



1982

## Cultural Change in the Moche Valley, Peru Considered Within an Environmental Framework

Margaret M. Sciscento  
*Loyola University Chicago*

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CULTURAL CHANGE IN THE MOCHE VALLEY, PERU,  
CONSIDERED WITHIN AN  
ENVIRONMENTAL FRAMEWORK

by

MARGARET M. SCISCENTO

A Thesis Submitted to the Faculty of the Graduate School  
of Loyola University of Chicago in Partial Fulfillment  
of the Requirements for the Degree of

Master of Arts

May

1982

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## VITA

The author, Margaret M. Sciscento, is the daughter of Mary and Donald Sciscento and was born in New Bedford, Massachusetts on February 3, 1949.

Her elementary and secondary education was obtained in parochial school in New Bedford.

In June 1970, she earned her B.A. in English Literature from the University of Massachusetts, Amherst, and in May 1977, she was awarded her MALS from Rosary College, River Forest, Illinois.

At Loyola, Ms. Sciscento worked as a research assistant for Dr. Essenpreis and thesis research was conducted in Peru in 1979. She received her M.A. in Anthropology in May 1982.

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## CHAPTER I

### INTRODUCTION

This thesis began as a formulation of a domestic ceramic typology for the North Coast of Peru. As sample retrieval progressed, an unexpected specimen scatter was observed - early (Formative/Salinaresque) sherds (Figure 1) were found near the top of the stratigraphic column, capped by Chimu (Late Intermediate) sherds. Interestingly, Moche sherds were largely absent (i.e., scattered through the later samples but not constituting a separate provenience) from the Moche River profile although presumed Moche architecture was found about 2 kms. south of the river, on Pampa Cacique (Figure 2). Also, at a point approximately 4 kms. east of the "pollen column" (Figure 2), Gallinazo sherds were found, constituting the only area along the Pampa Cacique river profile from which Gallinazo ceramics were retrieved. The pollen column serves as a marker along the river profile; in 1978 archaeologists gathered samples for pollen analysis from each of the geological strata represented in this area of the river profile. This area in particular was chosen because of the completeness of the geological strata and the existence of a marked disruption

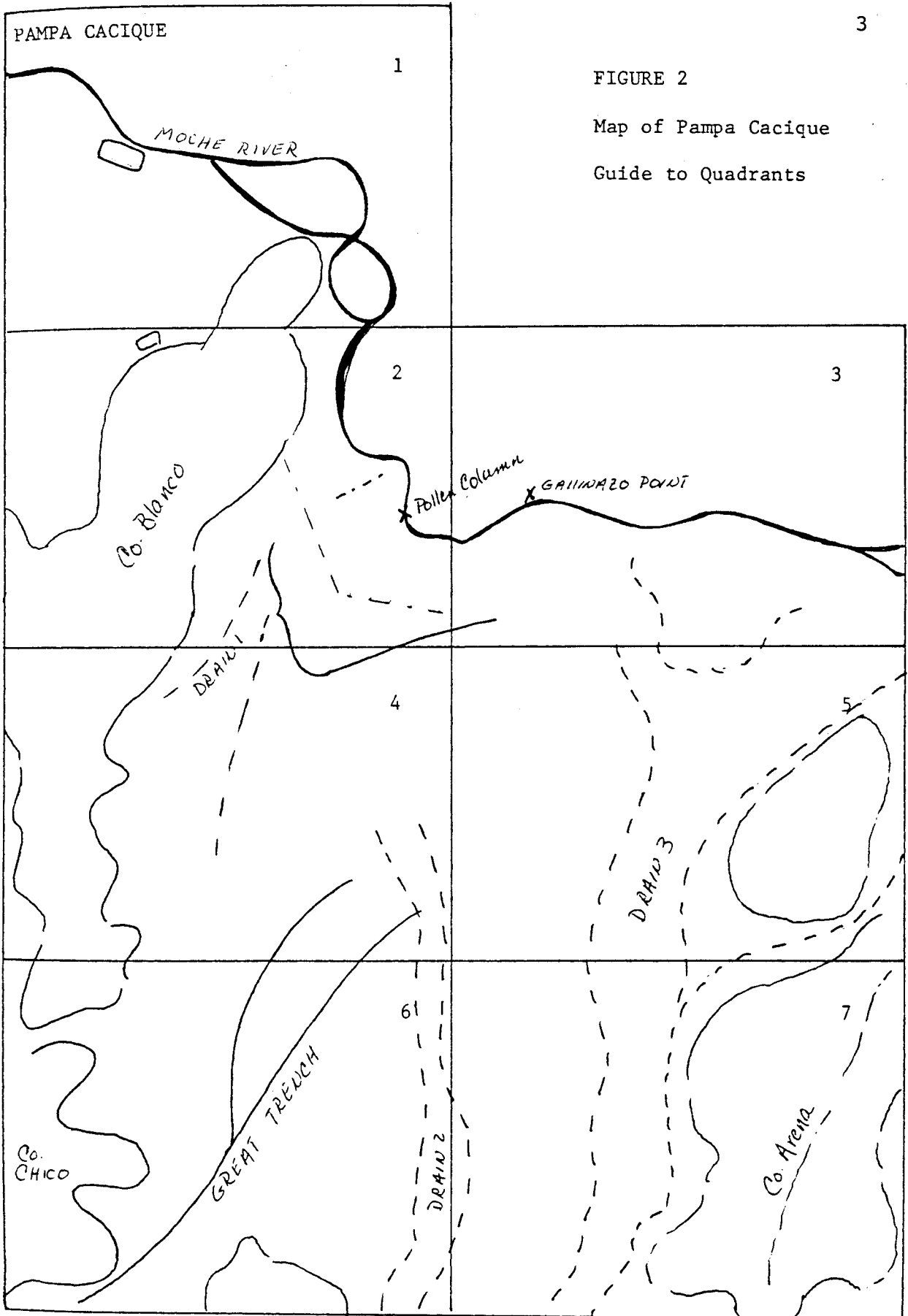
## CULTURAL CHRONOLOGY

PERIOD	MOCHE VALLEY	DATES
LATE HORIZON	INCA	1532
LATE INTERMEDIATE PERIOD	CHIMU	1470  900
MIDDLE HORIZON	MOCHE V	600
EARLY INTERMEDIATE PERIOD	MOCHE IV  MOCHE III  MOCHE II MOCHE I GALLINAZO  SALINAR	200 A.D. B.C.  400
EARLY HORIZON	CUPISNIQUE (CHAVIN INFLUENCE)	1400
INITIAL PERIOD	GUANAPE	1800
	PRECERAMIC	

FIGURE 1







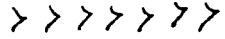

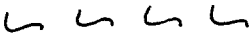
PAMPA CACIQUE

FIGURE 2  
Map of Pampa Cacique  
Guide to Quadrants

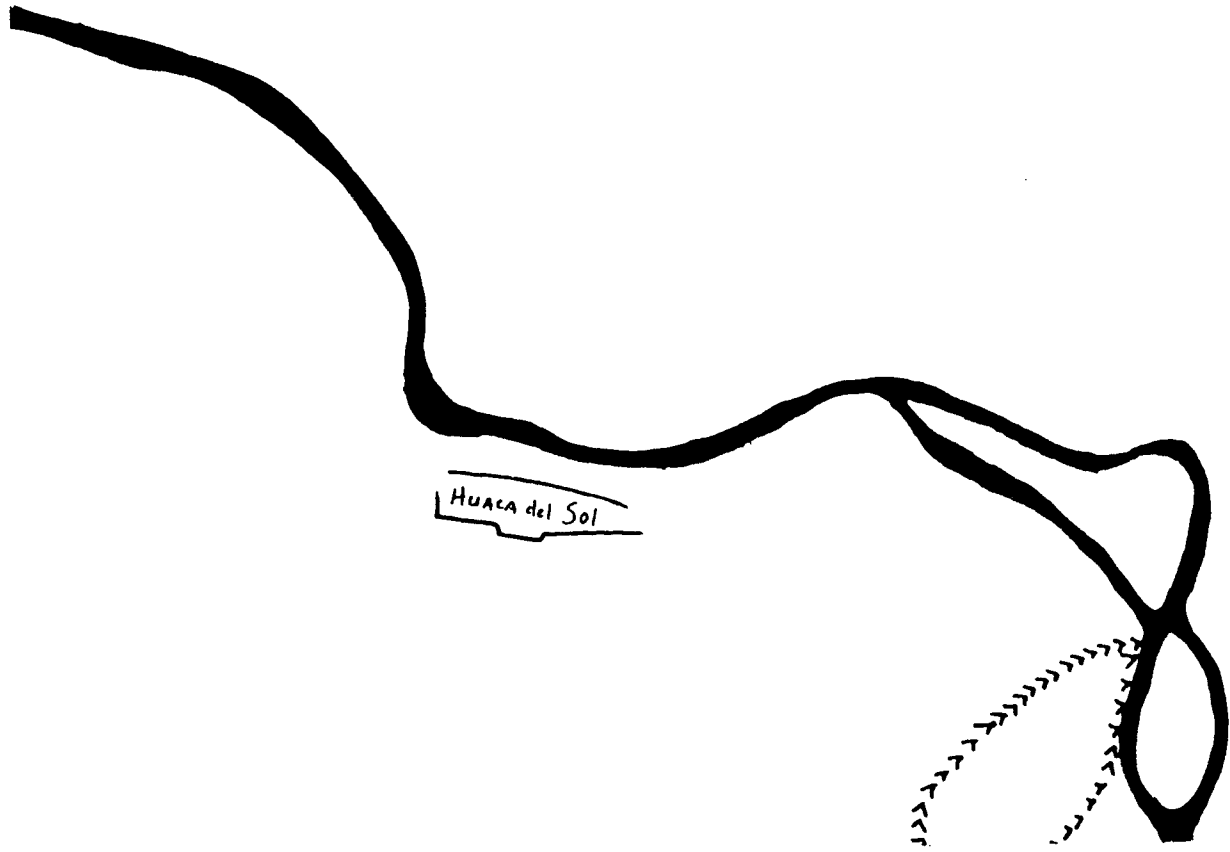


## Guide to Symbols Used

## Map of Pampa Cacique

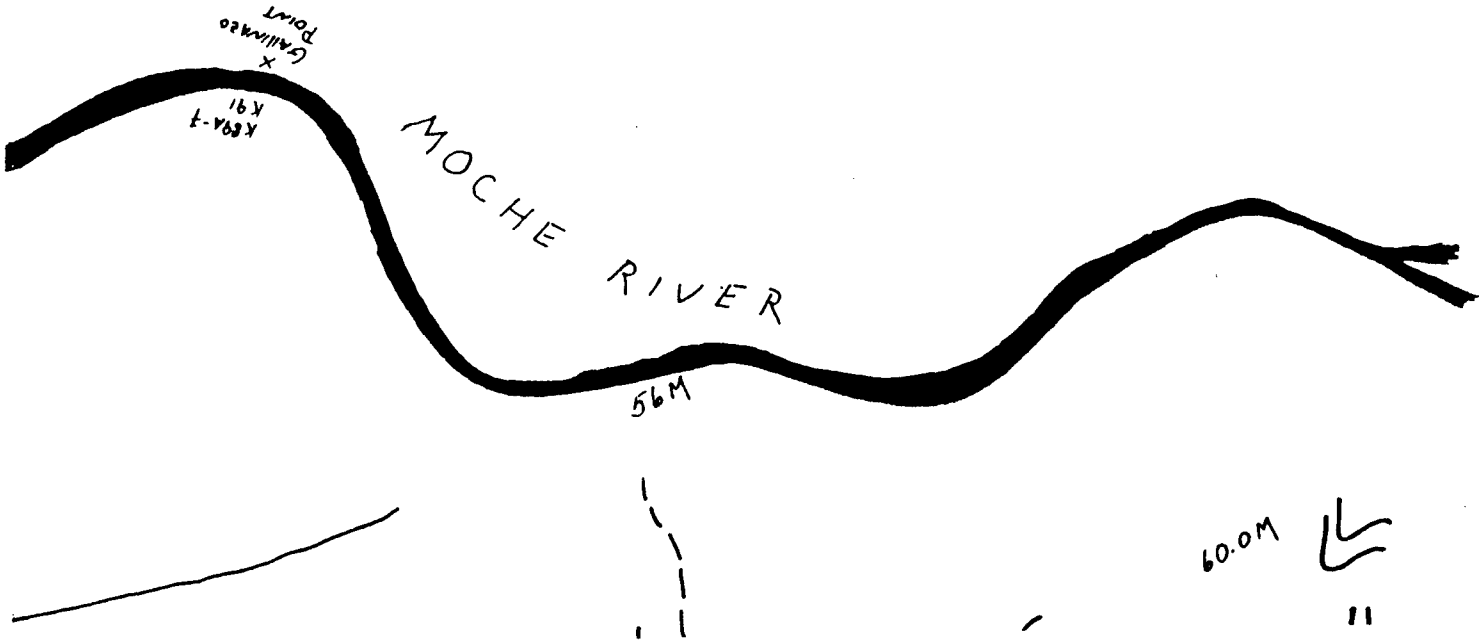
0	1 km.	Scale
		
		Canals
		Road or Wall
		Cemetery
		Masonry Structure
		Drain
		Cerro
		Elevation Due to Drain Cut
		Sand Dune
70 M		Elevation Above Sea Level
K _____		Site References

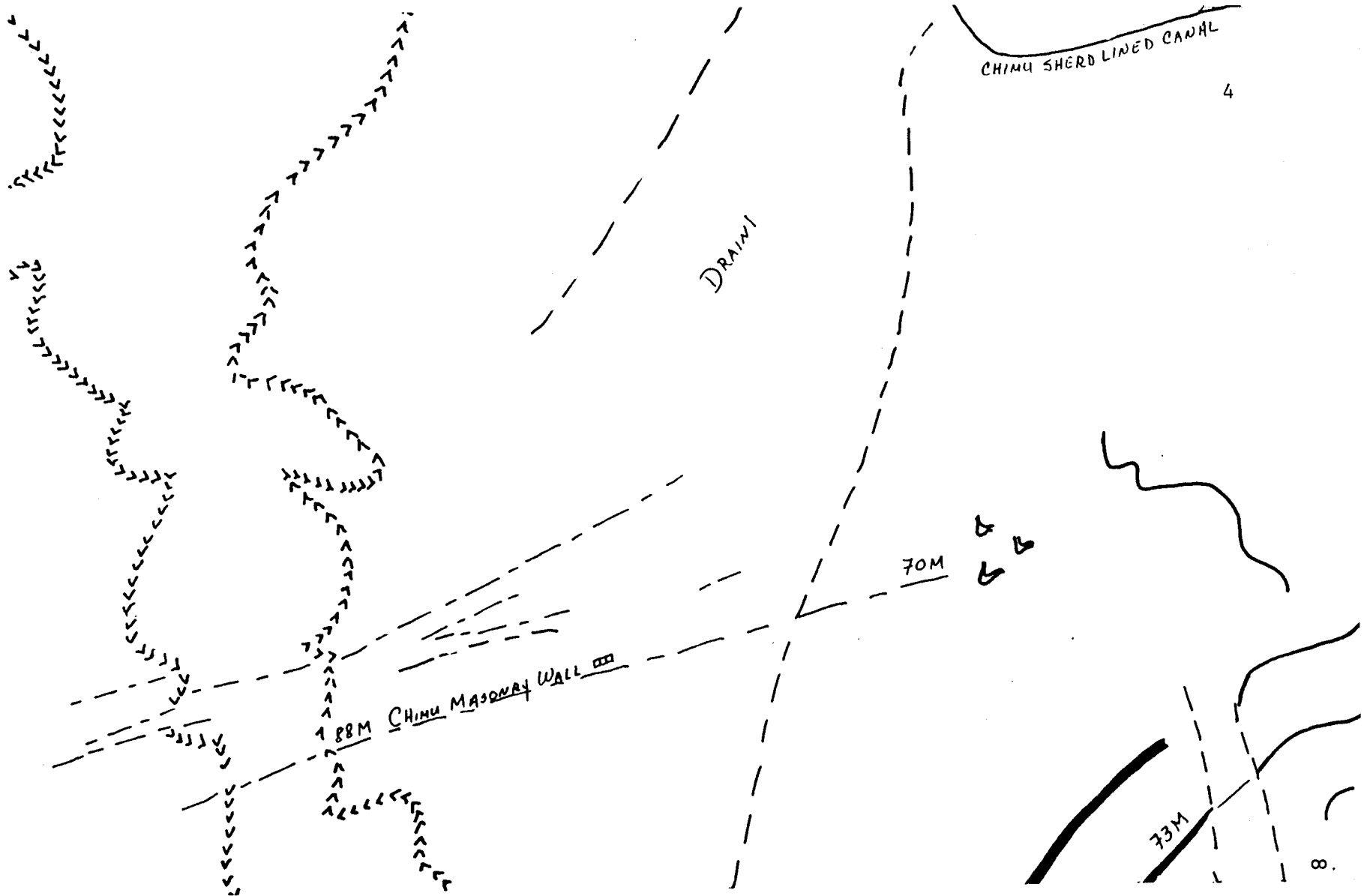
# PAMPA CACIQUE







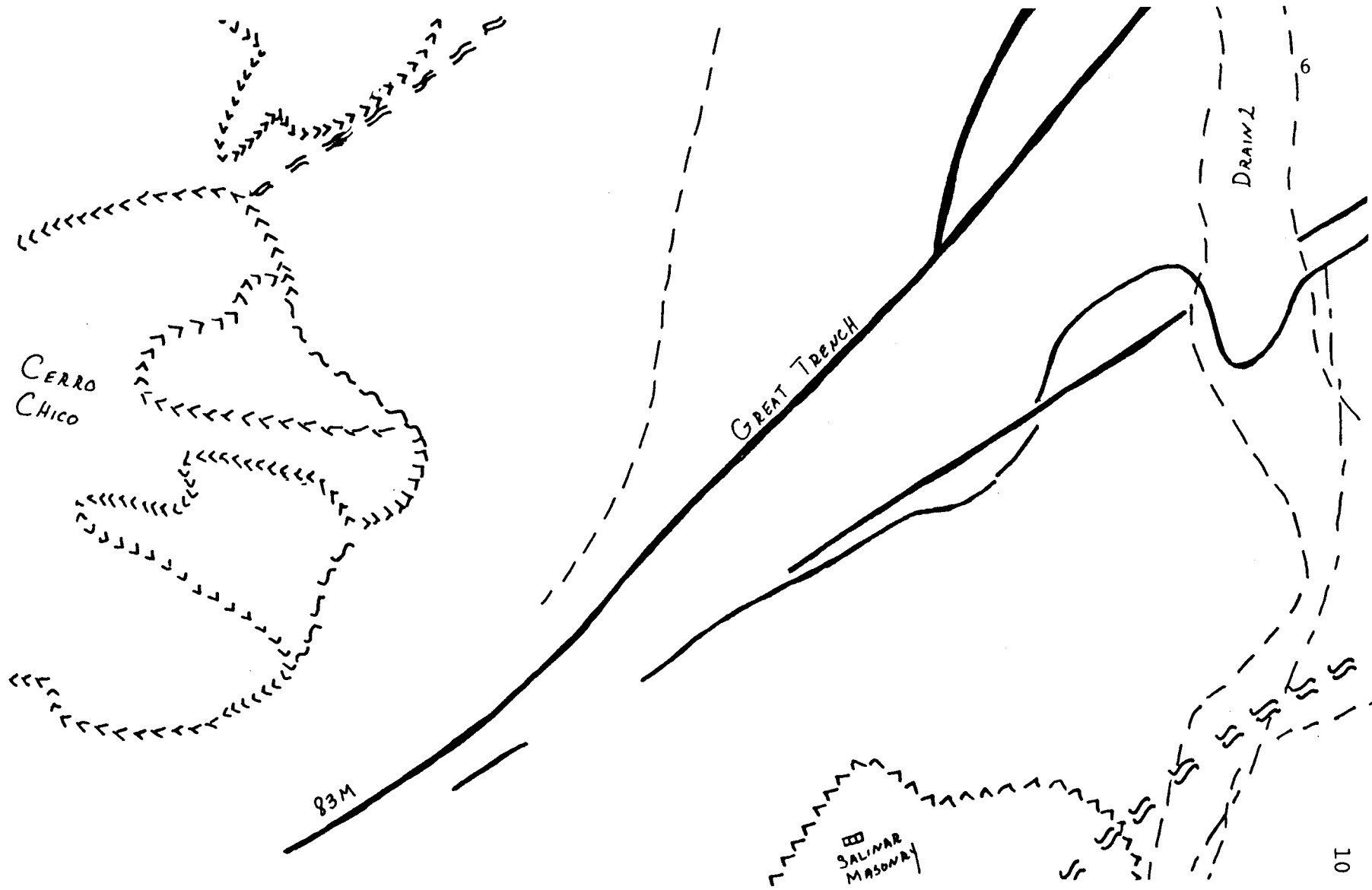






5

6





in the profile only a few meters to the west.

Thus, in addition to formulating a domestic ceramic typology, an explanation had to be found which could account for the near-absence of Moche in the Cacique profile. Programa Riego Antiguo archaeologists, who had been conducting research in the Moche Valley, had already concluded that recurrent periods of extensive flooding were responsible for extensive damage to irrigation canals during the Chimu occupation of the valley.

Canals are especially suited to a demonstration of flood activity because as canal walls are eroded away during a flood the channel itself is filled with flood wash. Relative intensity of a flood can be measured through the extent of damage to a canal and the discontinuation of the canal's primary function - to carry water. Periodic flooding was also suspected of destroying evidence of pre-Chimu agricultural projects, although conclusive data was still lacking. The hypothesis was advanced that large pieces of the cultural record had been washed away in the study area, a hypothesis substantiated by evidence presented in this thesis. In addition, evidence for radical environmental change caused by tectonic activity and sea level changes suggest that analyses of settlement patterns on the north coast of Peru must incorporate models of changing geomorphological conditions.

## THE HYPOTHESIS

The basic assumption upon which this thesis is built is that settlement patterns, as we perceive and interpret them today, do not necessarily reflect spatial organization within a society. To draw conclusions or make generalizations about a society's spatial organization based only upon archaeological remains is to assume that the environment within which these remains were deposited has remained essentially static since that deposition. After observing the arrangement of archaeological remains - structural, agricultural, and ceramic - in the Moche Valley, PRA archaeologists concluded that what we see on the surface today does not reflect cultural reality in antiquity. With this orientation, these archaeologists have tried to measure and evaluate previously undetected geological phenomenon in antiquity.

Did those same forces which place limitations on cultural life in the Moche Valley today - tectonic movement, the Peru Current/El Nino rains and wind moving sand - also place limitations on cultural life in the valley for at least the last 5,000 years? If so, environmental phenomena have altered the archaeological record; the extent of this alteration should be identifiable through a combination of archaeological and geological interpretations.

This thesis, then, is a brief exploration of how certain environmental phenomena have altered the archaeological record in the Moche Valley.

The ceramic typology which is also a part of the thesis is intended not only to describe the slow, barely perceptible changes in domestic ceramics through time, but also to date geological phenomena which have altered the valley and its archaeological record. The results of geological alteration are numerous. For example, the river itself has, through time, followed a course which has cut continuously southward; the movement of the river does not occur in a vacuum but the same tectonic movement which affects the river also affects the quebradas which empty into the river and into the ocean. It also causes the formation of beach ridges through the uplifting of the coast. Cultures exist within a geological environment and any change in the environment will affect the culture in some way. Thus, cultural reasoning and geological reasoning will be utilized simultaneously to identify and define major epochs of alteration in that interaction. These ceramics are intended to be useful in identifying and dating epochs of tectonic movement and el nino flooding and their subsequent effects on cultural development.



## THE SETTING

### Pampa Cacique

Pampa Cacique is the study area of this thesis. The pampa lies along the south side of the Moche River (Figure 3), approximately 10 kms. from the ocean, between Cerros Blanco and Arena. The earliest cultural occupations as yet identified on the pampa date to the Formative period. The Salinar village and related architecture on top of Cerro Arena and scattered across the pampa are the earliest archaeological features in the study area. Gallinazo and Moche cemeteries skirt the base of Cerro Arena and Moche burials have been found on Cerro Blanco. Criss-crossing the pampa are roads and walls which date from the Salinar through the Chimu occupations of the valley.

The ceramics studied in this thesis were obtained in 1979 by the author from two locational contexts. The first was the river profile itself. The Pampa Cacique portion of the river profile spans a distance of 5 kms. and has an average depth of 12 meters. In some areas, however, partially eroded buttes increase this depth to 15 meters. With the exception of the Gallinazo-like site, profile sherds were retrieved from a shallow, river-cut basin that was later filled in with river-derived fluvial sediments. This basin is located about 1 km. east of Cerro Blanco (Figure 2). These sherds were retrieved during a strata

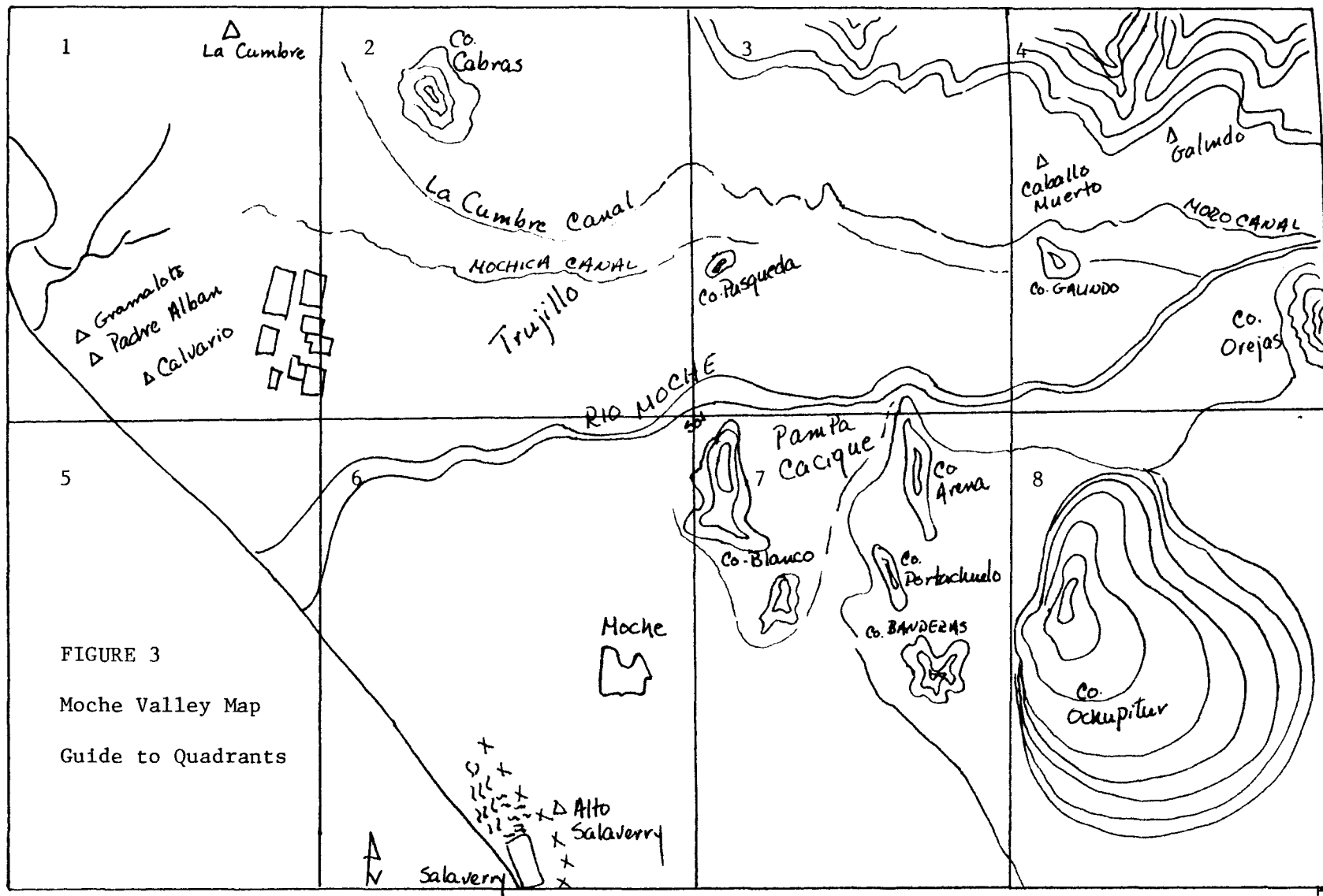
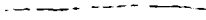


FIGURE 3  
Moche Valley Map  
Guide to Quadrants

Guide to Symbols Used

Moche Valley Map

x x x x x x x x



Beach Bluffs

Site

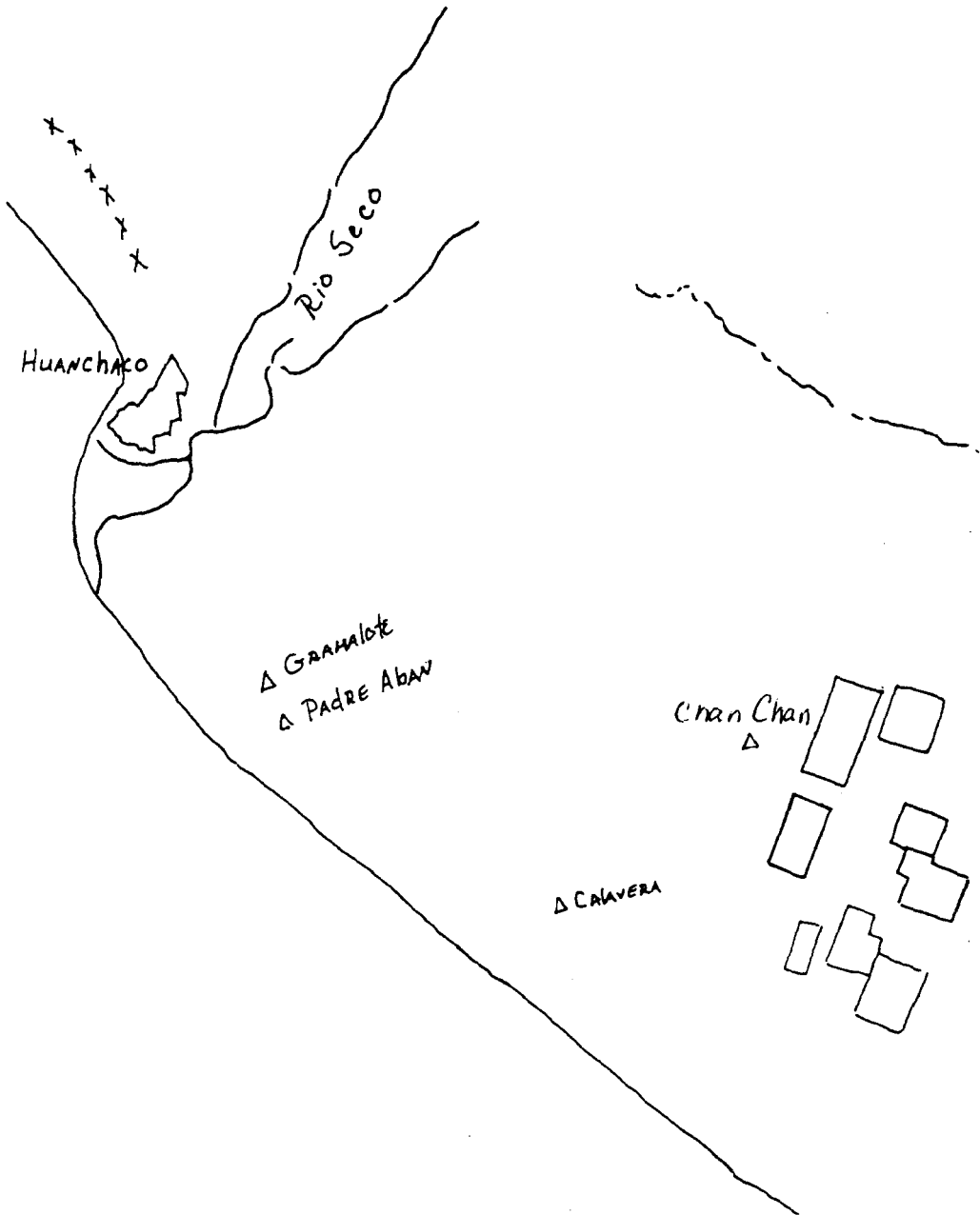
Canal

Sand Dunes

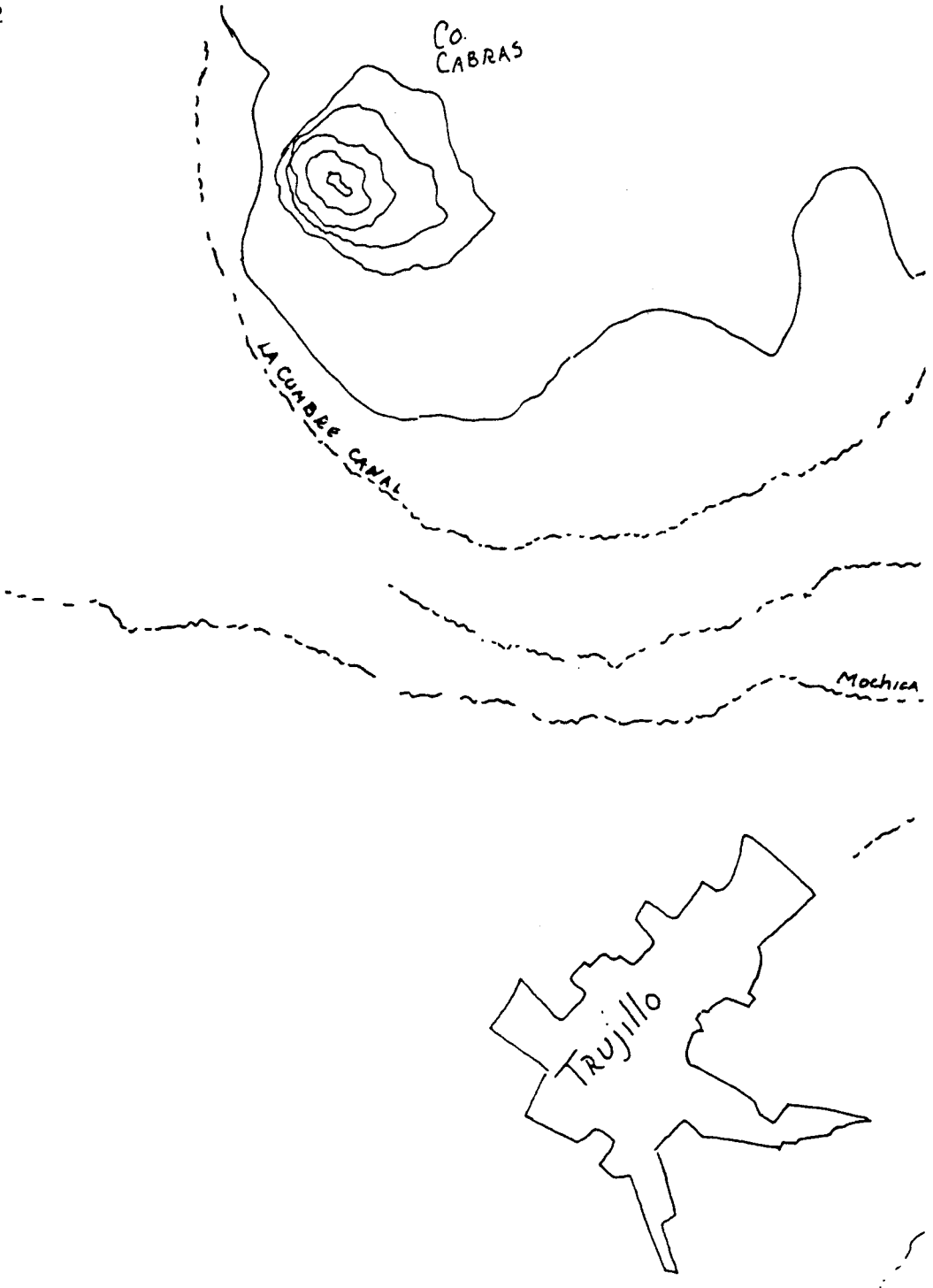
Elevated Areas

1

Δ La Cumbre

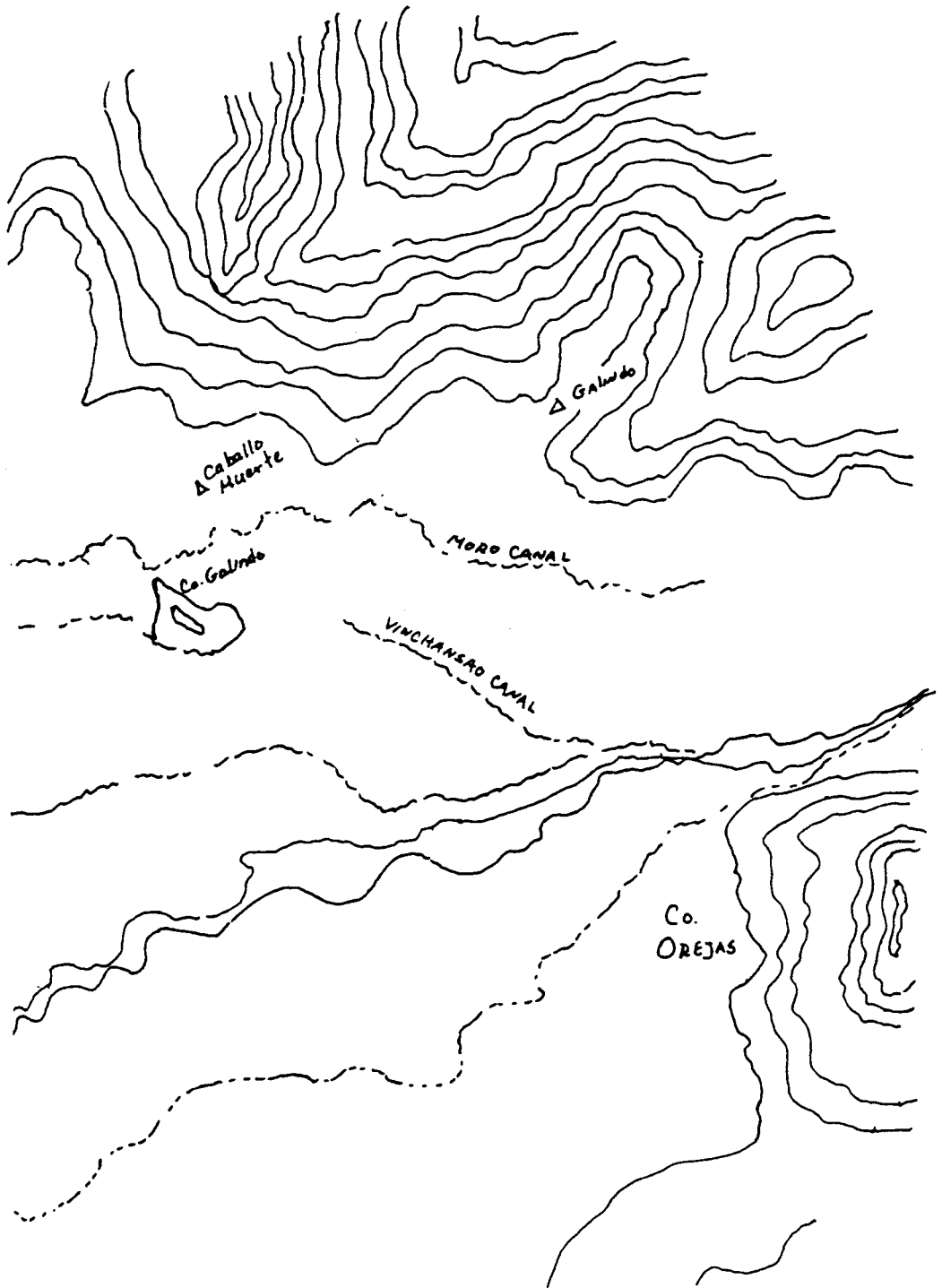


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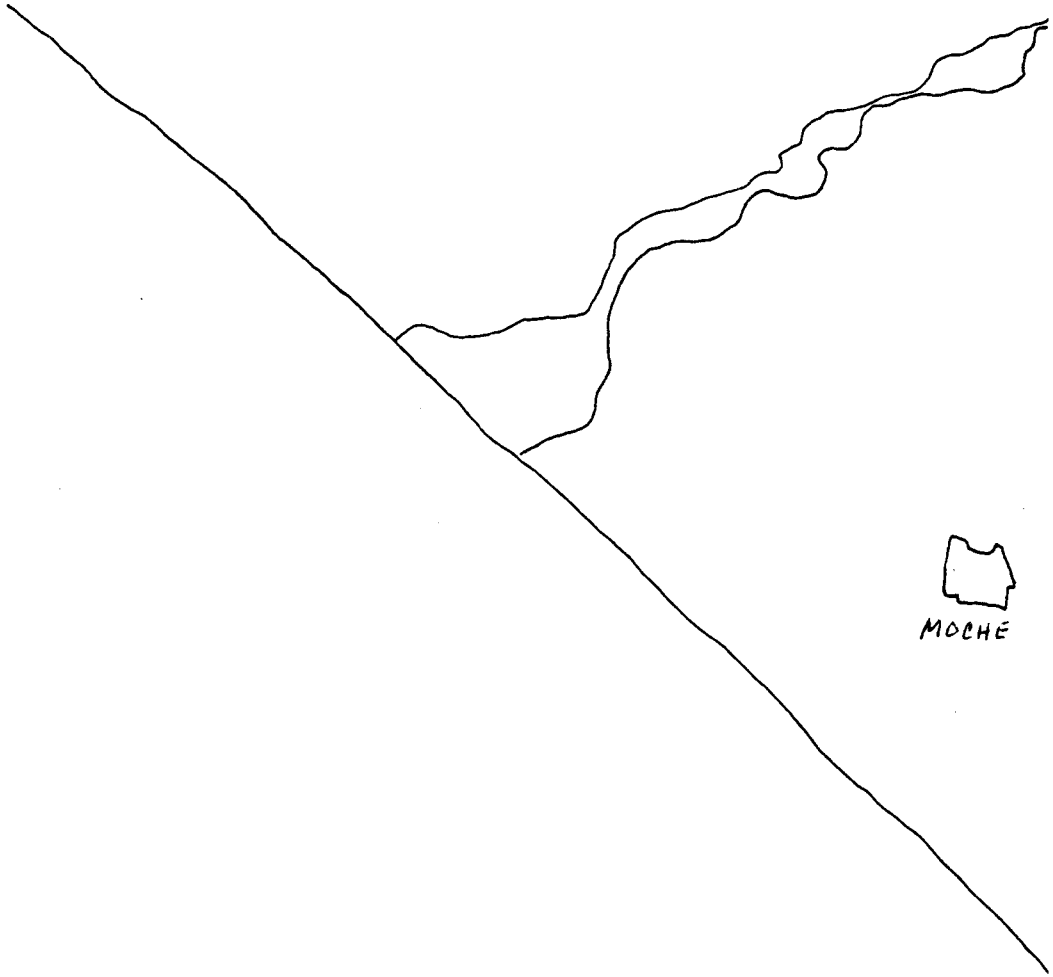




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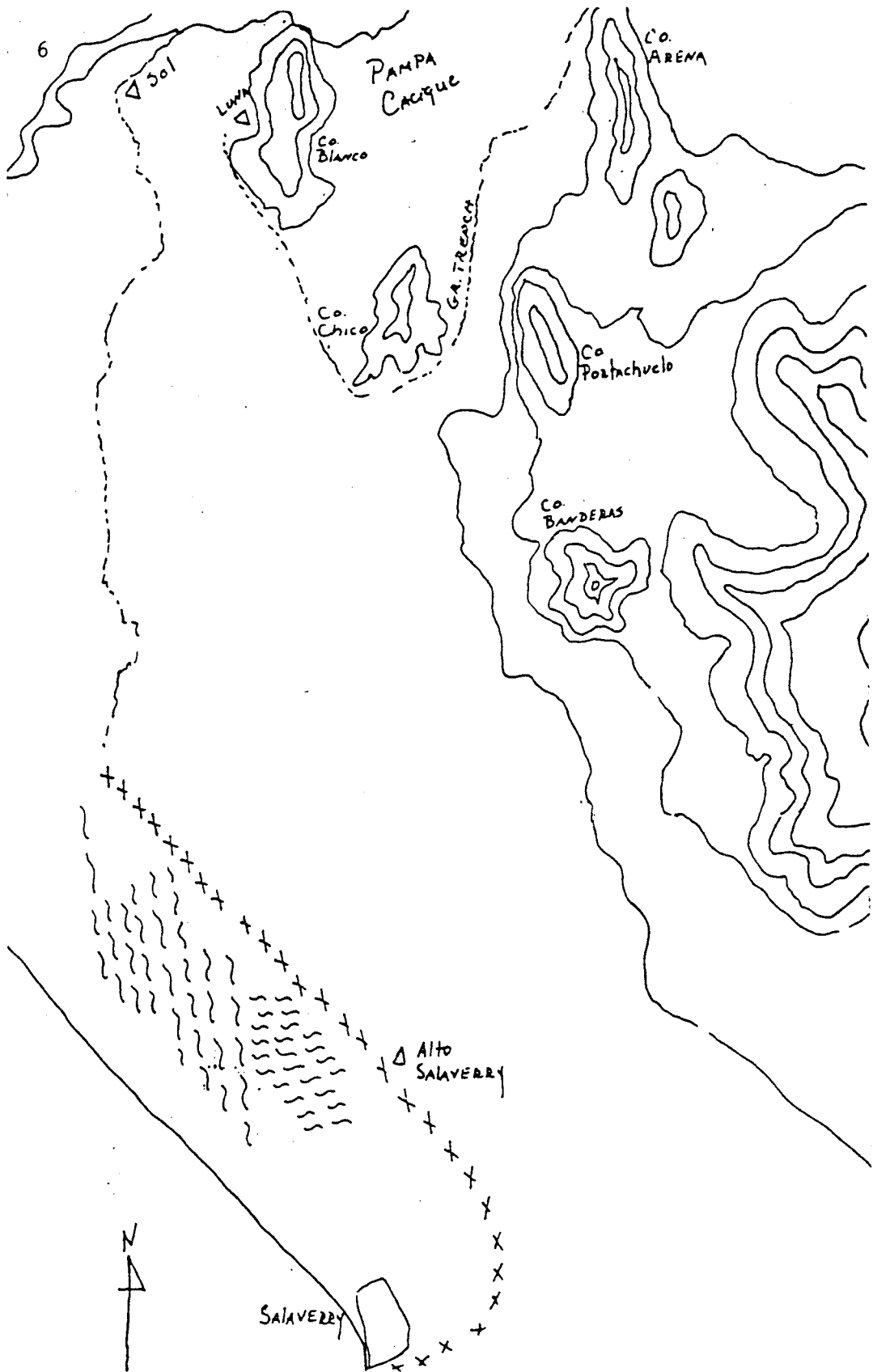
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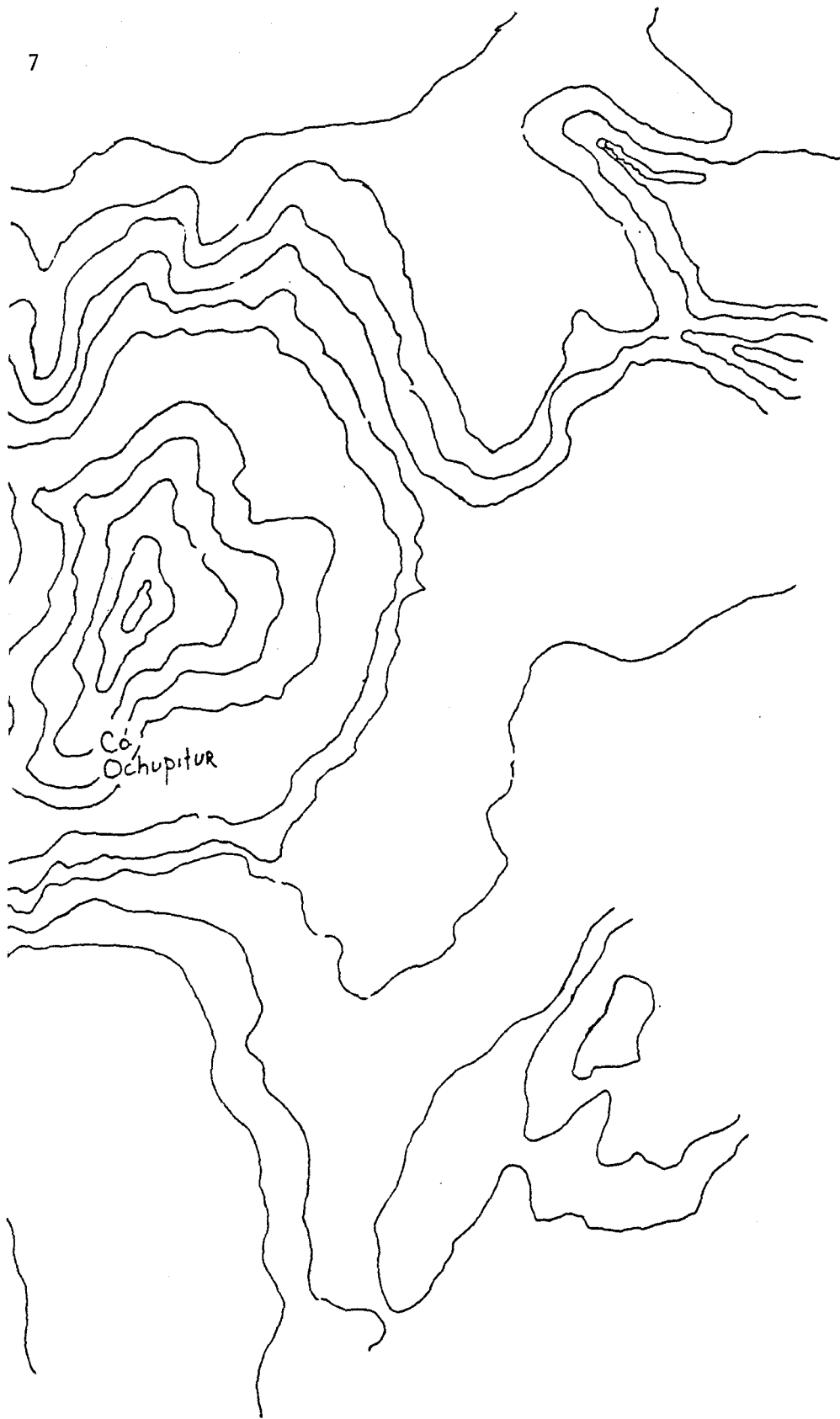
MOCHE

- CANAL
- △ SITE
- CITY OR VILLAGE
- - - SAND DUNES
- ELEVATION
- x x BEACH BLUFFS





7



survey as opposed to excavation. The Gallinazo site lies 4 kms. upstream from this river-cut basin. Sherds collected from this site were retrieved during strata survey and test pit excavation.

The second locational context is on the pampa itself, 2 kms. south of the river. At this site ceramics were taken from a Salinar wall. This wall was diagnosed as Salinar because of the adobe brick size and shape and because of the general characteristics of the majority of the sherds retrieved.

Briefly, then, sherds were retrieved during strata survey and excavation along the river profile and on the pampa. This strategy represents an attempt to control vertical and lateral stratigraphy. A summary of sites is found in Table I.

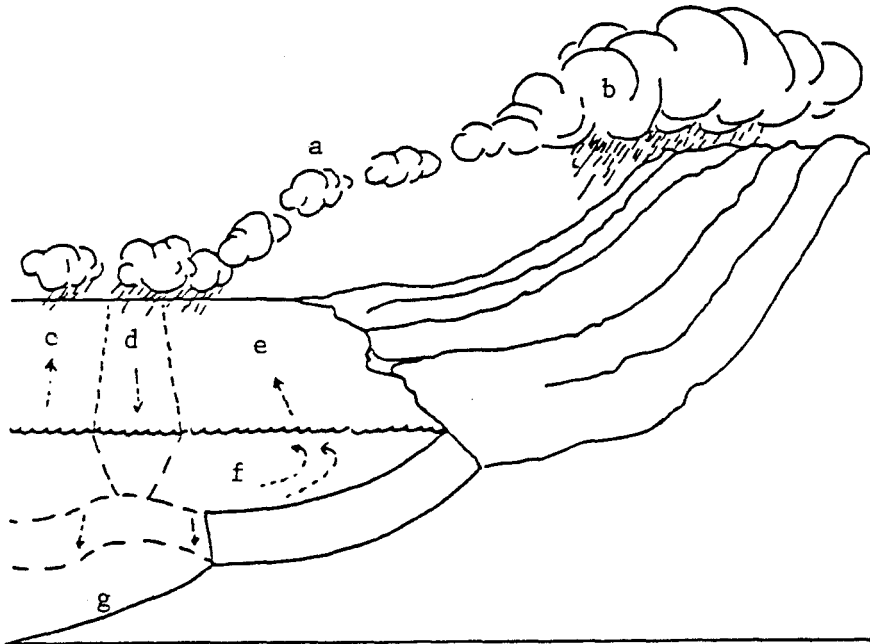
#### A Great Environmental Whole

The west coast of Peru is bisected by 57 drainages; the flood plains of these rivers create 57 oases in the coastal desert which is one of the most arid regions in the world. The environmental forces which make the coastal desert one of the world's most barren regions also make the coastal ocean one of the world's most bountiful. These interacting environmental forces are the Andes, the trade winds of the Pacific southeast, the coriolis force, and four off-shore ocean currents (Figure 4).

PAMPA SITES	VERNACULAR DESCRIPTION	COLLECTION NUMBER	CONTEXT
Excavation	Salinar Wall	K89A-5	In situ
Excavation	Salinar Wall	K89A-40	In situ
Excavation	Salinar Wall	K89A-41	In situ
Excavation	Salinar Wall	K89A-42	In situ
Excavation	Salinar Wall	K89A-46	In situ
RIVER PROFILE SITES			
Strata Survey	Pollen Column	K679911-0=1	Derived
Strata Survey	50 meters west of Pollen Column	K679911-0=2 K90-1W=1	In situ
Strata Survey	50 meters west of Pollen Column	K679911-0=3 K90-1W=2	In situ
Strata Survey	Below K679911-0=1, at Pollen Column	K90-1E=1	In situ
Strata Survey	Gallinazo Point	K91	In situ
Excavation	Gallinazo Point	Gallinazo Refuse K89A-7=5	In situ
Excavation	Gallinazo Point	Gallinazo Point K89A-7=4	In situ
Strata Survey	50 meters west of Pollen Column, Profile Buttes	K89A-10	In situ

TABLE I

Schematic cross-section of the coastal and current systems



Moisture carrying clouds, moving off the Pacific Ocean, are warmed by the land mass, and a temperature inversion inhibits precipitation (a), leaving the coast dry, but cool. Upon reaching the higher, cooler elevations of the Andes, the clouds yield rain above ca. 2500 m (b). The coastal waters off Peru are swept northward by the Oceanic Current (e), while the normally small Counter Current (d) pushes in the opposite direction following the deeper Under Current (g). Upwelling waters (f) from the oceanic depths carry rich nutrients that support abundant marine life (Moseley:1975:9).

FIGURE 4

The upthrust of the Andes starts less than 60 km. from the shore and follows a steep ascent . . . The Pacific trade winds are bent and channeled by the Andes. Blowing from the south and southeast, the winds tend to parallel the coast and graze the mountains before starting to spill over the rock barriers at higher altitudes. The cold water of Peru's nearshore currents keeps the ocean air cool and holds evaporation to a relatively low level. As the air moves along the coastal plain and up against the mountains it is warmed by the higher temperatures of the terrain. Heating the air expands its capacity to retain and carry moisture . . . Although the shore is often fog-shrouded, rain does not occur until the colds reach the higher, cooler elevations of the Andes above 2500 meters (Moseley:1975b:8).

As a result of this meteorological situation, coastal Peru is a desert which, during the South American winter, experiences so much fog called "garua" that a population of epiphytic plants is supported throughout half the year, replacing the coast's barren appearance with a greenish hue. Only the Rub al-Klali (Saudi Arabia), parts of the Kalahari and the South Australian desert exceed the aridity of the Peruvian desert (Robinson:1964:157).

The Pacific trade winds and the coriolis force, which is produced by the world's east-west rotational spin, push the two off-shore currents north and west; these are the large oceanic current and the narrow coastal current which sweeps the coast itself. Counteracting these currents is the warmer, narrow countercurrent pushing between the coastal and oceanic currents and the deep, cold undercurrent which upwells from the bottom of the ocean, bringing with it phosphates, nitrates and other nutrients

from the ocean depths. Thus, one of the world's richest environments exists adjacent to one of the most barren (Moseley:1975b:10).

This apparently stable and predictable interaction between ocean currents and land surfaces is occasionally thrown out of balance through a unique interaction of variables which culminate in el nino, cyclical episodes of rainfall and flooding along the entire coast of Peru. Also disrupting the predictable interaction is tectonic movement. Massive environmental change in the Moche Valley is considered on pages 42-67.

#### Geography of Southern La Libertad and the Moche Valley

The Moche Valley is situated at the 8° latitude south in the province of Southern La Libertad (Figure 5), a transitional zone between the low, wide desert of the north and the narrow valley deserts of the south. Throughout the last 5,000 years of cultural activity in the Moche Valley, the existence and lifestyles of studied populations have been disrupted by environmental and geological forces. The four valleys which comprise Southern La Libertad - the Chicama, Moche, Viru and Chao Valleys - all lie in the same seismic subdivision of the Cordillera Negra and are all similarly affected by tectonic movement. For example, all four rivers are characterized by a changing course which has steadily cut southward for the last 5,000 years; the

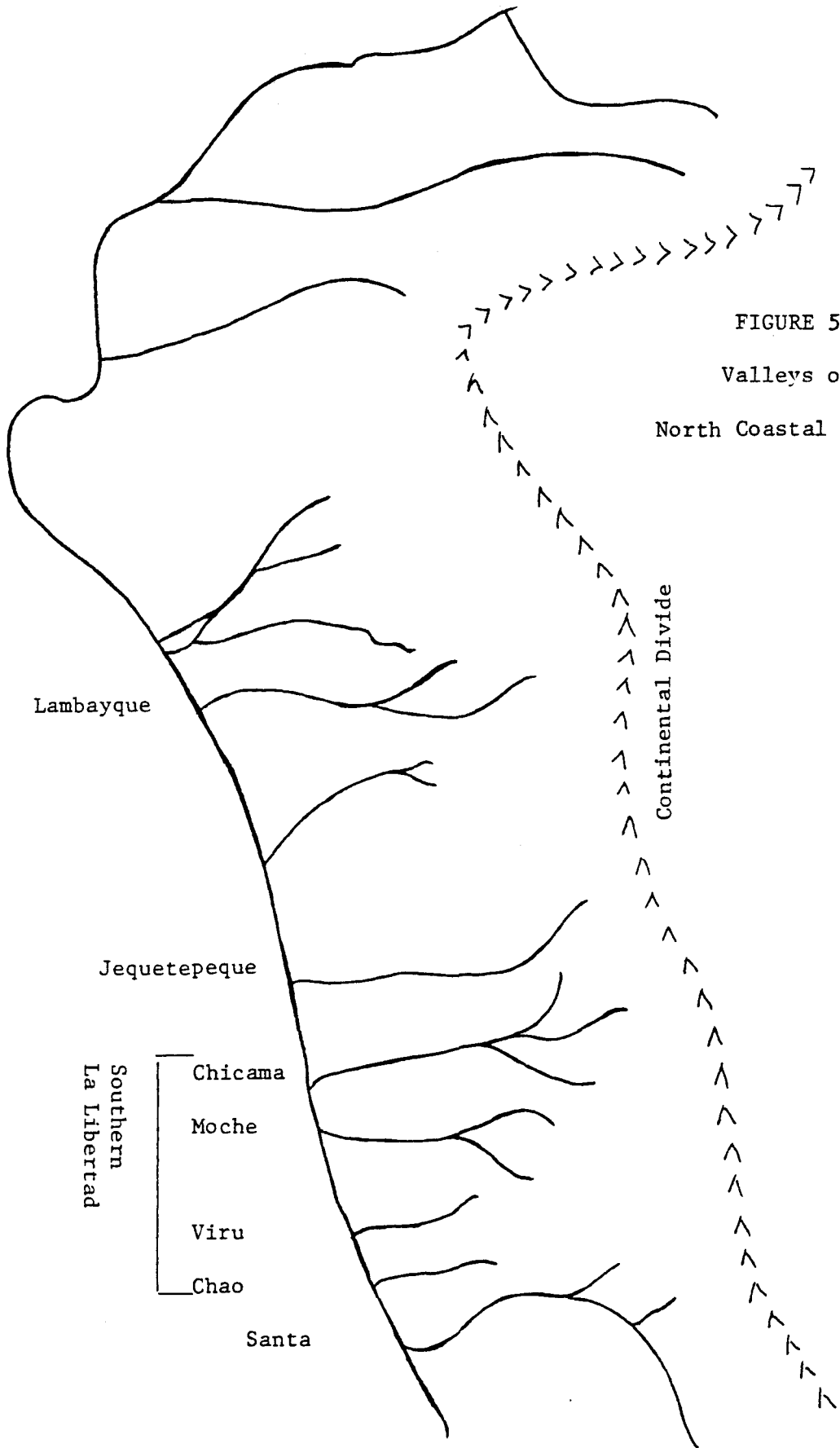


FIGURE 5  
Valleys of  
North Coastal Peru

Lambayque

Jequetepeque

Southern  
La Libertad

Chicama

Moche

Viru

Chao

Santa

Continental Divide



valleys themselves are composed of acutely inclining slopes and unconsolidated sediments which are subjected to constant erosion from wind and el nino rain, always exposing the newer sediments beneath, which are constantly being upthrust due to tectonic uplift.

Lacking in the valleys are fossil and marine deposits dating from before 12,000 years B.P., indicating that environmental forces work to remove early deposits, leaving only those which are most recent in origin. In the valleys of Southern La Libertad, the constant offshore wind, blowing from the south, has swept the ground year after year, blowing away the lighter unconsolidated sediments leaving behind the heavier stones to be polished and abraded. Thus, much of the desert is not covered by sand but by a polished desert pavement (Robinson:1964:163).

Evidence from bathymetric maps indicates that the coastal plain extended about 100 kms. further west than it does today 15,000 years ago. This receding shoreline was caused by changes in sea level combined with tectonic activity. Changes in sea level along the coast of Peru are further discussed on page 49.

Waterflow in the rivers of Southern La Libertad, as in the other 53 rivers bisecting the coast, does not come from coastal precipitation below c. 2,000 meters, except in the years of heavy el nino rains. As would be expected, the source of these rivers is found in the high Andes.

Although average rainfall in the Moche Valley is only 10-17 mm annually (and is approximately the same in the other three valleys of Southern La Libertad), the Moche and Viru Rivers are only occasionally dry, the Chicama River is never dry and the Chao alone is frequently dry (Ossa:1973:13).

Despite minimal annual rains, Paul Kosok (1965:34) estimated that about 50% more land was cultivated in the northern valleys in pre-Columbian times, and 15-20% more land was cultivated throughout the entire coast, than is cultivated today. He also suggested that more than half of the pre-hispanic coastal population, taken cumulatively, lived in north coastal Peru. Today in the Moche Valley, 20,026 hectares of land are irrigated (Robinson:1964:166). Despite monumental disadvantages such as insufficient rain and an irregular water supply, the ancient Peruvians built an agricultural civilization based on irrigation through networks of intervalley canal and feeder systems which supported a concentrated population.

About 23 kms. inland from the sea, the Moche Valley narrows to form a neck at Quirihuac where the valley bottom is under one km. wide (Figure 3). Below this point, the valley bottom spreads out until it reaches its widest point of 25 kms. at the sea. The river flood plain is fairly narrow and, in its present form, not very old. Due to the gradual southward shifting of the river, the valley sides

are asymmetrical; this southward shifting explains the newness of the valley flood plain as well. The north side of the river slopes gently and most of the arable land in the river plain is found on the north side.

South of the river the plain is much narrower and steeper with sharp slopes cut by outlying Andean foothills. From east to west, these foothills are Cerros Orejas, Arena and Blanco (Figure 3). Cerros Arena and Blanco define the limits of the study area (Figure 2). Agriculture on the south side of the river is minimal with sand and dunes as plentiful today as they probably have been for the last 5,000 years. The river inhibits the deposition of aeolian sands on the north side.

In the folds of the Andean foothills there are dry streams, called "quebradas", that join major flowing streams at irregular intervals. Many of the quebradas are clogged by sand dunes and appear to be totally barren and dry. However, these dry quebradas are the result of el nino rainfall and reflect past ninos.



## CHAPTER II

### A BRIEF CULTURAL HISTORY OF THE MOCHE VALLEY

The earliest known human occupation of the Moche Valley dates to approximately 11,000 years B.C. "Early lithic sites have been found on the north side of the valley in the upper Rio Seco, and south of the Moche River in the Rio Seco de los Ancados, Quebrada Santo Domingo, and upvalley in the Quebrada de Quirihuac" (Beck:1979:10) (Figure 3). The earliest occupants of the valley coexisted with now extinct megafauna. For example, the Paijan Complex site of La Cumbre ( $\pm 12,000$  B.P.) (Ossa:1973) is located in the upper Rio Seco, a few kms. inland from the sea. The presence of mastodon bone and lack of fish remains, would indicate that La Cumbre was a hunting site. Changes in the sea level during the last 8,000 years, or since the last period of glaciation, would explain the existence of a hunting site so close to the ocean where one would expect to find evidence of a fishing economy (Richardson:1980). Evidence for dramatic sea level changes are discussed in more depth on page 49.

Only two cotton preceramic sites are known in the Moche Valley (Beck:1979). Padre Alban ( $\pm 3,500$  B.P.) is a

stratified midden deposit located north of Trujillo. At Alto Salaverry (4,000 B.P.), located south of the river, in addition to midden deposits, formal and domestic architectural remains dating to this period have also been found (Figure 3).

The first ceramic sites in the valley predate the occurrence of the Cupisnique, or Coastal Chavin, complex. One such Initial Period site is Gramalote ( $\pm 3,000$  B.P.), also located north of Trujillo. This site is a midden deposit containing refuse, ceramics and architectural remnants.

#### CUPISNIQUE

Chavin influence dominated the Early Horizon. The Caballo Muerto complex, on the north side of the river near the valley neck (Figure 3), is the most important Cupisnique complex in the valley. Caballo Muerto consisted of eight platform mounds one of which was adorned with large adobe friezes. The largest mound, Huaca de los Reyes, appears to have been remodelled several times. While some of the remodeling may have been cultural in causation, other stages of remodeling may have been initiated as the result of destruction due to quebrada flooding. The Huaca sits on a terrace remnant within the quebrada and was very likely subjected to erosion during an early period of flooding. The coarse/domestic ceramics

from Caballo Muerto resemble the earlier ceramics taken at Gramalote, while the fine wares resemble those diagnosed as Cupisnique (T. Pozorski:1976).

#### SALINAR

The Salinar, Gallinazo and Moche cultures occupied the valley during the Early Intermediate Period. Cerro Arena, on the south side of the valley (Figure 3) is the most important, and largest, Salinar site in the valley. This site is a large, nucleated, residential site and sits atop Cerro Arena. It is at Cerro Arena that diagnostic Salinar white (slip)-on-red (paste) ceramics are found. According to Brennan (1978), the location of the site, providing visual and physical control of movement into and within the valley, could have been defensive in nature.

#### GALLINAZO

Gallinazo sites are scattered throughout the valley but none are large in size. Within the study area of this thesis are found two Gallinazo cemeteries which were later cut and exposed by a drain (or quebrada) running north/south across the pampa and which carried water during a post-Gallinazo period of flooding. There is also an in situ midden deposit exposed along the river profile. Other prominent Gallinazo sites in the valley include Huaca Estrella, 1½ kms. south of Huaca del Sol; and two large

adobe platforms on Cerro Orejas (Figure 3).

## MOCHE

The Moche Culture dominated the coast of Peru from Lambayeque to Nepena (Figure 5), but the Moche Valley was the cultural and administrative center of the Mochica. Moche sites are scattered throughout the valley but the settlement of Moche where the Huacas Sol and Luna are located is the largest and most important. The site of Moche was, apparently, first settled during Gallinazo times when the focal point of the community was Huaca Estrella.

The Moche culture has been chronologically divided into five phases. These phases were defined by Larco Hoyle (1938) and based upon variations in the shape of the Moche stirrup spout jars. Moche sites have traditionally been identified and grouped into phases based on their ceramics which are well-known for their naturalistic forms and designs and their red paste.

During the early Moche phases (phases I & II) little monumental architecture is recognizable at Moche. During the Moche III phase monumental architecture is well developed, and residential units show signs of social stratification. But by the end of the Moche IV phase the site was no longer occupied (Figures 1 & 3). According to Theresa Topic (1977), Huaca de la Luna may have been a

ruler's palace because of its murals and platforms and temples, whereas Sol was probably an administrative unit. The extensive ceramic scatter and the domestic architecture in the area indicate that the site was certainly not an empty ceremonial center as was believed by early archaeologists. After several natural catastrophes, including aeolian sand inundation and a flood, the site was abandoned. The evidence of flooding around the Huacas will be discussed on page 64.

The Mochica in the Moche Valley never regained the cultural pinnacle which they had attained during Moche III & IV. However, when the Mochica did reorganize, their administrative center was located at Galindo (Figure 3), upvalley on the north side of the river. Present at the Moche V site of Galindo are both formal and residential architecture, trenches, canals and walls. This site is heavily terraced, and the terraces are sequential in nature. The destruction of and subsequent rebuilding of walls which perpendicularly cross the terraces confirms the sequentiality of the terraces. Large silt deposits within structures and behind walls and the abrupt truncation of the walls which crossed the terraces indicate that once again a natural catastrophe, involving a flood, interrupted cultural occupation.



## CHIMU

During the Late Intermediate Period (Figure 1), prior to the Inca conquest of the Moche Valley, the center of power in the valley had once again moved to the valley mouth, to the Chimu city of Chan Chan (Figure 3). The most outstanding architectural feature of the city was the complex of nine ciudadela compounds. Archaeologists believed that for each successive king of the Chimu, a new ciudadela was built (J. Topic:1977). Chan Chan, however, was a true city including administrative, residential and storage structures, serving and supported by craftsmen and farmers throughout the valley.

The Chimu people continued the extensive agricultural projects begun by earlier cultures and the city was surrounded by 20 kms. of walls, roads, canals and fields. The agricultural village at Cerro Virgen and the village of La Joyada, near Cerro Orejas, were the most important Chimu farming communities (Figure 3). The Chimu presence in the Moche Valley was all-pervasive; Chimu sites and ceramics are scattered across the entire valley. While Chimu ceramics were both oxidized and reduced, the black mold-made ceramics are considered most diagnostic.

The Chimu suffered, as did earlier peoples, from natural cataclysms and their archaeological record also reveals a series of floods, disrupted canals and abrupt

terminations of technological projects. The Chimu, too, became part of the Inca empire during the Late Horizon (Figure 1) but the Inca did very little to change the cultural personality of the valley, probably because their dominance was so short-lived, lasting only for the latter years of the 15th Century and the early 16th Century, before the Spanish Conquest.

## CHAPTER III

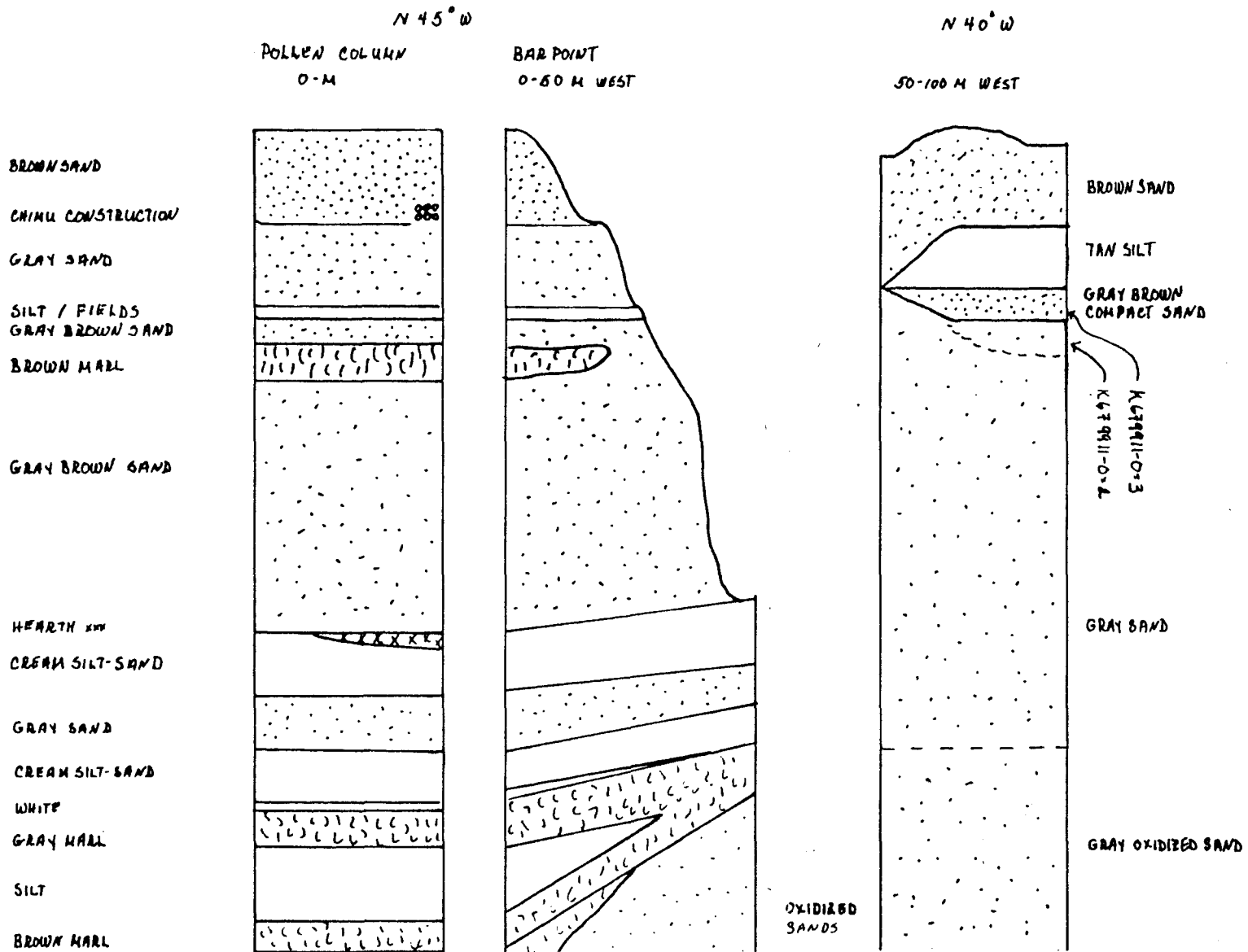
### MASSIVE ENVIRONMENTAL CHANGE

#### IN THE MOCHE VALLEY

#### INTRODUCTION

Deposits of the river profile reflect change due to the same natural phenomena which altered the cultural record of the Moche Valley. Today, there are 12 meters of sediments exposed along the south side of the Moche River at Pampa Cacique; in addition, there are 2 to 3 meters of higher sediments in butte-like remnants on the floor of the pampa. Carbon samples taken from the peat level at the base of the Cacique stratigraphic profile (Figure 6) have yielded C<sup>14</sup> dates of about 1,000 B.C.<sup>1</sup> In the last 3,000 years the Moche River has deposited and subsequently eroded through 15 meters of river profile. A complex of sequential river terraces, and the shifting drainage pattern across the pampa imply that other natural forces, in addition to flooding, were at work in the valley during the last few thousand years. How these geological occurrences affected the archaeological record will now be discussed.

<sup>1</sup>Washington State University #2190 and #2194.



Pampa Cacique Profile

FIGURE 6

continued from previous page

WHITE OXIDIZED MARL  
 WHITE ORGANIC SAND  
 CREAM SILT MARL  
 PEATY SAND

LAMINATED SANDS

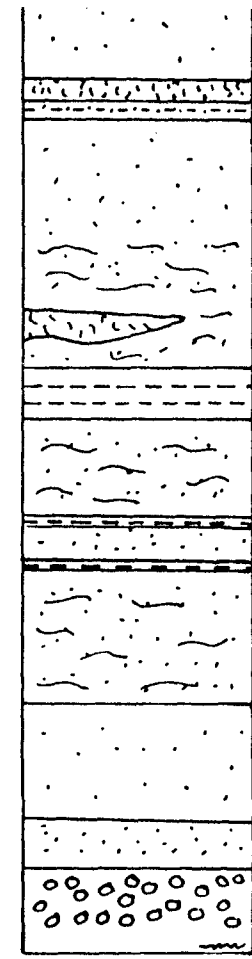
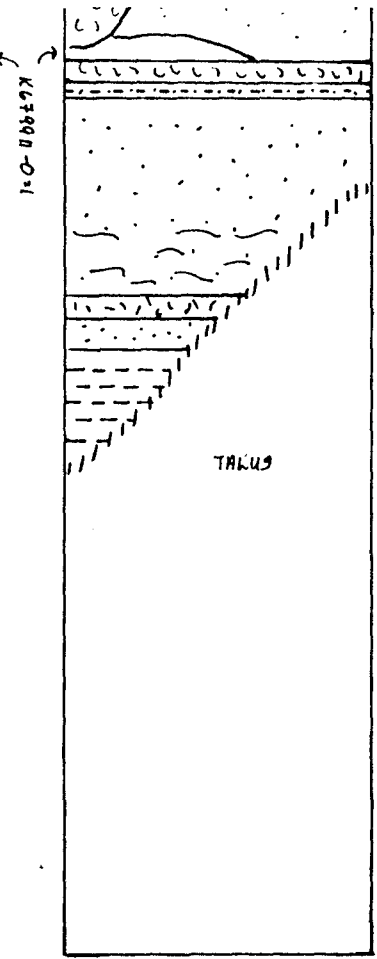
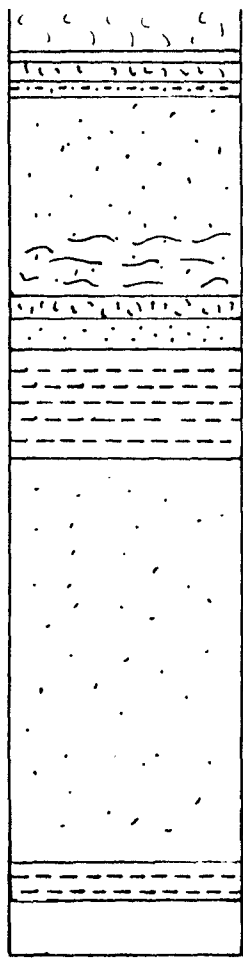
LIGHT MARL  
 SAND

PEAT

PINK-GRAY SANDS

PEAT

TALUS



CREAM SILT MARL  
 PEATY SAND

LAMINATED SANDS

PEAT

LAMINATED SANDS

PEAT  
 SAND  
 PEAT

LAMINATED SANDS

PINK-GRAY SANDS

SAND

GRAVEL

RIVER

### Wind, Water, and Earth Movement

Wind, water and earth movement in the Moche Valley within the last 5,000 years have wrought environmental changes equal to those of the Pleistocene in their landscape changing ability. The movement of land in relation to the sea, taken in conjunction with changes in the Peru (or Humboldt) current, are natural occurrences which cause recurrent but irregular torrential rains and erosion. These are the geological forces which have shaped the environment, and thus influenced cultural occupation of the Moche Valley. The proof of massive earth change in the valley during the Holocene can be found in the archaeological record.

The first clue for the archaeologist of this grand scale environmental change can be found in the fact that in the Moche Valley significantly more land was irrigated in prehispanic times than in the present (Kosok:1965:35). Indeed, north coast prehispanic reclamation projects united independent river valleys through irrigation canals extending from the Lambayeque to Santa Valleys. With this in mind, culture change in the Moche Valley was approached within the context of environmental activity and the causes of that activity.

### Radical Environmental Alteration Cycles

Michael Moseley et al. (1980) attribute this

degeneration of irrigative capacity to Radical Environmental Alteration Cycles (REACs). A REAC is the result of the interaction between tectonic movement and rainfall episodes which creates rare but recurrent cataclysms in the Andean Desert. The periodic rainfalls, known as "el nino", are due to unique changes in the Peru current which will be discussed at length on pages 59-66. These episodes of destabilization and restabilization have set such vast quantities of the arid mass in motion that the ensuing topographic transformations of the last 5 millenia are of "Pleistocene" magnitude, and have been generally mistaken for geological products of glacial epochs (Moseley et al.:1980:8). That tectonic movement and torrential rains have interacted to radically transform the topography of the Moche Valley, which is largely composed of unconsolidated sediments, can be proven through several lines of archaeological evidence. However, before presenting evidence, it would be well-advised to describe, briefly, how the two systems, tectonic movement and rain, are operating in the Andean Desert. Because both systems operate independently of each other and because neither operates in a continuous, uniform movement, the interaction of the two is sporadic, abrupt and cataclysmic.

#### TECTONIC MOVEMENT

Most of the world's tectonic activity - earth-

quakes, volcanoes, and mountain building - is concentrated along plate junctions. The west coast of South America is such a junction. Here the oceanic Nazca Plate . . . is consumed in the Peru-Chile trench, where it bends down and slides under the South American plate at a rate of about six centimeters per year (James:1973:61) (Figure 7).

Since 1973 when James first described the role of tectonic movement in the formation of the Andes, scientists have recalculated the assumed rate of subduction of the Nazca Plate. The rate of subduction is now considered to be 10 cms. per year (James:1978). At a depth of about 200-300 kms. the subducted Nazca Plate is partially melted and the resulting molten magma generates volcanism in the Andes; also, "any growth or thickening of the (Earth's) crust, such as by the injection of magma into the crust from below, will result in surface uplift" (James:1973:63).

The recurrent lifting of the Andean coast has resulted in the formation of tectonic plates. The Peruvian coast, from Lambayeque to Santa, forms a geological unit and is part of one tectonic plate. The igneous rock of which the large plate is formed has been further subdivided by fault lines which, as a result of tectonic movement, fracture it into smaller pieces.

Two kinds of earth movement are manifested in the Moche Valley - uplift and lateral shifting - which create vertical, horizontal and angular changes in the landscape. Both types of movement can be dated through archaeological evidence.



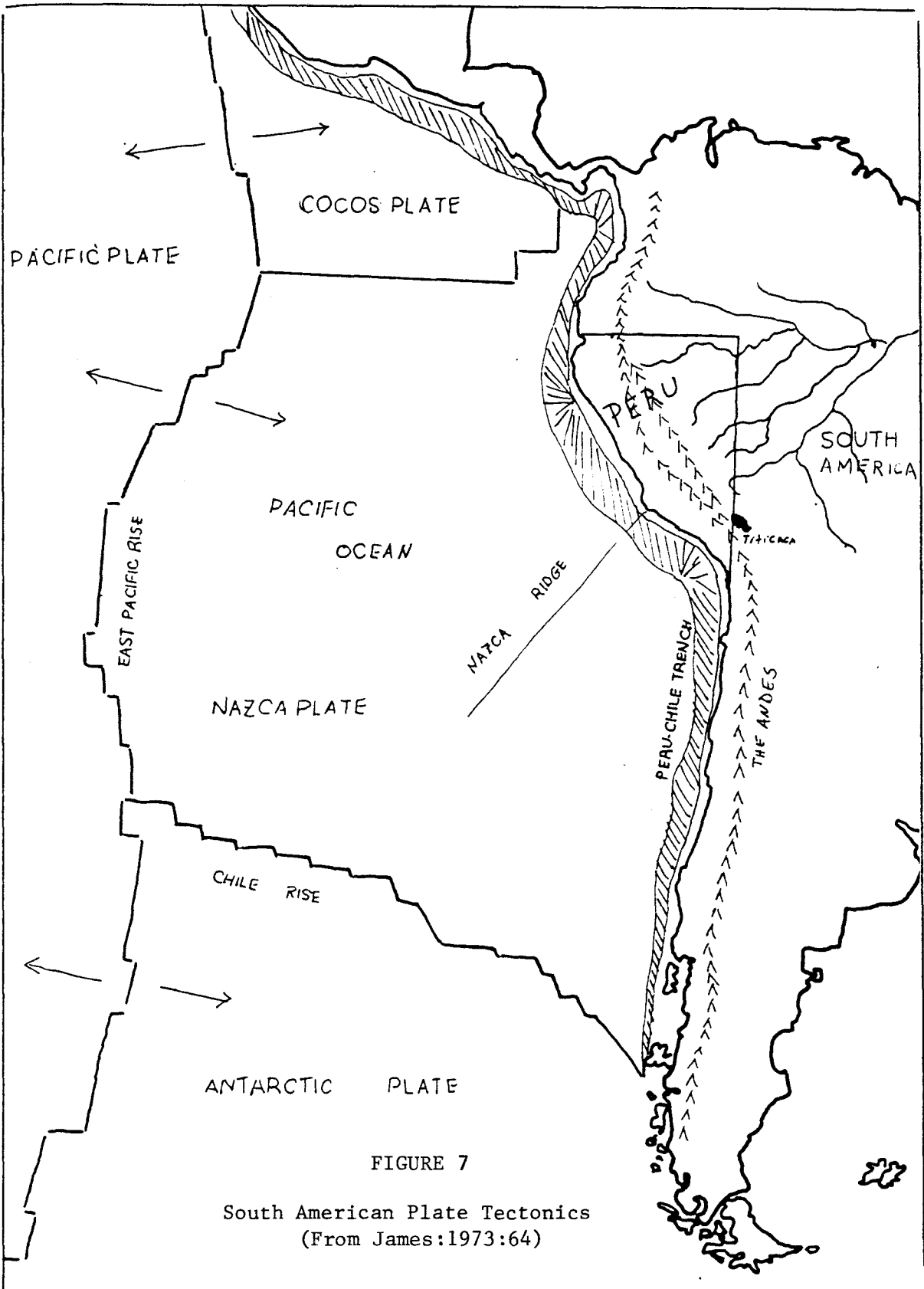


FIGURE 7

South American Plate Tectonics  
(From James:1973:64)

### Archaeological Evidence for Uplift and Lateral Shifting

Uplift is indicated by the recent formation (within the last 5,000 years) of beach ridges along the coast in the Moche area. Uplift has been interpreted archaeologically in a number of sites in the four valley (Chicama, Moche, Viru and Chao) area. The correlation of marine remains with early preceramic sites is one example which will be presented first. While evidence of uplift is fairly clear, preservation of lateral movement is less clear. Lateral movement is tentatively implied on Pampa Cacique, as will be discussed a little later.

### Earliest Known Sites - The Paijan Complex

The exploration of marine resources is associated with Paijan occupations such as the Paijan site of La Cumbre located in the Rio Seco of the Moche Valley (Figure 3), which yielded radiocarbon date of  $12,360 \pm 760$  years B.P. (Ossa:1973). At La Cumbre, although the site is only about 20 kms. from the sea, no fish remains were retrieved and one of the few Pleistocene megafauna found in the Moche Valley was found at La Cumbre. Today, La Cumbre is not associated with a littoral zone. The contradictions presented by this site - that a site close enough to the ocean to have been a fishing village was an apparent hunting site - can most probably be explained through changes in the sea level due to Pleistocene raising of the

sea level in the post-glacial millenia. Thus, the littoral fulcrum relevant to the site would have been submerged long ago, while in more recent millenia tectonic movement has uplifted the coast of Peru. James Richardson (1980) has interpreted bathymetric maps for this area and according to his interpretations, 10,000 years ago La Cumbre was probably 75-100 kms. inland. That La Cumbre was an apparent hunting site is not really a contradiction.

### Sea Level Changes

According to James Richardson (1980), during the post-glacial period of 15,000 to 5,000 B.P., ocean levels rose considerably, with various authors estimating rises ranging from 85 to 135 meters. This period of rising sea level was due to water released from Antarctic/Arctic and continental ice sheets. The Arctic ice sheet has remained stable for about 5,000 years, leaving the southern hemispheric sea level essentially unchanged. The substantial rise in sea level during this time span, which straddles early Paijan site complexes like La Cumbre, confirms the impression that the lack of marine resources at sites which are now near the sea is not a contradiction, and that these sites should be correlated with now submerged littoral zones. The enormous changes in sea level provide some insights into the lack of Pleistocene megafauna remains in the Moche Valley - they have been

washed away.

Richardson dramatizes the evidence for the submergence of coastal littoral zones during the millenia of sea level rise by employing bathymetric maps of the Peru-Chile continental margin and trench. Fifteen thousand years B.P., the oceanic depth of 100 meters would have been 100 kms. out to sea in the area of the Moche coastline. (Estimates of sea level rise range from 85 to 135 meters during the period 15,000 to 5,000 B.P.) Today, the oceanic depth of 100 meters is only 1/3 that distance out to sea.

At the same time the sea level was rising, the earth was not remaining stable; tectonic forces were still at work, and the earth was constantly lifting and shifting, although at a less appreciable rate than the sea level changes.

#### Environmental Changes After 3,000 B.C.

The environment of early hunter/fishers was not only changed by the rising sea levels and the influx of migrating sand dunes. That the sea rose faster than the earth for 10 millenia does not imply that the earth stood still for 10,000 years. The Moche Valley is largely composed of unconsolidated sediments; through wind and water erosion and the shifts of smaller blocks of bedrock along fault lines peculiar to sets of valleys on the northern Peru tectonic shear, small particles of sediments

became (and still become) subjected to the forces of nature and became redistributed throughout the valley or washed/blown out to sea by water or wind where they could be carried northward on the Peru current, deposited on whatever beach that was (is) exposed, and, via wind, reintroduced or introduced anew into a valley.

The uplifting of the earth, especially further upvalley, facilitates this process by creating an environment of sharp inclines, by constantly exposing new bedrock to the elements, and by fracturing blocks of bedrock even further. Because of the inclines created by uplift, unconsolidated sediments are moved rapidly out to the sea and the river erodes more easily in its efforts to establish a new state of equilibrium with the sea. This would apparently approximate the situation some 5,000 years ago when the sea stopped rising but the earth continued to lift. In the recent Holocene past (post 3,000 B.C.) the valley has been subject to a predominantly erosional regime. Any filling in of the valley has been due primarily to the introduction of sand. The earliest sands still extant are the yellow sands noted on page 52 which were introduced into the valley at some point after 15,000 years B.P. but prior to 5,000 B.P. The gray sands in the valley, dated archaeologically, are post 5,000 B.P. Thus, the Moche Valley is an active geological entity, with older sediments and fossil remains being washed away by flood

activity or buried by sand from uplifted surfaces, which in turn are subjected to erosion by wind and water.

#### Evidence for Changes Postdating 3,000 B.C.

Today, mollusks and marine remains found culturally on top of the beach bluffs and in situ on the beaches below in the Moche Valley have archaeological associations which all date to within the last 5,000 years. Since 5,000 B.P., marine remains and mollusks have been found in context with archaeological sites and with littoral zones, indicating approximately when the earth once again began to rise faster than the sea and the point at which the sea stopped rising appreciably.

The first shells which correlate archaeologically with sites on the wave-cut cliffs date to the cotton preceramic period. One such site is Alto Salaverry which has been C<sup>14</sup> dated as approximately 2,000-3,000 B.C. Alto Salaverry sits on yellow sands which are believed to be the oldest stratigraphically, entering the valley as aeolian sands between 15,000 and 5,000 B.P. With the uplifting of the beaches, formerly submerged surfaces were exposed to the action of trade winds which blew newly exposed sand northeast into the valley, filling in the valley floor in an aggradational regime which lasted until Gallinazo times.

The wave-cut cliffs represent the farthest inland point to which the sea has ever risen. The sands which

covered the newly raised beaches and which lay stratigraphically on top of the yellow sands are gray sands and archaeologically date to the period after 5,000 B.P. Today, northeasterly winds move sand dunes across the valley, creating a moving cadre of migrating sand dunes. Comparing air photos of the valley taken in 1942 and in 1969, dune movement has been calculated to as much as 1.5 to 2 kms. during this period.

#### Suspended Quebradas and Archaeological Sites

Another piece of evidence relevant to the dating of the wave-cut cliffs and epochs of tectonic movement lies in the many quebradas which cross the sea cliff perpendicularly, forming an east-west drainage pattern, but which do not grade down to the base of the cliff as gravity would dictate that a waterbearing channel should do. Instead, north and south of the fishing village of Huanchaco, which lies 15 kms. north of the Moche River, is a series of "suspended" quebradas. Dating of the sea cliff is more directly indicated by archaeological evidence here. South of Huanchaco lies the site of Gramalote which has been radiocarbon dated to approximately 3,500 B.P. (S. Pozorski:1976) (Figure 3). The site of Gramalote was cut through and partially washed out by one of these quebradas. However, the Chimu site of Calvario straddles a suspended quebrada and thus postdates the hanging valley phenomenon

which Gramalote predates. The two sites bracket a long period of uplift and cliff formation.

#### Archaeological Sites Along the Moche River

The Moche River, through its series of river terraces, provides another example of an erosional regime caused by uplift. In the post-5,000 B.P. period the erosional swing of the river has been largely southward (Figure 3); the same is true of all adjacent rivers which lie on the same tectonic shear and form a geological entity (this thesis, pages 30-33). Formative cultural remains tend to be scattered in the outskirts of the valley while later cultural remains, i.e., Chimu, tend to be very close to the present river course. Rather than concluding that the early inhabitants of the valley chose to live further away from the river, it would be more logical to consider the possibility that due to tectonic uplift and movement, the river has down cut and altered course, washing away evidence of early peoples living in the path of its southward swing.

#### Evidence for Earthquake at Pampa Cacique

The profile of the Moche River in the study area of Pampa Cacique reflects very clearly the effects of tectonic shifting. Figure 6 is an idealized diagram of the profile at N45°W and at N40°W. At a depth of 5 meters from the surface there is a clear break in the strata; one



geological level breaks course and cuts about 2 meters down to the east. The ceramics gathered below this level have been classified as early or formative. Above the level, the ceramic finds are also early (Salinaresque) despite deposition of about 4 meters and several intervening strata. Levels K679911-0=1, 2, and 3 are the references to these ceramics. (Further discussion is continued in a later section and in the appendix.) Looking at the pampa from the plan view (Figure 2), the geologists have identified a fault line directly above the profile break. The impression of tectonic uplift as the cause of the profile break is well-grounded in geological facts.

#### Lateral Shifting on Pampa Cacique

Again, looking at the Pampa in plan view, there is a series of three drains emptying into the river from an apparent source south of the pampa in the Cerros Ochupitur, Portachuelo and Banderas. While these drains may have all been active concurrently before identifiable occupation of the pampa, they also give the impression of sequential activity, or of having carried water at different periods in time. This impression is based on evidence from the archaeological features which they transect or which were built across the drains. The possibility of lateral tectonic movement is suggested since the drains follow fault lines.

Drain 1 (Figure 2) is that drain which once followed closely along the base of Cerro Blanco and is the westernmost drain on the Pampa Cacique. Dating of this drain cannot be exact since none of the archaeological features found in or near the drain pre-date it. Actually, this drain is of such antiquity that the major part of its course on the pampa has been obscured through time and filled in by aeolian sands. (Alternatively, there is a possibility that this is a fault line, not a drain at all.) However, at the base of Co. Blanco there is a Moche walled road from which no sherds were taken and so has no ceramic provenience reference cited in the thesis. Brick analyses of several test cuts supervised by other PRA archaeologists indicated that the bricks fell within the range for size and markings of other Moche IV bricks within the valley.

Also located near drain 1 is a Salinar wall with possible Moche IV reconstructions (Proveniences K89A-5, -42, -46, -45). Dated by ceramic analysis and adobe size, this wall lies roughly perpendicular to the Moche walled road on a NE/SW axis. As indicated in Figure 2, the western edge of Pampa Cacique has been terraced through subsequent periods of erosional activity. Both terraces are transected by the Moche IV walled road but the Salinar wall lies on the lower terrace only. Field analysis of the Salinar adobes revealed extensive water washing. The Salinar wall, at least what remains of it, lies between

drains 1 and 2 and was possibly washed by the second drainage at least during one episode of water activity.

Overlooking drain 2 for the moment, we might consider the easternmost drain, drain 3 in Figure 2, which consists of two main branches, the oldest which cuts along the base of Cerro Arena, and the more recently active which forms a wide-mouthed Y, emptying into the river, fracturing and churning river silts into bits. Drain 3 may be another fault. Archaeological features associated with drain 3 are many. Long linear features are of special interest here. Most of the canal systems on Pampa Cacique access the eastern valley by crossing the tip of Co. Arena at a natural pass, one of four such passes through which crossed canals and roads at least from Salinar times until Chimu occupation.

Along the banks of drain 3 east are found two Gallinazo cemeteries. Both cemeteries are in exposed drain cuts, above the floor of the drain, and have been turned out by erosional activity. Drain 3 west cuts all line features on the pampa, including the Chimu road identified by Colleen Beck (1979) and the four canal systems and their reconstructions identified by Michael Moseley.

If we imagine the drainage activity on the pampa to be sequential, drain 2 apparently carried water prior to drain 3. One large canal and its reconstructions are present in the drain 2 area. Nicknamed the Great Trench

because of its incredible depth and width, its relationship with the drains indicate that in its first state of construction it was operational at least by Gallinazo times, was washed out at least once by drain 2, and later reconstructed, although these reconstructions were not effected by water activity in drain 2. What appear to be possible extensions of the Great Trench as it neared Co. Arena were washed out by drain 3.

The Great Trench itself also provides evidence of tectonic uplift as well as later shifting. It runs at a slightly upgraded angle as it crosses the natural pass between Cos. Chico and Portachuelo, before dropping from an altitude of 83 meters above sea level at the pass to 73 meters in the center of the pampa. The trench is believed to be an irrigation canal because silt deposits were taken in auger samples at depths of 2 to 3 meters. The upward incline of the canal may reflect both tectonic uplift and deflating surfaces on the pampa.

Geologists have identified a fault line on Pampa Cacique, directly above the profile break in the river strata. Three drains on the Pampa appear to have carried water sequentially; periods of water activity have been bracketed through the dating of archaeological features. Drain 1 was active before the Salinar period. Drain 2 cuts through Gallinazo features, most notably the Great Trench. Drain 3 cuts all linear features on the pampa,

dating from Gallinazo to Chimu occupations, and therefore is presumed to be the most recently active drain of the three. Geological and archaeological evidence, taken in conjunction, point to later movement as the most logical explanation of drainage shifts on Pampa Cacique. The drainage shifts have altered the archaeological environment - sites have been exposed which would otherwise have remained buried by sands (the Gallinazo Cemeteries); other features have been destroyed and reconstructed (the canals), testifying to trauma during prehistoric times.

#### EL NINO

The occasional appearance of excessively warm water off the coast of Peru is referred to as El Nino. . . El Nino is a profound natural event; it is a manifestation of changes in the ocean-atmosphere system over the entire equatorial Pacific Ocean and probably beyond (Wyrтки et al.: 1976:343).

All significant coastal rains are products of nino conditions, yet not all ninos produce rains. All ninos, however, are associated with marine disturbances. Ninos are said to occur when the trade winds diminish or stop, when upwelling of cool currents ceases, and when the sea and air warm to unusual temperatures (Nial et al.:1979:5).

The occurrence of el nino corresponds with the southern hemispheric summer.

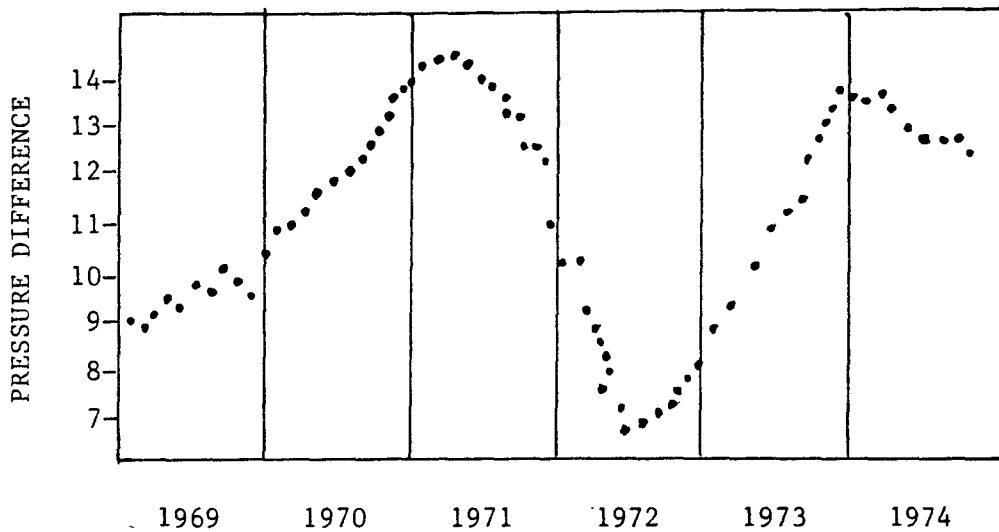
The causes of el nino are presently under investigation. However, Wyrтки et al. believe that the occurrence of el nino is linked to the "southern oscillation."

The southern oscillation . . . is loosely defined . . . as a fluctuation in the intensity of the intertropical general atmospheric and hydrospheric

circulation over the Indo-Pacific region, the fluctuation being dominated by an exchange of air between the southeast Pacific subtropical high and the Indonesian equatorial low. The difference in sea level atmospheric pressure between Easter Island, representing the South Pacific subtropical high, and Darwin, Australia, representing the Indonesian equatorial low, is used as an index to represent the southern oscillation because pressure measured at the two stations usually oscillate in opposition (Wyrcki et al.:1976:343).

A diagram taken from Wyrcki (Figure 8) illustrates the southern oscillatory conditions which precede el nino. In the approximately 12 months before the occurrence of el nino, the mean difference in the atmospheric pressure between the Easter Islands and Darwin, Australia, will reach a very high peak, followed by a gradual decrease in pressure differentiation until, within about a one year period, an extreme low is reached and el nino occurs.

What this means in less scientific terms and more easily observable by the people living along the coast of Peru, is that the upwelling of the cold Peru current decreases or almost ceases, thereby allowing warming currents from Ecuador to push southward, raising ocean temperatures; also, the trade winds become much weaker, or stop altogether, allowing the air to warm as the sea becomes warmer. The result is rain on the coastal desert. The intensity of the rain varies as will the intensity of the catastrophic effects. The most intense ninos result in rainfall, flooding, the disappearance of the coastal fish stock, and the death of the birds which depend on the fish



Southern oscillation index for 1969-74 in relation to the 1972-73 El Nino and the 1975 prediction. The index is given by the 12-month running mean of the difference of atmospheric pressure between the Easter Islands and Darwin, Australia (Wyrтки et al.:1976:344).

FIGURE 8

for food. The weaker ninos have little or no effect on rainfall or river discharge.

### The Chimu Nino

The largest flood identified to date in pre-hispanic times occurred about 1100 A.D. when the Chimu people occupied the Moche Valley. The Chimu occupied the valley from about 800 A.D. until the mid-15th century when they were conquered by the Inca. The valleys of southern La Libertad were the focus of the Kingdom of Chimor, and Chan Chan, in the Moche Valley, was its capital city (Moseley:1978).

Throughout the centuries of their kingdom, the Chimu were involved in reclaiming the desert of the Moche Valley through irrigation projects. So great were their engineering skills that nearly the entire north side of the valley was irrigated and a network of intervalley canals was attempted to bring together into one system valleys to the north and to the south of Moche. The La Cumbre canal, connecting the Chicama and Moche Valleys, which had a length of over 80 kms., is one such example. However, sometime during the early to middle period of the Chimu Kingdom, a natural disaster struck the Moche Valley. Nino rains and the flooding which they brought with them washed away canals and clogged the remaining trenches with flood wash. Within days a life support system was washed away.



The Chimu attempted to reconstruct their irrigation system; even the La Cumbre intervalley canal was rebuilt. But today the reconstructions show little or no evidence of use. Eventually, by the mid to late kingdom, canals were crosscut by walls or blocked by structures incompatible with agriculture. The scope of Chimu reclamation had been greatly reduced and no land reclamation project since has reached such a peak (Nials, et al.: 1979).

A truly cataclysmic event had taken place eight centuries ago in the Moche Valley. That event involved enormous amounts of water. In historic times, the greatest natural cataclysm involving water occurred in 1925 when the valley was again struck by el nino. We know that ninos are recurrent events and we know that they have recurred periodically since the Spanish occupation of Peru. The Chimu flood was the first nino to be identified in the millenia before the Spanish occupation. That it was the biggest in the last eight centuries is testified to by the fact that the erosion in the original Chimu canals was much greater than in any canal reconstructions or in most subsequent architecture.

Evidence of flooding is easily identified within an irrigation system. Canals which were in use at the time of a flood would most probably be blocked and destroyed by alluvial deposits whereas those which were eroded and worn through time and lack of use before the flood would be

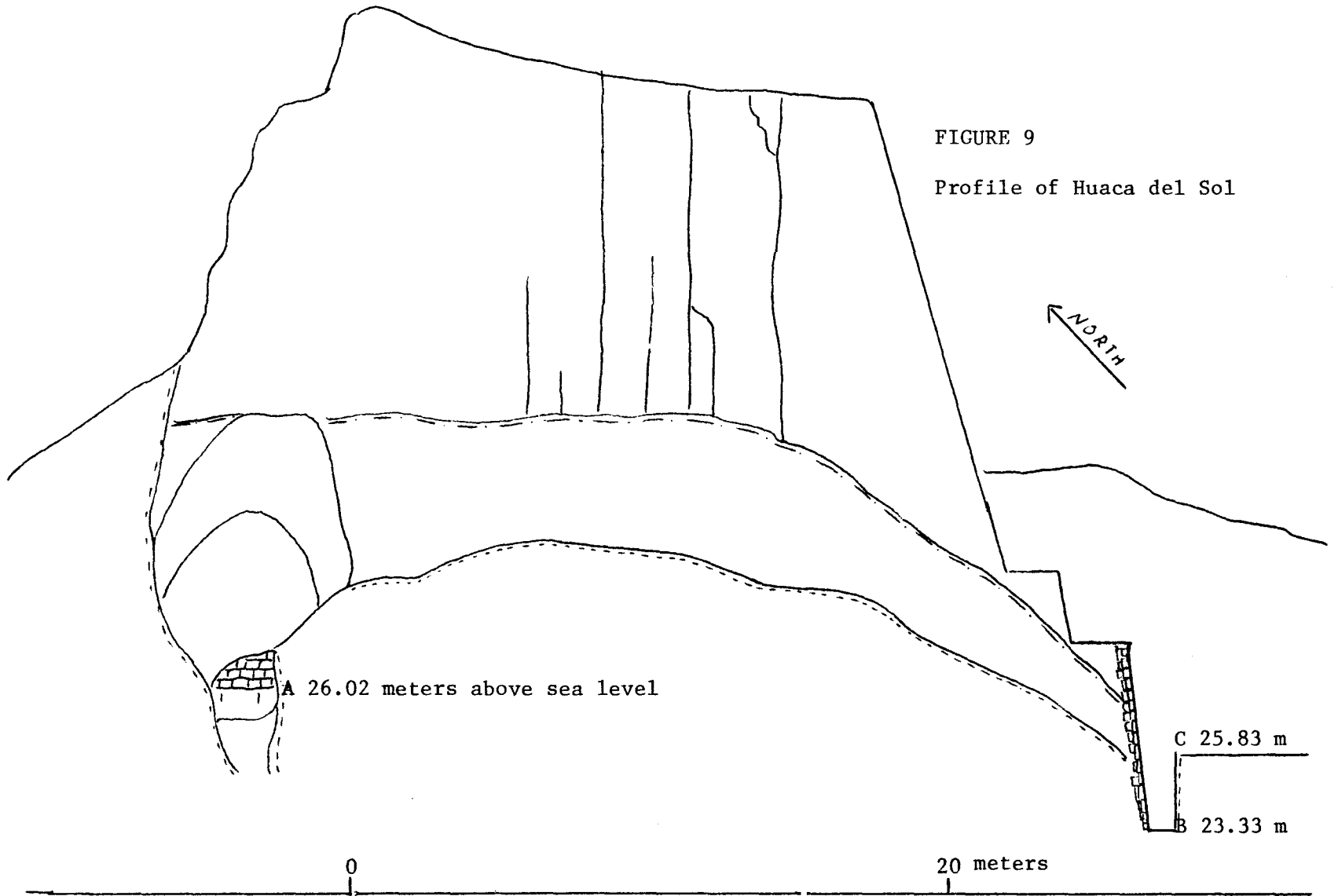
filled with local wind-blown sediments, in this case sand, before finally being clogged with alluvial deposits. Such is the case with the early Chimu canals and the later reconstructions which were hardly used.

### The Moche Nino

The Huacas Sol and Luna are located on the Pampa San Juan, on the western edge of Co. Blanco and on the south side of the river (Figure 3). The two huacas dominate the settlement of Moche which spans the pampa and was apparently both a ceremonial and habitational center in antiquity. Construction of the huacas began early in the Moche period, during Moche II and they were subsequently added to and rebuilt through the Moche IV period. This marked the beginning of Moche monumental architecture in the Moche Valley although earlier communities during Moche I and II existed on Pampa San Juan (T. Topic:1978). Some time before the last phase of construction the valley was apparently subjected to a cycle of massive erosion. The profile shown in Figure 9 shows the western face of Huaca del Sol. Point A shows the pre-erosional construction; point B shows the post-erosional ground level and greatest depth at which adobes were found. The difference in depth between points A & B is approximately 4 meters. Below point A, no adobes were found, only silt. Since the presumably last phase of construction, that level

FIGURE 9

Profile of Huaca del Sol



represented by point B, the pampa has filled in with aeolian sands to level C, the present found level today. Although the exact source of the flood water which washed away the base of Huaca del Sol is uncertain, the water itself is the result of el nino, just as the water carried in the drains on Pampa Cacique can only be the result of el nino.

## CHAPTER IV

### A DOMESTIC CERAMIC TYPOLOGY FOR THE NORTH COAST

#### INTRODUCTION

Cultural remains were laid down in an environmental context. Without consideration of the environmental framework, the distribution of ceramics really does not tell the archaeologist much about the settlement pattern of the culture under study. This is especially true on the north coast of Peru where the cultural record has periodically been disrupted by environmental cataclysms. The ceramics on Pampa Cacique and those retrieved from the river profile were considered within an environmental framework with dating of environmental phenomena dependent upon ceramic interpretations. Most of the ceramics taken from these two locations were "domestic" ceramics, i.e., those used for daily needs rather than as funerary ware or elite ware. Existing ceramic typologies for the north coast of Peru have typically been based upon an analysis of funerary or elite ware. Working with existing typologies, this thesis attempts to reconcile pampa and profile ceramics with fine wares studied at other sites.

### Three Approaches to Ceramic Typologies

A survey of the literature would lead one to believe that ceramic typologies can be done in three possible ways. Either attributes are arranged into types arbitrarily; or they are arranged into types based on the cultural behavior implied in the ceramics; or they are arranged into types which reflect groupings intended by the ancient artisans.

According to J. A. Ford, the latter approach is highly questionable.

It derives from the notion that there is a basic order in these phenomena, and the scientist's duty is to search for and discover this order. This was the viewpoint of the "natural sciences" in the nineteenth century. It fails to recognize that the apparent order has been imposed on the material either by chance circumstances or, more commonly, by the classifier himself. In actuality, the same group of archaeological material may be classified in an almost unlimited number of ways, each equally valid from an empirical point of view (Ford:1949:38).

In the debate over what constitutes a type or a variety, the test of reality is the extent to which a type can be described in terms of behavior. Concerning the second approach, Phillip Phillips does not believe "that potsherds are going to tell us very much about cultural and social behavior" (Phillips:1970:23). So the archaeologist might as well not concern himself over the probability that his types and varieties are arbitrary in this sense.

"The essential nature of the type-variety approach to classification is to summarize the variability in the data, often relating it to a single cause: chronological change"

(Redman:1978:160). Because many micropatterns of variation are lost through this arbitrary approach, Redman sees two central questions as being posed:

Is there a natural typological system inherent in the artifact collection, composed of types with historical integrity, that can be discovered?

Is it possible for the researcher to determine deductively the precise attributes that are relative to a proposed study in order to make them the focus of the analytical system? (Redman:1978:161)

While I agree that the essential nature of the type-variety approach to classification is to summarize variability in terms of a single cause, change, I would answer no to the second central question posed by Redman. Clearly there is a natural typological system inherent to an artifact collection; it is this natural system that enables us to identify the work of a single culture. Whether or not the natural system can be discovered would depend on the completeness of the artifact sample under study, and the archaeological and environmental milieu from which they were retrieved. In terms of the pampa and profile ceramics used in this study, the archaeological environment has been radically altered by climatic and geological phenomenon. What is left to be studied is limited and discovery of a natural typological system is unlikely. Thus, an arbitrary system of physical attributes easily observable and not dependent upon archaeological context or function has been chosen. A description of

these attributes will follow shortly.

As to the second question posed by Redman, the selection of precise attributes most relevant to a particular study and therefore the focus of an analytical system implies a preceptive manipulation of data - picking and choosing among attributes to answer questions is dependent on the typologist's theory of what he/she wants to find and how he/she wants to find it.

The domestic typology presented herein has made no attempt to deduce cultural/social behavior since these ceramics were not retrieved from features interpretable in terms of daily cultural/social behavior. The key attributes selected were those which could be evaluated and compared throughout the entire universe of sherds collected. These attributes were selected because they reflected the technology employed and can be compared from specimen to specimen and were observable and quantifiable. Technology reflects cultural behavior, but it is definable rather than elusive or implied and dependent on the archaeologist's interpretation of reality rather than the artisan's. Typological attributes are discussed more thoroughly on pages 73-74.

#### A Ceramic Time Scale

Many of the assumptions which Ford applied to the Viru Valley ceramics when establishing a cultural time



scale (1949:38-39) would also apply to the Moche Valley. Specifically,

- that during any one time period cultural features within the valley were essentially the same all over the valley:
- that with the passage of time marked changes of style occurred in all areas of a culture;
- that normally, cultural change will have taken place gradually, probably gradually enough that the artisans making the artifacts believed that they were making them as their fathers and grandfathers did; the new ideas which were most readily accepted probably were not entirely new or strange. The ceramics collected for this study were primarily domestic ware. The change reflected in the sample was very slow indeed. For example, the Salinaresque ceramics taken from proveniences K679911-0=2 and 3 (Figure 7 and Table I), while apparently Salinar in overall construction and in their stratigraphic relations, do bear decorations, especially incised rims, which resemble later Gallinazo rims. The ceramics must be viewed on a grand time scale to be securely identified, i.e., observed at 500 year intervals. The assumption is made that domestic ceramics will change much

more slowly than will elite goods; that elite goods are most susceptible to the latest trends since the elite are more likely to desire/require avant garde goods and since a power exists, in part, to implement change. In Peru, according to Theresa Topic (1977), different classes of ceramics change at different rates in response to very different pressures;

- that within any one cultural time period several stylistic norms will exist side by side, thus allowing the pottery to vary about the several norms such as jar, ollas, bowls, etc. or decorative norms.

#### The Moche Valley Domestic Sherd Typology: Theoretical Perspective

The typology for the domestic ceramics gathered from the profile of the Moche River and adjacent areas of Pampa Cacique attempts to tell the story, or part of it, of cultural change on the level of the common person. Largely excluded from this sample were ceramics made for the elite or fine wares. Technological change was primarily slow and gradual with the exception of the transition from Moche red wares to Chimu black wares. However, during the Chimu period the red/black technologies existed side by side. Prior to this the paste colors had gradual changes from brown to red to black, reflecting a gradual change in

firing techniques, over a period of 1,000 years.

In utilizing analytical procedures set forth by David Clarke (1968:71), attributes were divided into three categories: inessential, essential and key attributes.

Inessential attributes are those that do not vary significantly in the collection under study. Since variability either over space, temporal division, or in differing contexts is the source of archaeological knowledge, inessential attributes carry little perceptible information for the particular study . . . Essential attributes are those whose values are found to vary with respect to at least one interpretative dimension of the assemblage. Essential attributes form the basic elements of the subsequent typological and distributional analysis. Key attributes are groups of two or more essential attributes that are found to covary within the assemblage being investigated (Redman:1978:163).

The key attributes for this typology were paste color (interior not surface), sherd thickness, and quantity of temper (with few exceptions, type of tempering used was uniform). How these attributes covaried with each other was the basis of types and varieties. Other essential attributes noted were the amount of weathering on each sherd, decoration, and surface color treatment. These essential attributes do not covary with the essential attributes designated as key. Decoration and surface color/treatment were randomly distributed throughout the sample; weathering was related to environmental forces which differentially acted upon the various proveniences.

The method by which attributes were divided into types and varieties is as follows. Primarily, types were

differentiated according to paste color and sherd thickness, as described in Table II. Each type was further subdivided into varieties based on the quality and quantity of temper used. The quality of temper was judged by eye to be fine, medium or coarse. Variety 1 sherds had fine temper, variety 2 sherds had medium temper and variety 3 sherds had coarse temper. Surface color and treatment did not form the basis for differentiation of varieties since surface treatment seemed to be equally mixed through each sample regardless of thickness, temper or paste color.

The ceramic typology devised for this thesis makes absolutely no attempt to attribute specific behavioral attributes to any sherd or group of sherds. However, guesses have been made as to possible form intended by the ancient craftsmen, though no discussion of functional relationships is included. As a whole, the collection did not warrant functional analysis since some of the proveniences were not in their original cultural context. Nor was the typology approached with the perspective that an inherent order existed which could be discovered.

Many of the profile proveniences were not in situ. This assumption is made because of extensive weathering of the sherds and because of the general lack of other cultural refuse, i.e., bone and charcoal. The exceptions to this overall statement are K679911-0=2 and 3 (Salinar-like refuse) and K89A-7 (Gallinazo-like refuse).

CRITERIA FOR DIFFERENTIATING  
BETWEEN TYPES

TYPE 1:	Paste (core): brown, reddish brown Thickness: thin, 3-5 mm
TYPE 2:	Paste: brown, reddish brown Thickness: medium, 5-8 mm
TYPE 3:	Paste: brown, reddish brown Thickness: thick, 8 <sup>+</sup> mm
TYPE 4:	Paste: black, gray Thickness: 3-5 mm
TYPE 5:	Paste: black, gray Thickness: 5-8 mm
TYPE 6:	Paste: black, gray Thickness: 8 <sup>+</sup> mm
TYPE 7:	Paste: red Thickness: 3-5 mm
TYPE 8:	Paste: red Thickness: 5-8 mm
TYPE 9:	Paste: red Thickness: 8 <sup>+</sup> mm
TYPE 10:	Paste: orange, yellow Thickness: 3-5 mm
TYPE 11:	Paste: orange, yellow Thickness: 5-8 mm
TYPE 12:	Paste: orange, yellow Thickness: 8 <sup>+</sup> mm

The quality of temper was judged by eye to be fine, medium or coarse. Quantity and quality of temper formed the basis for differentiating varieties within types. Surface color and treatment did not form the basis for differentiation of varieties.

Even the Salinaresque sherds are weathered but due to the bone refuse accompanying them it is believed that they have not been transported far from the original site of deposition.

The typology utilized in this report was based upon core paste color, sherd thickness and temper. No unique types or varieties were created especially to accommodate possible fine wares; the key attributes which covaried with essential attributes to differentiate between varieties within a given type were surface treatment - paste color, primarily. Very few fineware sherds were encountered. A description of types and varieties, and the criteria for inclusion in each, is outlined in Appendix I.

Identification of Salinar-like ceramics was based upon Brennan's description of the Cerro Arena Salinar (1978). Identification of Gallinazo-like ceramics was based on Bennett's description of the Viru Valley Gallinazo (1950). Based upon Theresa Topic's (1979) and Gath Bawden's (1978) analyses of Mochica ceramics, it was determined that very little Moche material was mixed with earlier or later horizons. Keatinge's description of Chimu ceramics provided guidelines for identification of Chimu in the river profile.

## SALINAR

Previous Definitions of Salinar

The Salinar cultural phase was one of incipient urbanism on the North Coast of Peru. Distribution of Salinar sites within the Moche Valley demonstrates a hierarchy in size and elaboration of the sites, with the site at Cerro Arena being the largest. According to Curtiss Brennan (1978), this distribution of sites was designed to control their irrigation network and communication routes within the valley as well as access from without.

Brennan defined the Salinar ceramics gathered from a large, nucleated, residential site situated on the top of Cerro Arena. The extensive fineware assemblage described by Brennan emphasized highly burnished, but otherwise undecorated, black, brown or red bowls, and red burnished bottles. These finewares were most often thin wares. Cerro Arena utility or domestic ceramics emphasized white slipped red wares resembling the Puerto Moorin assemblage from the Viru Valley. The Puerto Moorin ceramics were first described by James Ford (1948) as white-on-red wares or brick red wares slipped white. Ford noted burnishing and incision as a common means of decoration. Brennan roughly compared his Cerro Arena Salinar utility wares with Ford's Puerto Moorin ceramics. However, there is a difference in the interpretation of burnishing as a charac-

teristic of fineware (Co. Arena) or as a characteristic of domestic ware (Puerto Moorin). Also, Brennan stated that that true incision, the cutting of lines into wet clay, was uncommon at Cerro Arena, but was apparently more frequent at Puerto Moorin. The criteria discussed by Brennan for differentiating between fine and utility wares were followed in this thesis.

Brennan based his fineware/utility ware distinction upon differences in sherd thickness, past texture and surface treatment. In general, all Brennan's vessels were well-manufactured in smoothly executed, symmetrical forms; uniformly mixed paste; and thoroughly, if often irregularly, fired. Temper consisted of small to moderate amounts of fine-grained sand.

Salinar-like ceramics were retrieved from the strata survey along the river profile at Pampa Cacique and from selected excavation of features on the Pampa itself. Following is a description of the sample and an analysis of the finds.

#### Salinar-like Sherds From the River Profile

The ceramics retrieved from the river profile are those taken from the K90 and K679911-0 proveniences. A summary of finding from each level is provided in Table III.



PAMPA SITES	VERNACULAR SITE DESCRIPTION	COLLECTION NUMBER	CONTEXT	CULTURAL ASSIGNATION	QUANTITY OF SHERDS IN KILOS
Excavation	Salinar Wall	K89A-5	In situ	Salinar	15½ - bodies 3 - diagnostic/rim
Excavation	Salinar Wall	K89A-40	In situ	Salinar	¼ - diagnostic/rim 3 - bodies
Excavation	Salinar Wall	K89A-41	In situ	Salinar	3/5 - diagnostic/rim
Excavation	Salinar Wall	K89A-42	In situ	Salinar	1½ - bodies 2/5 - diagnostic/rim
Excavation	Salinar Wall	K89A-46	In situ	Salinar	3/4 - bodies 1/8 - diagnostic/rim
RIVER PROFILE SITES					
Strata Survey	Pollen Column	K679911-0=1	Derived	Salinar	545 gr - bodies 60 gr - diag./rim
Strata Survey	50 meters west of Pollen Column	K679911-0=2 K90-1W=1	In situ	Salinar	16 - bodies 1 7/8 - diag/rim
Strata Survey	50 meters west of Pollen Column	K679911-0=3 K90-1W=2	In situ	Salinar	8 - bodies 1 1/8 - diag./rim
Strata Survey	Below K679911-0=1	K90-1E=1	In situ	Salinar	50 gr - bodies 65 gr - diag./rim
Strata Survey	Gallinazo Point	Gallinazo Refuse K91	In situ	Gallinazo	19 - bodies 2 2/3 - diag./rim
Excavation	Gallinazo Point	Gallinazo Refuse K89A-7=5	In situ	Gallinazo	9 2/3 - bodies 1 1/3 diag./rim
Excavation	Gallinazo Point	Gallinazo Refuse K89A-7=4	In situ	Gallinazo with Moche	19½ - bodies 1 1/3 - diag./rim
Strata Survey	Profile Buttes	K89A-10	In situ	Chimu with Moche	

TABLE III

The K679911-0 specimens were retrieved in 1977-78 from stratified fluvial deposits found in a shallow river cut basin. A profile of the basin strata is found in Figure 7. Of particular interest are levels K679911-0=1, 2, and 3. These levels lay on either side of the pollen column. The -0=1 sample, which was slightly east (less than 50 meters) of the pollen column, and at a depth of 6.9 meters above the surface, is not believed to be in situ because of the high degree of weathering on all the sherds and because of the lack of other cultural refuse found in context with the sherds. Fifty to 100 meters west of the pollen column, at a depth of 12 meters above sea level, lay level K679911-0=3 and, immediately below it, K679911-0=2. These two levels are believed to be in situ based on cultural debris found in conjunction with the ceramics - bone and shell - and on the overall lack of weathering.

Corresponding to the K679911-0 proveniences, but collected from strata survey in 1979 rather than in 1977-78 are provenienced K90-1E=1 (corresponding to K679911-0=1) and K90-1W=1 and 2 (corresponding to K679911-0=2 and 3). From these levels, the weight of diagnostic sherds retrieved totalled 4½ kilos. Table III provides a comparison of the total weight of sherds retrieved as compared with diagnostic sherds.

No carbon was taken from which a radiocarbon data could be derived for any of these levels, but similarities

in the ceramics from both sides of the pollen column indicate that all proveniences were once part of the same site. The pollen column is an arbitrary division between the proveniences. However, the profile strata break discussed earlier in this paper, also intervenes between K67991-0=1, K90-1E=1 and K67991-0=2, 3, K90-1W=1 and 2. These two groups of proveniences lay at a horizontal distance from each other of between 50 to 100 meters, and at a vertical distance of 5 meters. East of the profile break, the strata dip sharply (Figure 7). Earlier, this strata break was presented as evidence of tectonic shifting, with a possible north/south fault line cutting the Pampa directly above the strata break (Figure 2). If the entire course of drain 1 were still visible today, it would probably empty very close to the strata break in the river profile. With this evidence and the existence of two sherd universes, existing at a great vertical distance from each other, but being composed of the same type of ceramics, a strong argument can be made for a period of strong tectonic activity during or shortly after the Salinar occupation of the valley.

Overlying and sealing the strata containing the K67991-0=2, 3, and K90-1W=1, 2 proveniences may indicate a dino flood shortly thereafter, especially if these silts could be correlated with water damage done to Salinar features  $\frac{1}{2}$  kms. southwest of the profile on Pampa Cacique,

which will be discussed next.

### Salinar on the Pampa

About  $\frac{1}{2}$  kms. south of the river, test pits were placed in and around a Salinar wall (Figure 2) during excavations in 1979. Provenience numbers K89A-5, 40, 41, 42 and 46 identify the 25 kilos of ceramics retrieved from this wall. In all the K89A wall series consisted of 21 levels, not all of which yielded diagnostic sherds. Table II compares the proportion of diagnostic and non-diagnostic ceramics taken. The K89A diagnostic ceramics were almost identical to those Salinaresque ceramics taken from the river profile. Characteristics of the entire Salinar series will be discussed on pages 83-85.

This Salinar wall was well wetted during a period of flood activity; the adobes were melted and the wall is packed in wetted sands. If the extensive water damage done to the Salinar wall could be correlated with the silts overlaying the Salinaresque sherds in the river profile, it would be possible to tie together the lateral stratigraphy of the pampa and identify at least one major nino during the Salinar period or shortly thereafter.

### A Description of the Salinar Ceramics

The most notable characteristic of the Salinar or Salinaresque collections from the river profile and the pampa is the high proportion of neckless ollas found.

Brennan, Ford and Bennett all believe that the neckless olla is primarily a pre-Gallinazo phenomenon although it is found through the subsequent ceramic assemblages in the Moche Valley, but in small quantities. Other identifiable vessel forms occurring frequently were heavy flare neck jar rims and lipped, open bowls or jars. For all proveniences, rim forms and their frequencies in selected proveniences are reproduced in Appendix I. Later sherd contamination of the Salinar wall sample yielded some rims that may have been straight neck jars and one possible cambered neck. Decoration on these specimens included applique adornos and jars and ollas with appliques, notched ridges below the vessel edge. For all proveniences, decorated sherds are illustrated in Appendix II. Paste color was predominantly a shade of red, ranging from light red to reddish brown; the occasional brown ware was also found. In general, the entire sample was well-fired, if somewhat irregularly fired. From the Salinar wall about 1/3 of the sample was irregularly fired, while about 1/2 of the profile sherds were irregularly fired. The criterion used for identifying irregular firing was the variation between core paste color and surface paste color (when the surface had not been intentionally colored).

Brennan used burnishing or high polishing of black, brown or red wares as a criterion for inclusion in the fine ware category. A small number of red, brown and black

wares from the pollen column were burnished to a moderate degree. Because of the small number of burnished sherds in comparison with the collection size, no fine ware types were differentiated. Like the Cerro Arena domestic ceramics, these ceramics tended to be moderately thick. The Cerro Arena ceramics were oxidized wares, tempered with small to moderate amounts of fine-grained sand. The majority of walls and profile sherds would also conform to this standard. Many of the wall and profile sherds showed interior finger and wipe marks. Thomas Pozorski (1976) believe this is typical of early period ceramics.

The white slip described by Brennan at Cerro Arena and Ford at Puerto Moorin is lacking in the wall and profile samples. The general absence of white slip, though, is not really of consequence since this could be a result of differential preservation and weathering. Rim styles from the wall and profile are also reminiscent of the Cerro Arena rims. The occurrence of the flanged, applique rims is reminiscent of Gallinazo period ceramics, when this mode of design became very popular; however, the motifs are not especially Gallinazoesque. For this reason, the possibility exists that the collection is transational Salinar-Gallinazo. As was mentioned on page 71 of this thesis, domestic ceramic change will be slow, and those forms which most closely resemble familiar ceramic forms will be most readily accepted and incorporated into a new

art style. Thus, we would not expect to find an abrupt, radical change in Salinar to Gallinazo ceramics, but this sort of gradual transition possibly represented by the wall and profile ceramics.

#### Summary of Salinar Ceramics

The Salinaresque ceramics retrieved from the river profile or from pampa excavations very closely resemble those described by Curtiss Brennan at Cerro Arena and by J. Ford at Puerto Moorin. The great majority were oxidized wares, of medium thickness and tempered with fine-grained sand. Adornos and notched rim ridges were the most common means of decoration and in this respect they resemble slightly later Gallinazo ceramics. Both the wall ceramics and the profile ceramics were found in context with large amounts of silt which overlay the feature/stratigraphic level under observation. These silts possibly tie together the lateral stratigraphy of the pampa and data a major period of flooding in late Salinar times. Prior to this period of flooding, the study area was also subjected to an epoch of tectonic movement. A break in the profile strata lends the impression of tectonic movement; the juxtaposition of cultural horizons confirms this impression.

## GALLINAZO

Previous Definitions of Gallinazo

Wendell Bennett (1959) divided the Viru Valley Gallinazo culture into three phases. During the earliest phase, Gallinazo I, there was little evidence of a strong corporate state structure or of strong religious activity. Artistically, the typically decorated pot was incised or punched; and many of the Salinar types from Puerto Moorin were either copied or obtained through trade. In the preceding discussion of the decorated sherds from the Salinaresque levels in the Moche River profile, the possibility was presented that these profile sherds may represent a transitional Salinar/Gallinazo collection. That the transition from Salinar to Gallinazo was gradual and only perceptible from a historical perspective would apparently be supported by Bennett's data. Bennett found very few Gallinazo I finewares.

Through agricultural implication, i.e., field remnants, Bennett believed that during the Gallinazo II phase, large scale agricultural projects were maintained. Adequate political organization is implied in order to control a sizeable population and to maintain large agricultural



projects. However, habitations and burials did not suggest marked social distinctions. This, however, may be a result of the fact that major sites have been eroded away and minor sites would not typically show marked distinctions.

On Pampa Cacique, the "Great Trench" was identified as a Gallinazo construction originally. This identification was achieved through lateral stratigraphy utilizing both geological and archaeological features (pages 55-57). Although the Viru Valley project did not actually find canals which could be definitively dated archaeologically to Gallinazo times, widespread fields provided secondary evidence for early irrigation. The evidence for the Great Trench as an irrigation canal was primary - silt in the channel itself and cultural/geological context. Bennett's work provides additional support for this dating since cultural development in the two valleys was simultaneous.

In the Gallinazo II ceramics, collared jars predominated. Although many vessels were plain, the typical mode of decoration was through negative painting and small adornos. Although negative painting was absent in the Gallinazo Point ceramics from the Moche River profile (located about 3 kms. upstream from the pollen column, Figure 2), collared jars and handles were numerous, as were sherds decorated by incision, punctation and adornos. In the Viru Valley, as at Gallinazo Point, clay trumpets and modelled figurines were common.

By Gallinazo III phase, Bennett believed outside influences had begun to manifest themselves in Gallinazo ceramics and social structure and that these influences were from the Mochica on the north and the Recuay culture on the south. The Mochica influence was shown in the presence of large pyramids; the Recuay influence was manifested in stone-lined box tombs. Dwellings were differentiated according to size and location, suggesting class distinctions. Ceramic forms and decorations remained essentially the same, but with a greater emphasis on modelling and the introduction of the stirrup spout.

#### Gallinazo Point Ceramics

About 3 kms. upstream from the pollen column is another in situ site - a Gallinazo site - located at an altitude of  $\pm 10$  meters above the present surface level (Figure 10). This site was designated as in situ because the ceramics recovered from it were not weathered and because they were found in context with both bone and shell refuse.

The 54 kilos of sherds taken from this site are designated as proveniences K90-1 and K89A-7=4 and 5. The K91 sherds were retrieved through strata survey of the profile while the K89A-7 sherds were retrieved through test pit excavation 5 meters from the profile; both proveniences were collected in 1979.

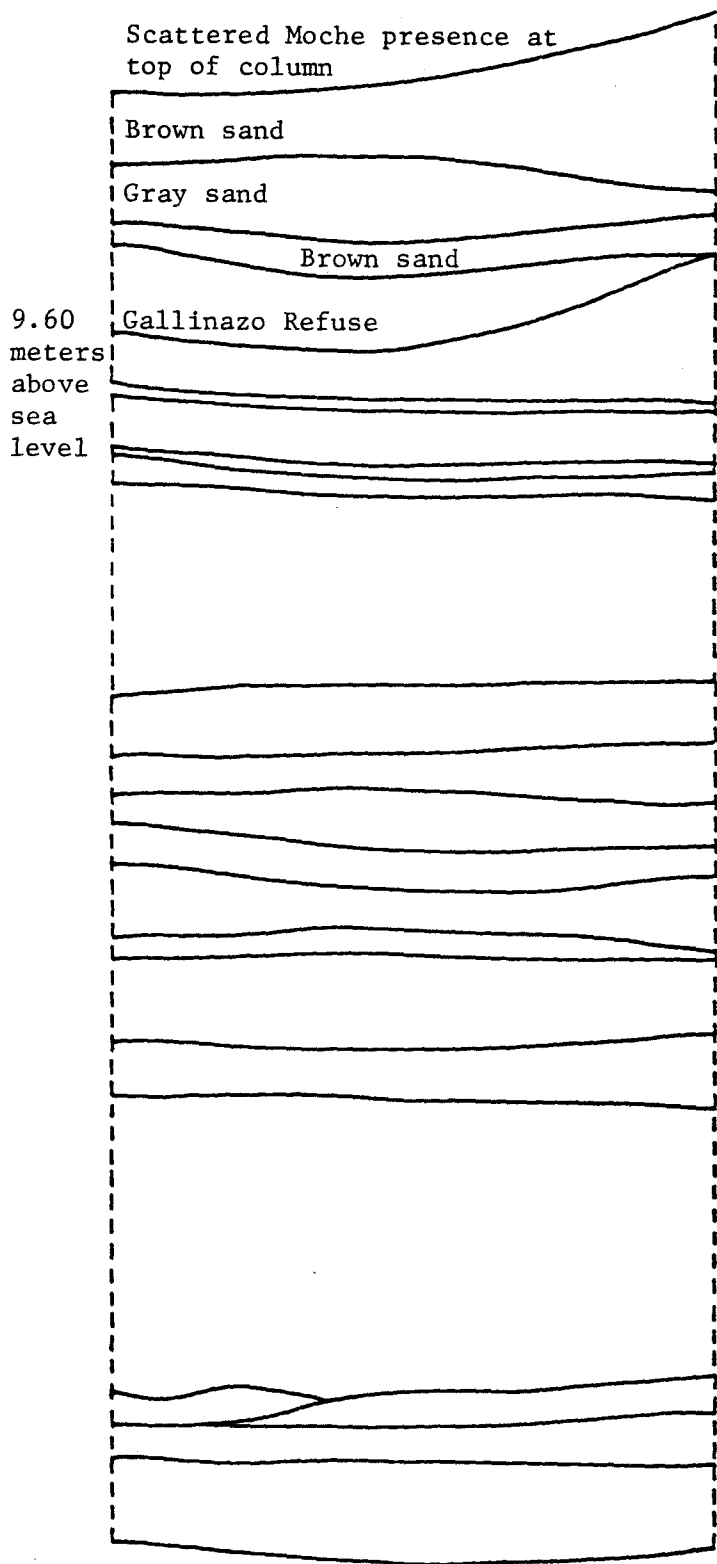


FIGURE 10

Gallinazo Point

Gallinazo Point sherds fall well within the type descriptions established by Bennett 30 years ago for the Viru Valley Gallinazo ceramics. Decoration techniques in this sample included punctation, incision and some burnishing/polishing. Modelled animal and human figures were found as were fragments of what appeared to be trumpets. Several fragments from handled jars were also recovered. Slipping was not common; only two pieces were slipped out of this very large sample. Vessel forms were predominantly flare neck jars, ollas, collared vessels and wide lipped bowls or jars.

Paste color in this Gallinazo sample was quite consistent - red to reddish brown and brown. Overall, the sample was well-fired with only  $\frac{1}{4}$  of the rim/diagnostic sherds analyzed being irregularly or incompletely fired. Only a small minority ( $\frac{1}{6}$ ) were weathered. A characteristic of earlier period domestic wares, i.e., from the Cupisnique or the Salinar periods, is interior finger and/or wipe marks. Only one sherd from this Gallinazo sample showed interior wipe marks and only two modelled, hollow figurines showed interior finger marks.

Differentiation of any one Gallinazo phase from another at Gallinazo Point was impossible. The characteristics which Bennett isolated as indicative of one phase or another were mixed through the sample and did not manifest any stratigraphic integrity.

### Implications for the Interpretation of REAC

Identified Gallinazo sites in the Moche Valley are not numerous. Although Gallinazo strata no longer exist along the entire river profile because they have been eroded away, this high remnant gives some insight into the erosional regime acting in the valley.

A major alteration of the environment occurred in Formative times, a period when there was a great influx of sand into the valley. At some point between the Salinar period and the Gallinazo period, there was an episode of major flooding, evidence of which exists in the silts separating the Salinar and Gallinazo horizons in the river profile. Evidence of a slightly later minor flood is manifested in the destruction, and later rebuilding, of the Great Trench, which was destroyed by drain activity. At least by the Formative period the river had begun its pattern of cutting southward, probably as a result of tectonic movement; early sites which had lain on the south side of the river would have been gradually destroyed, washed away. Additional episodes of flooding are indicated post-Gallinazo when drain 3 carried sufficient water to expose and partially destroy Gallinazo cemeteries in its path.

## MOCHE

Previous Definitions of Moche Ceramics

The Moche culture flourished on the north coast of Peru between the Jequetepeque and Casma Valleys. The transition from the Gallinazo Culture to the Moche culture reflected the emergence of a rigid and responsible class structure. This hierarchical authority was reflected in the expansion of state projects which were carried out through the enforcement of a labor tax (mit'a) which took the form of required labor by male citizens. Among these labor projects was the construction of huge pyramids and irrigation systems. Theresa Topic (1977) studied the Mochica settlement at Moche where the Huacas Sol and Luna are located. From the ceramics retrieved at Moche, Topic built a Moche typology which provided guidelines for analyzing possible Moche ceramics in the river profile at Pampa Cacique. Topic concluded that it was not feasible to build a ceramic typology based upon plain/domestic/utilitarian wares because these wares reflect the conservatism within a society and do not change very quickly. For example, Topic found a great deal of continuity from Gallinazo ceramics into Moche II ceramics. The differentiation of the five Moche cultural phases distinguished by Larco Hoyle (1938-39) was built mainly on changes in the shape, proportion and type of decoration on stirrup spout

jars. However, according to Topic, the stirrup spout jar is a rather rare form, thus making it difficult to use in dating other Moche forms. With a gradual change in form from Gallinazo to Moche II, it is very possible that on the domestic ware level, early Moche ceramics may go undiagnosed.

This may well be the situation in the river profile. As mentioned earlier, Moche ceramics did not form a cultural horizon in the river profile but Moche ceramics were scattered through earlier and later cultural collections. This near absence alerted PRA archaeologists to the depositional disruption demonstrated in the Cacique river profile.

At the site of Moche, Topic identified the best chronological ceramic markers. For Moche I and II these were applique and punctated filets, drag-jab faces on modelled figures, florero-like flares on medium ware jars. For Moche III and IV ceramics, the best chronological markers were floreros, ollas with short, small, everted necks and painted geometric designs.

Domestic wares in Moche I and II show great similarities to Gallinazo domestic wares, especially in decoration. These were produced for quantity rather than for quality and were especially impervious to fluctuations in ceramic fashion. Large jars and ollas fall into this category.

Finewares consisted of painted and modelled jars, bottles, stirrup spout vessels, and floreros, all executed in fine paste and usually mold made and slipped. These wares were most often found with burials.

#### REAC and the Cultural Record

The site of Moche was the capital of the Moche polity. Moche sites are scattered throughout the valley. Moche walls criss-cross upper Pampa Cacique. However, a Moche provenience or horizon was lacking in the profile. Some possible Moche ceramics were found mixed in with other cultural entities, particularly Gallinazo and the later Chimu. If decorated, these have been identified in Appendix II. Although individual sherds may have been misdiagnosed, it is impossible that an entire Moche horizon was overlooked. The near absence of Moche ceramics then, is used as negative evidence supporting the basic assumption of this thesis, that radical environmental alteration has destroyed much of the archaeological record in the Moche Valley leaving the observer of today with a somewhat inaccurate picture of settlement patterns in antiquity.

Within this framework, a feasible explanation of the near absence of Moche ceramics in the river profile is that the Moche presence has been either eroded away due to river downcutting as a result of tectonic movement; or much more likely that the Moche presence has been washed away during



one or more major episodes of el nino flooding. Evidence for the latter exists for Moche IV, when the valley was definitely subjected to at least one episode of el nino flooding. The erosion and subsequent rebuilding of portions of Huaca del Sol on a ground surface several meters lower than the original ground surface was discussed earlier (page 64). This most likely also produced the "Moche hiatus" in the Cacique profile.

#### Resettlement at Galindo

After the Moche IV phase, the Mochica polity experienced a decline. The Mochica were no longer the strong, organized force they had been, and Moche V sites in the valley are few in number. The settlement of Moche was deserted and the Mochica administrative center was moved to the valley neck, at a site called Galindo. Here, too, the Mochica were beset by environmental difficulties. Their city again was destroyed by flooding, rebuilt and destroyed again. Galindo represents a culture in decline, weakened by a strong adversary, the environment.

### CHIMU

#### Previous Definitions of Chimu Ceramics

The valleys of southern La Libertad were the focus of the Chimu development and it was the Chimu who built their capital at Chan Chan. With the Chimu, a north coastal

cultural phenomenon reached a level of state organization, complexity and conquest sufficient to be called an empire.

Between about A.D. 750 and 905, north coastal people began using substantial quantities of black ceramics in addition to their more traditional redware pottery. Archaeologists refer to the blackwares as "Chimu", and use the term loosely to designate the northern populations living in the nine valleys from the Motupe to the Chao Rivers. Chimu pottery is neither a unified corporate style nor a folk style but a mixture of both and archaeologists have just begun to sort them out. It includes the Chimor corporate style and several subsidiary corporate styles of polities in the region of the Lambayeque irrigation complex, which Chimor conquered and incorporated. Black pottery was also used in a wide series of loosely related folk styles by a number of different populations that spoke distinct dialects and languages. Thus, whereas the term "Inca" designates an ethnic group, a polity, and a particular corporate style, the term "Chimu" lacks this specificity and refers to some 700 years of black-pottery production, as well as many different north-coast phenomena (Moseley:1978:23).

Chimu corporates style emphasized stirrup spout bottles while folk pottery was most frequently mold-made. According to Richard Keatinge (1975) who studied only Chimu domestic wares, red oxidized wares increased through time while the black reduced wares decreased through time. Also, Keatinge supports the assumption made repeatedly throughout this paper that domestic wares will change more slowly than will finewares. The most frequent domestic vessel forms identified by Keatinge were ollas, jars, urns, plates, bowls, and incurving bowls.

### The Chimu Survey of the River Profile

The Chimu ceramics gathered from the river profile were collected from two areas: from butte remnants 50 meters west of the pollen column and at an altitude of 13 meters above the ground surface, and from a canal remnant less than 50 meters south of the river profile at Gallinazo Point (Figure 2). Although three collections totalling 1-1/3 kilos and 2¼ kilos of body sherds were made, only one (K89A-10=2) was deemed substantial enough to merit consideration here.

The K89A-10=2 ceramics were retrieved through strata survey of a butte remnant. This collection was interesting in that both red oxidized wares and black reduced wares were present, some of which were mold-made and others of which were hand-made. Rim forms were representative of those identified by Keatinge - flare necks, cambered necks, open bowls and plates.

This collection is also believed to be in situ because of the general lack of weathering and also because the pampa surrounding the butte manifests field remnants; the butte from which these ceramics were taken was composed of wetted agricultural sands.

### Implications for the Interpretation of REAC

Chimu ceramic scatters cover the Moche Valley. That they should be found at the top of the river profile is

perfectly predictable. That they should be found only in butte remnants is less predictable. However, this was the case, at least along the edge of the profile. The buttes are remnants of stratigraphic layers which have been eroded away since the Chimu occupation of the valley 800 years ago. Apparently, 2 meters of river profile have been washed/eroded away during a REAC cycle during those 800 years. Today, a walking survey along the edge of the river profile could be a dangerous endeavor; huge chunks of the uppermost strata have cracked during recent earthquakes and are just waiting for enough pressure or weight to break away completely. The Chimu remnants in the profile point out once again just how much of the archaeological picture has been lost due to environmental phenomena.

## CHAPTER V

### CONCLUSIONS

Several threads of evidence, positive and negative, have been analyzed to support the hypothesis that archaeological remains in the Moche Valley do not accurately reflect settlement pattern in antiquity. This discrepancy between cultural reality in antiquity and what we see today is due largely to radical environmental alteration in the Moche Valley. Tectonic movement, water and wind are the forces which have brought about REAC chance.

Tectonic movement, uplift and lateral, has created a geological environment of inclining slopes in which bedrock blocks are fractured and eroded into unconsolidated sediments which are easily washed or blown away by water and wind. Periodically, the Peru current reverses itself and warm equatorial waters force the cool coastal waters deep into the ocean depths and the coast itself is warmed, resulting in meteorological inversions which cause rain in the coastal desert. These rains and the warming current reversal are known as el nino. During el nino dry streams carry water and the coastal rivers overflow and flooding results, causing massive water erosion. Most afternoons

trade winds blow steadily across the coastal desert from the ocean, also eroding those unconsolidated sediments. These winds have also whipped the beach sands into gigantic dunes, forming over the years a cadre of migrating dunes which have buried cultural presences and blocked canals and drainages.

The cultural near absences in the river profile, the erosion at Huaca del Sol, Galindo and Virgen Village all attest to the erosive ability of nino flood waters. Suspended quebradas, shifting drainages on the pampa, and the downcutting of the river, and the strata break in the river profile attest to tectonic activity in the valley. The destruction of linear archaeological features such as canals and walls or the stranding of early archaeological sites such as La Cumbre, show the results of REAC in action.

The purpose of the ceramic typology was two-fold. One purpose was to devise a framework within which domestic ceramics from the North Coast could be evaluated. The second purpose was to use the typology to culturally date geological phenomenon in the river profile. The second purpose was achieved in dating the period of tectonic movement represented by the profile strata break; in dating a period of flooding after the Salinar occupation of the valley but prior to the Gallinazo occupation; and with negative evidence, in verifying the lack of Moche remains

along the profile. Pampa ceramics were correlated with those from the profile and used in a similar fashion, to date geological phenomenon.

Three periods of tectonic movement were identified through the lateral shifting of pampa drainages. The first occurred at least as early as the Salinar period; the second occurred during the Gallinazo occupation; and the third between the Gallinazo and Chimú occupations, probably during Moche. The cultural stratigraphy of the walls, canals and cemeteries on the pampa, used in conjunction with the domestic ceramic analysis, is the basis of this geological time scale.

Through the use of lateral stratigraphy in future research, these phenomenon on the pampa and the profile could be correlated with related geological occurrences in the whole valley and southern La Libertad.

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APPENDIX I

## K679911-0=2 SALINAR

TYPE	FLARE NECKS	OLLAS	FLOREROS	PASTE COLOR	
				Core	Surface
1		3 - rim 9, 14 cm. 1 - rim 10, 16 cm. 1 - rim 9, 16 cm. 1 - rim 9, 16 cm.		dk. brown dk. red brown	red
3	1 - rim 22, 22 cm., slipped, adorno 1 - rim 22, 20 cm., weathered 1 - rim 27, 26 cm., adorno 1 - rim 26, 12 cm.	2 - rim 11, 18 cm. 1 - rim 11, 10 cm.		brown red brown	black brown
3	1 - rim 24, 28 cm., weathered 1 - rim 23, 30 cm., slipped			brown	red
4		1 - rim 9 1 - rim 13, 12 cm., weathered 1 - rim 9, 16 cm.	1 - rim 3, 8 cm.	gray	brown red
5	1 - rim 22, 22 cm. 1 - rim 4, 14 cm. 1 - rim 5, 28 cm. 1 - rim 24, 24 cm.	1 - rim 11, 14 cm.	1 - rim 4, 18 cm. 1 - rim 5, 18 cm.	gray	red brown
6	1 - rim 24, 24 cm.	1 - rim 11, 16 cm.		gray	red
7	1 - rim 25, 16 cm.	1 - rim 9, weathered		red	red
8		1 - rim 9, 16 cm., weathered		red	red
9	2 - rim 28, 28 cm.			red	red
10	1 - rim 13, 16 cm. 1 - rim 11, 16 cm.	1 - rim 13, 16 cm. 1 - rim 11, 16 cm.		red	red

TYPE	FLARE NECK	Ollas	OTHERS	PASTE COLOR	
				Core	Surface
1		1 - rim 9, 10 cm. 1 - rim 9, 12 cm. 1 - rim 10, 14 cm.	1 body, incised & burnished	red brown	red red brown
2		1 - rim 10, 7 cm., incised, weathered 1 - rim 11, 20 cm.		red brown	red yellow
4		1 - rim 12, 14 cm. 1 - rim 9, 14 cm. 1 - rim 11, 16 cm. 1 - rim 10, 12 cm., weathered 1 - rim 11, 12 cm., weathered	2 bodies, incised & burnished	gray	lt. gray
5		1 - rim 10, 14 cm.		dk. gray	pale red
6	1 - rim 29, 20 cm. 1 - rim 29, 20 cm., slipped & weathered			dk. gray	red yellow
9	1 - rim 29, 22 cm. 1 - rim 29, 20 cm., slipped 1 - rim 29, 20 cm. 1 - rim 29, 22 cm. 1 - rim 29 1 - rim 29, 20 cm., slipped 1 - rim 24, 24 cm., weathered			red	red

K90-1W=2 SALINAR

TYPE	FLARE NECK	PASTE COLOR	
		Core	Surface
9	1 - rim 24, 30 cm.	yellow red	light red
	1 - rim 24, 26 cm.		

## K91 GALLINAZO

TYPE	FLARE NECKS	OLLAS	INCURVING BOWLS	MODELLED	OTHER	PASTE COLOR	
						Core	Surface
1		1 - rim 4, 7 cm., burnished			1 florero rim 2, black lustre	dk. br. red br.	red
2		1 - rim 4, 22 cm., weathered 1 - rim 3, 16 cm. 1 - rim 2, 22 cm.	1 - rim 4, 22 cm., weathered 1 - rim 5, 24 cm., weathered 1 - rim 3, 16 cm. 1 - rim 2, 22 cm.		2 handles 1 handle on punctated body 1 trumpet mouthpiece	dk. br. red br.	red
3	1 - rim 5, 10 cm. 1 - rim 11, 20 cm. 1 - rim 12, 16 cm. 1 - rim 13, 18 cm., weathered 1 - rim 14, 14 cm. 1 - rim 16, 20 cm. 1 - rim 19, 18 cm. 1 - rim 21, 28 cm. 1 - rim 4, 10 cm.	1 - rim 10, broken applique 1 - rim 5, 24 cm. 1 - rim 6, 20 cm., incised rim	1 - rim 8, 18 cm., weathered	1 - figurine	1 grater 1 slipped body	dk. br. red br.	red
4	1 - rim 4, 10 cm. 1 - rim 9, 18 cm. 1 - rim 7, 16 cm.	1 - rim 1, 26 cm.	1 - rim 11, 30 cm.	1 - figurine	1 human ear 1 slipped body	gray black	red
5	1 - rim 17, 18 cm. 1 - rim 3, 14 cm. 1 - rim 6, 16 cm. 2 - rim 10, 20 cm.	1 - rim 7, 16 cm. 1 - rim 3, 14 cm., slipped			1 notched app- lique piece 1 applique, incised disc	gray black	red red br.
7	1 - rim 18, 18 cm. 1 - rim 2, 18 cm. 1 - rim 7, 16 cm. 1 - rim 19, 14 cm.	1 - rim 2, 28 cm. weathered			1 body incised, burnished 1 incised disc	lt. red red	lt. red red
8			1 - rim 9, 16 cm.		1 handle	wk. red red dk. red	red red br.
9	1 - rim 1, 18 cm. 1 - rim 5, 10 cm.				2 trumpet pieces 1 plate, rim 2, 18 cm.	red red	red br. lt. red



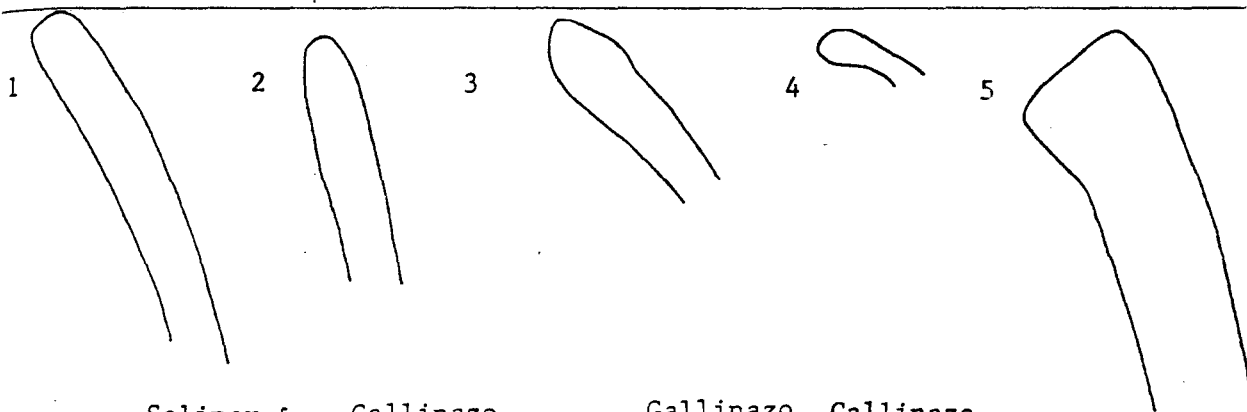
## K89A-7=5 GALLINAZO

TYPE	OLLAS	INCURVING BOWLS/JARS	FLARE NECKS	OTHER	PASTE COLOR	
					Core	Surface
1	1 - rim 4, 7 cm., burnished	1 - rim 9, 14 cm.		1 handle 1 body, incised 1 punctated	dark brown red brown	red
2				1 body, incised	dk. br. red br.	red
3	1 - rim 6, 18 cm.		1 - rim 11, 18 cm. 4 - rim 14, 16-20 cm.		dk. br. red br.	red
4			1 - rim 4, burnished		gray black	red
5			1 - rim 20, incised	1 body, burnished	gray black	red red br.
6			1 - rim 12, 16 cm., weathered 1 - rim 17, 22 cm.		gray black	lt. red lt. br.
7			2 - rim 17, 14-20 cm.	1 incised 2 punctated 2 trumpet pieces	light red red	light red red
8			2 - rim 10, 12 cm. 1 - rim 11, 20 cm. 1 - rim 7, 16 cm. 1 - rim 6, 16 cm. 1 - rim 24, 24 cm. 1 - rim 4, 18 cm.	1 trumpet piece 2 bodies, incised	weak red red dark red	red red brown
9			1 - rim 15, 16 cm. 1 - rim 3, 10 cm. 1 - rim 20, 18 cm.		red	lt. red red br.

## K89A-10=2 CHIMU

TYPE	FLARE NECKS	PLATES	CAMBERED NECK	OTHERS	PASTE COLOR		
					Core	Surface	
2			1 - rim 3, 12 cm. 1 - rim 3, 10 cm. 1 - rim 3, 14 cm.			red br.	lt. red
3	1 - rim 35, 8 cm., incised, weathered					brown	black
4				3 bodies, molded, decorated		gray	black
5		1 - rim 5, 24 cm. 1 - rim 5, 26 cm. 2 - rim 5, 24 cm. 1 - rim 6, 25 cm., weathered	1 - rim 4, 14 cm.			lt. gray dk. gray gray br.	black pale red, Moche?
8			1 - rim 4, 16 cm. 1 - rim 3, 10 cm. 1 - rim 5, 12 cm.	2 bodies, painted black		red lt. red	red lt. red
12		1 - rim 6, 26 cm., Moche?				red yell., Moche?	red yell., Moche?

OLLAS



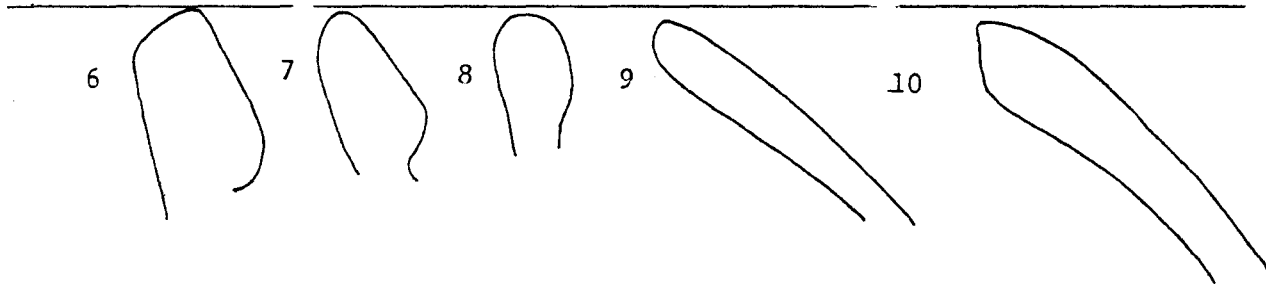
1 Salinar & Gallinazo  
18-26 cm.

2 Gallinazo  
28 cm.

3 Gallinazo  
14 cm.

4 Gallinazo  
7 cm.

5 Gallinazo  
24 cm.



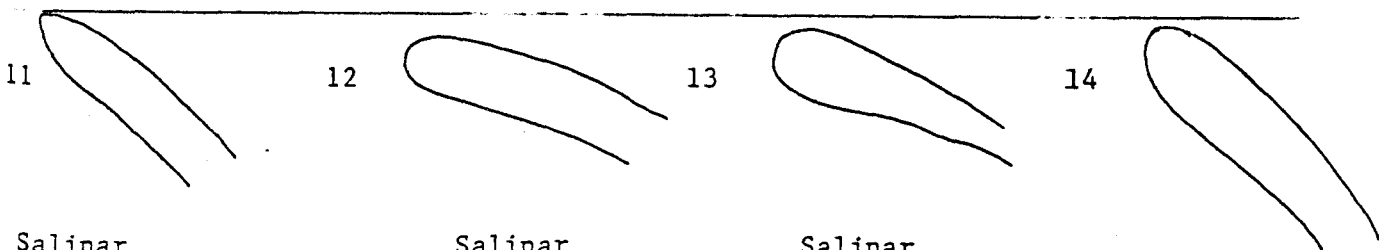
6 Gallinazo  
18-20 cm.

7 Gallinazo  
16 cm.

8 Gallinazo  
18 cm.

9 Salinar  
1-20 cm.

10 Salinar  
7-22 cm.

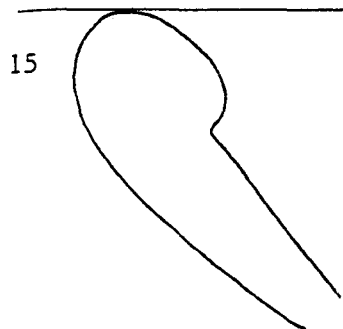


11 Salinar  
10-24 cm.

12 Salinar  
14-18 cm.

13 Salinar  
12-22 cm.

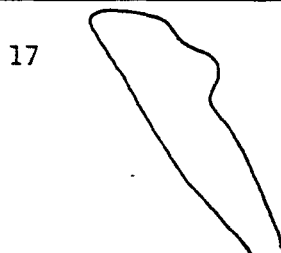
14 Salinar  
20 cm.



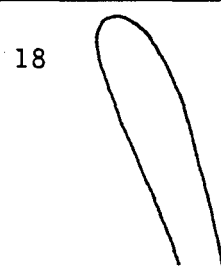
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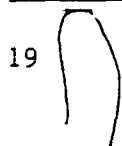
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20 cm.



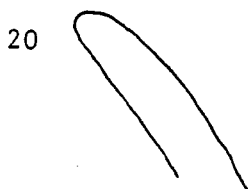
Salinar  
22-28 cm.



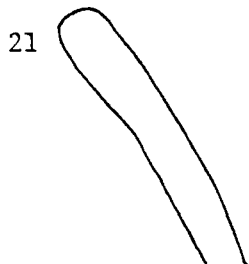
Salinar  
14 cm.



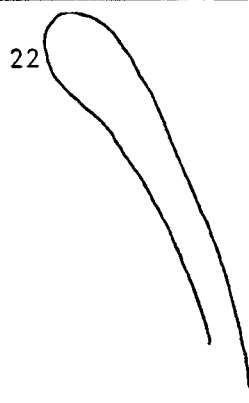
Salinar  
14 cm.



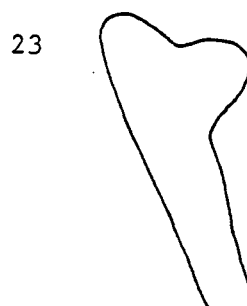
Salinar  
18 cm.



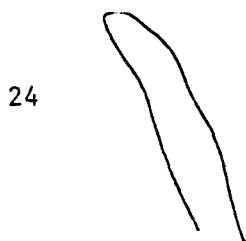
Salinar  
16-20 cm.



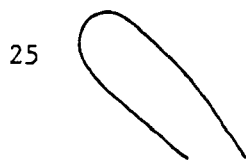
Salinar  
22 cm.



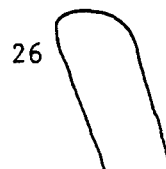
Salinar  
18 cm.



Salinar  
18-22 cm.

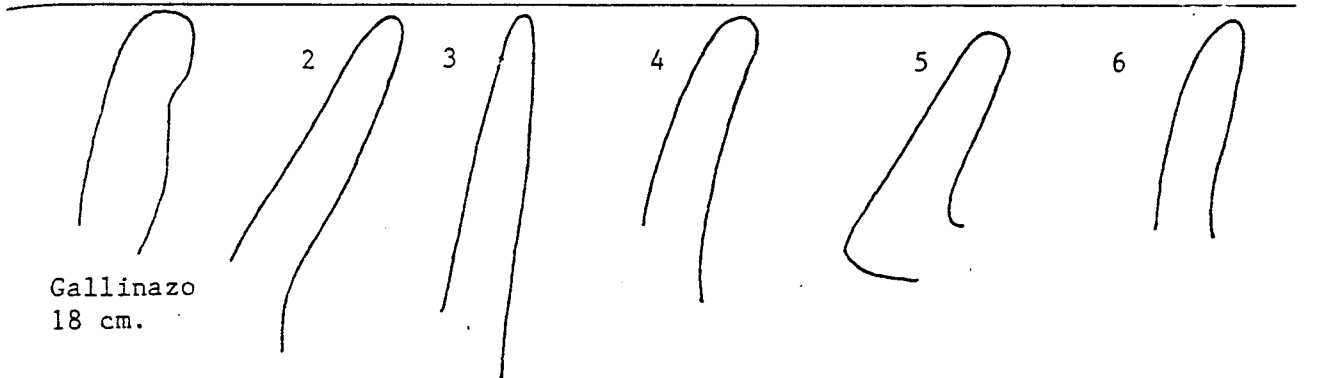


Salinar  
10 cm.



Salinar

FLARE NECKS



Gallinazo  
18 cm.

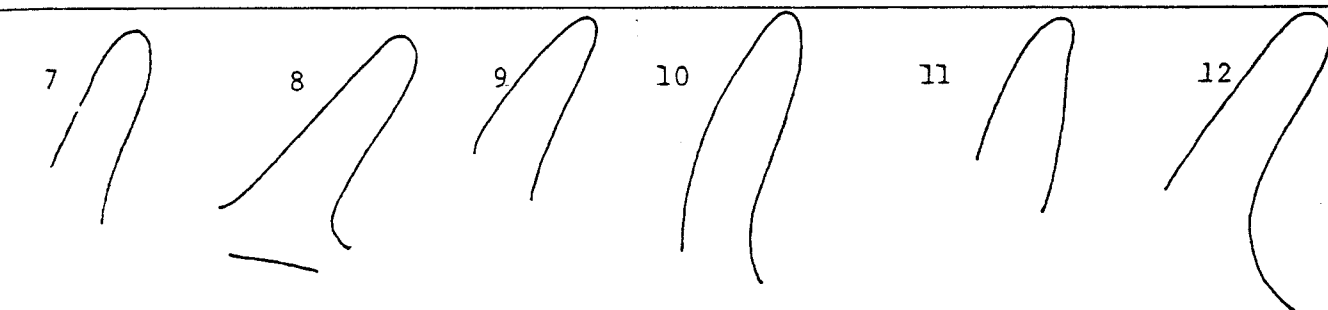
Gallinazo  
18 cm.

Gallinazo  
10 cm.

Salinar &  
Gallinazo  
14-18 cm.

Gallinazo  
10 cm.

Gallinazo  
16 cm.



Gallinazo  
16-18 cm.

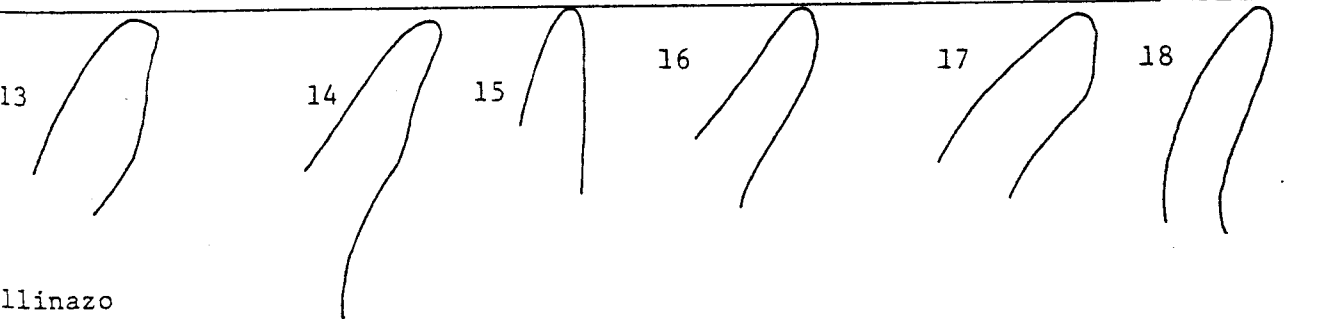
Gallinazo  
10 cm.

Gallinazo  
18 cm.

Gallinazo  
12-20cm.

Gallinazo  
20 cm.

Gallinazo  
16-18 cm.



Gallinazo  
8 cm.

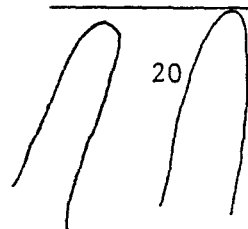
Gallinazo  
14-24 cm.

Salinar  
16 cm.

Gallinazo  
20 cm.

Gallinazo  
14-22 cm.

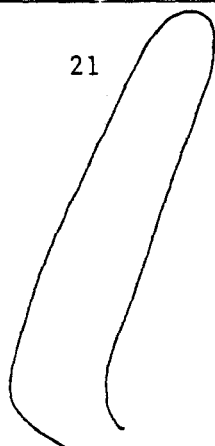
Gallinazo  
18 cm.



20

Gallinazo  
14-18 cm.

Gallinazo  
18 cm.



21

Salinar &  
Gallinazo  
28 cm.



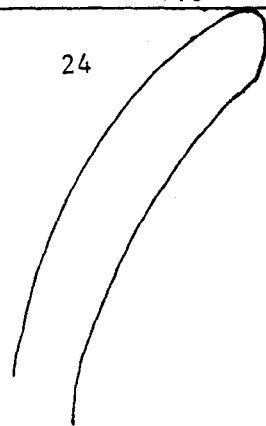
22

Salinar  
20-22 cm.



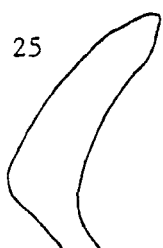
23

Salinar  
30 cm.



24

Salinar  
24-30 cm.



25

Salinar  
16 cm.



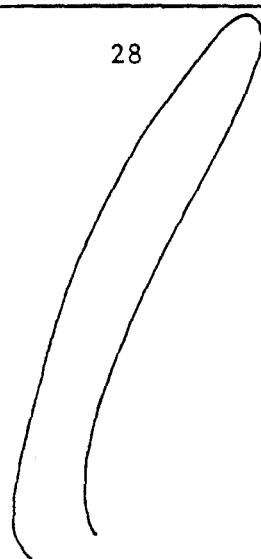
26

Salinar  
12-14 cm.



27

Salinar  
26 cm.



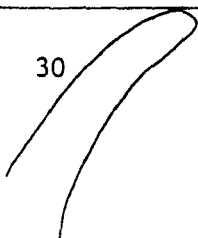
28

Salinar  
28 cm.



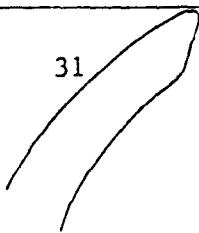
29

Salinar  
12-22 cm.



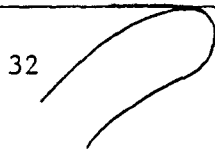
30

Salinar  
18-24 cm.



31

Salinar  
20 cm.



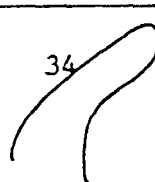
32

Salinar  
28 cm.



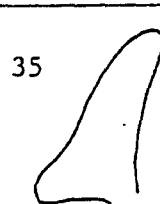
33

Salinar  
16 cm.



34

Salinar  
12 cm.



35

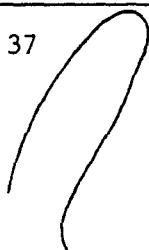
Chimu  
8 cm.

36



Salinar  
24 cm.

37



Salinar &  
Gallinazo  
18 cm.

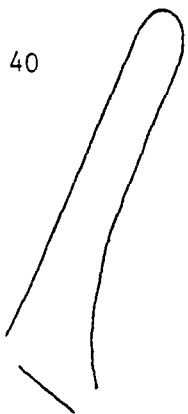
38



39

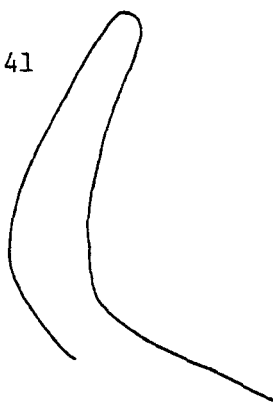


40



Gallinazo  
14 cm.

41



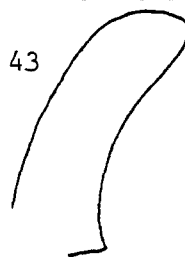
Salinar  
12 cm.

42



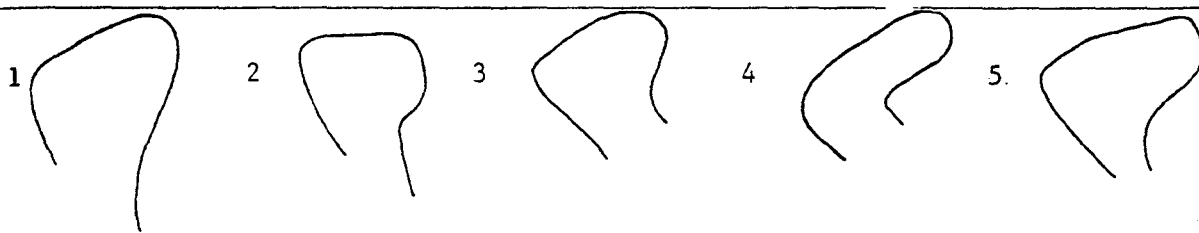
Salinar  
18 cm.

43



Gallinazo  
20 cm.

INCURVING BOWLS/JARS



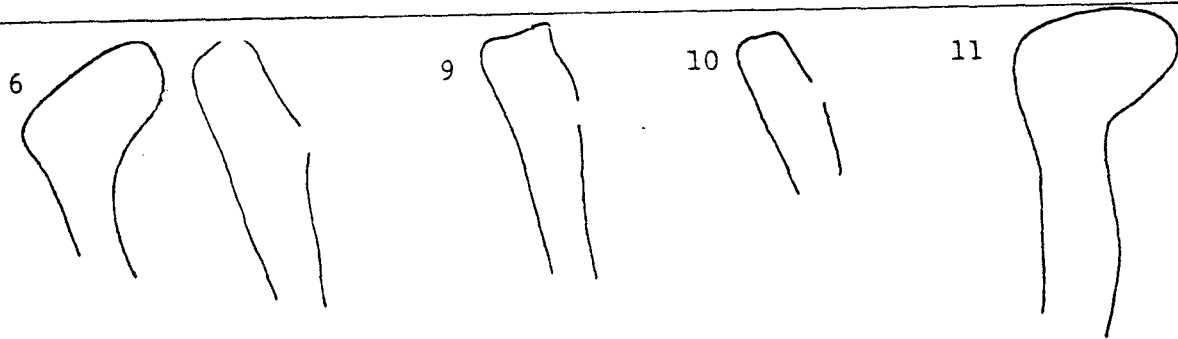
1 Gallinazo  
24 cm.

2 Salinar  
22 cm.

3 Gallinazo  
16 cm.

4 Gallinazo  
22 cm.

5 Gallinazo  
24 cm.



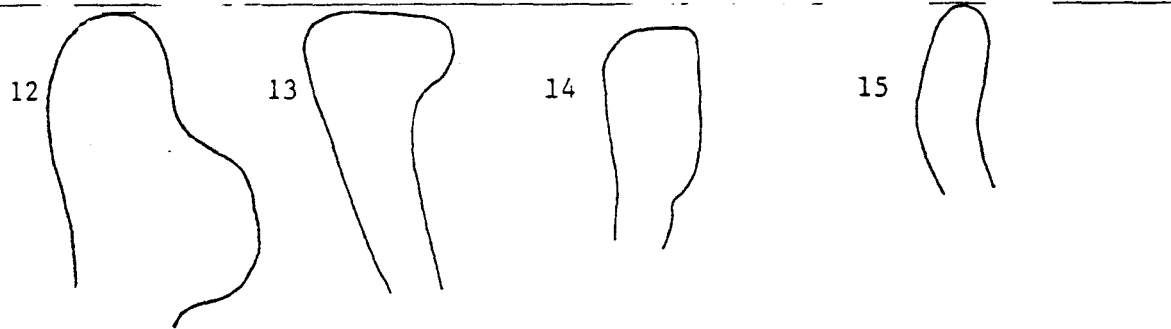
6 Gallinazo  
24 cm.

7 Gallinazo  
18 cm.

8 Gallinazo  
14 cm.

9 Gallinazo

10 Gallinazo  
30 cm.



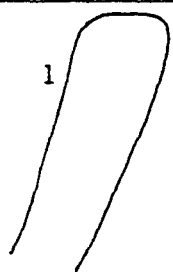
12 Salinar

13 Gallinazo  
26 cm.

14 Gallinazo  
20 cm.

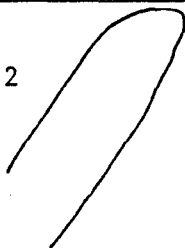


## OUTCURVING BOWLS/PLATES



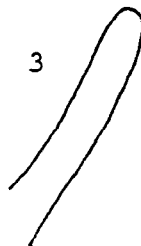
1

Gallinazo  
18 cm.



2

Gallinazo  
16-18 cm.



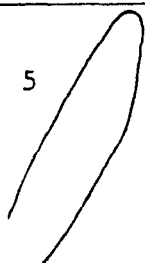
3

Salinar  
22 cm.



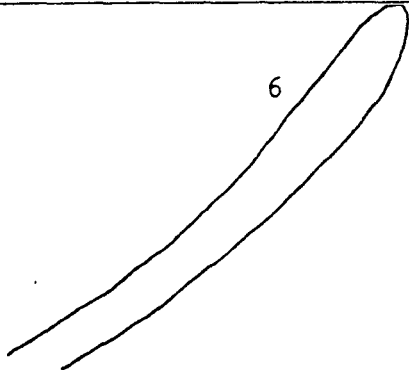
4

Salinar  
23 cm.



5

Chimu  
24-26 cm.



6

Chimu  
24-26 cm.



7

Gallinazo  
20-22 cm.

## FLOREROS



1

Gallinazo



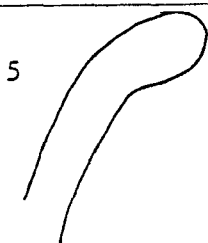
2

Gallinazo  
14 cm.

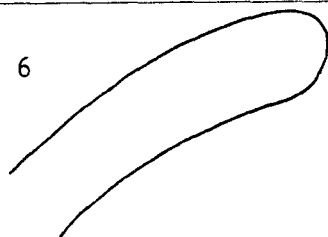
3

Salinar  
8 cm.

4

Salinar  
18 cm.

5

Salinar  
18 cm.

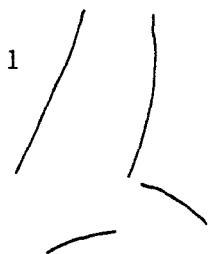
6

Chimu  
22 cm.

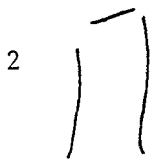
7

Salinar  
18 cm.

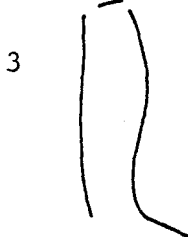
## CAMBERED NECKS



Chimu? Taken  
from Salinar  
feature with  
later reconstruc-  
tion



Same as  
no. 1



Chimu  
10-14 cm.

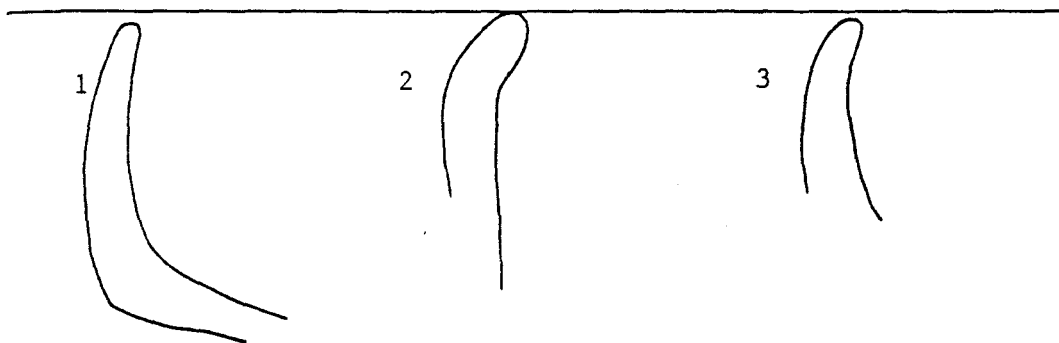


Chimu  
14-16 cm.



Chimu  
12 cm.

## STRAIGHT NECKS



1  
Salinar feature with  
Moche reconstructions  
10-12 cm.

2  
Salinar  
12 cm.

3  
Salinar feature  
with Moche

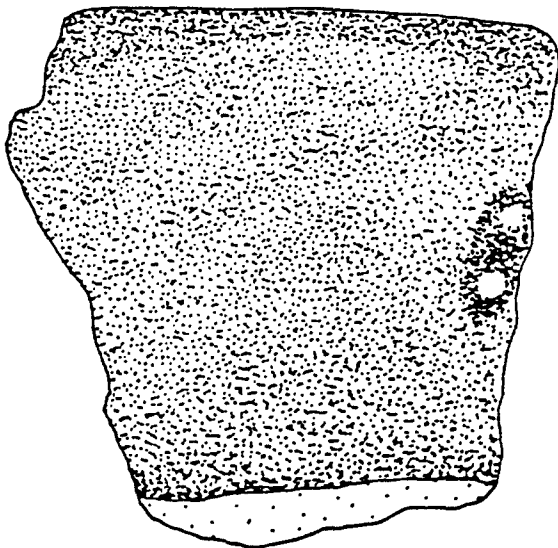
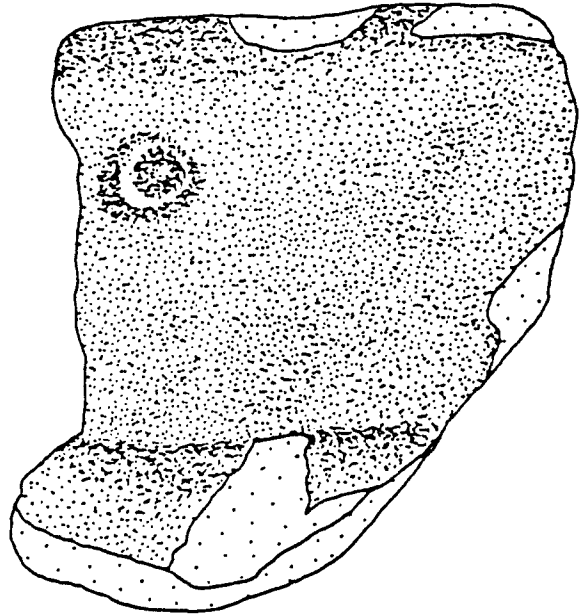
APPENDIX II

SALINAR STRATA SURVEY

K679911-0=2

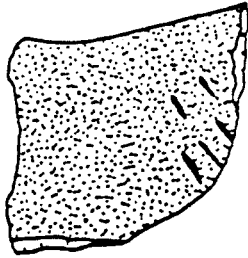
Type 2, Variety 3

Flare neck with flower adorno



Type 2, Variety 3

Flare neck with adorno

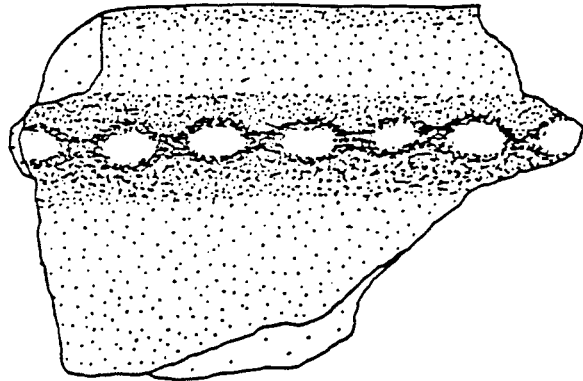


Type 4, Variety 2

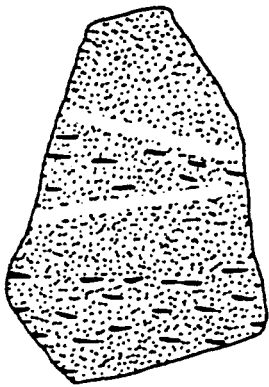
Olla, slipped red and  
incised

Type 9, Variety 2

Bowl with ridge  
applique



K679911-0=3



Type 1, Variety 1

Incision on a polished surface



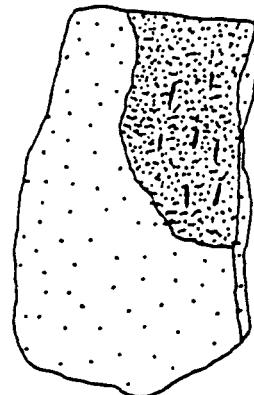
Type 4, Variety 2

Incision on polished surfaces



Type 2, Variety 2

Incised, very worn surface

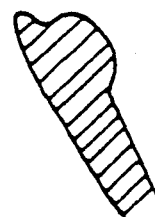
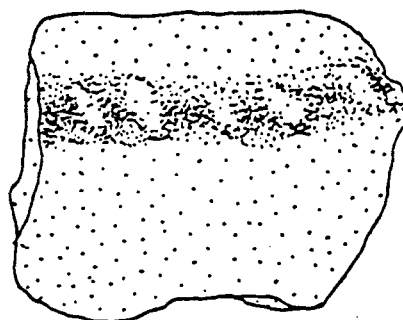




K89A-5=B1

Type 7, Variety 1

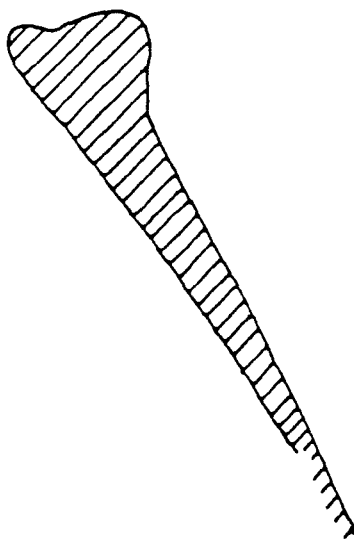
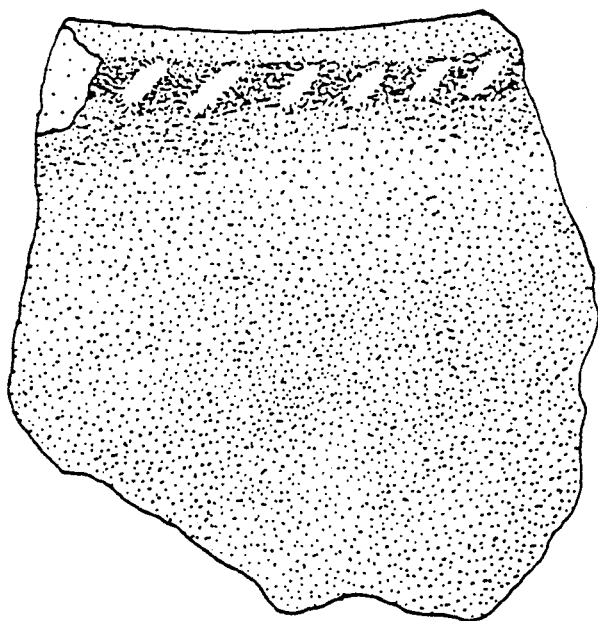
Olla with notched rim  
applique

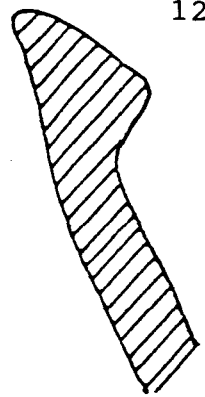
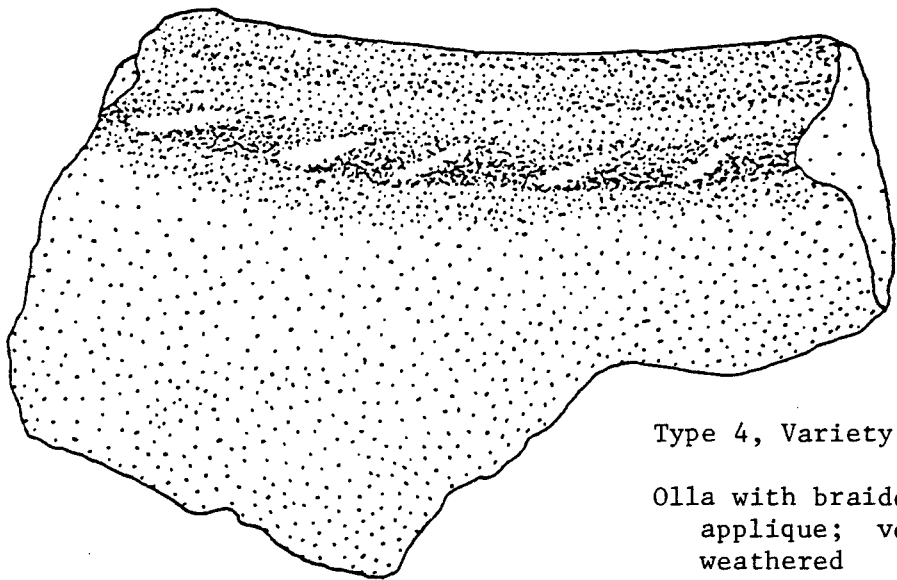


K89A-5=C1

Type 4, Variety 2

Olla with braided  
rim applique



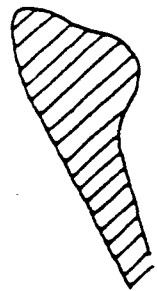
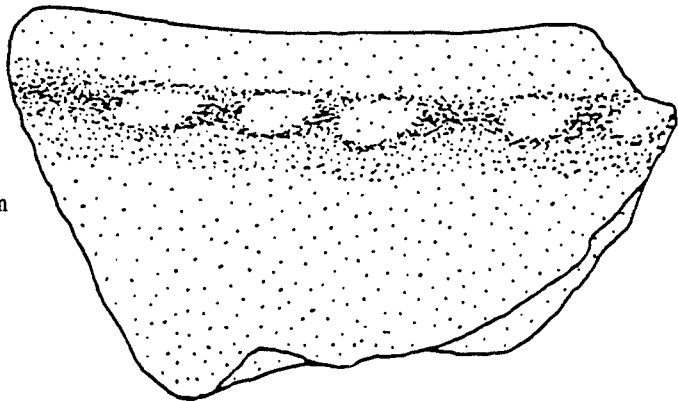


Type 4, Variety 2

Olla with braided rim  
applique; very  
weathered

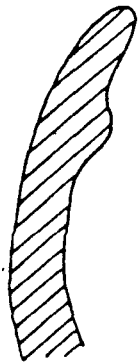
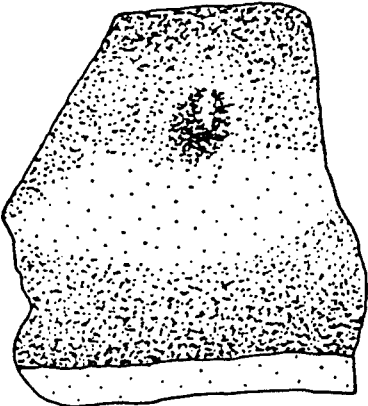
Type 5,  
Variety 2

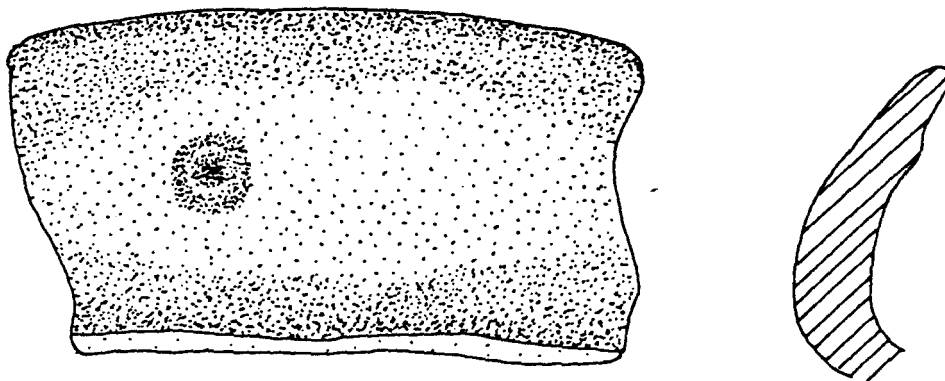
Olla with  
braided rim  
applique



Type 5, Variety 2

Flare neck with applique  
adorno; red slip; very  
weathered

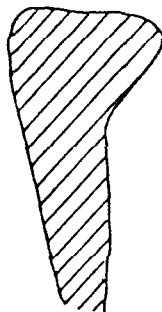
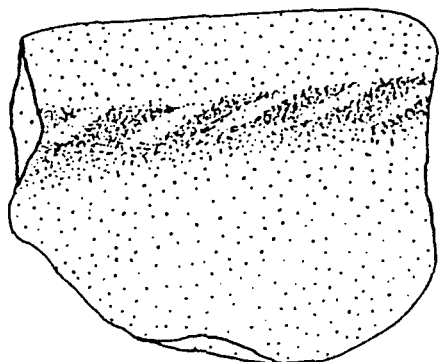




Type 5, Variety 2

Flare neck with adorno

## SALINAR WALL



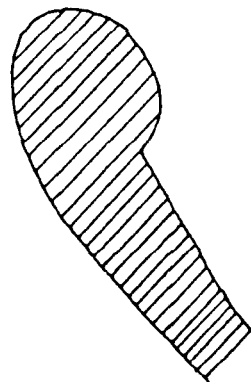
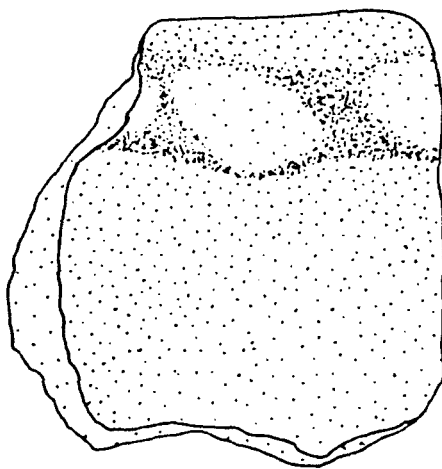
K89A-5=2

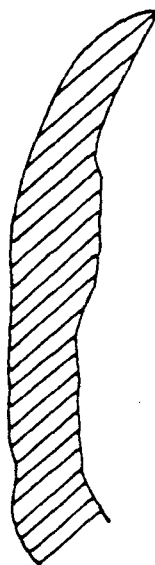
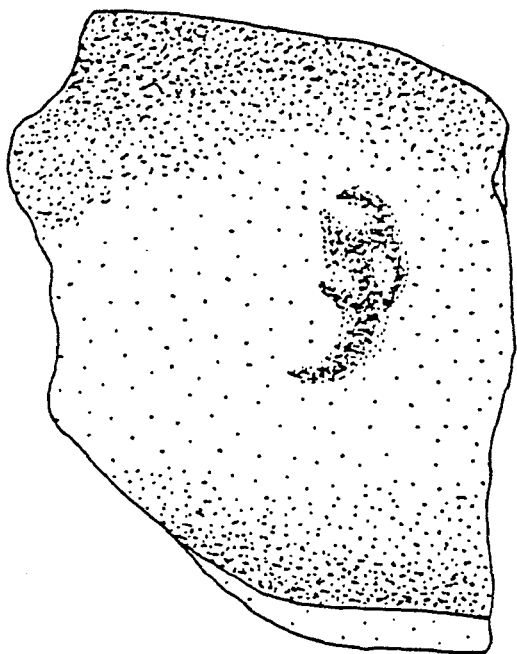
Type 5, Variety 1

Bowl or jar with  
notched applique  
rim design

K89A-5=3

Type 6, Variety 1

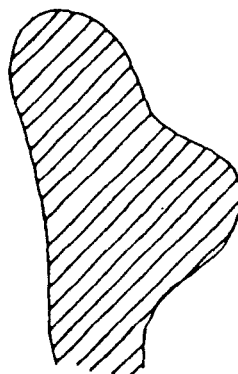
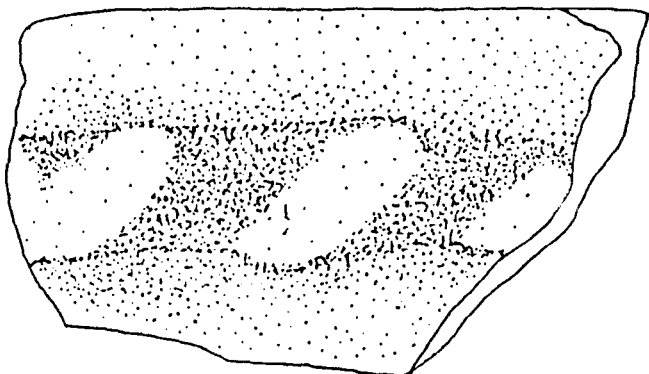
Neckless olla with  
notched rim



K89A-5=5

Type 5, Variety 2

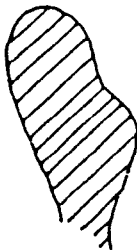
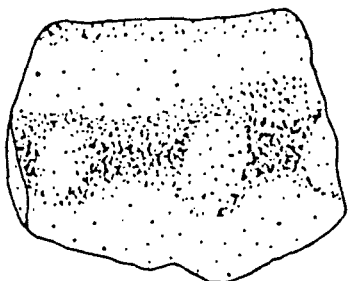
Applique adorno  
on flare neck



K89A-5=7

Type 6, Variety 1

Large olla with  
notched rim  
applique



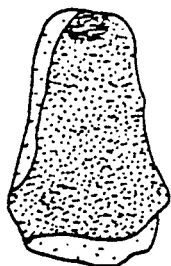
K89A-5=9

Type 2, Variety 1

Large olla with notched  
rim applique

## GALLINAZO REFUSE

## STRATA SURVEY



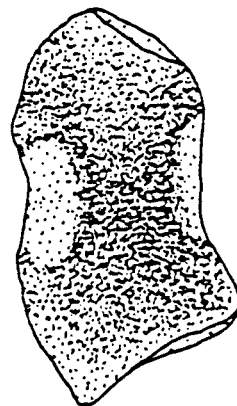
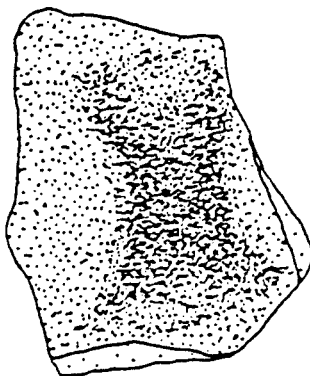
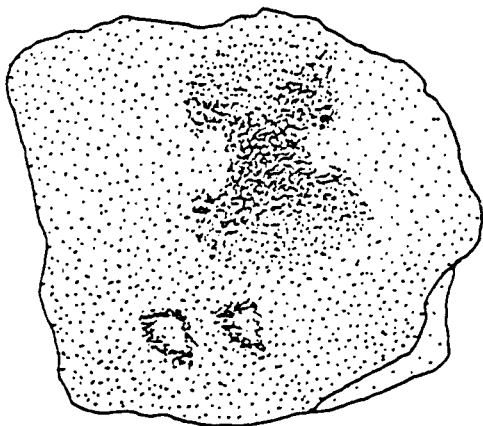
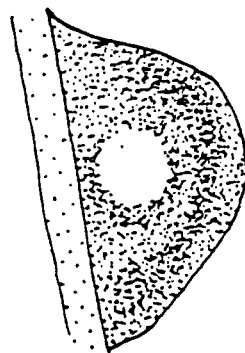
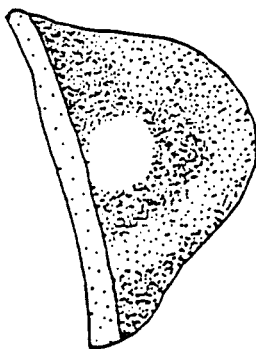
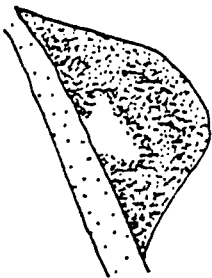
K91

Type 2, Variety 1

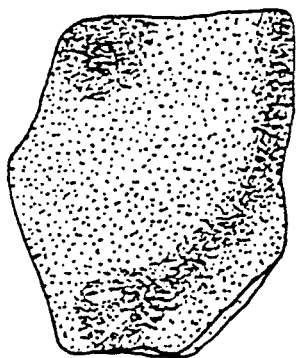
Trumpet mouthpiece

Type 2, Variety 2

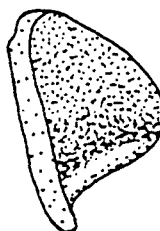
Assorted strap handles, side and front views



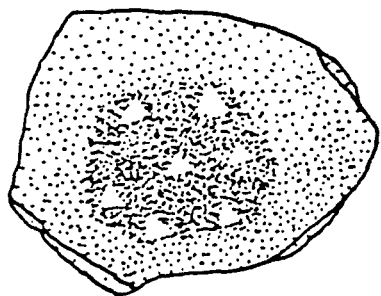
Type 2, Variety 2



Hollow bodied human figurine

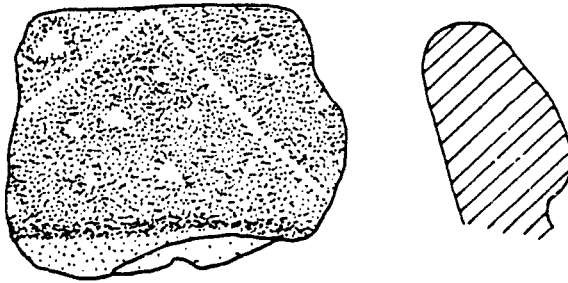


Modelled human nose



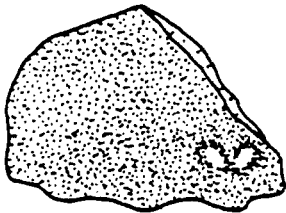
Type 3, Variety 1

Punctated body sherd



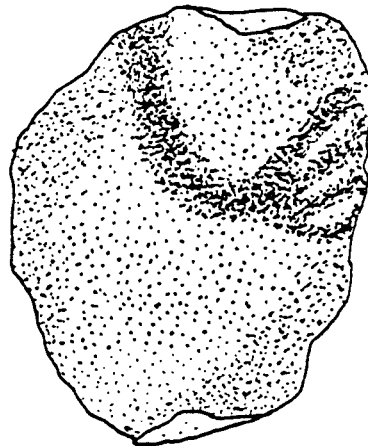
Type 3, Variety 2

Incision and punctation



Type 4, Variety 1

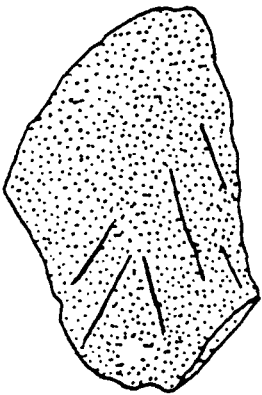
Punctated body



Type 5, Variety 2

Hollow bodied human figurine





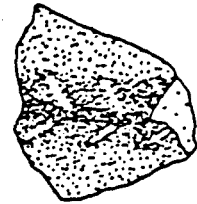
Type 7, Variety 1

Incised lines on  
body sherd



Type 7, Variety 1

Incised, polished  
body sherd

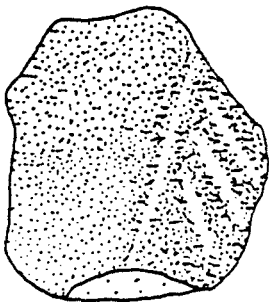


Type 7, Variety 2

Incised body  
sherd

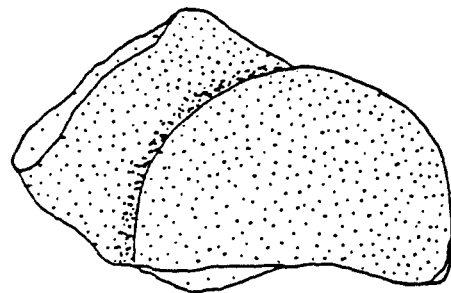
Type 10, Variety 1

Incised lines on  
body sherd



Type 11, Variety 1

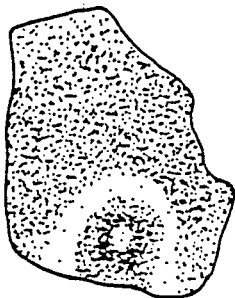
Ring base, bottom view



## GALLINAZO REFUSE

K89A-7=4/5

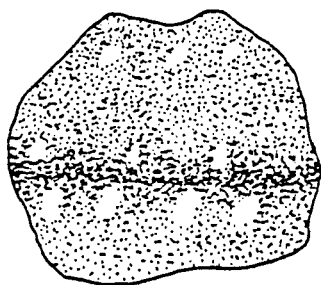
Type 1, Variety 1



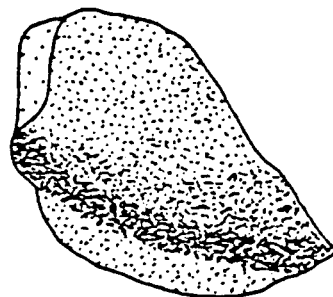
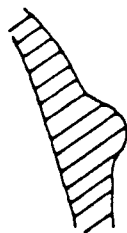
Burnished olla body



Incised body sherd

Incised lines  
on flare (?)  
neck

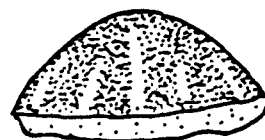
Notched, applique ridge

Pedestal base,  
bottom view

Type 2, Variety 1



Incised body, burnished



modelled, with  
drag-cut design

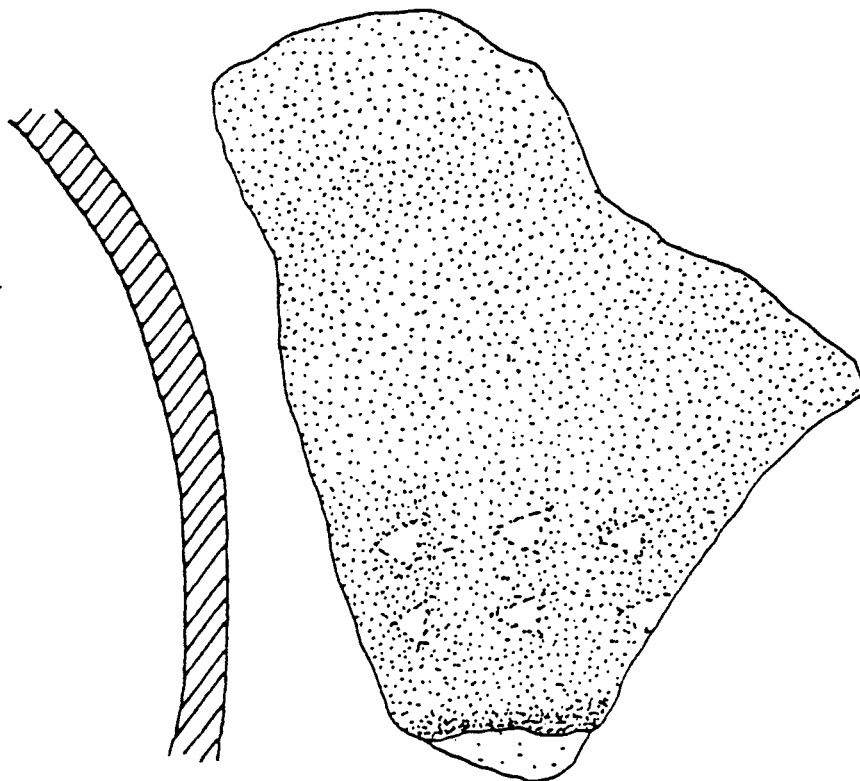


Type 7, Variety 2

Punctated body sherd

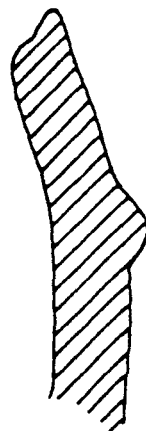
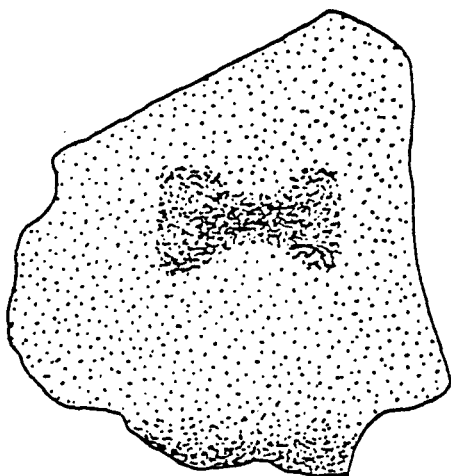
Type 8, Variety 1

Punctated olla body

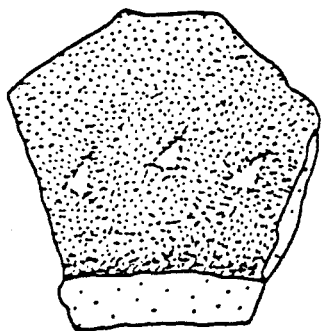


Type 8, Variety 1

Applied handle  
on olla body

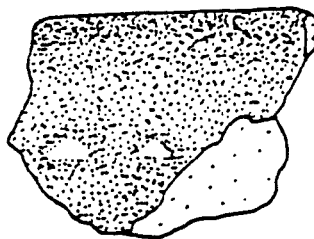


Type 8, Variety 2



Punctated flare neck

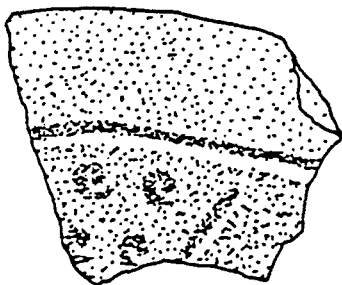
Type 8, Variety 3



Punctated flare neck

## CHIMU STRATA SURVEY

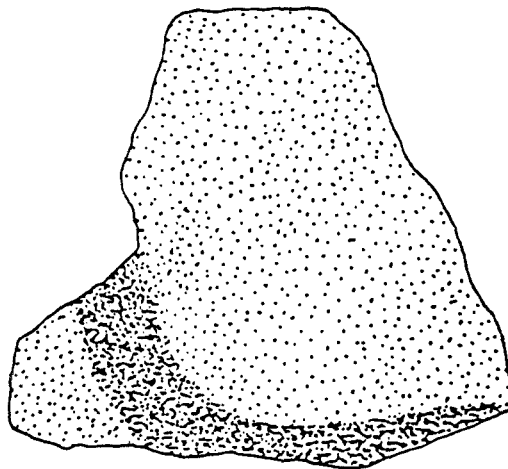
K89A-10



Type 4, Variety 1

Black mold-made bowl

Type 8, Variety 1

Black painted design  
on body sherd

APPENDIX III

SALINAR

GALLINAZO

MOCHE

CHIMU

OLLAS

INCURVING BOWLS

FLARE NECKS

CAMBERED NECKS

OUTCURVING BOWLS OR PLATES

STRAIGHT NECKS

FLOREROS

OCCURENCE OF VESSEL FORMS

SALINAR

GALLINAZO

MOCHE\*

CHIMU

|----- PASTE 1 - 3 -----|

|----- PASTE 4 - 6 -----|

|----- PASTE 7 - 9 -----|

|----- PASTE 10 - 12 -----|

## OCCURENCE OF PASTE TYPES

\*Moche sherds were mixed in with some Gallinazo and Chimu proveniences



APPROVAL SHEET

The thesis submitted by Margaret M. Sciscento has been read and approved by the following committee:

Dr. Patricia Essenpreis, Director  
Assistant Professor, Sociology/Anthropology,  
Loyola

Dr. Christine Fry  
Associate Professor, Sociology/Anthropology,  
Loyola

Dr. Michael Moseley  
Associate Curator, Anthropology, Field Museum  
of Natural History

The final copies have been examined by the director of the thesis and the signature which appears below verifies the fact that any necessary changes have been incorporated and that the thesis is now given final approval by the Committee with reference to content and form.

The thesis is therefore accepted in partial fulfillment of the requirements for the degree of Master of Arts.

April 19, 1982  
Date

Patricia J. Essenpreis  
Director's Signature