Site Stratification in a Lacustrine Environment: Evidence from Highland Ecuador

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Abstract

During the summer of 1973 the Indiana University Museum initiated a program of research to identify the native adjustments to the environment of San Pablo Lake through time. It was possible to distinguish several topographic conditions which might be appropriate to differential prehistoric utilization.

Prelminary results indicate that the largest sites tend to be located either on the low hills which surround the lake or on the high ground near Peguche Falls. Another large site was located on the 7 meter terrace, but the terrace does not seem to have been heavily utilized for habitation sites. No large sites were found on the low ground between the terrace and the lake.

All of the sites are characterized by a red slip ware which apparently belongs to a ceramic tradition which continued into the Historic Period. Very little evidence of other ceramic traditions was found.

Introduction

The earliest evidence of settled life in South America comes from coastal shell mounds in areas where mollusk beds provided a stable resource base. Riverine stations with abundant fish resources probably were equally capable of sustaining settled life at an early date. Although no riverine stations have yet been dated prior to 3000 B.C., it seems significant that the earliest well defined pottery phase on the Ecuadorian Coast, the Valdivia Phase, is often found in riverine situations (9).

The research of Padre Porras in the Ecuadorian Oriente demonstrates the close relationship of early Pastaza ceramics with those of the Valdivia Phase. The Yasuni Phase of the Napo River seems to be a somewhat later member of this ceramic tradition (2, 8). If the Early Formative ceramic complexes from both sides of the Ecuadorian Andes are closely related, contemporary cultures in the Andes might have served as intermediaries between the early ceramic complexes to the east and west.

Although the best known Valdivia sites are coastal shell middens (8), there are also sites on the Daule River in which the nature and quantity of the refuse indicate that settled communities, or villages, must have existed as early as Valdivia A (9). Fish from the river would have been a major food resource and we know also that maize was cultivated by peoples of the Valdivia Phase (13). In short, at least some of the Early Formative Period sites of coastal Ecuador could have based their subsistence on fishing and agriculture, supplemented by wild food resources, precisely the same subsistence base that is most likely for contemporary cultures on the upper Napo and Pastaza Rivers in eastern Eucador. Related cultures in the Ecuadorian Andes

are most likely to be found in areas which most closely approximate the critical resource potentials of coastal and eastern rivers.

Even though the rivers of the coast and of the Oriente penetrate the Andes, they are not the most likely place to look for early Formative settlements because their character is markedly different in the two zones. Instead of meandering rivers with broad floodplains which characterize the coast and Oriente, in the Andes we find deeply dissected, rapidly flowing rivers with very restricted flood plains. While fish undoubtedly were found in these Andean rivers, it seems unlikely that they existed in sufficient numbers to support settled populations comparable to those on the coastal rivers or in the Oriente. Fish populations large enough to support large settled communities probably existed only in the highland lakes.

There are four highland lakes in the Andes north of Quito: Mojanda; Cuicocha; Yaguarcocha and San Pablo. Lake Mojanda, at 3716 m, and Lake Cuicocha, at 3068 m, are probably too high to support very much early agriculture. Therefore, our efforts focused on San Pablo Lake (2661 m) (Fig. 1) which is well known for its modern Indian populations (1) as well as for its importance in the late prehistoric (4, 12) and early historic periods (11). Among other things, we hoped to establish the relationship between modern and prehistoric populations as an aid to archaeological interpretation. Other parts of the total study will include ethnographical and botanical research.

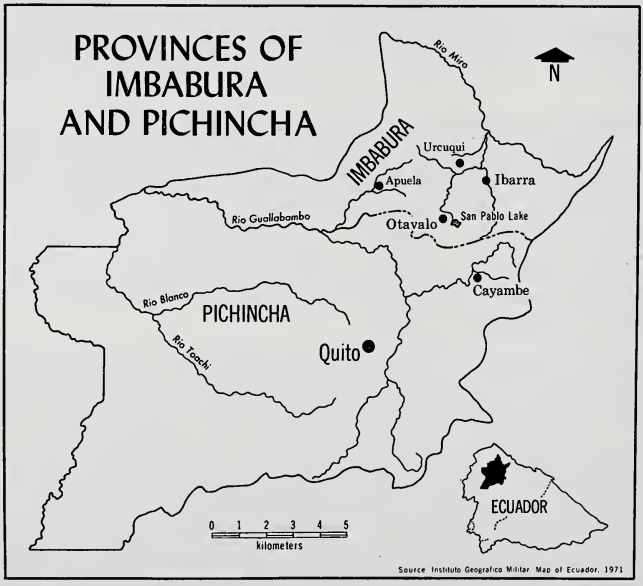

FIGURE 1. *Archaeological sites near San Pablo Lake, Ecuador. Source of base map: Servicio Geografico Militar, Mapas Topograficos: Illuman, Otavalo and San Pablo sections. 1938.*

The Andes of northern Ecuador is a volcanic region, much of it of fairly recent origin. The upper geological strata are characterized by soft, easily eroded ash layers. Major rivers such as the Guayallabamba and Ambi are deeply incised with little or no floodplain. However, some of the upper tributaries of these streams have U-shaped valleys with broad, relatively flat bottoms in which the rivers have cut no more than a few meters below the floor of the valley.

The Provinces of Imbabura and Pichincha are well known for their large earthen mounds, called *tolas*, which have been reported by various authors. Although many of these mounds have been excavated (5, 6), the nature of the reporting makes it difficult to know precisely what is involved. Evidently, there are at least three basic forms of tola: a circular tola, often with a central burial; a rectangular tola; and a rectangular tola with a long ramp. Recent work conducted at tola sites (10) should make it possible to re-evaluate the earlier data. Our project, however, was not directed toward the study of these ancient monuments but rather toward a systems analysis of the San Pablo Lake area. We feel this area is likely to produce a long archaeological sequence during which the relationships between the lakeside niche and other niches changed in response to changing environmental and sociological conditions. The first season's work was devoted primarily to archaeological survey, with some testing, and to archaeological salvage projects in conjunction with the Instituto Otavaleño de Antropología.

Geographical Description

Nestled among the hills of the Province of Imbabura, Lake San Pablo covers an area of a little more than 6 km^2. The lake is teeming with bass, trout and carp which have been introduced in the last few decades. At the time of the Spanish Conquest, the only fish species in the lake was the preñadilla (*Pimelodes cyclopum*), a small fish less than 10 cm in length which was trapped on dark nights (11). The modern Indian populations seem to make little use of the lake for either fishing or collecting edible plants. However, they continue to make reed boats which are similar in construction to those found on Lake Titicaca and the north coast of Peru. The modern Indians grow such crops as maize, quinoa, beans and peas around the lake and on the low hills: a little higher up potatoes are grown. The fields closest to the lake are utilized as pasture.

Within the vicinity of the lake we recognize seven ecological zones which seem to offer somewhat different advantages for site location. Zone A refers to the hills which separate Otavalo from San Pablo Lake. The tops of these hills are suitable for dry farming but since there are no springs for domestic use, water would have to be carried from below. The hills were thoroughly surveyed except in the extreme northern sector. Ten sites were identified including several large sites (OT-5, 6, 11), tola (OT-9), and a site with a circular configuration (OT-12), locally known as Arbol Pucara.

Zone B includes the area from the base of the hill to the edge of the terrace (Fig. 2). It also includes areas above the edge of the

terrace elsewhere around the lake. Sites in Zone B would have ready access to lacustrine resources and also to level areas suitable for dry farming. However, the streams are too deeply incised to permit irrigation. This zone was surveyed at the western end of the lake and 14 sites were located, only one of which (OT-20) approaches the size of the large sites in Zone A.

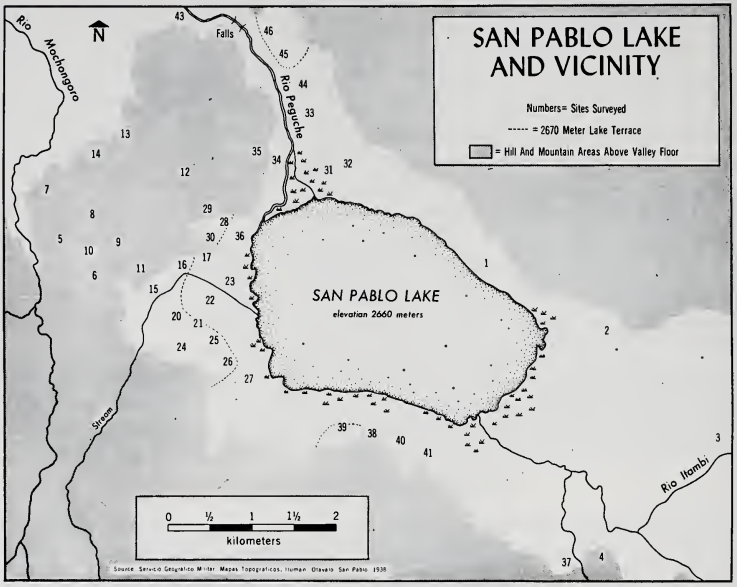

FIGURE 2. *Provinces of Imbabura and Pichincha. Source: Instituto Geografico Militar, Map of Ecuador. 1971.*

Zone C refers to the lands below the terrace which slope gradually toward the lake. Much of this land is sufficiently low-lying that it is subject to occasional flooding. Five small sites were found in this area.

Zone D refers to the foothills which approach the lake. They are somewhat lower and have better access to water than Zone A, but otherwise seem very similar. All three of the areas classified as Zone D have modern villages. Four sites were found in San Rafael at the southern end of the lake (OT-38, 39, 40, 41); one very large site in Gonzalez Suárez at the southeastern corner (OT-4); and one site in Araque (OT-2) which may be nearly as large as the one in Gonzalez Suárez.

Zone E is the floodplain of the lower Rio Itambi, which is irrigable. There is a group of circular tolas (OT-37) about 2 km from the lake.

Zone F is the Peguche Valley above the falls. The river has a small floodplain which might be irrigable but most of the land is

suitable only for dry farming. Six sites were found in Zone F including three large sites just above the falls (OT-44, 45, and 46). Several irrigation canals begin at the falls. The low, wet area below the falls is characterized by many stinging insects. No one lives there today and it was probably also an unattractive place in the past.

Zone G refers to the valley which extends northeastward from the lake, drained by the upper Rio Itambi, which is deeply incised into the broad floor of the valley. Although little work was done in Zone G, one site (OT-19) was found on the floor of the valley, and another (OT-18) at the edge of the valley, close to a spring.

Artifacts

Red slipped ware is prominent at all sites. It is associated with a plain ware, often with red slipped rims. The red ware vessel forms most frequently encountered include footed bowls and small ollas. Large jugs with an unpolished red slip are also common on some sites. Plain ware vessels are typically jars or ollas which sometimes have tall, solid tripod supports. Strap handles and tall, narrow flat bases are sometimes found as well. Decoration other than a red slip is very rare. Rectilinear red-on-natural painted decoration is found at several sites. The fragments are too small to permit design reconstruction but both cross-hatch and "V" design fragments can be observed. Pellet applique decoration, typically associated with a rim form suggestive of a cambered jar (8) is also found at several sites.

The aggregate of sherds collected from OT-11 stands out from all of the other sites in the area that have been collected so far, in that the range of design motifs and decorative techniques is far greater than has yet been identified at any other site. In addition to the combed decoration and pellet applique decoration, the aggregate of sherds from OT-11 exhibits at least four other modes. These include a pair of circumferential grooved lines above the shoulder angles; several sherds with diagonal incised decoration; an engraved band design above the shoulder angle; and a reed punctate and dot motif. In spite of the difference in sample size, there can be little doubt that OT-11 is a multi-component site, one of the very few that we have been able to identify so far.

Obsidian artifacts were also found in varying frequencies at all sites. Despite excellent raw material, examination of thousands of obsidian chips and fragments has not revealed the presence of a single piece which appears to have been worked into a predetermined form or that shows evidence of bifacial flaking. While the edges of some of the flakes appear to have been modified to form a working edge, the obsidian industry as a whole can be characterized as a utilized flake industry. At this point, we are not prepared to say anything about edge utilization differences from one site to another.

Ground stone tools were also found on many sites. For the most part, these were manos of which there appear to be two major

varieties: the first has a circular cross-section; the second has a triangular or trapezoidal cross-section. In museum collections and around modern house sites we have seen trough metates which might be expected to be associated with the second type of mano. When questioned, the Indians using these metates say that they are old, but from our own evidence we cannot associate this metate form with any particular site.

Discussion

The archaeology of the highlands of northern Ecuador is very poorly known. Although there are a few radiocarbon dates, the materials with which they are associated have not been published. Neither is there a verified stratigraphic sequence anywhere in the area. While there is a seriation of grave associations from the Province of Carchi (3), it deals mostly with more elaborate materials than have been found in our surface collections. Comparisons also can be made with materials from the Oriente and from the Coast.

The chronological system employed here was developed by Meggers (7), based largely upon dated materials from coastal Ecuador. The ways in which this system can be extended to the highlands is open to considerable doubt which can only be removed when the development of highland cultures becomes better known.

Formative Period (2500 B.C. to 500 B.C.)

OT-11 appears to have been occupied during the early Formative Period since it shares a number of traits with the Valdivia and Machalilla Phases of the Coast (8). These include closed mouth carinated bowls, double spout and bridge vessels and jars with cambered rims as well as red-on-natural painted designs, bands of diagonal incisions, grooved decoration, pellet applique, and pottery discs. Side by side comparison of these sherds from OT-11 with those from a coastal site of the Valdivia Phase indicates that our sherds could easily be lost among the Early Formative materials from the Coast. The high degree of similarity is surprising because of the distance between the two sites. However, other characteristics of Valdivia and Machalilla Phase pottery, such as zoned cross-hatch decoration, do not appear in our collections. Nevertheless, there can be little doubt that the occupation of OT-11 dates back to the early Formative Period, probably prior to 2000 BC. At OT-5, 20 and 45 pellet applique decoration on a cambered rim, virtually identical to the examples from OT-11, suggests that these sites may also have been occupied during the Formative Period. Other artifacts suggestive of Formative occupation were also found at OT-1 and 44.

Sites of the Formative Period are found in four of the ecological zones: Zones A, B, C and F. The site in Zone C is located on a low rise well above present lake level. The quantity and extent of the refuse indicate that it is a very small site, probably occupied for a very short period of time. The area covered by Formative refuse at OT-11 is much larger, but not so great as the later occupations of the site.

Regional Developmental Period (500 B.C. to 500 A.D.)

Resist painted pottery associated with deep shaft and chamber graves is characteristic of this time period from the middle Cauca Valley, in Colombia, to the north coast of Peru. This combination has been identified at two sites in the vicinity of San Pablo Lake: OT-4 and OT-18. However, the apparent absence of resist painted wares cannot be taken to mean that other sites were not occupied during this period. Resist decoration is highly fugitive so the smallest amount of surface abrasion or weathering would eliminate all traces of it. Typically such decoration is found on a red slip in the Carchi area (3). As noted, red slip is found on all sites around San Pablo Lake.

Sites definitely belonging to the Regional Developmental Period are found in Ecological Zones D and C. However, sites of this period may yet be identified in other ecological zones.

Integration Period (500 A.D. to 1500 A.D.)

There is a large number of sites which share several ceramic traits characteristic of the Integration Period. These include footed bowls and ollas, vessels with solid conical tripod supports and vessels with heavy triangular rims. Even though we have small surface collections from many sites, 18 of them share two or more of these characteristics.

Sites of the Integration Period occur in Ecological Zones A, B, C, D, and F. In addition, the group of circular tolas in Zone F probably belongs to the Integration Period. The largest sites are located in the southern part of Zone A (OT-5, 6 and 11) and in the northern part of Zone F (OT-44, 45 and 46). The sites in Zone F would have been in an ideal location to control the flow of water into irrigation canals which begin at the falls. Since we found evidence of irrigation during the Integration Period near Cayambe, it is possible that the control of irrigation waters was an important consideration in the placement of sites above the falls.

Not only are there more sites which belong to the Integration Period, but the sites are also larger than those of earlier periods. Since there is no evidence to suggest massive immigration from other areas, we attribute the apparent increase in population to the normal processes of population growth.

In the final phase of the Integration Period, northern Ecuador fell under the control of the Inca Empire. The seat of Inca power at San Pablo Lake was probably at Arbol Pucará (OT-12). To date, we have found no archaeological evidence that **mitimae** populations were introduced by the Inca to consolidate their control.

Historic Period (beginning 1500 A.D.)

Documentary references (11) to towns of the Early Historic Period mention many centers which continue to be occupied. In addition to these centers we have identified one site (OT-15) which was occupied during the early Historic Period. A feature salvaged from this site produced red slip footed bowls and footed ollas very similar to those of

the Integration Period. However, the specimens from OT-15 were made on a fast wheel—a technique of pottery manufacture which was not known in the New World prior to the arrival of the Spanish. Thus there is evidence of cultural continuity between the prehistoric period and the modern Indians of Otavalo.

Conclusions

Archaeological evidence from San Pablo Lake suggests that the area was occupied during the Formative Period, probably before 2000 B.C. Although the area continued to participate in developments that were taking place elsewhere in Ecuador, there is nothing to suggest massive immigration or foreign control before the Inca invasion in the late Integration Period. While the inhabitants of San Pablo Lake must have been in contact with the outside world, they appear to have retained control of their own destiny, accepting or rejecting foreign ideas as they saw fit. This situation contrasts with the culture history of the Central Andes which is characterized by the rise and fall of empires. The societies of the highlands of northern Ecuador appear to have followed their own road to the development of complex society, unaffected by the spread of Peruvian empires until they were finally conquered by the Inca.

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