	L-56	
	107					x	x	L-58	
	108	x					x	L-60	
	109					x	x	L-64	
	110					x	x	L-64	
	111					x	x	L-64	
	112	x					x	L-64	
	113					x	x	L-67	
	114					x	x	L-70	
	115						x	L-71	
	22	x					x	I-37	
South of									
San Dimas	8					x	x	I-45	
	9					x	x	I-48	
	13					x	x	I-48	
	18					x	x	I-48	
	20					x	x	I-40	
	23	x					x	I-45	
	48					x	x	I-42	
	49	x					x	I-42	
	50					x	x	I-44	
	51					x	x	I-44	
	52					x	x	I-44	
	68					x	x	I-40	
	75					x	x	I-236	
Connecting									
Area	15	x					x	I-220	
	16		x				x	I-259, 268	
	36						x	I-221	
	37						x	I-221	
	43						x	I-223	
	55						x	I-224	
	76					x	x	I-238	

LOCATION	Site#	Time Periods Present					SC	T	Ref.
		ZB	E	M	L	U			
Bay of	27					x		I-376	
Salinas	63					x		I-370	
Salt Flats	77					x		I-379	
	87		x	x			x	I-82	
	118					x			
Shell Mounds	26		x	x	x		x	I-325	
/Middens	62				x		x	I-224	
on Bay	65			x			x	I-226	
	86					x			
	117					x			
Flat Land	38					x		I-313	
Back From	39					x		I-317	
Bay	40					x		I-378	
	42	x				x		I=323	
	46					x		I-320	
	47					x		I-321	
	45					x		I-315	
	67		x	x	x		x	I-234	
On High	35		x				x	I-221	
Ridges	41					x		I-322	
Back From	85			x			x	I-69	
Bay	116					x			

ZB = Zoned Bichrome

E = Early Polychrome

M = Middle Polychrome

L = Late Polychrome

U = Unknown temporal association

SC = Surface Collected only

T = Tested

Ref = Source of detailed survey and excavation report (I = 1969 survey report; L = 1970 survey report by Cathy Lair).

TITLE OF THESIS Culture History of the Sapoa River Valley, Costa Rica

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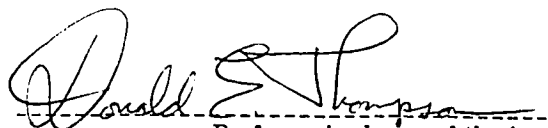
Delta Kappa.

Publications see attached

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