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RESIDENTIAL ZONING AT PREHISPANIC TZINTZUNTZAN, MEXICO REVISITED: A QUANTITATIVE ANALYSIS

By

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ABSTRACT

RESIDENTIAL ZONING AT PREHISPANIC TZINTZUNTZAN, MEXICO REVISITED: A QUANTITATIVE ANALYSIS

By

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This thesis focuses on the archaeological site of Tzintzuntzan, a Prehispanic site located in West-Central Mexico. Situated within the Pátzcuaro Lake Basin, Tzintzuntzan was once the capital of the Tarascan Empire, a state-level, Mesoamerican society that emerged around AD 1350. In 1970, Helen Pollard completed an archaeological survey of Tzintzuntzan, forming the basis of her PhD dissertation in 1972. Central to Pollard's dissertation was the concept of urbanism in the formation of Tzintzuntzan. She tested the presence of urban planning and zoning, the function of Tzintzuntzan as the major Tarascan city, and whether it was political, ceremonial, or economic in nature. This thesis reanalyzes Pollard's Tzintzuntzan survey with focus on the ceramic artifacts collected, and provides a quantitative analysis for the classification of sites into zonal categories.

Through multiple lines of evidence, bridging arguments are made that identify ceramic variables sensitive to social class and that aid in the classification of sites into residential and public zones. This allows for the quantitative testing of Pollard's original zonal interpretations, and aids in identifying the extent to which urbanism occurred at Tzintzuntzan. Ultimately, this thesis has created a methodological framework for reanalyzing archaeological surveyed data from the Late Postclassic period, one that isn't limited to Tzintzuntzan but can be applied elsewhere in the Tarascan Empire.

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Chapter One

Introduction and Problem

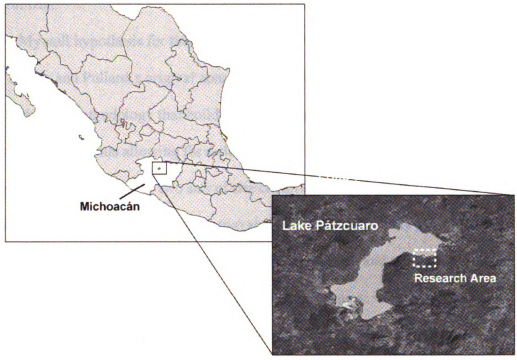
Problem

This thesis reanalyzes the results of an archaeological survey that was completed by Helen Pollard at the site of Tzintzuntzan in Michoacán, Mexico. Tzintzuntzan is an ancient Mesoamerican settlement which became the capital of the Tarascan Empire around AD 1350 (Pollard 1993: 29). The survey area is located in the northeast portion of the Pátzcuaro Lake Basin on the shores of the lake, and is 901 hectares in size[1]. The survey was completed by Pollard in 1970, and formed the basis of a PhD dissertation in 1972. The dissertation and its subsequent publications are an invaluable asset to archaeology, both within and outside of the Mesoamerican archaeological community. Since the original survey, the archaeological record has been compromised due to looting, soil erosion, and construction in or around the site of Tzintzuntzan. Because of this, it is impossible to recreate Pollard's original survey to test her interpretations of Tzintzuntzan.

Central to Pollard's dissertation was the concept of urbanism in the formation of Tzintzuntzan. She tested the presence of urban planning and zoning, the function of Tzintzuntzan as a Tarascan city, and whether it was political, ceremonial, or economic in nature. These questions are at the center of my thesis, as I reanalyze the artifacts from the Tzintzuntzan survey to test the internal urban characteristics that Pollard has concluded were present at Tzintzuntzan. Such questions of urbanism include the dichotomy that exists between urban planning and urban zoning, ranging from the level

[1] Utilizing GIS technology and methods, the map of the survey area was georeferenced to a rectified aerial image, and the previous survey size was corrected accordingly. See page 9 for a more detailed methodological description.

Figure 1 – The State of Michoacán and the Research Area



of the individual to the settlement level (Smith 2007: 3). Michael Smith explains this dichotomy in his updated approach to ancient urban planning. He discusses urban planning in terms of a range of variation instead of the commonly held misnomer that an ancient city was either planned or unplanned. Smith discusses this range in terms of specific variables that define the level of planning, such as the coordination among buildings, orthogonality and access and visibility to name a few (2007:7). Furthermore, both Smith and Pollard acknowledge zoning to be considered a form of urban planning, where space is patterned upon differential land use, and the land use having different functions within society. The thesis focuses on the testing of Pollard's zonal assignments of the survey sites, primarily with regard to the residential and to a smaller degree the public zones. This aids in the analysis of the internal structure of urban zoning at

Tzintzuntzan, and helps to test Pollard's original inferences about the urbanization of Tzintzuntzan.

My null hypothesis for this thesis is that there are no differences between my zonal results and Pollard's original zonal assignments. In order to test this hypothesis, I have laid out a methodology that builds bridging arguments that tie social status to ceramic variables, thus allowing for a classification of the survey sites separate from Pollard's classification. The two sets of site classifications will then be compared, revealing any differences between the two analyses. This ultimately tests Pollard's interpretation of the urbanism that occurred at Tzintzuntzan, and allows for a different analysis to be completed with updated theory and techniques.

This thesis works from the assumption that Tzintzuntzan was a socially stratified city that represents the Tarascan capital. What is being tested for is the extent that urbanism occurred at Tzintzuntzan, with a distinction made between zoning and planning. By testing Pollard's residential and public zones, I intend to determine what role zoning and planning had within Tzintzuntzan settlement. I predict that my results will confirm Pollard's original conclusion that zoning was the primary form of urbanism, and that urban planning although present, did not occur at the settlement level (Pollard 2003: 363).

A major aspect of this thesis is the ability to use different analytical methods to test Pollard's data. Pollard's analysis of the sites and their artifact distributions was done primarily by intuitive inspection of the artifacts and their attributes, without any quantitative testing and in a non-systematic way. Through identification and isolation of specific ceramic variables, Pollard was able to determine survey site function and thus

designate the site a zone. This thesis uses quantitative analysis in conjunction with a GIS database to reanalyze the zonal designations that Pollard had assigned to survey sites. The ability to apply statistical tests and use a geodatabase for mapping and display allows for a more detailed inquiry into the artifact distributions and subsequent patterns at Tzintzuntzan.

Also of importance will be the previous and subsequent excavations done by the Instituto Nacional de Antropología e Historia, Mexico (INAH) at Tzintzuntzan. These excavations were carried out at the main ritual platform at Tzintzuntzan, and are another important resource that will be analyzed with respect to status and gender associated with certain artifact variables. The combination of Pollard's research, the INAH excavations, and the ethnohistorical evidence provide for a complete study of the spatial distribution of artifacts and the characteristics of an urban landscape in a Prehispanic state capital.

Previous Research

This thesis is the product of a pilot study done for a graduate level seminar focused on statistical analysis and research design in archaeology. It was this study where GIS was first utilized in creating a digital map of the Tzintzuntzan survey and was used in exploring possible research ideas for the survey data. The project focused on very specific ceramic variables that were indicative of social status markers, and when statistically analyzed would help to isolate survey sites that would be indicative of higher status function. A multivariate cluster analysis was used to analyze the distribution of these elite variables across sites, and a polythetic classification was undertaken which assigned the survey sites to clusters that varied based on variable frequency. The results

yielded very interesting patterns, with the survey site clusters falling within the elite residential zones that Pollard first designated. By using the polythetic classification, certain sites did stand out from the others based upon the variable's presence or absence and the frequency of the different variables. These results allowed for further questions to be raised for this thesis, and were vital in exploring the data and helping to build a research framework in which to begin preparing for this thesis.

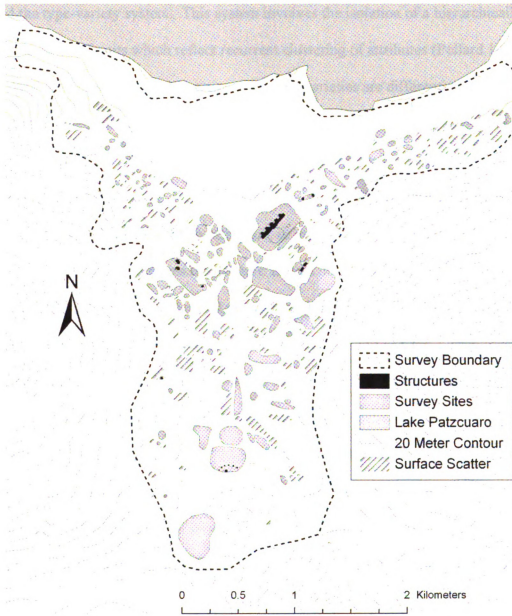
Research Goals and Data

In the survey of Tzintzuntzan (see Figure 2 for survey map), Pollard collected artifacts from areas of surface scatter across the survey area, an area that was defined by both artifact density as well as geomorphology of the land. In most cases, the land was highly eroded on the outer edges of the survey area creating a void of artifacts and thus setting the survey boundaries. The collection includes n = 2152 ceramic artifacts (including sherds, pipes, and other) as well as n = 1047 lithic artifacts. During the survey, Pollard focused on collection of ceramic sherds with rims and decoration, which allowed for her analysis of the survey sites and the ability to create zonal categories based on ceramic variables. Plain-ware pottery was collected when it was sensed that the density of the ceramics was enough to define a site.

The primary unit of analysis is the sites that Pollard designated in her survey. In her dissertation, Pollard defines the survey area by the artifacts found in the surface survey along with the associated surface topography (Pollard 1972: 28). Within the survey boundaries, "concentrations of artifacts were noted and located on the survey maps", and "all concentrations that were spatially isolable were given numbers and

considered sites" (Pollard 1973: 28). Because of funding and permit restriction, Pollard's survey sampling was non-random, made for the purpose of "isolation of temporal variability (determination of the contemporaneity or lack of contemporaneity of the sites), and the isolation of intra-settlement variability that might be reflective of economic, social, or political differentiation within the settlement" (Pollard 1972: 190).

Figure 2 – The 1970 Tzintzuntzan Survey



From this point, Pollard undertook two classificatory procedures in order to perform an intra-settlement analysis (Pollard 1972: 191). One procedure, called analytical classification, involves isolating modes, which are selected attributes or clusters of attributes that "display significance in their own right" (Pollard 1972: 191). Examples of modes from Pollard's work include slip type, paint, decoration and motifs, and vessel form. The other procedure used by Pollard is the taxonomic classification termed the type-variety system. This system involves the isolation of a hierarchically organized series of units which reflect recurrent clustering of attributes (Pollard 1972: 192). Within this system, wares, groups, types and varieties are differentiated by the sharing or lack of sharing of similar states of particular attributes. For example, wares are distinguished by the attributes of paste composition and surface finish, types by the attributes of a vessel from and decorative style, and varieties by minor variations in the attributes of vessel form, decorative technique, or decorative style (Pollard 1972: 192).

This thesis only examines the ceramic artifact data from Pollard's original survey. It utilizes Pollard's ceramic modes and wares that were derived from the type-variety classification as variables for this analysis. These variables include slip, vessel form, decoration, paste (also called ware), paint and supports. These variables have been chosen because of their ability to isolate social status and function for each of the survey sites depending on their presence or frequency. The spatial distribution of ceramic pipes and pipe fragments from the survey are also analyzed. The pipe analysis will provide a greater insight into the ritual and religious functions of sites and their relation to public zones, an analogy made by Pollard in her use of the *Relación de Michoacán* (1541) to

attribute function to pipes as being "used by priests and other members of the nobility in association with religious ceremonies" (Pollard 1993: 165).

The outcome of these procedures is the ability to isolate ceramic variables that display some distinguishable pattern that refers to a "zoning" behavior. Zoning, according to Pollard, refers to the pattern of differential land use within a given area (1972: 71). This differential land use is based on differential functions of particular special units (Pollard 1972: 71). For analytic purposes, Pollard defines each site according to zone characteristics, which are based on historic, ethnohistoric and archaeological data (Pollard 1972: 73). The main source of this type of data is the *Relación de Michoacán* (1541), which is an Early Colonial document, recorded in Tzintzuntzan by the Spanish as dictated by Tarascan high priests. Within this, drawn figures illsutrate food preparation occurring in what seems to be commoner housing by people in commoner dress. The ceramic material indicative of this type of food preparation, coarse wares in the form of shallow bowls or everted rim jars, and then associated with what Pollard refers to as residential type Ri zones (Pollard 1972: 74). From this, Pollard established three residential zones, ranging from Ri to Riv, Ri being the low or commoner status, Rii being highest status or upper elite, Riii being an elite status but not including the king, and Riv being a group defined solely on the presence of Querenda White ceramics (1972: 80).

By using these status-sensitive ceramic variables, I more closely analyze the division that Pollard associates with residential zones. For example, the Rii (upper elite) and Riii (lower elite) zones are both considered elite zones, except that Pollard makes the distinction that Rii is the highest status zone which includes the king and his family,

while Riii represents the "lower branches of the high-status group in the social structure of Tzintzuntzan" (Pollard 351: 2003). The difference in these groups is slight, where residential iii "contains some, but not all of the lithic and ceramic artifacts found at the high status (Rii) sites" (Pollard 353: 2003). Another zonal question that will be analyzed was first found in the pilot study described previously. The study isolated what was considered elite variables, one of them being the Querenda White ware. Analysis showed the Querenda White ware was limited spatially, occurring only in the northeast portion of the survey area. In Pollard's dissertation, she believed this to be an ethnic barrio, characterized by non-local ceramic production of Querenda White ware ceramics. Both of these issues present an interesting research question that may be clarified with the combination of additional ceramic variables in analysis. By utilizing GIS and quantitative analysis, I analyze these zonal differences more carefully, and provide statistical evidence that either supports or provides alternate evidence for the placement of these residential zones.

Review of Literature

The majority of research literature that is used is from Pollard's work and publications. The main data resource for analysis is her dissertation. Other literature includes Pollard's 1993 book, *Tariacuri's Legacy: The Prehispanic Tarascan State*; journal articles dealing with urban planning and city-state development both at the capital of Tzintzuntzan and elsewhere in Mesoamerica; and Amy Hirshman's 2003 dissertation, *A Case Study in the Relationship between Social Complexity and the Organization of Ceramic Production from the Lake Pátzcuaro Basin, Michoacán, Mexico.* This last

resource aids in classifying certain ceramic types based upon variables that designate them as elite or commoner ceramic types. Hirshman's main concern was to distinguish between utilitarian, market-oriented production versus specialized production intended for elite consumption (2003: 84). Specifically, she discusses decoration, slip, finish, and vessel form. Vessel form is a very common and wide ranging variable in ceramic production. According to Hirshman, temporally we see a shift in the percentage of bowls to jars in burial and non-burial context, with a higher percentage of bowls in burial contexts, and a higher percent of jars in a non-burial context (2003: 98). This type of research sheds light on what the ceramic utility may have been, and with what class group it is found.

The excavations carried out by INAH at the main platform at Tzintzuntzan are also an integral part of this research. The excavations are detailed in publications of individual field seasons as well as summaries of all nine seasons come from Acosta (1939), Rubin de la Borbolla (1939, 1941, 1944), Castro Leal (1986), and Cabrera (1987). The use of the INAH excavation reports from the main platform, which includes elite burials, allow for the selection of specific ceramic variables can be utilized as markers for elite status.

Gerald Migeon's and Olivier Puaux's dissertations and publications are also a vital asset in providing analogous material in which to bridge the ceramic variables to specific social status. Migeon's dissertation examined excavations within Tarascan habitations at the site of Las Milpillas on the Malpaís of Zacapu, Michoacán during the Late Postclassic, a site located approximately 37 kilometers to the northwest of the Pátzcuaro Lake Basin. These resources aid in determining the material distinctions

between the commoner (Ri) and lower elite (Riii) classes, and also between lower elite (Riii) and the upper elite (Rii). Of importance is the fact that the excavations by Migeon have been described as commoner and lower to middle elite residences, lacking the upper elite which were present at the adjacent site of El Palacio on the southern end of the Malpaís (Migeon 1990).

The dissertation from Olivier Puaux analyzes burials at a main pyramid at the site of Las Milpillas. These lower elite and commoner burials will be important because they can be compared to the upper elite burials at Tzintzuntzan. These comparisons will help to differentiate between the social statuses and define distinct ceramic assemblages to be used in the zonal classifications. Both Puaux's and Migeon's research provide evidence of social distinctions from outside of the Pátzcuaro Lake Basin, and aid in the discussion of Tarascan urban traditions.

Michael Smith's work on urban theory is also referred to when defining the urban extent of the Tarascan capital of Tzintzuntzan. By using his updated concepts of zoning and planning and setting them into the framework of Mesoamerican cities, Smith provides the means for describing the range of urbanism that is present at Tzintzuntzan. Also because of his detailed approach to ancient urbanism, space at Tzintzuntzan is more closely examined thus providing for a thorough intra-site analysis of urbanism.

A final resource that is utilized is the *Relación de Michoacán* (1541), which is an ethnographic account of the Spanish encounters with the Tarascan people. These Early Colonial accounts and sketches give an invaluable aspect to understanding the life ways of the Tarascan people in a pre-Hispanic setting. Pollard utilized this by analyzing specific scenes from drawings that illlustrate specific ceramic usage associated with

certain events, such as a commoner meal or an elite burial. By using this resource, I am able to understand the role of certain socially significant variables seen in the ceramics collected by Pollard.

Research Methodology

One of the main components of this thesis is the ability to analyze data from a GIS interactive mapping database. This requires the placement of the data into a geospatial program that has the ability to spatially map and analyze the sites and their associated attributes. For this study, I utilize ArcGIS ™ (ArcMap ™, ArcCatalog ™, ArcToolbox ™), which are Geographic Information System (GIS) products created by the company ESRI. The first step is to convert the original map created by Pollard into a TIFF file, which is an appropriate file system used in ArcMap. From there, the map is overlaid upon the aerial photograph of the site of Tzintzuntzan, called a digital orthophoto quad. Digital orthophoto quads are rectified images from which accurate maps can be created. The aerial image is tied to specific, real world geographical points (i.e. lat/long coordinates), and when the map is positioned as closely as possible, the image is georeferenced, rectified and is then associated with specific geographic coordinates. At that stage of consolidation, a new map must be made that resembles the old map, but in this case attribute data can be directly tied to the new digital map and can then be used in analysis. The map is created from a process called digitization, which involves tracing over the old sites to create new ones in digital form. After each site is created, it is given the associated site number, the frequency of artifacts, the types of artifacts, and any other relevant attribute data that could be used for analysis. In this

case, the sites are given the number of observations for each variable that was just discussed. This allows a query of data that is directly displayed through the map just created, and is invaluable in data display and spatial analysis.

The unit of analysis is the site and the variables include any ceramic variables that give further insight into form and function of the site they are contained in. With that said, the primary statistical approach to be used is a cluster analysis. The cluster analyses used are a multivariate statistical procedure that starts with a data set containing information about a sample of entities and attempts to reorganize these entities into relatively homogeneous groups (Hirshman 2003: 113). The sites are run through an agglomerative, hierarchical cluster analysis with a polythetic classification, where "multiple variables are taken into account to form the groups with no one variable sufficient or necessary to group membership (Hirshman 2003: 113). The hierarchical cluster used is based on a between group cluster that uses the average linkage between groups. Average linking is a "space conserving algorithm that defines distance between groups as the average of the distance between all pairs of individuals in the two groups" (Hirshman 2003: 117).

The usefulness of the methodology I have laid out is that it provides bridging arguments that isolate ceramic variables that represent specific status groups, and to then take these variables and group them accordingly. So for example, variables will be combined, such as specific slips, decoration, paste, and will all share a common link in that they are associated with a specific status group. The sites will then be run through an agglomerative, hierarchical cluster analysis based upon these status variables in order to aid in placing sites into zonal categories. Alternatively, a monothetic classification may

be used with the specific variables, thus creating a much clearer spatial assignment of the sites based upon variables that must be present in order to be placed into a specific group based upon zonal characteristics. Depending upon the number of the clusters that the analysis returns, an additional K-means cluster analysis may be performed to deal with outlier sites. The K-means cluster analysis is based on the hierarchical cluster, but refines the results as the user adjusts the subjective number of output clusters required, moving the cases that were initially miss-assigned in the one-pass hierarchical results (Hirshman 2003: 120).

Once the sites have been assigned to zones based upon the clustering of their ceramic variables, a non-parametric statistical test is carried out that compares my zonal results to Pollard's original zonal results. Because the data are ranked, the test will be a median based statistical test, as opposed to a mean based test. The test will be a Wilcoxon signed-rank test, which will compare the differences between two measurements on the same sample. I will also run a sign test, which will analyze the directionality of the measurements on the sample using a nominal scale. These statistical tests should display any significant differences in my zonal assignments versus Pollard's, thus testing my null hypothesis that there will be no difference between my zonal classifications and Pollard's.

Predictions

I predict that my results will not differ from Pollard's original results. Because of the quantitative analysis, certain patterns may be shown more clearly when determining site function and status. I believe that if any sites do not conform to Pollard's original

results, it is because the ability to run statistical tests may reveal site clusters that pattern in ways that are difficult to determine in the manner that Pollard originally did her analysis. By being able to run a variety of cluster analyses using both monothetic and polythetic groupings, it is also hoped that the variables will provide site patterning that may better define what Pollard calls a Rii, upper elite residential zone. These sites vary little from the Riii (lower elite), and I believe with the planned analysis the sites will not differ substantively from Pollard's original zonal classifications, but still may provide smaller-scale patterns that better explain the statistical differences between Rii sites (upper elite) and Riii sites (lower elite).

Significance of Research

One aspect of this research hopes to add to the growing literature on integrating GIS with archaeological research. Even though a limited analysis is done using GIS in this paper, it still displays the capability of GIS as an interactive database where information can be stored, manipulated, analyzed and displayed. GIS is used in this thesis to create an interactive site map, one where the ceramic variables are tied to the sites and thus linked to a database capable of running statistical and spatial analysis. The use of GIS will also bring about specific questions dealing with spatial data that has been collected through sampling. The statistical and display advantages of a GIS will help in a better understanding of how a sampling strategy affects the interpretation of the data.

The primary goal of this thesis is to provide a quantitative analysis to the archaeological survey data from Tzintzuntzan. This will allow for a more comprehensive view of the role of urbanism at Tzintzuntzan, and will shed light on the internal structure

of the social hierarchy of the Tarascan capital. Hopefully, this will convey a better understanding of the archaeological landscape and the use of space at Tzintzuntzan, and may aid in the discourse centered on Pre-Hispanic, state-level social theory. The hope is to provide a methodology that utilizes multiple lines of evidence and statistical analyses capable of working with small sample sizes, and thus providing results with a higher degree of confidence than was previously thought. This may result in a framework that can be tested elsewhere in the basin and aid in the understanding of how we might interpret concepts of social status from the archaeological record.

Chapter 2
Research Methodology

This chapter presents the methodology used in this analysis. Data and results from previous research that aids in the classification of ceramic variables into distinct groups based upon social identity within the framework of the socially stratified Tarascan capital are presented. The data that structures the selection of variables comes from (1) analyses of ceramic production and the economy of the Tarascan state based on excavation and survey from the sites of Urichu and Erongarícuaro, (2) mortuary and household excavations at Tzintzuntzan and Urichu in the Pátzcuaro Lake Basin, and the Tarascan site of Milpillas in the Zacapu Basin, (3) and ethnohistoric data from the *Relación de Michoacán*. All of these provide evidence for social stratification within the Tarascan Empire, but more importantly provide material evidence of social classes including ceramic goods. By linking historical and archaeological evidence representative of material culture to social status, I create bridging arguments for the association of ceramic variables, such as decoration and vessel form, into social classes.

Ceramic Production

Crucial to any analyses of material goods is the knowledge and understanding of their contexts for production and utilization. In the case of Tzintzuntzan, ceramic production is closely aligned with the presence of a socially stratified community, in that production changes relative to the organization of labor and emerging economies. In her dissertation, Amy Hirshman looks closely at the relationship between the emergence of the Tarascan state and the organization of ceramic production. By using the

"Standardization Hypothesis" within the context of the social evolutionary model and the political economy model, Hirshman "assesses changes in the ceramic assemblage reflective of larger changes in organization of ceramic production" (Hirshman 2003: abstract). Hirshman's ceramic assemblage consists of 37,301 sherds from survey and excavations from the lower southwest portion of the Lake Pátzcuaro basin, including the sites of Urichu, Pareo, and Jarácuaro (2003:5).

Of importance to this analysis is Hirshman's interpretation of ceramic specialization within the Tarascan economy. Craft specialization in terms of the political economy model could be considered a function of the upper class within the state, sponsored by the elite for purposes of control within the economic and political realms (Earle 2002:145). Specialization may also exist in producing for a general market for commoners, where specialist producers exist "because of gains in efficiency resulting from underlying economic conditions" (Earle 2002:145). In either case, specialization is measured by means of standardization as defined by the "standardization hypothesis", which "maintains that the product of specialized producers will exhibit less variation than the products of non-specialized producers" (Hirshman 2003:3). To determine the specialized level of a ceramic product, Hirshman discusses ceramic variables in terms of efficiency, energy, routinization of task, and labor investment (2003:3).

As discussed in the introduction I have chosen to focus on ceramic modes rather than work wholly within the type-variety system of the region. To better explain, a mode is a standard or concept that evokes a behavior within, for example, a community of ceramic producers, and displays significance based on its own right (Hirshman 2003: 102). This technique was taken from Hirshman's analysis, as she too found it easier to

use ceramic modes in explaining social status within the organization of ceramic production. For example, she notes that the modes slip, paint and finish are likely indicators of labor investment (2003:135).

Slip is one of the variables I have chosen for this analysis. There are five colors of slips present within the ceramic assemblage at Tzintzuntzan; red, cream, pink, grey, and white. Of these Hirshman notes that throughout the temporal phases, red and cream remain the most important slip colors. This is true in the survey collection from Tzintzuntzan, with cream slip as 68% and red slip 24% of the total slips present. With such large percentages, it is clear that both slips range across a variety of ceramic types, including both coarse and fine wares, and cannot be expected to be limited to any specific social class. Likewise, we cannot assume that a specific ceramic variable is only found on elite ceramics based solely on that variable's low frequency within the assemblage, although Hirshman does notice that the white slip becomes "more common" over time, yet still doesn't become significant within the assemblage (2003:135). At Tzintzuntzan, white slip is 5% of the total slips from the survey collection. It may be that the increasing frequency of white slip reflects a need for the growing elite class within the Pátzcuaro Lake Basin. This may explain the slip's "more common" presence, yet also why it never is viewed as a common ceramic mode within the assemblage. This of course is mere speculation, but may provide useful insight when analyzing data from the excavations of burials and habitations in the Late Postclassic.

Paint may be a more useful variable in determining social status in ceramic sherds. Hirshman notes the absence of paint dominating in all phases of the temporal sequence of the Pátzcuaro Lake Basin (2003:135). Paint colors do occur in all phases,

with either one color being used alone, in pairs or in threes on any given sherd, the latter being rare. Hirshman sees the use of three paint colors as significant, as "three paints require greater labor, and the only incidence of three paints occurs in the Late Urichu and Tariacuri Phase" (2003: 137). When discussing paint color, Hirshman notes that the most common color is red, and the most common two-paint combination is red and white. It is clear that paint combinations may give more insight into labor investment in ceramic production, doing so on a continuum of high occurrence to low occurrence in both paint number and color. Based on the aspects of ceramic production discussed here, we can begin to suspect that more decorated ceramics, with regard to paint, can be correlated with higher social classes.

The use of resist, also called negative decoration, is another decorative technique that Hirshman discusses within Tarascan ceramic production. Resist is a technique where wax is applied to a previously fired vessel, and then fired again in a reducing atmosphere. During the firing the wax protects the design underneath and eventually melts away thus creating a black, smudged pattern where the wax wasn't applied and leaving intact the protected original design (Hirshman 2003: 141). Of course this technique is time consuming as well as requiring a higher cost for labor and a second firing. Hirshman notes several things about the resist patterns that must be examined more closely within this analysis. First, she notes that a low percentage of sherds exhibit resist in the Tariacuri phase. She also notes that resist occurs primarily in areas that have been designated as commoner contexts (2003: 141). Hirshman also notes that there was no commoner substitute for the resist technique that produced a similar decorative style, such as the use of black paint to mimic the resist look (2003: 141). So based upon the

labor cost and specialization needed to produce ceramic with resist, one might assume it is a variable that belongs to an elite ceramic assemblage. On the other hand, Hirshman's findings also place the resist patterns in commoner contexts, not with elites. These issues will be kept in mind as the analysis continues within the Tzintzuntzan ceramic assemblage.

Excavations in the Zacapu Basin

To the immediate northwest of the Pátzcuaro Lake Basin are the archaeological sites of the Zacapu region. These sites represent another social center within the Tarascan state containing similar organization and social stratification to that of Tzintzuntzan. The dissertations of Gerald Migeon and Olivier Puaux describe excavations of structures and burials at the site of Mich. 95 (Las Milpillas) within the Malpaís of Zacapu. The excavations at Mich. 95 took place in 1984 and 1985, and focused on the smaller area of Group B of the Milpillas site (Migeon 2003; 104). The sites range in temporal phase from La Joya, Palacio, and Milpillas. This thesis will be concerned only with the Palacio and Milpillas phases, or the Postclassic phases[2].

Migeon's dissertation describes excavations that were carried out within and around 40 structures[3] (see Figure 3) (Migeon 2003: 104). These structures represent both residential and public buildings, and the *in situ* excavations will be used to link certain ceramic types to areas of differential social function and status within the Group B area.

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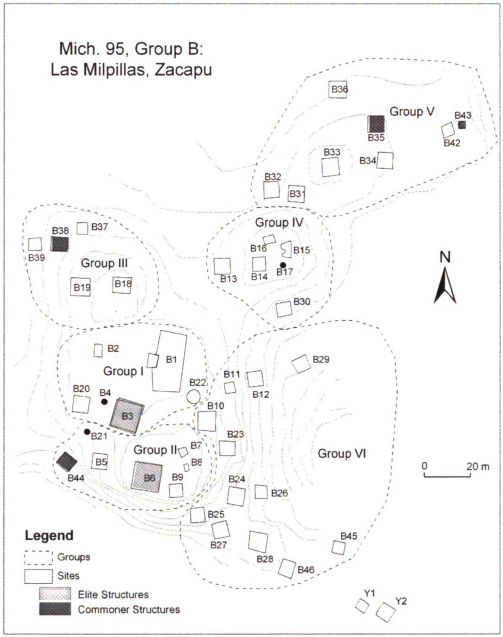
[2] Migeon doesn't readily distinguish between phases within the excavations of the structures. The types are given for the artifacts, but aren't further categorized into specific time periods. Thus, the artifacts range from the Palacio and Milpillas phases, the Palacio being the Early Postclassic, the Milpillas being the Late Postclassic.

[3] In this case, "structures" refer to a variety of architectural features, from the level pyramid platforms (*yácatas*) to commoner habitation. For the purpose of this paper, I am primarily concerned with habitation structures, but will also look at ceremonial and communal structures as well.

Figure 3 – The Site of Las Milpillas



As taken from Michelet, 1998

Also of importance is the fact that during the Late Postclassic, it is known from ethnohistoric documents that the upper elite were present at the adjacent site of El Palacio, as it was the administrative, political, and religious center in the immediate region during the Late Postclassic (Migeon 1998: 43). Thus, Mich. 95 has been

described as an area with a lesser range of social stratification, consisting of the smaller, plain dwellings of the commoners to the *grande maisons* (great houses) and *centre civico-ceremoniel* (civic ceremonial centers) of the intermediate and administrative elite of the district (Migeon 1989: 490-91). These will be used to construct material associations between what Pollard defines as the Riii zones, occupied by the lower elite, lacking the highest elites defined primarily by the royal family, and the Ri zones, defined as the commoner residential zones.

Of significance is how Migeon describes the range of variation within the artifact assemblage of the Group B structures, stating that even though a large range in structure size exists, the artifact assemblage is fairly homogeneous throughout (1989:418). This gives us some insight into a possible relationship between social classes. The existence of a relatively homogenous artifact assemblage at the Zacapu site of Milpillas suggests that the lower elites are actually closer to the commoners, at least in a material sense, than they are to the upper elites at El Palacio. This may provide a useful avenue of analysis to pursue when looking closer at the class distinction proposed at Tzintzuntzan. One thing that should be kept in mind are the differences in location between the two Tarascan centers; where El Palacio is physically removed from Mich. 95 creating somewhat of a spatial disconnect, the social stratification being analyzed at Tzintzuntzan consists of shared urban space creating more of a continuum of social classes, both in a physical and ideological sense.

Migeon describes in detail the size, architecture and surrounding features (such as proximity to ceremonial centers and pyramids) of each structure. Utilizing the ethnohistoric information from the *Relación de Michoacán*, Migeon distinguishes

between the structures excavated in Group B based upon their size and the interior arrangement of hearths, walls and altars (1989; 418-21). Structure size and relative distance from what Migeon terms the *centre civico-ceremoniel* (ceremonial/civic center) is the primary means through which he determines the possible function, and more importantly social status, pertaining to each structure. He does pair this with the artifacts excavated in each structure, but his final conclusions for each structure's social significance are more inferences, and not based on solid analytical methods. Therefore I will be looking primarily at what Migeon confidently asserts are structures of this intermediate elite, and the commoner residences, with only a few cases in each category. In certain cases Migeon describes in detail the artifacts found for each structure by lot (our equivalent of an excavation unit and level), and in other cases they are described in less detailed terms by summarizing each structure's artifact assemblage. I will be combining the two forms in chart format to gain a better understanding of the artifacts found within each structure.

Migeon, although somewhat uncertain or unclear about most of his inferences about social status pertaining to each structure, does distinguish between several structures that he claims are representative of a specific social class within Group B. What he classifies as the political elite of the district are present at structures B3, B4, B6-B9, and B20 (Migeon 1989: 491). According to Migeon, these structures are the primary elite habitations in the area and are closely tied to ritual and tribute, as they are (1) in a central location in terms of the site, (2) close to the ritual structures, and (3) in close proximity to storage structures[4] as well as being the largest habitation structures in size[5]

[4] What were originally defined as ritual altars and hearths in group B by Migeon and Dominique Michelet have since been identified as storage structures, called *Maritas* (Pollard 2005). These storage structures

(1989: 491-92). Because Migeon states that structures B3 and B6 are the best examples of the "big houses" and thus are the best representative of elite habitation in Group B, only the artifacts from these two structures will be analyzed for the elite category. The commoner residences are located near the edges of Group B, defined by the smallest habitation structures. Many of these are referred to as Migeon as "plain dwellings" (1989: 484). Of the commoner structures, B34, B38, B43, and B44 have been randomly selected and are those whose artifacts will be analyzed.

Migeon describes the pottery primarily by vessel form and by ceramic complex for each structure. The three ceramic complexes, or what are actually groups in the type-variety system, that are used in Migeon's analysis consist of *Zacapu Grossier* (Zacapu coarseware), *Milpillas Poli* (Milpillas polished), and the *Malpais a Blanc Laiteux Poli* (Malpaís with white-milky polish). Each of these groups are determined primarily by slip and finish; thus the Zacapu group is a coarseware and the primary plainware ceramic; the Milpillas group is a slipped but non-painted fineware; and the Malpais group is a "milky white" (white or cream) slipped decorated fineware (Migeon 1989; 431-432). Unfortunately, this is the most detailed that Migeon is when describing the ceramics. Decoration, paint and slip are variables that are lacking throughout his analysis, except in the general type descriptions of the three complexes above.

The ceramic artifacts from both the elite and commoner structures may first be analyzed quantitatively, and are summarized in Table 1 below. Structures B3 and B6 have much higher counts than any combination of commoner structures. The two sites

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have been depicted in the *Relacion de Michoacán* as well as the *Relacion de Tiripitio* (Michelet 2005, Pollard 2005).

[5] In the case of the "Grande Maisons", which are structures B3 and B6, they are 10 x 10 meters in size with an interior size of 70 to 90 m^2.

combined have a total of n=205 sherds of jars from the Zacapu group, n=24 bowl sherds from the Zacapu group, and n=21 Zacapu group supports. The Milpillas group yielded n=471 bowl sherds, the dominant vessel form for this type. The Malpais group yielded n=30 bowl sherds, and n=34 supports. Also found in all three groups from the elite structures were miniature vessels (jars, vases, bowls). Their numbers are low, eight in total from both B3 and B6. The commoner structures present quite a different artifact assemblage when compared to the two elite structures. The most common artifact found throughout all four commoner structures is the Zacapu jar. Only eight bowl fragments were found in the Zacapu group from all four structures. The Milpillas group yielded

Table 1 – Ceramic Assemblage from Mich. 95, Group B

	Elite Structures			*Commoner Structures*				
	B3	B6	Total	B35	B38	B43	B44	Total
Zacapu Group	93 jars, 12 censors, 14 bowl sherds, 1 comale, 4 mini, 2 mol, 7 supports, 3 tecomates	112 jars, 27 censors, 10 bowl sherds, 4 comales, 14 supports, 7 tecomates	205 jars, 24 bowl sherds, 10 tecomate, 5 comales, 21 supports, 4 minis, 2 molcajetes	jars, 1 censor, 2 bowl sherds	jars, censors, 3 bowl sherds, 1 mini	jars, censor, 1 bowl sherd	jars, censor, 2 bowl sherds	jars, 1 mini, 8 bowl sherds
Milpillas Group	141 bowl sherds, 7 jars, 6 mol, 1 mini, 3 supports, 1 tecomate	332 bowl sherds, 2 jars, 3 mol, 2 mini, 2 tecomates	471 bowl sherds, 9 jars, 3 tecomates, 3 molcajetes, 3 minis, 3 supports	1 jar, 7 bowl sherds	11 bowl sherds	9 bowl sherds	7 bowl sherds	34 bowl sherds, 1 jar
Malpais Group	3 jars, 8 supports, 6 bowl sherds	24 bowl sherds, 1 mini, 26 supports, 2 jars	30 bowl sherds, 34 supports, 5 jars, 1 mini, 1 tecomate	none	1 bowl sherd	2 jars	none	1 bowl sherd, 2 jars

n=34 bowl sherds and one jar, whereas the Malpais group was limited to one bowl sherd and two jars between the four sites. Also, out of the four commoner structures, only one miniature vessel fragment was found.

The ceramic assemblage from both the elite and commoner structures exhibit interesting patterns that may be associated with the artifacts at Tzintzuntzan. The dichotomies between the two social classes as seen in the ceramics are present both qualitatively and quantitatively. It is clear that the elite structures had a much higher frequency of ceramics than the commoner structures, especially of the Milpillas and Malpaís finewares. The presence and consumption of these finewares is an overwhelming elite phenomenon, as we may have expected. The Malpaís group indicates this fact, as the four commoner structures only had three Malpaís group ceramics present, whereas the two elite structures had n=71 combined ceramic sherds.

The final association that can be made by looking at the ceramics from Group B at the Milpillas site is the vessel form. The two vessel forms that are most representative of the commoner structures are the Zacapu jars and the Milpillas bowls, although at a lower count. The Zacapu jars are the plain ware storage vessels that are most common throughout the Tarascan state. Used for water and food storage and cooking, it is the most basic utility vessel and one most common in commoner households. The Milpillas bowls are a fine ware ceramic that is undecorated and lacks supports. We know this because both commoner and elite structures had high counts (relative to the overall artifact assemblage size) and out of n=512 Milpillas bowl sherds from the elite and commoner structures, only three Milpillas supports were recorded. The Milpillas bowl is also a utility vessel, used as both cover lids for jars and serving vessels. The reason there

is such a high number of these from the elite structures may be due to the fact that they are being given, along with their contents, as tribute from the commoners to the elites in Group B. They also may represent multiple family households, with multiple wives and more surviving children. Also, the Milpillas group is not very representative of jars, a vessel form that may be most associated with the plain ware ceramic types. The final type, the Malpais decorated fine ware, is an almost entirely elite ceramic type. Because of the high support count in the elite structures from this type, we may infer that the primary vessel for this ceramic type is the decorated tripod bowl, a vessel form not found in the commoner context. Below, Table 2 shows the vessel forms from the elite and commoner habitations, exemplifying the phenomenon of open versus closed vessels as representing a distinction both between the ceramic groups and within the social classes.

Table 2 – Jars: Bowls: Miniature Vessel Ratios from Mich. 95, Group B

	Elite Structures			*Commoner Structures*				
	B3	B6	Total	B35	B38	B43	B44	Total
Zacapu Group	93 jars: 19 bowls:4 mini	112 jars: 17 bowls: 0 mini	205 jars: 36 bowl: 3 minis	? Jars: 2 bowl	? Jars: 3 bowls: 1 mini	? Jars: 1 bowl	? Jars: 2 bowl	? Jars: 8 bowl: 1 mini
Milpillas Group	7 jars: 149 bowl: 1 mini	2 jars: 336 bowl: 2 mini	9 jars: 485 bowl: 3 mini	1 Jar: 7 bowl	0 jar: 11 bowl	0 jar: 9 bowl	0 jar: 7 bowl	1 jar: 34 bowl
Malpais Group	3 jars: 6 bowl	2 jars: 24 bowl: 1 mini	5 jars: 30 bowl: 1 mini	none	0 jar: 1 bowl	2 jars: 0 bowls	none	2 jars: 1 bowl

Although Migeon (1989) once again is lacking in specific descriptions, he does provide a count of painted[6] sherds found in each structure. The elite structures of B3 and B6 have the highest total of painted sherds, a combined n=267. The three intermediate structures only have n=87 painted sherds, and between the nine commoner structures there are n=74 painted sherds (Migeon 1989; 194-222). The problem is that in relative percentages, the painted sherds only make up 2% of the total sherds from B3 and B6, 1.3% from the intermediate structures, and 2.7% from the commoner structures (Migeon 1989; 194-222). Merely explaining the sherds as painted gives no insight into labor investment, as Hirshman explained, and thus no insight into inferences of status. As the painted sherds seem homogenous in distribution throughout the structures, a presence/absence or high/low frequency also doesn't reveal any patterns into social status. The one thing that was found was the presence of negative (resist) decoration on one sherd in structure B38. No such sherds were found in any other context, and although only one case was found it may aid in directing future analysis.

The dissertation by Olivier Puaux describes the burials excavated within Group B, and supplements Migeon's dissertation by providing more distinct associations between certain ceramic types and social status. Puaux completed the dissertation on the burials in Group B of Mich. 95 in 1989, with the work at Group B having been carried out from 1983 to 1987. The dissertation analyzed n=35 burials with a total of n=67 individual human remains (Puaux 1989:110). The important aspects for this thesis are the artifacts found in association with the burials, and the subsequent interpretations made by Puaux that may indicate the social status of the buried individuals. Migeon's work has already

[6] Paint, in the unclear sense of the term as presented in Migeon's dissertation, has no relevance when discussing decoration, except in the one instance of a negative decoration.

discussed social statuses associated with certain structures, and combining his work with Puaux's should give insight into status and ceramic associations.

When discussing the burials, Puaux cites several different variables that may reflect the individual's social status. Puaux includes the (1) burial structure, (2) method of deposit, (3) the orientation and position of the body, (4) the location of the burial in relation within the cemetery, (5) whether it was an individual, group, primary or secondary burial, and (6) the nature of the burial goods (Puaux 1989:213-214). He goes on to state that cremation is the most exclusive category of funerary methods, one reserved for the highest social class including the king[7] (Puaux 1989:213). Since the Tzintzuntzan survey did not include burials, less attention will be paid to these variables, while more will be paid to the gender, age and artifacts of the burial.

Puaux also discusses artifact categories that may better elucidate the gender distinctions and status roles at Las Milpillas, such as the presence of pipes and metal artifacts among the burial offerings. Puaux states that pipes are found in the context of adult males, and based on the *Relación de Michoacán*, are tied primarily to ritual and ceremonial use (1989:177). Metal is the other artifact discussed in detail by Puaux. As he states, it is known from the ethnohistoric documents that metal was a prized commodity for the political and religious elites. Within the burials at the Milpillas site, Puaux notes four instances of metal offerings, primarily related to female burials, with one instance of an infant burial (1989:189). We can now assume (because of its scarcity and the ethnohistoric evidence) that burials associated with metal may also be interpreted as higher status (Pollard 1987; Pollard & Cahue 1999).

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[7] This based on the description of the funeral of the Tarascan king described in the *Relación de Michoacán* (1956).

The burials at the B1 pyramid are located on its western façade and are grouped by Puaux in three sections, the south-west, west, and north-west areas (refer to Figure 1 for a map of the burials). From the burials at structure B1 in Group B, 24 of the 35 burials were associated with artifacts, and out of the 67 individuals from the 35 burials at B1, 29 had artifacts associated with them. There were also two burials of three individuals each uncovered near the structure of B14, both of which had artifacts. Of the 32 individuals (from both B1 and B14) whose burials were associated with artifacts, 13 were male, only two of which were young males. The remainder were mature, or approximately thirty years of age or older. There were also ten females associated with artifacts, five of whom were mature, the other five being young adults. The remaining six individuals were adolescent or infants, whose gender was undetermined. There were also three individuals, one young adult and two mature adults whose gender could not be identified. Table 3 displays each burial, the gender, age, and associated artifacts.

The artifacts from these burials are very sparse, containing a total of only seven decorated ceramics with the rest being undecorated[8]. These seven decorated ceramics occur among five individuals, two female, two male and one undetermined. All except one, a young adult, are mature adults. The scarcity of artifacts from the burials seems to convey an understanding of the divide between commoner and lower elite within Group B at Mich. 95. Even among the burials where artifacts are found, only six were found with artifact counts higher than three[9].

[8] Decoration is believed to be paint motifs, plastic manipulation, or negative decoration. Puaux is somewhat vague as to his definition of decoration, thus this analysis must rely on a presence/absence classification.

[9] This does not include the large funerary urns, as they are considered a burial container and not an offering.

Table 3 – Burials with Age, Gender, and Artifacts from Mich. 95, Group B

Burial #	n-2	n-4a	n-4c	n-4e	n-4g	n-4h
Age	young adult	mature adult	old adult	young adult	mature adult	adult
Gender	female	female	male	female	male	?
Artifacts	mono-chrome mini jar	mini jar	mini jar (2), basin	large urn, basin, mini jar	tripod vase (2), open bowls	decorated mini jar

Burial #	n-5a	n-5b	n-8	n-9	n-12	n-19
Age	child	mature adult	infant	mature adult	young adult	mature adult
Gender	?	male	?	male	?	male
Artifacts	large urn, basin	decorated mini jar	large urn, large jar	jar, basin	metal, basin	basin

Burial #	n-20a	n-21	n-22	n-23	n-24a	n-25
Age	mature adult	young adult	old adult	young adult	mature adult	young adult
Gender	female	female	male	female	male	female
Artifacts	open bowl, mini jar, basin	mini jar, metal (2)	large urn, open bowl	decorated tripod, large urn, jar	mini bowl	basin

Burial #	n-26a	n-26b	n-27	n-28	n-29	n-31
Age	old adult	old adult	adult	young adult	mature adult	mature adult
Gender	female	female	?	?	female	male
Artifacts	jar	jar	pipe	basin, large urn	decorated mini vase, large urn	mini vase, projectile points

Burial #	n-32a	n-33	n-34a	B14 n-1	B14 n-2
Age	infant	mature adult	mature adult	infants (2)	mature adult
Gender	?	male	female	?	male
Artifacts	copper ring	pipes (2)	mini vase	large urn, obsidian frags.	decorated tetrapod, vase, mini jar, mini bowl w/ supports

It seems reasonable to suggest that these small percentages of burials are those individuals who would have had an elite status in the community at Group B. Also associated with this elite status are those burials which included decorated ceramics and metal artifacts were found. Based upon these lines of evidence, we may conclude that miniature vessels, and vessels with supports (tripod and tetrapod) are associated with the middle elite of Group B. The large funerary urns and the basins[10] are somewhat difficult to comment on in terms of status association. In terms of the burials, both vessel forms are found in the context of the high status urn burials and are associated with elite individuals. This fact seems only true in the context of burial and funerary ritual where they are a mode of burial, with the remains placed inside the urn and the basin used as a cover for that urn. For this reason, the urns and the basins will be disregarded as artifacts that may be used in association with social status.

The final artifacts to make note of from Puaux's burial interpretations are the pipes found in the burials. Three pipes were found in burials 26, 27 and 33, respectively. Of the three burials, both 26 and 33 are adult male individuals, whereas the remains from burial 27 are incomplete and the sex cannot be determined. Although this is a small sample size, we may begin to infer that along with a more elite status symbol pipes are associated with adult males within the Tarascan culture. The fact that there is such a small sample of pipes may be indicative of the social class of these individuals, and that they are in fact of lower elite status.

The burials from Group B in Mich. 95 seem to represent a sample of the artifact assemblage from the commoner and middle elite within the Tarascan state. Puaux's

[10] A basin, in this instance, refers to a deep bowl, also used as lids for funerary urns.

research deals mostly with vessel form and the presence and absence of decoration[11]. The evidence from the burials place miniature vessels and the vessels with supports (tripod and tetrapod) in contexts of more elite individuals. This is supported by the type and mode of the burial, where the more elite individuals are those found in primary burials in separate cavities, or are cremation burials found in urns. In the case of the two burials found in structure B14, we can assume an elite status based on the fact that B14 is described by Migeon as a ritual area, thus associated with an upper class as well as ritual significance.

Based upon the mortuary and household excavations at Mich. 95 (Milpillas) within Group B, the following class associations can be established: Within the commoner assemblage, the most common ceramic artifacts are the Zacapu coarseware, which is dominated in vessel form by the larger everted rim jar. The commoner ceramics remain predominantly unslipped and undecorated, with the few exceptions of the Milpillas polished ceramics, which are slipped but not decorated. Decorated polychromes are almost absent from the commoner ceramic assemblage, as are the vessel forms that usually accompany them including the tripod vessels, miniature vessels, and plates. Closed vessels, used for storage and cooking, dominate the commoner ceramic vessel form.

The lower elite at Milpillas are defined by the presence of the decorated polychromes, but in low frequencies. The burials exhibit miniature and tripod vessel forms, but once again in low frequencies. The majority of the lower elite ceramic

[11] Decoration, according to Puaux, is plastic manipulation as well as certain paint styles and color combinations, although decorative motifs are not discussed. For the artifacts found in the burials, specific description of the decoration is lacking, thus creating a presence/absence analysis rather than a detailed descriptive analysis.

assemblage occurs with the Milpillas polished ceramics, which are slipped and polished yet not decorated. The main difference between the lower elite and the commoner ceramics is in quantity, with the lower elite having much higher frequencies of all three ceramic groups. The vessel forms within the lower elite assemblage are a combination of open and closed vessels, with the Milpillas polished bowls having the highest frequency. Miniature vessels are also a distinct form in the burials, along with the presence of pipes which aren't found in commoner contexts. It is clear that the lower elite seem to exhibit aspects of both the commoner and upper elite ceramic assemblages, but with quantitative differences defining their assemblage.

Excavations and Collections at Tzintzuntzan

Beginning in the early 1930's, excavations were undertaken at Tzintzuntzan through the Instituto Nacional de Antropología e Historia, Mexico (INAH). The work at Tzintzuntzan spans nine field seasons, consists of ritual, mortuary and habitation excavations, and ranges in time from the 1930's to the 1960's. The area of focus of all the excavations was the main platform located on the northwest slopes of Cerro Yaguarato. This platform, called Tz-25 by Pollard, is what constitutes the *Zona Arquelogica* as defined by INAH. The main platform consists of five *yácatas* (pyramids) which, according to the RM, were the main ritual zone of the area as well as being an area of burial for high status individuals (Pollard 1993:47). Excavations were also carried out at habitation structures on and adjacent to the platform. These projects and their subsequent articles and reports are the main focus of this section. Examining the artifacts found in the context of a highly elite and highly ritual area such as the main

platform will allow for bridging arguments to be made as to the nature of the ceramic artifact assemblage of the upper elite at Tzintzuntzan.

Seasons I and II of excavations at the main platform are described by Acosta and Rubin de la Borbolla. The first season included habitation and mortuary excavations at and around *yácatas* 2 and 5, as well as *edificios* (habitation structures) A and B. Acosta goes into great detail about the architecture of the yácatas and ruins on the main platform, and mentions briefly the ceramic artifacts found. He states that they are of classic Tarascan typology, and are from the *ultima epoca,* or what can be translated as the Late Postclassic (1939:97). The ceramics included decoration of white and black on red, negative decoration, figurines made from molds, and decorated pipes (Acosta 1939:97). This very brief mention of the ceramics is due in part to the small amount of sherds found, and also because Rubín de la Borbolla was going to complete a more in depth analysis later on.

The second aspect of the excavations at the main platform was the burial excavations described by Rubín de la Borbolla. These excavations took place during the second season, and are detailed by Rubín de la Borbolla in his 1939 publication. There were five recorded burial areas, or what Rubín de la Borbolla refers to as *entierros.* Four of these were located in *pozos*[12] 1 or 2 of *edificio* B, while the last was defined as the "ossuary of Tzintzuntzan", located to the north of *edificio* B (1939:111). The majority of Rubín de la Borbolla's analysis is the mortuary and forensic analysis of the burials, with brief descriptions and illustrations of the ceramics found in both *pozos* 1 and 2. The ceramic assemblage associated with these burials consists of a variety of polychrome

[12] *Pozo,* in this instance, refers to a test pit placed in the *edificio,* or building.

pottery, including mini bowls with supports, sherds with decorated motifs, and pipes with intricate twist stems and incised-decorated stems (1939:116-117).

The reports from Season III of excavations at the main platform discuss in more detail the excavations at *yácata* 5, and in particular the ceramics found on the interior stairs of what is called Offering I (Moedano 1941). The excavation was in trench form, and was placed on the backside of the *yácata* through what is described as a primitive staircase. Moedano summarized the ceramic goods in the offering as many polychromes, both miniature and regular sized vessels, large red slipped, polished vessels and obsidian (1941:21). The more detailed ceramic analysis from Offering I of Season III was completed by Rubín de la Borbolla, and is summarized in Table 4. This analysis allows for much greater scrutiny of the ceramic variables than those at the Milpillas site. All ceramics found typify the Late Postclassic phase.

Table 4 – Ceramics from Offering I, *Yácata* 5 on the Main Platform at Tzintzuntzan (Season III)

	Paste, Slip & Paint	**Decoration**	**Vessel Form**	**Supports**	**Pipes**
barro ocre (paste)	sandy red-orange paste, non-polish	white on red, motifs with right angled lines and curves	Convex wall bowl	small supports - hollow cylindrical	thin wall, bevel-lipped wall
	red-orange paste, little sand, polished, no paint	red and white: motifs include vertical dashes, Z band, lines of dots	everted rim bowl	small supports - spider	bulbous base
barro café (paste)	reddish-brown with sand, polished, painted on two sides with red bottom and white motifs	red on white, usually on handles with curved lines and/or parallel lines	out sloping wall bowl	small supports - conical	bowl with conical supports
	brown-orange with sand, polished, painted on one side to bottom with red (large brush strokes) and white strips	red and white on cream, large red bands and red and white spirals	Large concave jars	small supports - solid foot	zoomorphic bowls

Table 4 Continued

barro café (paste) *Cont.*	very sandy brown, polished, painted red on one side	red and white on polished red slip, red on white dots, linear fashion along the border	Shallow Convex bowls (thick rim)	small supports - foot-claw	Anthro-pomorphic bowls
	sandy brown, polished, painted on one side in red and black.	uniform 'scarce' white, polychrome, red, black and white, triangular motif with reds, whites on black margin	tripod bowls	regular supports - hollow rattle cylindrical	twist stems
	brown brick, slight sand, no polish, red painting on both sides	also present on above style is negative decoration, both on the exterior and interior	mini bowls	regular supports - hollow rattle w/ wide top	circular cross section w/ incision
	dark brown, little sand, no polish, painted red on both sides	appliqué conical pellets (referred to as al fresco) usually with white	tripod mini bowls	regular support - hollow nub	na
	dark brown, little sand, no polish, painted red on one side	red on cream	Miniature jars	na	na
	dark brown, great thickness, no polish	white on black	everted rim jars		
	reddish brown, much sand, very thick, one side painted red with medium polish				
	dark brown little sand, polished, painted black on both sides				
	dark earthy brown, polished, painted red				

Based on the four seasons of excavations on the main platform and his analysis of the artifact assemblage, Rubín de la Borbolla summarized the artifacts from the main platform in his 1948 publication, calling it a uniform material culture. He states that this

uniform material culture is based on certain artifact (including metal, ceramic, lithic), architectural, and mortuary characteristics that define a zone within Tzintzuntzan. He lists certain prevalent ceramic characteristics that define this culture: spouted vessels with loop handles, tripods and tetrapods with conical supports, geometric decorations, negative (resist) decoration, finely polished black ceramics, bowls with diagonal walls, concave wall bowls, and large convex bowls with handles (1948:29-30). Rubín de la Borbolla also mentions the use of the pipe as a dominant aspect of this material culture, with circular and twist stems and incised stems (1948:30). This "uniform material culture" along with the ceramic analysis from Season III creates strong associations with these ceramic characteristics and the upper elite that were present at Tzintzuntzan.

The final excavations to be analyzed from the Tzintzuntzan investigations are from the 10th excavation season from 1977-1978 by Ruben Cabrera. The excavations center around *yácatas* 2 and 3, along with several habitation structures on the main platform. The excavations around *yácata* 3 yielded several burials to the southwest and northwest of its front side. The burial goods from these burials included pieces of copper, obsidian prismatic blades, polychrome vessels including miniature bowls and vases, plates, pipes, convex wall bowls, and spouted vessels with loop handle.

The excavations at the habitation structures included *edificios* F, and G, and structures B and E. Although the descriptions of the habitation area artifacts aren't as detailed as the burial goods, we can say a few things about these elite habitations. The artifacts include copper pieces, pipe fragments, polychrome ceramic fragments, *metates*, and obsidian fragments. More specifically, among the ceramics were miniature vases

with negative decoration, miniature bowls, everted rim jars, vessels with black paint and geometric motifs, a jar with appliqué conical pellet decoration, and tripod vessels.

Excavations and Collections at Urichu

The archaeological project at Urichu was conducted from 1990 to 1996 under Helen Pollard. The project included surface surveys in the first season, followed by analyses and block excavations. The reason Urichu was selected for investigation was because it was one of "ten Protohistoric administrative centers that were ethnohistorically documented to have been centers of elites prior to the consolidation of the Tarascan state" (Pollard and Cahue 1999:261). The main focus for this thesis from the Urichu work will be the Late Postclassic burials that were excavated in Area 1. Within the 19 burials excavated in Area 1, there were 21 individuals. Nine of the individuals are male, seven female, and five are unknown. Of these 19 burials, only six were without burials offerings. Table 5 summarizes the burials and the grave goods associated with each.

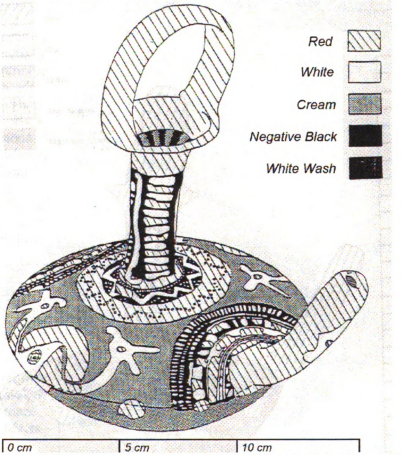
The burial goods are representative of elite burials, similar to those found on the main platform of Tz-25 at Tzintzuntzan. We know that they are associated with the upper elites and not the lower elites, especially because of the presence of the lip plug because according to Pollard "only office holders were permitted to wear lip plugs in the Tarascan State"[13] (1999). Also, the individuals are distinguished by cranial deformation and dental mutilation, an elite characteristic that separated these families from the surrounding populations (Pollard & Cahue 1999: 275). It is clear that these elites are the local, upper elites of Urichu, yet not of a status as high as the royal family located at Tzintzuntzan. Regardless, the clear distinction between these elite and the lower elite at

[13] Pollard directly referenced this fact from the *Relación de Michoacán*, (1956).

the Milpillas site is the quantity of artifacts and the presence of certain artifacts that are seen in the ethnohistoric data as upper elite goods.

It is clear that the elite class is associated with the intricate polychromes of the Tarascan style. The vessel forms found in the burials include miniature bowls, miniature vases (no supports), and the spouted vessel with loop handle. Also associated with the elite burials are the metal artifacts, more specifically bronze. When compared to the lower elite burials from the Milpillas site, the burials at Urichu contain more burial goods, and more specialized goods, particularly the metal, polychrome ceramics, beads and obsidian. The bronze artifacts are similar to those found within the burials at Group B in the Milpillas site, except that they are more abundant in the Urichu burials.

Figure 4 – A Tarascan Decorated Polychrome with Basket Handle and Spout



(As Taken from Versluis 1994: 413)

Table 5 – Burials with Age, Gender, and Artifacts from Urichu, Pátzcuaro Lake Basin, Area 1

Burial #	1	2	3	4	5	6	7
Age	adult	adult (2)	adolescent	adult	adult	adult	adult
Gender	male	males	?	male	female	female	female
Artifacts	none	none	1 ceramic bead	2 ceramic beads, 2 ceramic spindle whorls, 5 stone polishers, 1 obsidian blade, 4 bronze artifacts	2 Tarascan poly-chrome vessels	none	3 poly-chrome vessels, 6 spindle whorls, 1 jadeite bead, 2 shell beads, 4 bronze artifacts

Burial #	8	9	10	11	26	27	28
Age	adult	child (2)	adult	adult	adult	adult	adult
Gender	female	?	male	male	male	?	male
Artifacts	7 polychrome vessels, 3 figurines, 67 beads, 3 spindle whorls, 1 stone polisher, 2 bone battens, 1 shell bead, 3 bronze artifacts	1 poly-chrome vessel, 8 bronze artifacts	1 poly-chrome vessel, 1 obsidian lip plug	none	none	none	1 poly-chrome vessel, 1 spindle whorl

Burial #	29	30	31	32	33
Age	adult	adult	adult	adult	adult
Gender	?	female	male	female	female
Artifacts	1 polychrome vessel, 9 bronze artifacts	2 shell beads, 1 shell fragment	1 poly-chrome vessel	2 bronze artifacts	3 poly-chromes, 3 spindle whorls, 2 obsidian prismatic blades, 1 bronze artifact

Ethnohistoric Data

The final resource that will be used to create bridging arguments for this analysis is the ethnohistoric document, the *Relación de Michoacán* (RM). The RM has been referenced in this chapter at some length, with both the mortuary and household excavations at Milpillas and Tzintzuntzan referring to its textual accounts and illustrations. The RM is a historic document, recorded in 1538-1539 in the Tarascan capital of Tzintzuntzan, and was given to the Spanish Viceroy in 1540 (Pollard 1993:17). The account was recited by the Tarascan high priest, or *petamuti*, and recorded by a Franciscan priest. It documents many aspects of Tarascan life before and during the Spanish conquest. The accounts cover areas such as the Tarascan religion, society, and history including the Spanish conquest (Pollard 1993:17). The data used from the RM for the purposes of this analysis will be taken from the 44 illustrations that accompany the narrative. These illustrations will help to link the material culture of the Tarascans to the ritual, social, and economic aspects of their society.

The first illustration to be examined is called "On the marriage of lords", and is an account of a marriage of what are the lower elite[14] of Tzintzuntzan (1956:207). Depicted in the illustration are three classes of ceramics, everted rim jars, convex wall bowls, and spouted vessels with loop handles. There appears to be no distinct markings on the vessels to determine decoration, paint or slip. A similar illustration, "On the marriage of commoners", displays a similar scene to that of the lord's marriage (1956:213). In the commoner marriage there are present also the large everted rim jars, and the convex wall bowls. There is no depiction of the spouted vessels with loop handles in the commoner

[14] Lower elite refers to the lords, referred to as *senores* in this illustration of the RM, are the leaders of towns or villages and are considered the lowest administrative position of the Tarascans. They are also referred to as *caciques* or *Angamecha.* (Pollard 1983: 125)

marriage. The spouted vessels with loop handles show up twice more in the RM, and both in elite contexts. One illustration, referred to as "How he died and the ceremonies with which they buried him", is an account of the king's funeral and the ritual associated with it (1956:218). In this case, the spouted vessel is being carried by a woman in the funeral procession who is walking ahead of the deceased individual. The illustration goes on to describe sacrifice rituals and funerary rituals, including the cremation of the body. The other illustration is an account of the king fleeing his household in fear of the Spanish arrival. In this depiction, servants are witnessed carrying his goods out of his house. The goods include these spouted vessels, tripod bowls, and everted rim jars. These illustrations provide an association between the elite and the spouted vessels with loop handles as well as the tripod bowls, as well as linking the spouted vessel to ritual and ceremony in the Tarascan society.

The final illustration from the Relación de Michoacán is called "Concerning the general administration of justice" (1956:11). This illustration depicts several of the Tarascan administrators presiding over what seems to be trials, some of which result in execution. The administrators labeled in the illustration as *caziques* (caciques, lords) and are shown smoking pipes. All are male, and all are witnessed to be part of a state administrative ceremony. This supports the excavation data from both Milpillas and Tzintzuntzan in confirming the fact that pipes are associated with males and range from the lower to upper elite status. Furthermore, it demonstrates that pipes are not a basic household item, but are ritual and ceremonial in nature and are used primarily within those contexts.

Ceramic – Status Associations

The goal of this chapter is to provide bridging arguments for the associations between certain ceramic variables and specific social classes. To achieve this end I have reviewed analyses done of ceramic production, excavations in the Zacapu region and at Tzintzuntzan, and an ethnohistoric analysis of the *Relación de Michoacán.* This research provides useful evidence for what can be defined as a socially stratified society as seen through the ceramic assemblage. Based on these interpretations, Table 6 summarizes the ceramic variables associated with the social classes defined by Pollard in her original analysis (1972).

The vessel form for each class is defined by the vessel's function. From the excavations at Milpillas and Tzintzuntzan, the main difference between commoner and elite when regarding vessel form seems to be open versus closed vessels. The open vessels, primarily seen in elite contexts, are those vessels used for serving and eating, whereas the commoner vessels are represented by the closed vessels, used for cooking and storage. The lower elite, as seen at the site of Milpillas, seem to have evidence of form, as the smaller supports are from the miniature vessels and are associated with an elite class. Furthermore, the regular, hollow supports are associated with the polychrome tripods, and are also an elite ceramic. The regular solid supports are associated with larger plainware vessels, and are therefore a lower elite and commoner variable.

Table 6 – Ceramic Variables and Associated Social Classes

	Vessel Forms	Decoration	Paint	Supports	Ware	Slip
Commoner (Ri)	convex wall bowls, everted rim jars, incurved rim bowls, incurved rim jars	none	Mono-chrome or non-painted	regular supports; solid conical	Tariacuri Coarse, Yaguarato Coarse, Ichupio Coarse	unslipped unpainted
Lower Elite (Rii)	convex wall bowls, everted rim jars, incurved rim bowls, spouted vessels	all motifs, no negative	One or two color paint combos	regular supports; solid conical, solid spider	Tariacuri Brown, Yaguarato Coarse, Sipiho Grey	slipped
Upper Elite (Rii)	mini jars, mini bowls, spouted vessels, spouted handles, convex wall bowls, out-sloping wall bowls, *brasero*, plates (convex and flat base)	negative, appliqué conical pellets, all motifs	Polychrome: two and three color combos including negative as a type	small supports (all), regular supports; hollow rattle cylindrical, hollow rattle wide top, hollow nub	Tariacuri Brown, Yaguarato Cream, Tarerio Cream, Sipiho Grey	slipped

Decoration and paint will be an important factor when determining social status. In the excavations at Tzintzuntzan, the vast majority of the ceramics were decorated and polychrome ceramics. At Milpillas, the lower elites were also seen to have these decorated polychromes, but in much lower frequencies, whereas the commoners have few to no ceramics of this type. The difficult aspect of the analysis will be defining the lower elite, as they display ceramic characteristics from both the commoner and elite assemblages. The key qualifier for the lower elite will be quantitative, as they are

expected to have a higher frequency of plain ware ceramics, and a lower frequency of the decorated polychromes.

Ware and slip are the most difficult variables to associate with social class. The ware of the Tzintzuntzan ceramics at Offering I (see Table 4) was described by Moedano in detail. This, along with the ceramic groups described by Migeon at the Milpillas excavations, helped to determine what ware occurred most frequently in commoner, elite, and lower elite contexts. The slip, though, is much more difficult because as noted by Hirshman it ranges across a variety of ceramics, including coarse and fine wares and thus may not be useful in determining social class associations. Instead what will be analyzed is merely the presence or absence of slip.

These variables have been chosen for their ability to clearly display trends within the material culture that are representative of class distinctions within Tarascan society. Emphasis must be made that these trends are just that; tendencies toward a certain aspect of the material culture. In no way do these categories represent stringent, clear-cut divisions between classes. The ceramic assemblage as I have presented it exists as a continuum from commoner to elite, with the ceramics representing aspects of status that change through time and space. Variables such as access to resources, access to specialized production, wealth, and location all determine the material culture that defines that class. This analysis of ceramics has chosen as its variables ceramic characteristics that *best* represent social classes, and in no way is complete or all encompassing in terms of variables that represent each class.

Chapter 3
Ceramic Analysis

The methodological framework defined in Chapter Two has created categories of ceramic variables that define specific social classes within the Tarascan capital of Tzintzuntzan. These categories must be spatially analyzed to determine the zonal characteristics of the urban center. This will allow for the survey sites to be classified into residential zones and/or public zones based on social status. This chapter presents the statistical analysis of the survey site classifications and the subsequent interpretations that will ultimately determine the urban characteristics of Tzintzuntzan.

As discussed previously, the data set consists of 120 survey sites, 89 of which had artifact collections. The ceramics comprise the bulk of the artifacts, and consist of n = 2152 ceramics sherds, pipes, and other (such as spindle whorls, figurines, or unknown). The data set is count data, containing many zeros due to the nature of the archaeological survey process. The unit of analysis will be the survey site. An area of uncertainty will be the treatment of the n = 31 sites that lack artifacts for analysis. These sites may have been defined by architectural features, such as Tz-25 that contains that main platform but where no collections were made by Pollard, or by artifacts noted by Pollard yet not collected (1993:189). To determine the social significance of these sites, they will have to be interpreted through the field notes that Pollard originally took on the features of the site[15]. This includes any architecture present, descriptions of adjacent sites that may relate to or overlap the site in question, and artifacts that were noted yet not collected.

[15] The archaeological survey notes can be found in the Appendix 1 of Pollard's monograph *Tariacuri's Legacy: The Prehispanic Tarascan State*.

Cluster Analysis

The primary statistical approach used is a cluster analysis. The cluster analysis that will be used is a multivariate statistical procedure that starts with a data set containing information about a sample of entities and attempts to reorganize these entities into relatively homogeneous groups (Hirshman 2003: 113). The sites will be run through an agglomerative, hierarchical cluster analysis with a polythetic classification, where "multiple variables are taken into account to form the groups with no one variable sufficient or necessary to group membership (Hirshman 2003: 113). The hierarchical cluster used is based on a between group cluster that uses the average linkage between groups. Average linking is a "space conserving algorithm that defines distance between groups as the average of the distance between all pairs of individuals in the two groups" (Hirshman 2003: 117). This will allow for each variable to help spatially assign the sites based upon a specific ranking tied to status and function, which will define its corresponding zone.

Furthermore, K-means cluster analyses will be completed that will show the membership qualifications for the resulting clusters. A K-means cluster is based on the hierarchical cluster, but refines the results, moving the cases that were initially miss-assigned in the one-pass hierarchical results (Hirshman 2003: 120). The one distinction of the K-means cluster analysis as opposed to the hierarchical analysis is that the number of clusters in the output is subjective and up to the discretion of the analyst. In this analysis, the K-means cluster will be done after the hierarchical and the number of output classes will be defined by results of the previous hierarchical cluster analysis.

As previously explained, the variables chosen are in no way complete in the sense that they include all ceramic characteristics attributed to a certain social class. The reality of the material culture of the Tarascans is that there is a continuum, and therefore overlap between social classes as seen in the ceramic assemblage. This will result in an overlap of variables between social classes, and will also result in an overlap of the sites in the cluster analysis, meaning the classification of the sites will not be as clear and concise as the cluster analysis methodology may make it seem. Because of this, the methodology for the cluster analysis is as follows: All n = 89 sites will be clustered first based upon the upper elite variables defined at the end of the previous chapter. The resulting clusters will be analyzed, both quantitatively and qualitatively, on the basis of cluster membership. The cluster(s) best exemplifying the upper elite ceramic characteristics will be noted and removed from the analysis. This will effectively be removing the outliers from the analysis, thus allowing for the remainder of the sites to be clustered further on the same upper elite variables. This will allow for a more detailed analysis into those sites that may display both lower elite and upper elite characteristics. As I have stated before, I believe the primary distinction between the lower elite and upper elite will be the quantity of the upper elite ceramic variables. Hopefully, by removing the outliers, these sites may be better analyzed and properly classified.

The following analyses are explained in terms of quality and quantity of the ceramic variables. To clarify the terms that will be used, I must provide some background about the data for a better understanding of the proceeding analysis. The variables are discussed in terms of high, medium and low frequencies when referring to cluster membership. For instance, the total number of sherds for these n=89 sites is

n=1810, thus leaving an average of 20.3 sherds per site. This is a medium-low frequency for sherds, with a high count ranging from forty to over 100 sherds. The problem is that for each sherd many variables may exist. To define what a low, medium and high frequency refers to, the variables from each of the social status categories (elite, lower elite, commoner) were added across the sites, and then the mean was derived for each site. For the upper elite variables, the average frequency for each site was n=22.8 variables. For the lower elite variables, the average was n=26.2 variables per site. For the commoner variables, the average was n=10 variables per site. Thus the range for low frequencies of variables is n=1-9, a medium frequency is n=10-20, and a high frequency is n>20.

Cluster Analysis – Upper Elite Variables

The first analysis to be completed will be on the upper elite variables. These variables were chosen first due to the evidence seen in previous excavations and surveys, which were discussed in the previous chapter. It is more likely that the elite ceramics contains variables that range across all three social class assemblages, exemplifying this continuum-based material culture. This top-down methodology assumes that the elite assemblage contains more commoner-defined ceramics (i.e. coarse wares, undecorated pottery), than the commoner assemblage contains elite ceramics (i.e. polychrome minibowls, resist decoration).

A hierarchical cluster analysis was completed containing all n = 89 sites using the upper elite ceramic variables defined in Chapter Two. The result of this first cluster analysis was two groups, one of which contained four sites. Membership for this cluster

was based on extremely high frequencies for the variables, especially the motifs, small supports, convex bowls, the fine ware pastes, and spouts. In order to take a better look at the other sites and their distribution of variables, a K-means cluster analysis was done that separated the clusters further into three groups. In this case, the same four sites constituted one cluster based once again on the high frequencies of variables. These four sites, Tz-12, Tz-16, Tz-17, Tz-91, are the outliers due to their high frequencies of the upper elite variables. The second cluster's membership was based on extremely low frequencies of the variables and in many cases were zero. Most of the sites, n = 82 to be exact, fell into this cluster. The third cluster only contained three sites, and aided in distinguishing between the final two clusters in the first hierarchical cluster analysis. The sites Tz-18, Tz-59, and Tz-85 were placed in this cluster with membership being defined by high frequencies of the variables in convex wall bowls and motifs and medium frequencies for the remaining elite variables. These sites aren't as extreme as the four outlier sites in terms of the frequencies of the variables. These sites require a closer examination of their variables to determine into what class, lower or upper elite, they fall.

In order to better examine the remaining n=82 sites both a hierarchical cluster analysis and a K-means cluster analysis were done to determine the nature of the clustering. The resulting clusters from the hierarchical analysis were much greater in number and created a much more diverse dendrogram as opposed to the clusters that formed when the seven outlier sites were included. The outlier sites for this hierarchical cluster analysis were sites Tz-63, Tz-70, and Tz-99, followed closely by sites Tz-23, Tz-78, Tz-90 and Tz-107. When looking at the group membership for all clusters, it is clear that now we are dealing with a variety of sites that range in variables and frequency from

low to medium, with no sites being considered extreme outliers. To better determine how the cluster analysis was defining its group membership, a K-means cluster was done that defined four output clusters. Of these four, no one cluster stood out. Cluster one had a medium frequency of convex bowls and a small to medium frequency of small supports and motifs. Cluster three was interesting because of its medium high frequency of spout handles, yet lacked distinct frequencies in any other variables.

It seems that in this stage of the analysis, the upper elite sites have been identified and we are now dealing with a range of sites that represent the lower elite status. This is apparent in the low frequencies of elite ceramic variables. Based upon a closer analysis of these "on-the-bubble" sites, it was determined, based on a low frequency and lack of the defining upper elite variables, that sites Tz-59, Tz-63, Tz-70, Tz-78, Tz-99, and Tz-107, are most likely lower elite sites, and not upper elite. Sites Tz-18, Tz-85, and Tz-90, however were seen to contain these defining upper elite variables in medium frequencies, and even though in lower frequencies than site Tz-12 for example, still exhibit the characteristics of the upper elite assemblage discussed in Chapter Two. To further examine zonal characteristics, the remaining sites will now be analyzed by cluster analysis based upon the lower elite variables that were defined in Chapter Two.

Cluster Analysis – Lower Elite Variables

The five definite upper elite sites (Tz-12, Tz-16, Tz-17 and Tz-91) were removed from the next cluster analysis, leaving n = 84 sites to analyze. A hierarchical cluster analysis was performed for these sites, using the lower elite variables defined in Chapter Two. The resulting dendrogram looking very similar to the last hierarchical cluster

analysis performed for the upper elite variables. To better understand the clusters created by the hierarchical analysis, a K-means cluster analysis was done with the number of output classes set at four. The result was one cluster defined solely by site Tz-18, two clusters defined by medium frequencies for the majority of the variables, and a final cluster containing none of the variables. It is clear that Tz-18 may be considered both an upper elite and lower elite site. Due to the fact that the cluster analysis shows it as an outlier, distinct from the other sites, makes me think it belongs in the upper elite category. Tz-18 is defined by a medium frequency in the motif, a high frequency of the red on cream paint scheme and a medium frequency of the all over red on cream paint scheme. It is clear that polychrome pottery is significant at this site, thus placing it into the upper elite category. The remaining n = 26 sites in clusters 1 and 2 are representative of the lower elite category as defined in Chapter 2. Both clusters base membership on medium frequencies across all variables, with focus on the paint variables, motifs, jars and wares.

These sites are indicative of this lower elite class, in that they do contain polychrome pottery but lack the minibowls and tripod vessels that define the upper elite assemblage. They also tend to have a higher amount of jars than bowls, though both vessel forms are represented in average quantities. The coarse wares are also more prevalent within the site's assemblages than at the upper elite level, showing a tendency in the lower elite assemblage to contain aspects of both the commoner and upper elite ceramic variables, but never in great numbers. To test this fact, I added miniature bowls as a variable to the lower elite cluster analysis to see if this upper elite variable played a significant role in the clustering. As it turns out, the n= 84 sites clustered in exactly the same fashion with the minibowls than they did without the minibowls. This shows that

these sites are now definitely out of the range of the upper elite category, as the presence of an upper elite variable had no statistical significance in the remaining site's classification.

Cluster Analysis – Commoner Variables

The sites not classified into the upper or lower elite categories may ultimately be considered the commoner sites. To be sure that these sites fit the commoner category, they will be put through a final cluster analysis with the lower elite variables being used for classification. It is possible that some of these n = 61 sites may not exhibit any of the ceramic characteristics of the commoner zones, thus relegating them to zones such as lithic manufacturing or public zones. To clarify once again, the commoner sites will be defined by the presence of coarse ware ceramics, the higher frequency of jars to bowls, and the absence of decoration, paint, miniature vessels, and overall lower counts for all variables.

The first hierarchical cluster analysis that was done included n=61 sites, excluding the definite upper elite sites (n=7), and the lower elite sites defined by the previous lower elite cluster analysis. The resulting dendrogram was more complex than the previous upper and lower elite clusters, and showed no definite outliers. The sites seem to be more associated based on the variables chosen, as would be expected now that the elite classes have been selected for. A K-means cluster was then done and three output classes were chosen. Only Tz-70 stood out as being different from the remaining sites. Because of the higher than normal frequencies expected for a commoner site, Tz-70 will be examined more closely to determine whether it belongs in the commoner category or the lower elite

category. The remaining sites were placed into two clusters. The first cluster contained n=43 sites, and membership was defined based on a frequency of one or absence of the variables. The second cluster contained n=17 sites, and was defined by low frequencies in bowls, jars, and wares. These sixty sites will most likely constitute the commoner sites for the survey area.

Cluster Analysis – Public Zones

The public zone cluster analysis is based on the presence of pipes and pipe fragments at the survey sites. The research in Chapter Two equates pipes with males, ritual, and a tendency toward elite use. Based on these notions then, the distribution of pipes will aid the classification of the sites in two ways: (1) It will provide an alternative analysis for those sites that remain in the grey area as to their classification into lower elite or upper elite zones, and (2) will locate the survey sites whose zonal function may not only be a residence but also a public zone. According to Pollard, the public zones are defined by ritual and religious use, and are the local religious centers of the settlement (1987: 49). She goes on further to state that the primary public zone for Tzintzuntzan was the main platform of Tz-25, and is described as such in the *Relación de Michoacán* (1987: 47). The problem with the secondary public zones is that they are also located within residential areas within the settlement. Pollard's research led her to conclude that the public zones also contain middle-status (lower elite) habitation assemblages, and are all associated with looted burials (1987: 49). This possible overlap in the zones will help in providing insight into the urban structure of Tzintzuntzan, and may provide further

insight into the social status of the residences that have already been classified in the cluster analysis.

To determine how the sites were classified into public zones, variables were chosen that best represented social differences in the pipes. The burials and excavations at the main platform at Tzintzuntzan yielded pipe fragments displaying a range of decorative characteristics, including: incision on the stems, painted stems and bowls, and elaborate bowls in decorative styles such as anamorphic and zoomorphic figures (See Table 7 below for a detailed description of the pipe variables used in the following cluster analysis) The decoration-based variables will be applied to the pipe cluster analysis thus allowing for a possible identification of elite sites versus commoner sites. This will aid in defining elite zones and public ritual zones, but will remain a secondary factor as the quantity of pipes will be the primary designator for public zones.

The hierarchical cluster analysis clearly showed site Tz-12 as an outlier, because of its extremely high frequencies of pipes with circular cross section pipe stems. A second cluster included seven sites, with the third cluster containing the remaining n=81 sites. To determine the reasons for cluster membership, a K-means cluster was performed with an output of four classes so as to try to limit the effect of Tz-12 on the results. Once again Tz-12 was given its own cluster, cluster 1, because of its high frequencies of pipes. Cluster 2 had 21 members, membership defined by a medium frequency in the circular and oval pipe stems, no incised stems, and one twist-four pipe stem. Cluster 3 contained n=66 sites, and was based on solely on the presence of one circular cross section pipe. Finally cluster 4 contained one site, Tz-112, because of its high frequency in the circular cross section.

Table 7 – Pipe Variables: Stems, Bowls, and Bits

Bowls	Stems	Bits
thin wall beveled lip	simple twist	ground around
thin wall conical bowl	incised twist four	beveled
bulbous base	twisted and incised	pattern burnished
conical supports	twisted and scalloped	incised
	oval cross section	
	circular cross section	
	incised twist three	
	scalloped	
	corn cob	

To determine if any other sites were distinct from the n=21 or n=66 sites, Tz-12 and Tz-112 were removed and a K means was run again. This time the bits and bowls were removed, leaving only the stems as variables in the cluster analysis. It was clear in the first two cluster analysis, that due to the extremely low frequencies of both bowls and bits, they were playing no part in the classification of the sites in the analysis. The stems proved valuable because of the range in slip, decoration, and form, thus providing a good reflection in social status. The second cluster analysis was run with an output of three classes. The fist cluster contained nine sites, with membership based on a medium frequency in circular cross sections. Cluster 2 contained n=22 sites, and also was based on circular cross section stems but in a lower frequency. Cluster 3 contained the remaining sites, and was based on an absence of pipe variables.

Cluster Analysis – Querenda White Ware

The final cluster analysis is solely based on the presence of the Querenda White ware. Previous research has shown this ware to be spatially isolated to the northeast section of the settlement at Tzintzuntzan. Unlike the other wares, the Querenda White

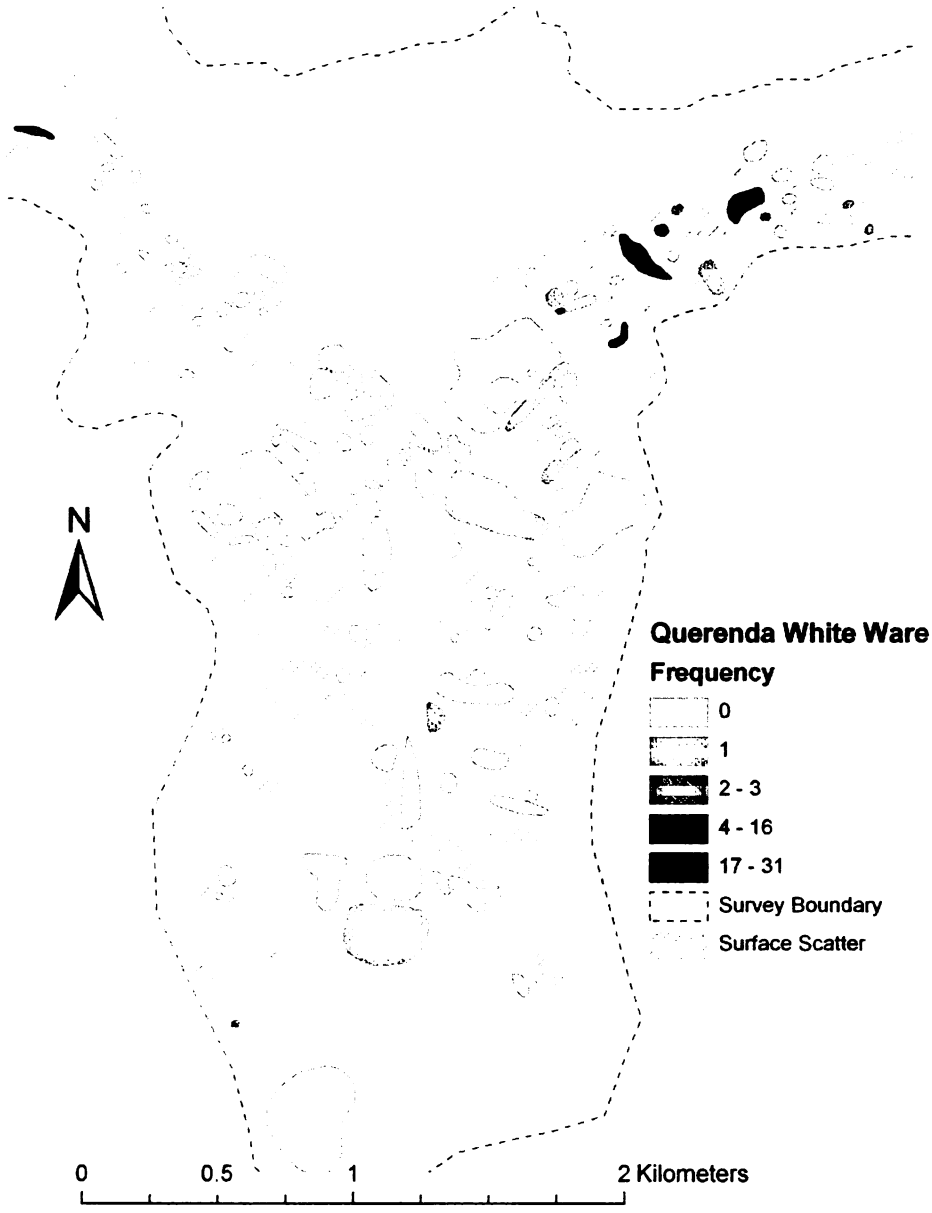
was thought to be different based on the distinct paste that constitutes it. Pollard hypothesized that this ware is indicative of an ethnic variation within Tzintzuntzan, one defined by a distinct ceramic tradition characterized by the Querenda White ware.

The resulting cluster analysis displayed a limited number of sites with a frequency of Querenda White ware ceramics. The first hierarchical cluster analysis returned three sites as outliers, Tz-59, Tz-63, and Tz-70. The following three class K-means also supported this pattern, and placed Tz-59 in its own cluster due to an extremely high frequency (n=31) of Querenda White ware ceramics, with Tz-63 and Tz-70 as a second cluster with a medium frequency of the ware. The remaining sites formed a cluster due to a low or zero frequency. The three outlier sites were removed, and the K-means was run again with an output of three classes. The result was one cluster with a frequency of zero which contained n=67 sites, one cluster with n=16 sites containing a frequency of n=1, and a final cluster of three sites that had a frequency of n=3. Figure 4 contains a map locating the sites that contained the Querenda White ware ceramics.

After mapping the distribution of the Querenda White ware, it is obvious that they are in fact concentrated in the northeast area of the survey site. The high frequency of the ware in this area and extremely low frequency in other areas seems to form a distinct area. Originally this northeast area was thought to contain an ethnic *barrio*, or community, whose origins derive from outside the basin[16]. More recent research on the paste and firing techniques have shown that this ware is most likely from an earlier occupation at Tzintzuntzan, probably before the emergence of the state and Tzintzuntzan as the capital (Pollard, personal communication, March 2008).

[16] Pollard located sherds of identical paste in such areas as Zacapu, Guanajuato and others elsewhere outside the Pátzcuaro Lake Basin, leading her to believe the ware's presence was due to an ethnic variation within Tzintzuntzan (Pollard 1993:215-216).

Figure 5 – Location of Querenda White Ware Ceramics



Interpretations

The purpose of these cluster analyses was to place the sites into zones that represent certain social statuses within Tzintzuntzan society during the Late Postclassic period. The variables that represented each zone were chosen through a carefully researched methodology that included analyzing excavations and survey data from

Tzintzuntzan, sites immediately within the Pátzcuaro Lake Basin, and Tarascan sites outside of the lake basin. The cluster analyses provided a statistical foundation for the classification of sites into zones, a factor that was absent in Pollard's original analysis of the Tzintzuntzan survey data.

To summarize the results, the main hypotheses for the expected social distinctions within the ceramic assemblages were accurate. The cluster analysis for the upper elite showed that the outlier sites were based on both high frequencies and the most distinctive of elite ceramic variables, such as the motifs and paint schemes as seen in the polychrome pottery, the resist decoration and the small supports. As expected, the primary distinction between these sites and the sites identified as the lower elite sites was measured quantitatively. The lower elite sites did contain aspects of the upper elite ceramic assemblage, but in much lower frequencies. The lower elite sites also contained aspects of the commoner ceramic assemblage, with more plain ware and non-decorated ceramics. Finally, the commoner sites saw a dramatic decline in the elite ceramic variables, with the cluster memberships being defined by medium to low frequencies in jars and the coarse wares. The overall variable counts were low across the board for the commoner sites.

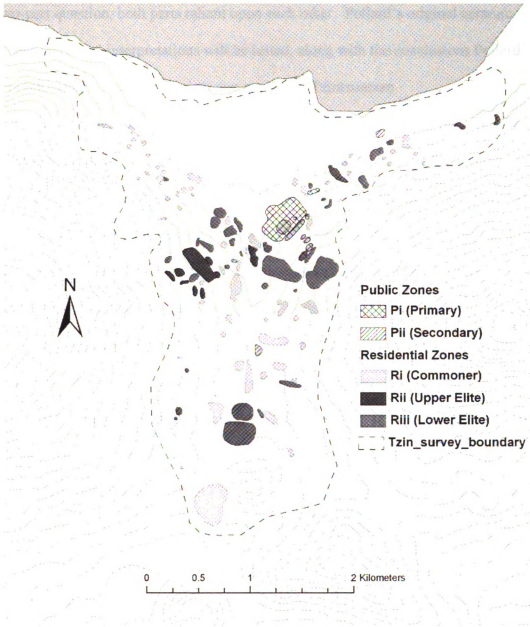
The results of the cluster analysis are displayed in Table 8 below, as well as in the Figure 5 map of the zonal assignments. The sites that are classified into zonal categories are the n=89 sites that were analyzed in the cluster analysis. The only change made was Tz-11 due to the combination of a medium pipe frequency with a low frequency in lower elite variables. In this case of Tz-11, the qualitative distinctions override the quantitative factors, and it was moved from a commoner zone to a lower elite zone. Also, because from the ethnohistoric evidence we know that Tz-25 was the main ritual platform, sites

Tz-1, 2, 3 and 5 which are all located either on or directly adjacent to Tz-25 are considered Primary Public zones (Pi). As noted in Chapter Two, these sites have been the focus of many previous excavations and surveys, leaving the main platform and its nearby sites devoid of any artifacts. Even though the artifacts found are typical of the quantity and quality of commoner zones, the fact that they are related to the primary public zone overrides this fact. The remaining sites are all classified based upon their zonal assignments from the cluster analysis. The remaining n=31 sites will be looked at further and assigned a zonal category based on Pollard's interpretations and the variables and methodology from chapter two of this thesis. These sites will not be used in testing a possible association between Pollard's zonal classifications and my own, but will be used in discussing the urban characteristics of Tzintzuntzan.

Table 8 – Zonal Classification of Sites (n=89) Based on Cluster Analysis

Upper Elite (Rii) n=7	**Lower Elite Zones (Riii) n=24**	**Commoner Zones (Ri) n=58**	**Primary Public (Pi) n=7**	**Secondary Public (Pii) n= 11**
Tz-12	Tz-8 Tz-63	Tz-1 Tz-35 Tz-55 Tz-93	Tz-1	Tz-11
Tz-16	Tz-10 Tz-70	Tz-2 Tz-36 Tz-56 Tz-95	Tz-2	Tz-12
Tz-17	Tz-11 Tz-75	Tz-3 Tz-37 Tz-58 Tz-97	Tz-3	Tz-70
Tz-18	Tz-15 Tz-76	Tz-4 Tz-38 Tz-60 Tz-99	Tz-6	Tz-75
Tz-85	Tz-19 Tz-77	Tz-5 Tz-40 Tz-62 Tz-102	Tz-7	Tz-76
Tz-90	Tz-20 Tz-78	Tz-6 Tz-41 Tz-65 Tz-104	Tz-8	Tz-87
Tz-91	Tz-22 Tz-84	Tz-7 Tz-42 Tz-67 Tz-105	Tz-9	Tz-90
	Tz-23 Tz-107	Tz-9 Tz-43 Tz-68 Tz-106		Tz-104
	Tz-39 Tz-110	Tz-13 Tz-46 Tz-73 Tz-108		Tz-112
	Tz-53 Tz-112	Tz-14 Tz-47 Tz-74 Tz-109		Tz-114
	Tz-59 Tz-114	Tz-21 Tz-49 Tz-81 Tz-110a		Tz-117
	Tz-61 Tz-117	Tz-24 Tz-50 Tz-86 Tz-111		
		Tz-32 Tz-51 Tz-87 Tz-113		
		Tz-34 Tz-54 Tz-89 Tz-115 Tz-119 Tz-120		

Figure 6 – Zonal Classification of Tzintzuntzan Sites



Statistical Significance of the Cluster Analyses

The intention of the cluster analysis is to place the sites into zonal categories based on statistical methods, methods not used by Pollard in her original analysis of the Tzintzuntzan survey. By creating these zonal categories, I am now able to statistically

compare Pollard's original classifications to my own. The reanalysis will inherently test a two-part question, both parts reliant upon each other. Pollard's original ceramic analysis and zonal interpretations will be tested, along with the conclusions Pollard made about the extent to which urbanism was present at Tzintzuntzan.

To test whether my zonal interpretations are different from Pollard's a Wilcoxon signed-ranks test will be carried out. This test is a nonparametric analysis designed for ordinal data that is not dependent on a given distribution (Sokal and Rohlf 1995:444). Thus, the test is not concerned with specific parameters but instead with the distribution of the variates. The Wilcoxon signed-ranks test is an analysis of two dependent observations taken from the same population. In the current case, the two observations are my zonal classifications of the survey sites and Pollard's zonal classifications. This test determines the magnitude of difference between the two observations as well as the directionality of the difference. For this test, my null hypothesis is that there will be no difference in zonal classification between the zones determined by Pollard and myself.

The zonal data are ranked and coded based upon social status. The zones were coded as follows; Ri (commoner residential) = 1, Pii (secondary public)= 2, Riii (lower elite residential) = 3, Pi (primary public)= 4, Rii (upper elite residential)= 5. The differences between my zones and Pollard's are calculated and ranked without regard to sign. The ranked sums are then calculated and interpreted as to whether the difference is significant and in what direction the difference occurs. The lowest, absolute numerical ranked sum was taken, in this case was T = 81. Because the sample size contained so many ties, the sample size was dropped to n=21. The *z* score was calculated in both SPSS and by using $z = T - \mu / \sigma$. In this case, $\mu = n(n+1)/4$, and $\sigma = \sqrt{n(n+1)(2n+1)/24}$.

The score for *z* is calculated to be -1.255, which is within the 0.209 critical level of a two tailed significance test. This means that approximately 80% of the time, differences seen between the two paired observations (Pollard v mine) are not due to chance but instead have different medians.

The problem with a test such as the Wilcoxon rank is that it doesn't take into consideration the ties that occurred, and only looks at the differences between ranks. In this case, there were n=58 ties between Pollard's zonal assignments and my own, which out of n=79 total cases is approximately 73%. It is clear that Pollard's assignments and my own are highly associated, yet in areas of disagreement there seems to be significant differences. These differences are a key component of this analysis, as they will give an insight into details of the artifact assemblages that may have been overlooked by Pollard but are in fact of statistical significance.

Discussion

A closer look at the n=21 differences in zonal classifications between Pollard and myself reveals striking patterns. Of the multiple combinations that are possible for zonal assignment, the differences occurred within six combinations. In terms of social ranking, only one drastic difference stands out, where at Tz-13, I classified the site as a Ri (commoner) and Pollard an Rii (upper elite). The following differences in classification are minor in terms of frequency and social status ranks:

- Tz-41, Tz-56, Tz-111 – Pollard classified as Pii (secondary public), I classified as Ri (commoner residential)
- Tz-53 – Pollard classified as Pii (secondary public), I classified as Riii (lower elite residential)

- Tz-8 – Pollard classified as Pi (primary public), I classified as Riii (lower elite residential)

The interesting aspect of this analysis is the remaining n=15 cases where Pollard and I differed. In n=12 instances, the differences were between Ri zones (commoner) and Riii zones (lower elite). In these circumstances, half of the time I classified the site as a lower elite site and Pollard classified the site as commoner, and vice versa. In the remaining n=3 cases, the differences were between Rii (upper elite) zones and Riii zones (lower elite), where in both cases I classified the site as being a lower elite and Pollard classified as being an upper elite. The main reasons for the classification into a lower elite zone rather than an upper elite zone is not the lack of presence of the upper elite variables, but rather the lower frequencies with which they occur. The latter distinction is a very intriguing aspect of the analysis, as previously it was thought the main differences between Pollard and my classifications were to be between the upper and lower elite zones, and not between the commoner and lower elite. Below in Table 9 are the differing classified sites and possible reasons why they were classified as they were.

As Table 9 shows, the trend of classification into lower elite zones seems to be the low frequency of the upper elite variables, such as resist decoration, motifs, minibowls, small supports and spouted vessels and spouted handles, and paint combinations. All of these variables are deemed significant due to the ethnohistoric and archaeological evidence as described in Chapter Two. Due to their low frequency in the above sites (Tz-19, Tz-39, Tz-70, Tz-76, Tz-107, Tz-110), they may have been have been overlooked by Pollard in her original analysis but yet were statistically significant in the cluster analyses.

Table 9 –Differences between Commoner and Lower Elite Zones – Pollard v. Mine

Sites	My Zone	Pollard Zone	Reason for my zonal classification (*f* = frequency)
Tz-14	Ri	Riii	low (or n=1) *f* of all elite variables
Tz-19	Riii	Ri	medium *f* of slip/painted sherds; low *f* of spouts, spouted handles, resist and motifs
Tz-39	Riii	Ri	low *f* of spouted handles, motif, supports; medium *f* of paint and slipped sherds
Tz-65	Ri	Riii	no ceramic artifacts associated
Tz-70	Riii	Ri	medium *f* of painted sherds; low *f* of supports and motifs; high *f* of slipped sherds
Tz-76	Riii	Ri	medium *f* of painted/slipped sherds; low *f* of resist and motifs
Tz-86	Ri	Riii	low *f* of spouts, supports, resist; medium *f* of paint, slip
Tz-89	Ri	Riii	low *f* slip, paint, motif(n=1), and low jars with n=1 bowl
Tz-93	Ri	Riii	low frequencies throughout, low slip and paint
Tz-107	Riii	Ri	low *f* minis, plates, supports, spouted; high *f* of slip/paint sherds; medium *f* of motifs
Tz-110	Riii	Ri	low *f* minis, supports, resist, motifs; medium *f* painted sherds; high *f* slipped sherds
Tz-119	Ri	Riii	only ceramic consisted of one grater sherd

The original hypothesis about any possible distinctions between Pollard's analysis and my own were thought to be between the categories of upper and lower elite. Yet the cluster analysis shows the differences between these two groups seems markedly more distinct than between the lower elite and the commoner. The lower elite seem to share a more related assemblage with the commoner class than they do with the upper elite. Chapter 4 will discuss the possible reasons for the trends seen in this analysis chapter, and the implications of these analyses on the nature of urbanism at Tzintzuntzan.

Chapter 4
Urbanism at Tzintzuntzan Revisited

The cluster analyses in Chapter 3 resulted in several patterns that must be discussed within the larger scope of the urban characteristics of Tzintzuntzan. These patterns can be summarized into three themes: (1) the dichotomy between the commoner and lower elite assemblages that arises when comparing Pollard's zonal interpretations to mine, (2) the theme of zonal overlap that occurs between the public and residential zones, and (3) the larger issue of zoning and planning as expressed by the ceramic assemblages at Tzintzuntzan. Also, a brief discussion concerning the spatial distribution of manufacturing zones in relation to the residential and public zones may add further insight into the social and economic behavior of the Tarascans. By examining these themes in relation to Pollard's original analysis of Tzintzuntzan and by positing them within current urban theory in Mesoamerica, I hope to shed some light on the urban nature of the Tarascan capital as it existed in the Late Postclassic period.

Before examining the zonal classifications in detail, I must make explicit the methods of the original analysis completed by Pollard. In her original analysis of the Tzintzuntzan survey, Pollard used the full range of artifacts found in the survey as well as evidence of architecture, proximity to areas such as the main platform, and the ethnohistoric data to classify the survey sites into zones. Using an alternative line of evidence, the lithic artifacts for these sites are examined (with focus on the obsidian) to determine if any other artifact type was used by Pollard in these instances to assign a specific zone. It may be that in certain cases where I have classified the site as a commoner zone, Pollard looked at the frequency of obsidian and thus classified the site

as a lower elite zone. Obsidian is considered both an elite and ritual item as evidenced in the *Relación* as well as in relation to high status burials, and therefore can be associated with the elite social classes (Pollard 1999:278).

Of the n=21 differences mentioned in Chapter Three, only four seem to have been given a different zone due to the presence of lithic artifacts. Tz-8 was classified by Pollard as a primary public zone (Pi) instead of a lower elite zone (Riii) because of a high frequency of grey obsidian and prismatic blades. Tz-10 was categorized as an upper elite site because of the presence of red and green obsidian, and an obsidian ear/lip plug, an artifact described in the *Relación* as an adornment only permitted to be worn by office holders in the Tarascan state (RM 1956:201-202, Pollard 1999:265). Likewise, Tz-65 was also classified as a lower elite zone (Riii) because of the presence of an obsidian lip/ear plug. Finally, Tz-93 was classified as a lower elite zone (Riii) by Pollard due to its very high (n=76) frequency of grey obsidian as well as the presence of the more rare red obsidian. The remaining sites that saw differing classifications from Pollard and me were not affected by the presence/absence of lithic artifacts.

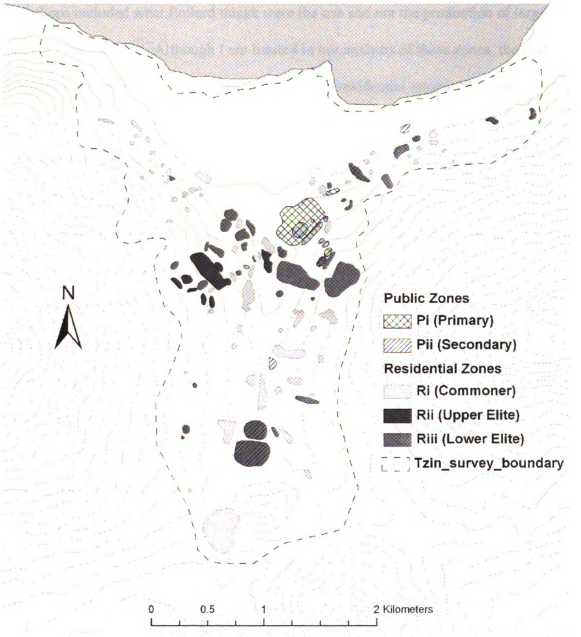
This leads me to believe that the cause of the differing classifications between the lower elite and commoner zones is due to either the presence or absence of a low frequency of elite ceramic variables. In each case, as presented in Table 9, those sites classified into a lower elite zone were due to the presence of elite variables at lower frequencies. The variables, such as the small supports, the resist and motif decoration, spouts and spouted handles and miniature vessels, all have been defined in Chapter Two as upper elite variables. I propose that the presence of these variables in low frequencies

is something that is statistically significant in terms of the cluster analyses performed, yet is small enough to have been possibly overlooked by Pollard in her original analysis.

From this we can begin to evoke issues of behavior within the social classes present at Tzintzuntzan. It seems that the lower elite ceramic assemblage is in fact more closely related to the commoner (Ri) assemblage than it is to the upper elite (Rii) ceramic assemblage, a zone whose sites were very clearly defined in the cluster analysis. The distinctions between the lower elite and commoner classes though were much harder to discern, even when working within the results of the cluster analysis. The distinctions were slight yet significant and helped to define the difficult lower elite zones. From a spatial standpoint, a closer look at Figure 6 shows that the lower elite sites form a buffer between the upper elite sites and the commoner sites. This is the physical portrayal of the continuum of the social classes as can be seen in the artifacts. The lower elite represent an amalgamation of both extremes of the continuum, and it is my belief that due to the nature of the spatial orientation of the sites, they are more closely related to the commoner in terms of ceramic characteristics than they are the upper elite. The spatial orientation shows that the lower elite sites are in closer proximity to commoner areas than they are the one upper elite area in the west-central portion of the settlement, especially in the southern and north-east areas (see Figure 6). This speaks to the nature of the lower elite's role in Tzintzuntzan, and reinforces concepts of authority and the social hierarchy within the Tarascan state. We know from the *Relación* as well as Pollard's research that these lower elite were office holders and held the administrative positions that carried out the will of the king in a "flow of authority from the center to the village" (Pollard 1993:124). These positions included overseeing tribute storage, payment and

redistribution, the military, and the secondary public zones dedicated to the state religion, all of which included dealing and living directly among the larger commoner class. This concept, which has been applied to the Tarascan state, also applies to an intra-site analysis, explaining the close relationship between the lower elite and commoner artifact assemblages at Tzintzuntzan.

Figure 7 – Public and Residential Zone Classifications from Cluster Analyses

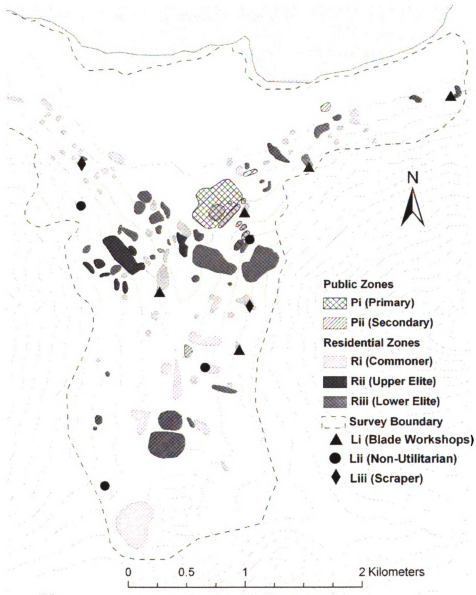


The second issue that explains economic behavior within Tzintzuntzan is the location of manufacturing zones. Pollard distinguishes between three types of lithic workshops that are characterized as manufacturing zones. The primary function for the type 1 lithic workshop (Li) is the production of lithic tools, primarily prismatic blades (1993:43). Type 2 lithic workshops produced other various artifacts, and are characterized by a high frequency of red and green worked obsidian (1993:43). Type 3 workshops included what Pollard thinks were the use and not the production of large scrapers (1993:43-45). Although I am limited in my analysis of these zones, the spatial distribution can be seen in relation to the public and residential zones and some inferences may be made about the economic nature of these sites as well as the larger economic structure of Tzintzuntzan.

As Figure 7 reveals, the manufacturing zones are located in close proximity to the residential and public zones assigned by the cluster analysis. Some patterns that can be seen from the spatial orientation of the workshops is that the Li workshops where the blades are manufactured are located either within or in close proximity (<300 m) to a public zone. The Lii workshops are more sporadically distributed spatially throughout the settlement, and of the four sites designated as Lii workshops, three occur in commoner zones. The final workshop, Liii, also occurs in the context of commoner zones. It seems that in the primary zonal context for the Li workshops occur in or nearby public zones and lower elite residential zones, whereas the Lii and Liii zones occur entirely in commoner residential zones. The fact that the workshops that manufacture the prismatic blades (Li) are closely related to public and lower elite zones tells us two things about the possible nature of the Tarascan economy. First, the lithics manufactured at

these Li sites are being used directly by the public zones, explaining their close proximity to each other. Second, it reinforces the concept that the obsidian prismatic blades are a ritual item, used primarily by the elite classes. And third, it suggests that once again due to the fact that these workshops are occurring in or near lower elite sites that the producers are either attached specialists, distinct from the commoner manufacturers or that they are being produced by the lower elite themselves.

Figure 8 – Location of Manufacturing Zones (Li, Lii, Liii)



This leads to the third theme of this analysis, which is the zonal overlap of the public and residential zones. For both the primary (Pi) and secondary (Pii) zones, there are n=23 sites classified. Of these n=23, there are eleven which were classified by the pipe cluster analysis. The remaining sites are either those that had no collected artifacts in the original survey and the classifications were made by Pollard, or they are sites located on or directly next to the main platform (Tz-25). Of the n=11 sites classified as both residential and public by the cluster analysis, n=2 occurred in sites also classified as upper elite residential sites, n=7 occurred in sites also classified as lower elite sites, and the remaining n=2 sites occurred in sites also classified as commoner. In Figures 8a and 8b, I have created larger zones, distinct from the zonal categories assigned to each individual site that the previous maps have displayed. The illustrations display the spatial orientation of the public sites in relation to residential zones. The zones, as defined by Pollard, are grouping of sites that are defined by zonal characteristics, and a cluster of similarly categorized sites represent a zone (Pollard 1972:71).

Thus, analyzing the sites defined by public zonal characteristics in terms of the larger residential zones gives insight into the level of overlap of these two functional zones. Of the n=23 sites defined by their public zonal characteristics and assigned by either myself or Pollard, n=12 occur in lower elite residential zones, n=2 occur in upper elite residential zones, and n=1 falls into a commoner residential zone. There is one site that falls outside of any definable residential zone (Tz-27), because it lacked any collected artifacts to be analyzed and the sole classification it was given by Pollard was as a secondary public zone. The other remaining n=7 sites are those that are

Figure 9a – Residential Zones

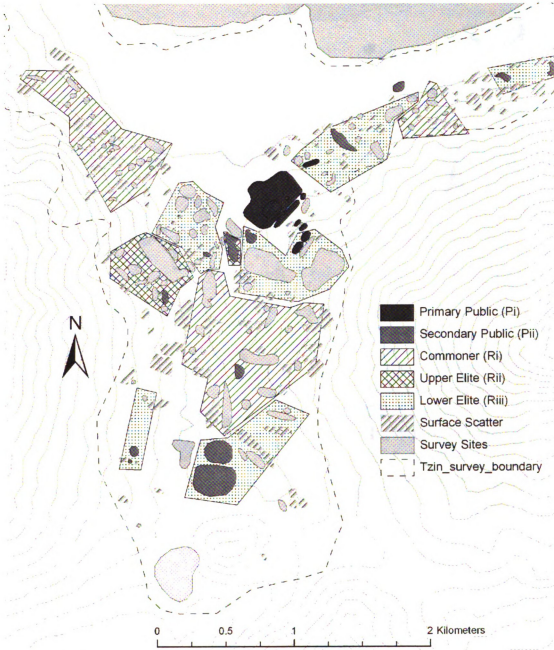
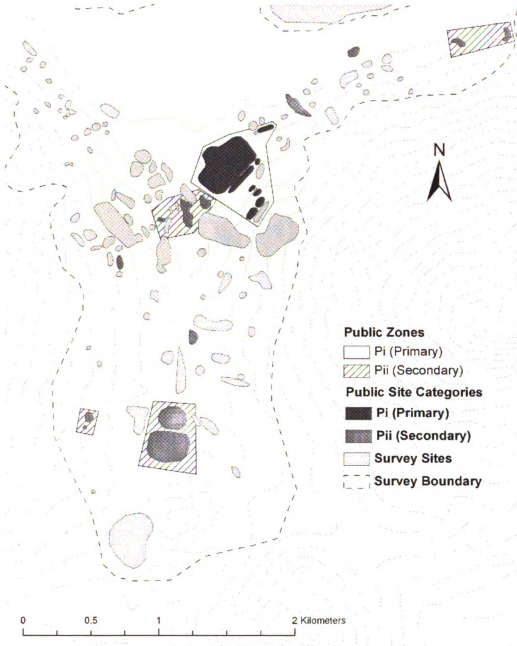


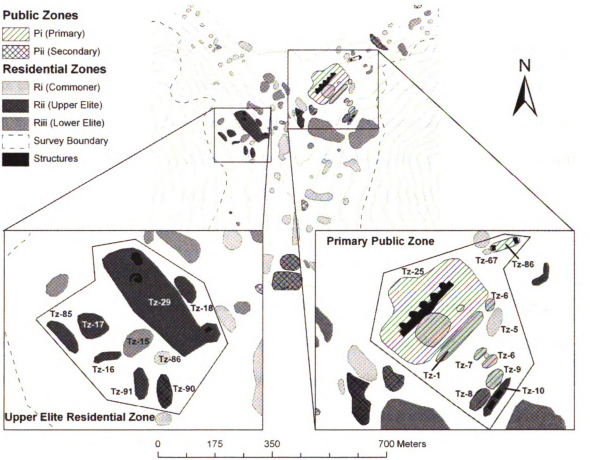
Figure 9b – Public Zones



located in or around Tz-25, which is the main platform. These seven sites constitute the only primary public zone at Tzintzuntzan (see Figures 8b and 9). Unfortunately due to looting, extensive excavation and erosion, this area is practically devoid of artifacts, and the cluster analysis shows no significant residential sites related to this primary zone.

The *edificios* which were discussed in Chapter Two and are located on the main platform are evidence of habitations occupied by priests of the state religion. This type of residency further demonstrates the distinct functionality of the primary public zone.

Figure 10 – The Primary Public Zone and Upper Elite Zone at Tzintzuntzan



It is clear that the overlap between elite residential zones and these public zones are very closely related, and signify an important aspect to an urban tradition at Tzintzuntzan. Pollard addresses this aspect of organization by stating "While the religious subsystem was clearly distinct in the zoning of functions as revealed in structures, features, and artifacts, the political subsystem was heavily embedded in the social structure of the upper class" (1999:67). While I agree with Pollard that this is true

for the primary public zone as defined by the main platform and its immediate surrounding sites, it is less clear when discussing the secondary public zones. As I have stated earlier, the secondary zones seem heavily embedded into the residential zones, especially in the case of the lower elite residential zones where the majority of the secondary zonal characteristics may be witnessed. One very interesting example of this is site Tz-12, which contains both a high count in upper elite ceramic variables as well as an extremely high count for ritual items, such as obsidian prismatic blades and pipes. Although I have classified the site based on primary public zonal characteristics, it is not close enough to the main platform to place it into the primary public zone and is thus will be considered a secondary public zone, along with site Tz-112 (see Figure 6).

Urbanism at Tzintzuntzan

The last theme that emerges from the zonal analysis is the issue of urbanism at Tzintzuntzan. The main concepts employed in the current urban theory on ancient cities include issues of urban zoning and planning. Zoning, as defined by Pollard, is the patterning of differential land use within a given area, with that differential land use being based on differing functions of particular spatial units (Pollard 1999:48). For this analysis these spatial units are the survey sites. Planning is described by Michael Smith in two new components of urban planning theory: (1) coordination among buildings and spaces in a city. This includes the arrangement of buildings, formality and monumentality of layout, orthogonality, other forms of geometric order, and access and visibility (Smith 2007:7). The second component is (2) standardization among cities in terms of urban architectural inventories, spatial layouts, orientation, and metrology.

Smith describes this theory in detail, and explains that the past literature focuses on ideals of simplistic urban planning when referring to ancient cities[17]. In simple terms, the past theory refers to cities as planned versus unplanned, without addressing the variations described above (Smith 2007:5). This discussion will utilize the updated urban theory that Smith proposes in conjunction with the conclusions made by Pollard in her previous research on a Tarascan urban tradition.

Urban Planning

Using the concepts laid out by Smith, we find that in fact Tzintzuntzan contains a lesser level of urban planning. Both Pollard's and my analysis show that Tzintzuntzan exhibits a relatively low degree of standardization and layout. However, the surviving buildings do exhibit components of what Smith discussed as being planned. There is definite evidence that the construction of the two central platforms represent a planned attempt at coordination of a space. The main platform (Tz-25) consists of the five *yácatas* which are standardized both between each other as well as represent an architectural form present elsewhere in the basin[18]. They are laid at an alignment 45 degrees east of north, and they are most definitely monumental in their construction and are visible within the known settlement. The second platform consists of the Santa Ana platform (Tz-29), which is the center of the upper elite residential zone. It is also an elevated platform that was constructed 45 degrees west of north and contains the remains

[17] Smith defines an ancient city to "designate preindustrial urban settlements outside of the Classical world of Greece and Rome." He goes on to state that this includes Mediterranean cities before the sixth century B.C., and cities in other parts of the world prior to European conquest or industrialization (Smith 2007:4).
[18] *Yácatas* that exhibit identical structural form and architecture are also present at Ihuatzio and Erongarícuaro (Pollard 1980: 685-690).

of structures. It is thought that the royal family including the king lived at this site. (See Figure 8 for a map of both platforms)

Table 10 – Survey Sites and Site Size Categorized by Zone

*(Ri = Commoner, Rii = Upper Elite, Riii = Lower Elite, Pi = Primary Public, Pii= Secondary Public)

Rii*	(ha)
Tz-12	1.24
Tz-16	0.21
Tz-17	0.58
Tz-18	0.35
Tz-85	0.45
Tz-90	0.39
Tz-91	0.35

Riii*	(ha)
Tz-8	0.47
Tz-10	0.57
Tz-11	0.58
Tz-15	0.54
Tz-19	0.58
Tz-20	0.93
Tz-22	0.92
Tz-23	0.87
Tz-39	0.16
Tz-53	0.28
Tz-59	0.99
Tz-61	0.78
Tz-63	0.28
Tz-70	1.21
Tz-75	0.43
Tz-76	0.41
Tz-77	5.8
Tz-78	6.04
Tz-84	0.34
Tz-107	0.84
Tz-110	0.12
Tz-112	2.85
Tz-114	0.39
Tz-117	6.09

Ri*	(ha)	Ri (cont)	(ha)
Tz-1	1.04	Tz-56	0.15
Tz-2	1.36	Tz-58	0.09
Tz-3	0.15	Tz-60	0.13
Tz-4	0.03	Tz-62	0.18
Tz-5	0.46	Tz-65	0.13
Tz-6	0.2	Tz-67	0.06
Tz-7	0.15	Tz-68	0.35
Tz-9	0.38	Tz-73	0.1
Tz-13	0.12	Tz-74	0.1
Tz-14	0.96	Tz-81	0.29
Tz-21	0.34	Tz-86	0.16
Tz-24	0.12	Tz-87	0.15
Tz-32	0.1	Tz-89	0.27
Tz-34	0.28	Tz-93	2.07
Tz-35	0.21	Tz-95	0.15
Tz-36	0.12	Tz-97	1.19
Tz-37	0.16	Tz-99	0.3
Tz-38	0.19	Tz-102	0.39
Tz-40	0.01	Tz-104	0.57
Tz-41	0.08	Tz-105	0.8
Tz-42	0.06	Tz-106	0.17
Tz-43	0.05	Tz-108	0.36
Tz-46	0.11	Tz-109	1.74
Tz-47	0.11	Tz-110a	0.07
Tz-49	0.49	Tz-111	0.71
Tz-50	0.14	Tz-113	1.99
Tz-51	0.14	Tz-115	0.06
Tz-54	0.4	Tz-119	0.93
Tz-55	0.29	Tz-120	0.35

Pi*	(ha)
Tz-1	1.04
Tz-2	1.36
Tz-3	0.15
Tz-6	0.2
Tz-7	0.15
Tz-8	0.47
Tz-9	0.38

Pii*	(ha)
Tz-11	0.58
Tz-12	1.24
Tz-70	1.21
Tz-75	0.43
Tz-76	0.41
Tz-87	0.15
Tz-90	0.4
Tz-104	0.57
Tz-112	2.9
Tz-114	0.39
Tz-117	6.1

The extent of the planning at Tzintzuntzan coincides with what, according to Smith, occurs in the earliest cities. He states that in most cases the central district, also termed the urban epicenter, exhibit planning whereas the surrounding residential zones do not (2007:7). The epicenter at Tzintzuntzan is clearly defined as the central area

extending from the upper elite residential zone on the west-central area to the primary public zone in the east-central area of the settlement. It is clear that the zones, both residential and public, and the architecture represent a planned center, whereas the surrounding zones are not formally arranged. Regardless of the informal arrangement of the zones, they still exhibit planning to the extent that they are zoned, and represent areas of differential land use defined by the function of the sites that constitute them.

Table 11 – Summary of Spatial Extent of Zoned Sites at Tzintzuntzan

Zone	*# Sites*	*Total Hectares*
Upper Elite (Rii)	7	8.83
Lower Elite (Riii)	24	32.5
Commoner (Ri)	58	22.26
Primary Public (Pi)[19]	14	14.98
Secondary Public (Pii)	11	14.4
Sites + Surface Scatter	145.80 ha	
Residential Zone Sites	63.59 ha	43.6% of total
Public Zone Sites	29.38 ha	20.2% of total

Urban Zoning

The concept of urban evolution theorizes that urban centers become increasingly larger and complex through time (Pollard 1999:68). This is clear in the zoning characteristics of an urban settlement, and as Pollard points out "can be taken as a postulate that as urban settlements evolve, there is an increase in the number and kind of zones, and in the degree of specialization" (1999:68). This analysis has discussed three types of zones, residential, public, and manufacturing. Due to the nature of Pollard's

[19] Primary Public refers to the sites analyzed and classified in Chapter 2, as well as the remaining sites that compose the Primary Public Zone (see Figure 9 for map of the Primary Public Zone)

analysis and the use of more variables than just the ceramics to identify zones, she has identified two more zones (agricultural and commercial) in addition to the previous three. These five zones constitute the urban settlement of Tzintzuntzan.

This analysis has shown that of the three zones examined, all three show a high level of overlap and embeddedness within each other. The most embedded can be seen in the residential zones, as they are multipurpose in terms of the political and social structure of Tzintzuntzan. Pollard makes this point, as she states "From the *Relación* it is clear that the king and lords, the upper class, occupied the dominant positions within the political administration as their primary status" (1999:67). My analysis supports this statement, as the analysis in no way provides any separate zone that is defined by any political function, whether it is administrative, judicial, or legislative.

The second aspect of zonal overlap is one that exists between the residential and public zones. It is clear that due to the nature of the zonal classifications for the survey sites, that the majority of the lower and upper elite classified sites also contained ceramic variables characteristic of a religious and/or ritual function. The religious and ideological systems can be removed, unlike the political system, from the residential zone and identified as a distinct zone and are defined as public zones. This is very evident in the primary public zone, which includes the main platform at Tzintzuntzan (Tz-25), and is almost totally removed from any residential zone. Pollard attributes the zonal overlap to fact that the "political system dominated the religious hierarchy, utilizing the ideological system to reinforce political power and legitimacy" (1999:67).

My analysis does support this fact, but also shows a more embedded role between the secondary public zones and the lower elite residential zones at Tzintzuntzan than may

have been previously thought. It may be that in these lower elite residential areas all functions of the state, including the political, economic and religious aspects, are being combined and carried out at a more local level by the lower elite class. The location of the lithic workshops, especially the blade workshops (Li), support this fact, as they are either in very close proximity or are contained within lower elite sites. It seems that the lower elite are in charge of the more localized state functions, ranging from production of ritual items to the rituals themselves, of religious function through their residential zones. These zones seem to have more embedded functions than perhaps was previously thought, as they envelop all aspects of what is defined as a public space in terms of the state.

Conclusion

The ceramic analysis of the Tzintzuntzan survey sites was done to test the original interpretations made by Helen Pollard about the nature of the settlement and its urban characteristics. The null hypothesis for my analysis was that there would be no difference between Pollard's original zonal classifications and my zonal classifications. The analysis showed that 73% of the time, Pollard and I agreed as to the zonal classification given to the individual sites. The remaining instances of disagreement could be explained in part by the larger number of variables that Pollard used to define a site's zonal category, as well as the discovery of a distinct patterning between the ceramic assemblages of the lower elite class and the commoner class. Overall, I have failed to accept my hypothesis but I believe that the major components of Pollard's interpretations have been supported by my analysis of the Tzintzuntzan ceramics.

Speaking to the urban nature of Tzintzuntzan, my analysis parallels Pollards in that it shows Tzintzuntzan to display a low to moderate level of urban planning overall, with an urban center displaying a higher level of urban planning and the surrounding zones displaying a low level of planning. To this point, I agree with Pollard in that "the implication is that Tzintzuntzan was a small, relatively less complex urban form at an early phase in urban evolution" (1999:68). This is also discussed by Smith, as he found that "in a comparison of the sizes of Postclassic Mesoamerican cities, ...the absolute area of the urban epicenter (i.e., the planned proportions of cities) was strongly associated with the administrative level of cities; the most powerful capitals had the largest planned areas" (2007:30). Though I cannot speak to the effect of Tzintzuntzan's overall impact on the larger landscape, this point does explain the highly embedded use of space by the upper elite for state functions that encompassed the economic, political, and religious aspects of Tarascan society. Because of this overlap and the lack of space defined by distinct functional characteristics, it is evident that Tzintzuntzan was still in an early phase of state and urban evolution at the time of the Spanish contact.

The research provided in this thesis has created a methodological framework for the reanalysis of an archaeological survey. Because it is now impossible to recreate the original survey completed by Pollard in 1970, the reanalysis of the survey data must be approached with a range of analytical tools and multiple lines of evidence in order to provide the most thorough results. This resulted in a methodology that utilizes multiple lines of evidence to create bridging arguments that relates social status to the artifact assemblage. The methodology also utilizes statistical analyses that aid in site classification based on the status sensitive assemblages as well as testing the results from

the site classification to Pollard's original results. Finally, the analysis worked within a geospatial database and GIS framework that helped to display, analyze, and map the Tzintzuntzan archaeological survey data.

The goal of the bridging arguments was to link the concepts of a hierarchical social system in a state-level society to specific ceramic variables that represent the distinct social classes. To do so, multiple lines of evidence were needed to create these associations. They included excavations at Tzintzuntzan within the INAH official archaeological zone, which includes the main platform (Tz-25), excavations of burials at the major center of Urichu within the Pátzcuaro Lake Basin, and the habitation and burial excavations at the site of Las Milpillas at Zacapu outside of the lake basin. Also, research of the ceramic production and specialization within the lake basin added the economic and manufacturing aspects of the association between social class and artifact. And finally, the ethnohistoric evidence as seen in the *Relación de Michoacán* (1956) provided firsthand accounts of Tarascan life that associated aspects of Tarascan society to social class and ceramic artifacts. These areas of evidence helped to create specific categories that were able to detect status-sensitive distinctions in the ceramic assemblage.

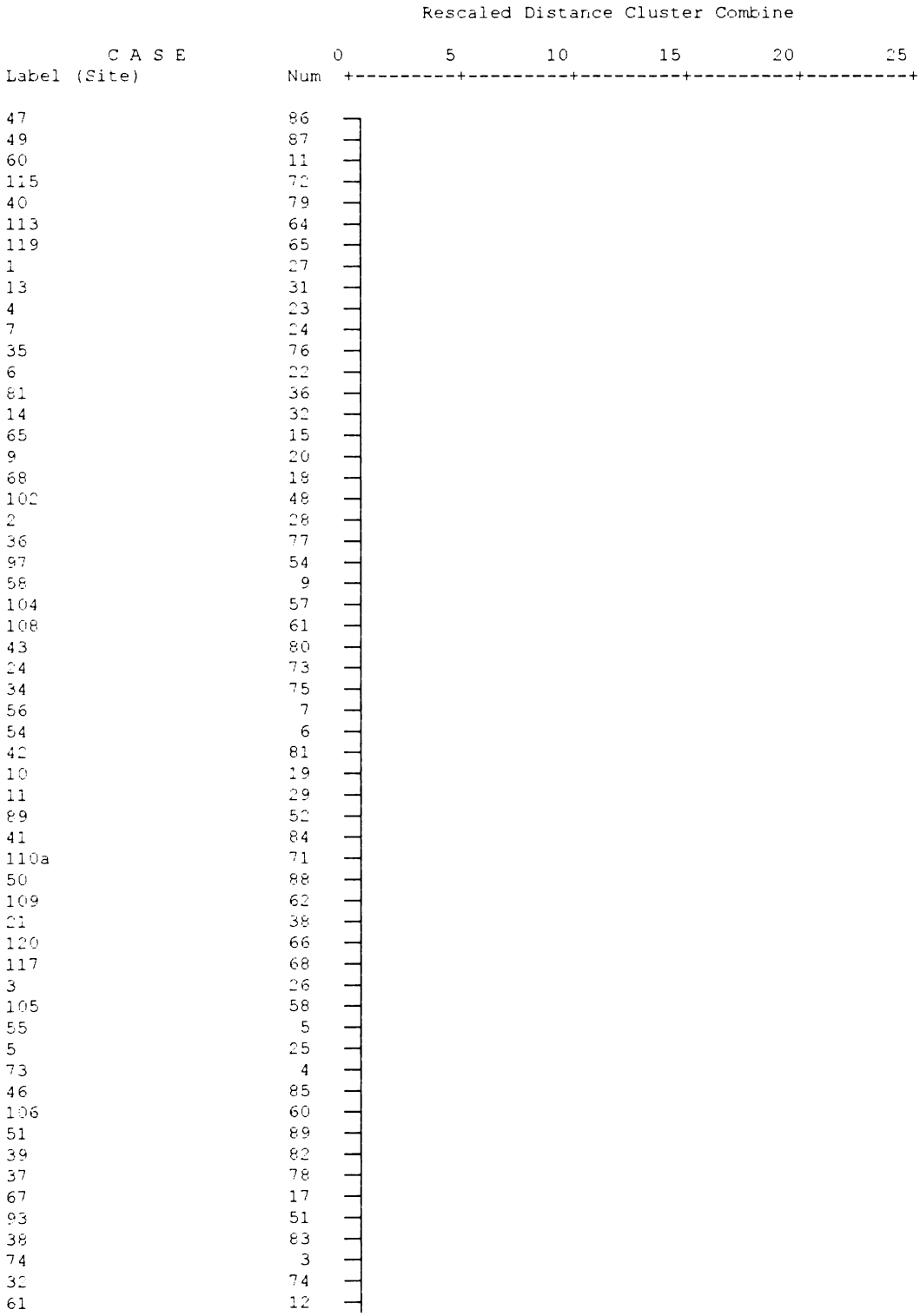
The second aspect of the methodology provided in this thesis is the use of both hierarchical and K-means cluster analysis and non-parametric statistical tests to analyze the sites in terms of the status-defined ceramic variables. In Pollard's original analyses, statistical and systematic tests were not done to derive her zonal classifications. The statistical tests used in this analysis were important because they provided a thorough method with a higher degree of confidence when working with small sample sizes in count data form.

The combination of these multiple lines of evidence and statistical analyses provide a methodology that isn't limited to the site of Tzintzuntzan. The method may now be applied elsewhere in the Pátzcuaro Lake Basin to test the range and variability of Tarascan social hierarchy in terms of the archaeological record. By utilizing this methodology at such sites as Urichu, Erongarícuaro, Pareo, Jarácuaro, and others within the lake basin, the artifact-status associations can be tested and may provide uniform artifact assemblages that display homogeneity between social classes across Late Postclassic period sites. The application of this methodology may also show distinctions between sites, and we may find that, for example, the lower elite are represented differently in the archaeological record at the capital of Tzintzuntzan than they are the center of Erongarícuaro. Evidence such as this may provide a closer look at social distinctions within Tarascan society, and help us to better understand the dynamic aspects of the Tarascans both at the emergence of the state and at the time of Spanish contact.

APPENDICES

Upper Elite Variables: Cluster Analysis
-Hierarchical Cluster Analysis (n=89 sites)

Figure 11 – Upper Elite Variables: Dendrogram Using Average Linkage (Between Groups)



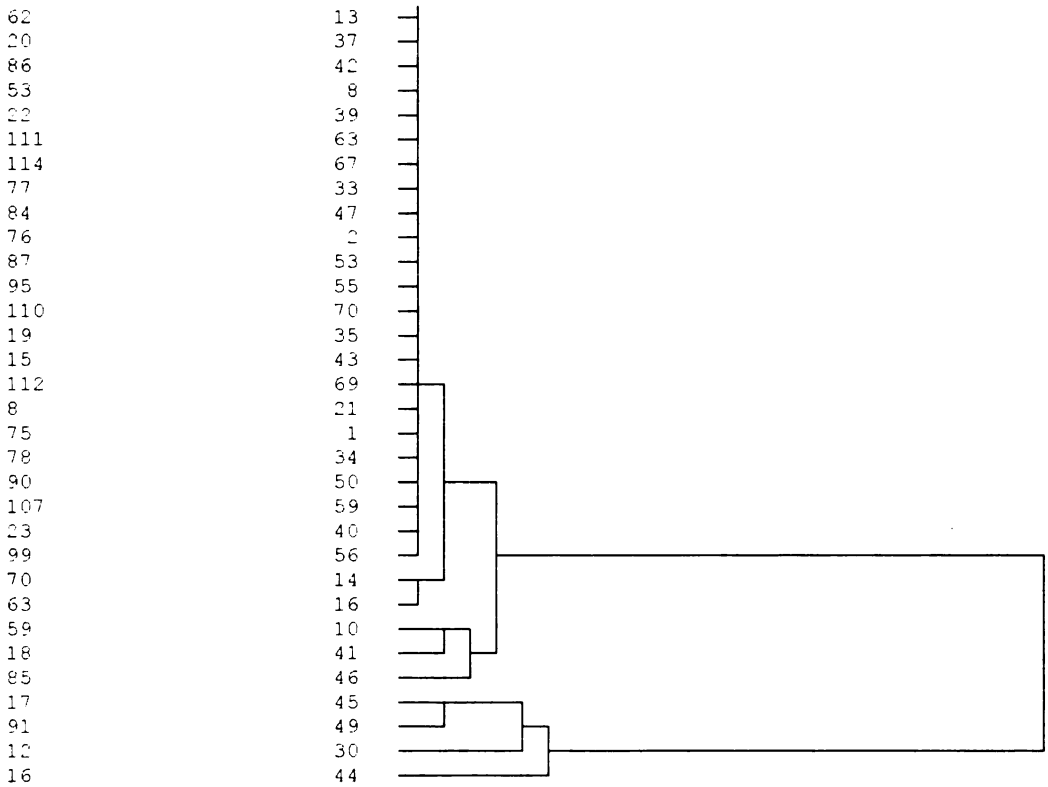

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Table 12 – Upper Elite Variables: Cluster Membership – K-Means Cluster Analysis (n = 89 sites)

Case #	Site	Cluster	Distance
1	75	1	7.824
2	76	1	5.831
3	74	1	4.575
4	73	1	3.513
5	55	1	3.905
6	54	1	2.136
7	56	1	4.04
8	53	1	8.05
9	58	1	3.116
10	59	3	8.192
11	60	1	3.908
12	61	1	6.204
13	62	1	5.877
14	70	1	11.007
15	65	1	3.732
16	63	1	13.691
17	67	1	3.31
18	68	1	3.819
19	10	1	2.475
20	9	1	3.732
21	8	1	5.292
22	6	1	3.555
23	4	1	3.908
24	7	1	3.908
25	5	1	3.555
26	3	1	3.534
27	1	1	3.908
28	2	1	3.021
29	11	1	2.055
30	12	2	15.906
31	13	1	3.908
32	14	1	3.585
33	77	1	7.112
34	78	1	10.467
35	19	1	5.486
36	81	1	3.208
37	20	1	6.269
38	21	1	2.692
39	22	1	6.956
40	23	1	8.712
41	18	3	8.913
42	86	1	7.617
43	15	1	7.856
44	16	2	17.564
45	17	2	12.728
46	85	3	10.96
47	84	1	8.541
48	102	1	3.468
49	91	2	12.021
50	90	1	10.905
51	93	1	2.772
52	89	1	2.618
53	87	1	4.949
54	97	1	3.235
55	95	1	4.68
56	99	1	9.648
57	104	1	2.91
58	105	1	3.778
59	107	1	8.847
60	106	1	3.415
61	108	1	3.461
62	109	1	2.253
63	111	1	4.243
64	113	1	3.908
65	119	1	3.908
66	120	1	3.623
67	114	1	6.2
68	117	1	2.811
69	112	1	8.191
70	110	1	3.189
71	110a	1	2.552
72	115	1	3.908
73	24	1	3.538
74	32	1	4.68
75	34	1	3.22
76	35	1	3.963
77	36	1	3.021
78	37	1	2.803
79	40	1	3.908
80	43	1	4.249
81	42	1	2.296
82	39	1	3.492
83	38	1	3.372
84	41	1	1.754
85	46	1	2.772
86	47	1	3.908
87	49	1	3.908
88	50	1	2.061
89	51	1	3.716

Table 13 – Upper Elite Variables: Final Cluster Centers – K-Means Cluster Analysis (n = 89 sites)

Final Cluster Centers

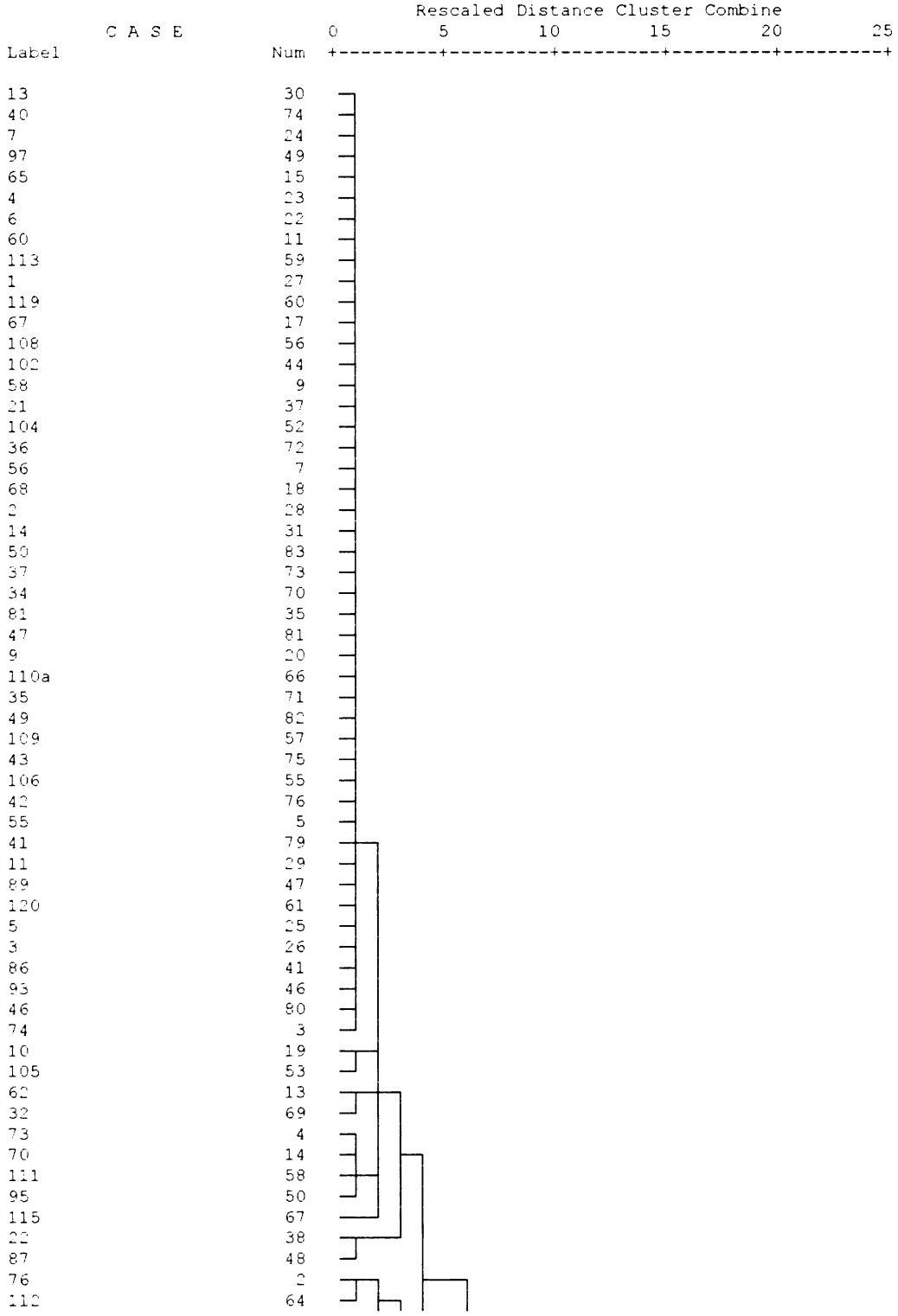
	Cluster		
	1	**2**	**3**
Tarerio Cream	2	27	8
Yaguarato Cream	2	16	14
Siphio Grey	1	18	6
Bowls: convex wall	1	19	12
out-sloping wall	0	0	2
minibowls: total	0	4	0
Plates: convex wall	0	2	1
flat base	0	0	0
spouted vessel: 2.7.1,5,4	0	1	1
spout handle 2.7.2	0	2	0
small-spider	0	4	1
conical	0	1	1
flat-oblong	0	0	0
foot-claw	0	0	0
flared	0	0	0
hollow cylinder	0	0	0
solid foot shape	0	0	0
small supports	1	6	2
hollow rattle cylind.	0	0	1
" " wider top	0	0	0
" " nub	0	0	0
Motifs: 3.3.2	0	8	2
3.3.8	1	9	3
3.3.7	0	10	1
3.3.9	0	2	0
3.3.1	0	2	1
3.3.3	0	0	0
3.3.4	0	2	0
3.3.5	0	2	0
3.3.6	0	0	1
3.3.10	0	1	0
3.3.11	0	0	0
3.3.12	0	0	0
3.3.13	0	0	0
3.3.14	0	0	0
Motifs	2	37	8
Applique conical Pellet	0	0	0
negative (total)	0	10	1
neg./red	0	1	0
neg./red/white	0	3	0
red,white&black/cream	0	0	0
neg./cream	0	0	0
neg./red&white/cream	0	5	0

Number of Cases in each Cluster

Cluster		
	1	82
	2	4
	3	3
	Valid	89
	Missing	0

Lower Elite Variables: Cluster Analysis
-Hierarchical Cluster Analysis (n=84 sites)

Figure 12 – Lower Elite Variables: Dendrogram Using Average Linkage (Between Groups)



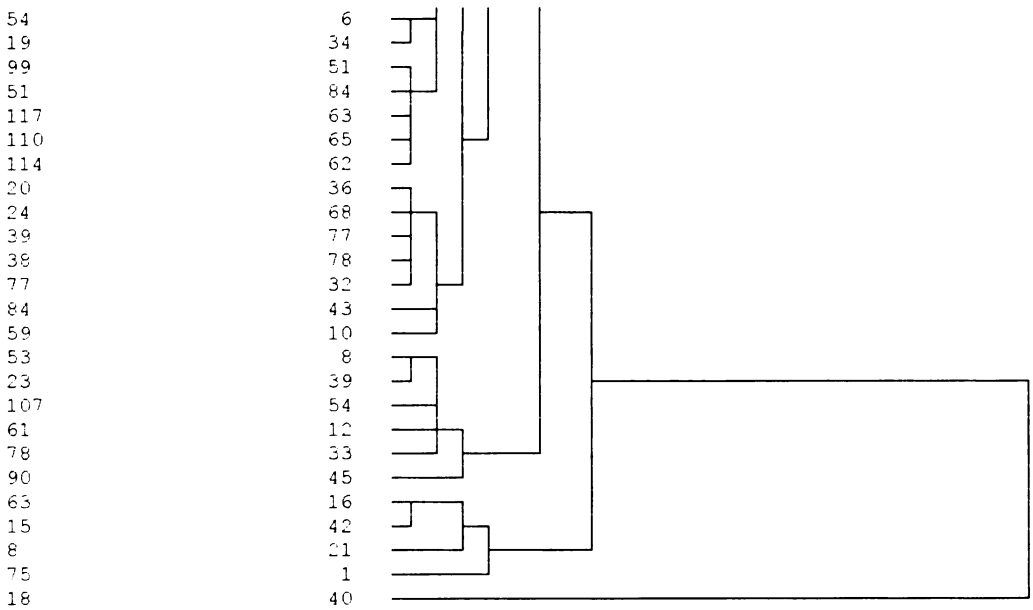

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Table 14 –Lower Elite Variables: Cluster Membership - K-Means Cluster Analysis (n = 84 sites)

Case#	Site	Cluster	Distance
1	75	1	9.975
2	76	1	5.008
3	74	4	3.941
4	73	4	5.737
5	55	4	3.093
6	54	4	7.562
7	56	4	2.285
8	53	2	3.433
9	58	4	2.381
10	59	1	6.376
11	60	4	2.623
12	61	2	3.845
13	62	4	5.26
14	70	4	5.806
15	65	4	3.093
16	63	1	7.815
17	67	4	1.88
18	68	4	2.33
19	10	4	5.264
20	9	4	2.063
21	8	1	5.406
22	6	4	2.707
23	4	4	2.862
24	7	4	3.176
25	5	4	2.474
26	3	4	3.471
27	1	4	2.481
28	2	4	3.003
29	11	4	2.308
30	13	4	3.176
31	14	4	2.763
32	77	1	4.01
33	78	2	7.209
34	19	1	7.335
35	81	4	2.675
36	20	2	5.718
37	21	4	2.794
38	22	2	6.264
39	23	2	3.774
40	18	3	0
41	86	4	4.493
42	15	1	7.714

Case #	Site	Cluster	Distance
43	84	2	5.254
44	102	4	2.843
45	90	2	8.316
46	93	4	3.78
47	89	4	2.609
48	87	2	6.583
49	97	4	2.897
50	95	4	5.482
51	99	4	6.016
52	104	4	1.727
53	105	4	3.976
54	107	2	4.428
55	106	4	1.776
56	108	4	2.629
57	109	4	2.03
58	111	4	4.798
59	113	4	2.801
60	119	4	2.862
61	120	4	2.974
62	114	1	5.959
63	117	1	4.591
64	112	1	4.936
65	110	1	3.496
66	110a	4	2.713
67	115	4	5.978
68	24	1	4.335
69	32	4	5.114
70	34	4	2.662
71	35	4	3.031
72	36	4	2.088
73	37	4	2.367
74	40	4	3.176
75	43	4	2.389
76	42	4	1.592
77	39	2	4.687
78	38	1	4.893
79	41	4	2.255
80	46	4	4.435
81	47	4	3.126
82	49	4	3.381
83	50	4	2.323
84	51	4	4.819

Table 15 – Lower Elite Variables: Final Cluster Centers – K-Means Cluster Analysis (n = 84 sites)

Final Cluster Centers	**Cluster**			
	1	**2**	**3**	**4**
Tariacuri Brown	6	6	6	1
Siphio Grey	2	2	3	1
convex wall	0	0	0	0
spouted vessel: 2.7.1,5,4	0	0	1	0
Yaguarato Coarse	2	1	1	1
Jars - everted rim	7	5	12	2
regular - solid conical	0	0	0	0
Motifs	3	6	6	1
solid spider	0	0	0	0
incurved rim	0	0	3	0
white/red	0	0	7	0
red/white	0	1	2	0
red&white/white	0	0	0	0
red/cream	8	3	21	1
white/cream	1	1	2	0
red&white/cream	4	9	6	1
white all over red/cream	0	0	1	0
all over red/cream	1	0	16	0

Number of Cases in each Cluster

Cluster	1	14
	2	11
	3	1
	4	58
	Valid	84
	Missing	0

Commoner Variables: Cluster Analysis
-Hierarchical Cluster Analysis (n=61 sites)

Figure 13 – Commoner Variables: Dendrogram Using Average Linkage (Between Groups)

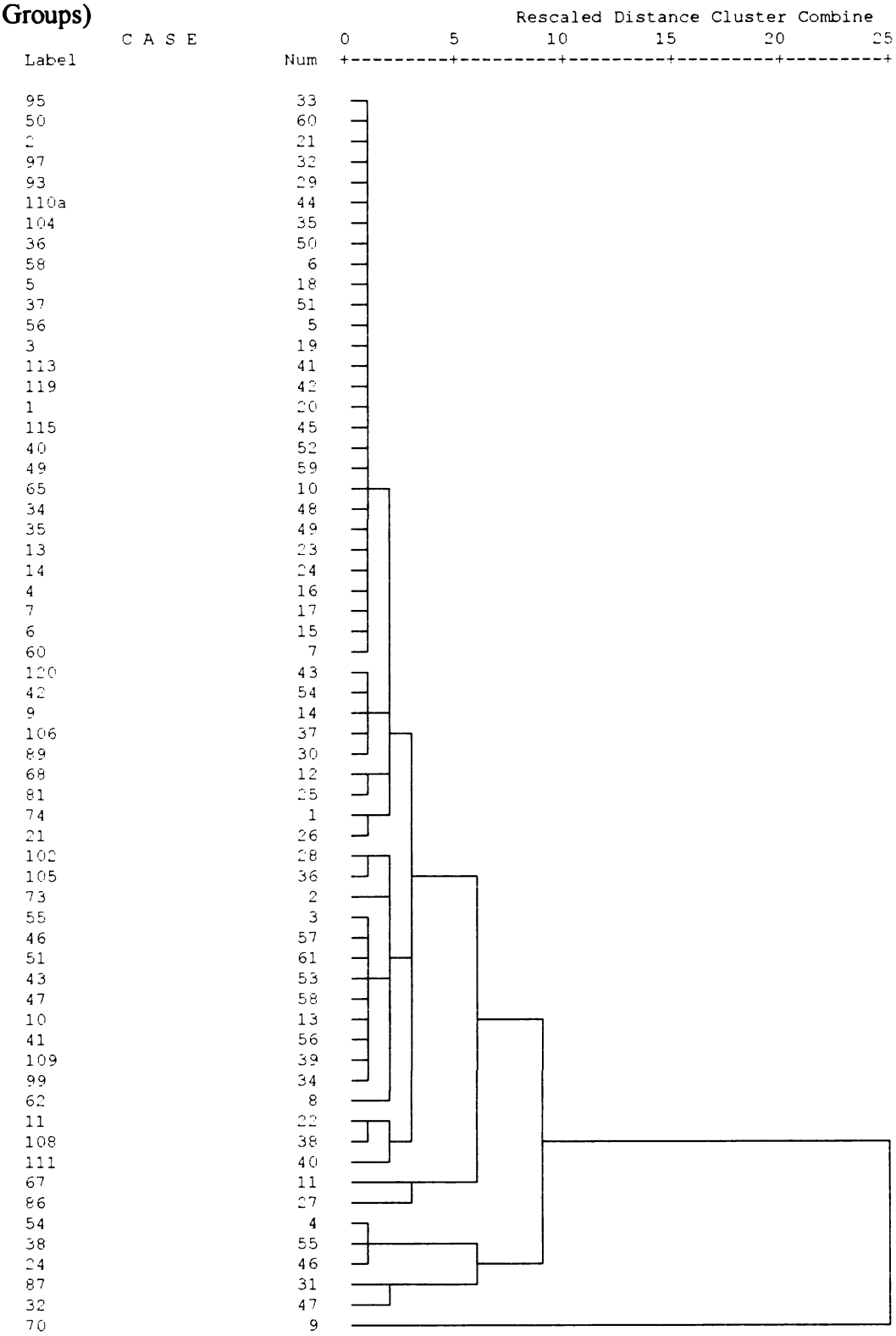


Table16 – Commoner Variables: Cluster Membership – K-Means Cluster Analysis (n=61 sites)

Case #	Site	Cluster	Distance
1	74	1	1.938
2	73	1	1.997
3	55	2	1.685
4	54	2	4.002
5	56	1	1.253
6	58	1	0.471
7	60	1	1.681
8	62	2	1.441
9	70	3	0
10	65	1	1.29
11	67	1	3.439
12	68	1	2.099
13	10	2	1.771
14	9	1	1.646
15	6	1	1.29
16	4	1	1.29
17	7	1	1.29
18	5	1	1.574
19	3	1	0.843
20	1	1	0.971
21	2	1	0.971
22	11	2	3.099
23	13	1	1.29
24	14	1	1.29
25	81	1	2.099
26	21	1	2.39
27	86	1	5.293
28	102	1	2.38
29	93	1	1.225
30	89	1	2.032
31	87	2	3.432

Case #	Site	Cluster	Distance
32	97	1	0.971
33	95	1	1.491
34	99	2	1.883
35	104	1	0.471
36	105	2	2.38
37	106	1	1.646
38	108	1	2.28
39	109	2	1.668
40	111	1	2.798
41	113	1	1.196
42	119	1	1.467
43	120	1	1.491
44	110a	1	1.225
45	115	1	0.971
46	24	2	3.525
47	32	2	3.467
48	34	1	1.29
49	35	1	1.29
50	36	1	0.471
51	37	1	1.41
52	40	1	1.29
53	43	2	2.048
54	42	1	1.491
55	38	2	3.003
56	41	2	1.771
57	46	2	0.698
58	47	2	1.787
59	49	1	1.29
60	50	1	1.491
61	51	2	1.668

Table 17 – Commoner Variables: Final Cluster Centers – K-Means Cluster Analysis (n=61 sites)

Final Cluster Centers

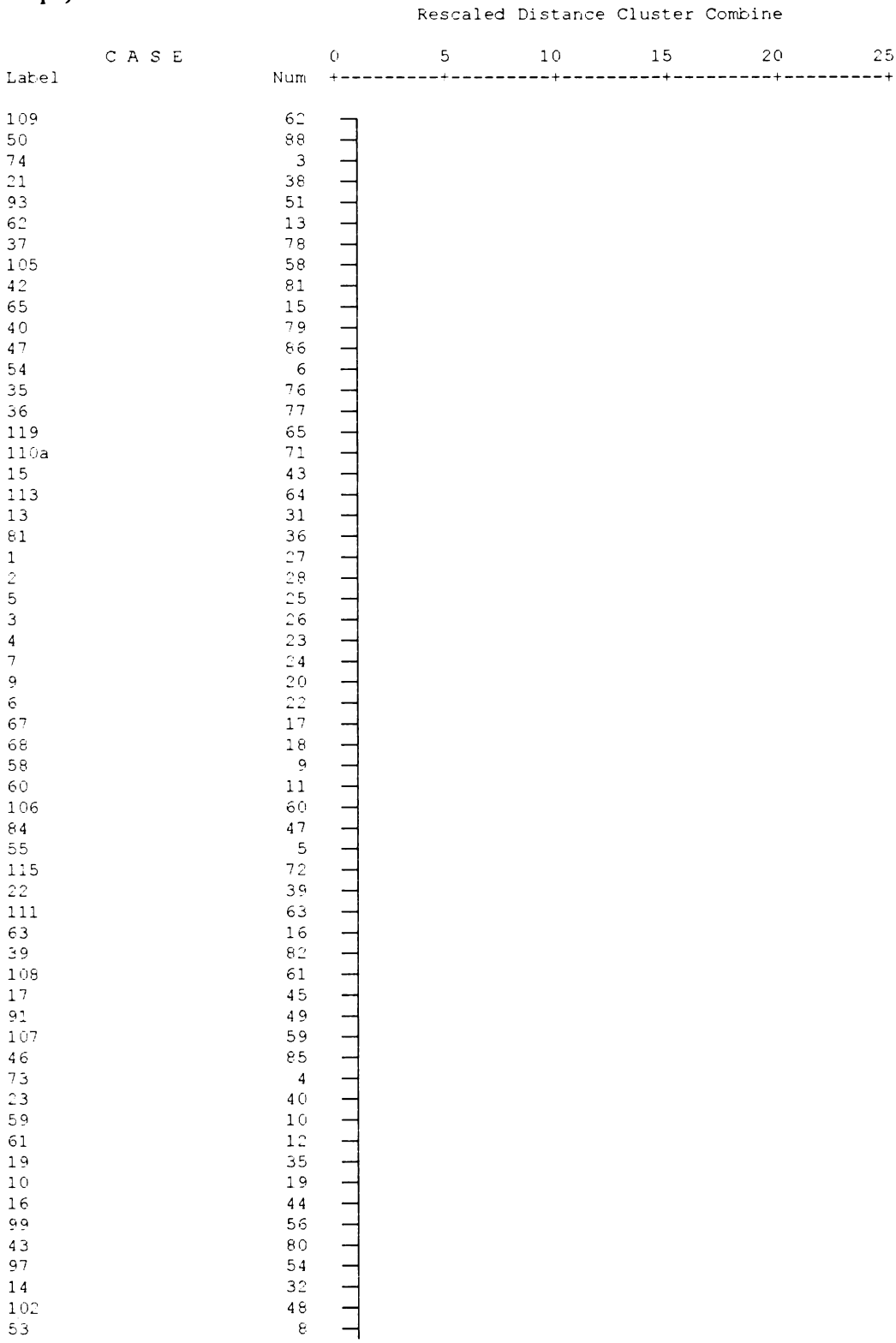
	Cluster		
	1	**2**	**3**
Taruacuri Coarse	0	1	1
Yaguarato Coarse	0	2	2
Ichupio Coarse	0	1	1
Bowls - convex wall	1	1	11
incurved rim	0	0	0
Jars - everted rim	1	4	2
incurved	0	0	1
regular - solid conical	0	0	0
unslipped-unpainted	0	0	2

Number of Cases in each Cluster

Cluster	1	43
	2	17
	3	1
	Valid	61
	Missing	0

Public Zone Variables: Cluster Analysis
-Hierarchical Cluster Analysis (n=89 sites)

Figure 14 – Public Zone Variables: Dendrogram Using Average Linkage (Between Groups)



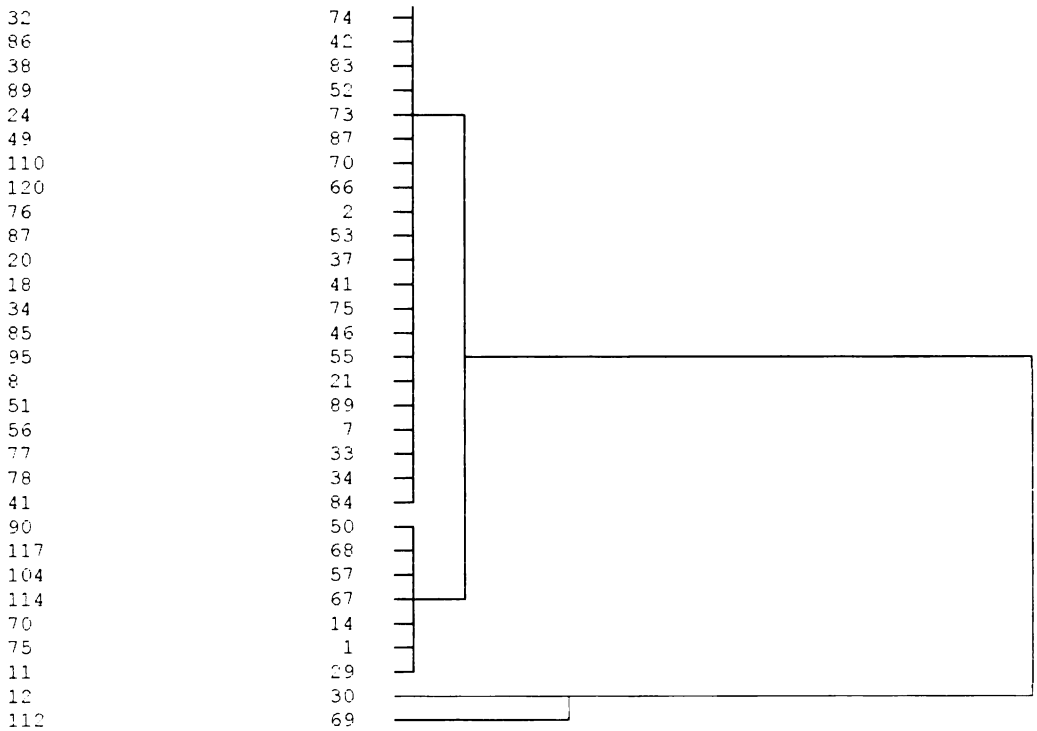

32
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Table 18 – Public Zone Variables: Cluster Membership – K-Means Cluster Analysis (n=89 sites)

Case #	Sites	Cluster	Distance
1	75	2	4.347
2	76	2	1.132
3	74	3	0.605
4	73	3	1.195
5	55	3	1.016
6	54	3	0.72
7	56	3	3.21
8	53	2	2.802
9	58	3	0.72
10	59	3	1.031
11	60	3	0.72
12	61	3	1.268
13	62	3	0.605
14	70	2	2.369
15	65	3	1.031
16	63	3	1.447
17	67	3	0.72
18	68	3	0.72
19	10	3	1.706
20	9	3	0.72
21	8	3	2.264
22	6	3	0.72
23	4	3	0.72
24	7	3	0.72
25	5	3	0.72
26	3	3	0.72
27	1	3	0.72
28	2	3	0.72
29	11	2	2.919
30	12	1	0
31	13	3	0.72
32	14	3	1.892
33	77	3	2.834
34	78	3	3.317
35	19	3	2.168
36	81	3	0.72
37	20	2	2.126
38	21	3	0.605
39	22	3	1.088
40	23	3	1.661
41	18	2	1.938
42	86	2	1.361
43	15	3	0.72
44	16	3	1.661
45	17	3	1.361
46	85	3	1.733
47	84	3	1.207
48	102	3	2.658
49	91	3	1.361
50	90	2	3.162
51	93	3	0.605
52	89	2	1.661
53	87	2	1.526
54	97	3	1.9
55	95	3	1.733
56	99	3	1.596
57	104	2	2.17
58	105	3	1.031
59	107	3	0.955
60	106	3	1.195
61	108	3	1.488
62	109	3	0.605
63	111	3	1.457
64	113	3	0.72
65	119	3	0.72
66	120	2	2.192
67	114	2	2.59
68	117	2	2.69
69	112	4	0
70	110	2	1.975
71	110a	3	0.72
72	115	3	1.315
73	24	2	1.067
74	32	2	2.192
75	34	3	2.303
76	35	3	0.72
77	36	3	0.72
78	37	3	1.143
79	40	3	0.72
80	43	3	2.075
81	42	3	1.031
82	39	3	1.394
83	38	2	1.361
84	41	2	3.192
85	46	3	1.859
86	47	3	0.72
87	49	2	1.838
88	50	3	0.605
89	51	3	2.413

Table 19 – Public Zone Variables: Final Cluster Centers - K-Means Cluster Analysis (n=89 sites)

Final Cluster Centers	Cluster			
	1	2	3	4
Bowls:-thin wall bevel lip	2	0	0	1
" " conical bowl	2	0	0	0
thick modeled	0	0	0	1
bulbous base	1	0	0	0
conical supports	0	0	0	0
Bits: -Plain	1	0	0	0
ground around	2	0	0	0
beveled	1	0	0	1
pattern burnish	0	0	0	0
incised	1	0	0	2
Circular Cross-section	25	5	1	16
Simple Twist	2	0	0	3
Incised twist four	5	1	0	2
Incised Twist Three	2	0	0	0
Twisted & Incised	4	0	0	4
Twisted & Scalloped	1	0	0	0
Oval Cross-section	0	1	0	3
unslipped: pattern bur.	0	0	0	0
stamp incised	0	0	0	0
incised str. Line	0	0	0	0
incised wavy line	0	0	0	1
Scalloped	0	0	0	0
"corn cob"	0	0	0	0

Number of Cases in each Cluster

Cluster		
	1	1
	2	21
	3	66
	4	1
	Valid	89
	Missing	0

Table 20 – Public Zone Variables: Cluster Membership - K-Means Cluster Analysis (n=87 sites) (Tz-12 and Tz-112 removed and variables pipe bits and bowls removed)

Case #	Sites	Cluster	Distance
1	75	1	3.051
2	76	1	1.444
3	74	3	0.747
4	73	3	1.384
5	55	3	0.993
6	54	3	0.448
7	56	2	2.499
8	53	2	2.038
9	58	3	0.448
10	59	3	1.128
11	60	3	0.448
12	61	3	1.358
13	62	3	0.747
14	70	1	1.659
15	65	3	0.879
16	63	3	0.975
17	67	3	0.448
18	68	3	0.448
19	10	3	1.371
20	9	3	0.448
21	8	2	1.304
22	6	3	0.448
23	4	3	0.448
24	7	3	0.448
25	5	3	0.448
26	3	3	0.448
27	1	3	0.448
28	2	3	0.448
29	11	1	2.882
30	13	3	0.448
31	14	3	1.304
32	77	2	1.75
33	78	2	2.407
34	19	3	1.997
35	81	3	0.448
36	20	2	1.304
37	21	3	0.747
38	22	3	0.975
39	23	2	1.558
40	18	2	1.075
41	86	2	1.587
42	15	3	0.448
43	16	3	1.495
44	17	3	1.159
45	85	2	1.338
46	84	3	1.063
47	102	2	2.29
48	91	3	1.159
49	90	1	1.281
50	93	3	0.747
51	89	2	1.587
52	87	1	1.757
53	97	3	1.234
54	95	2	1.338
55	99	3	1.219
56	104	1	1.482
57	105	3	0.879
58	107	3	1.063
59	106	3	1.063
60	108	3	1.219
61	109	3	0.747
62	111	3	0.975
63	113	3	0.448
64	119	3	0.448
65	120	2	1.032
66	114	1	2.102
67	117	1	1.556
68	110	2	1.075
69	110a	3	0.448
70	115	3	1.304
71	24	2	1.338
72	32	2	1.776
73	34	2	1.405
74	35	3	0.448
75	36	3	0.448
76	37	3	0.747
77	40	3	0.448
78	43	3	2.014
79	42	3	0.879
80	39	3	1.495
81	38	2	1.587
82	41	2	2.658
83	46	3	1.924
84	47	3	0.448
85	49	2	0.654
86	50	3	0.747
87	51	2	1.529

Table 21 – Public Zone Variables: Final Cluster Centers - K-Means Cluster Analysis (n=87 sites)

(Tz-12 and Tz-112 removed and variables pipe bits and bowls removed)

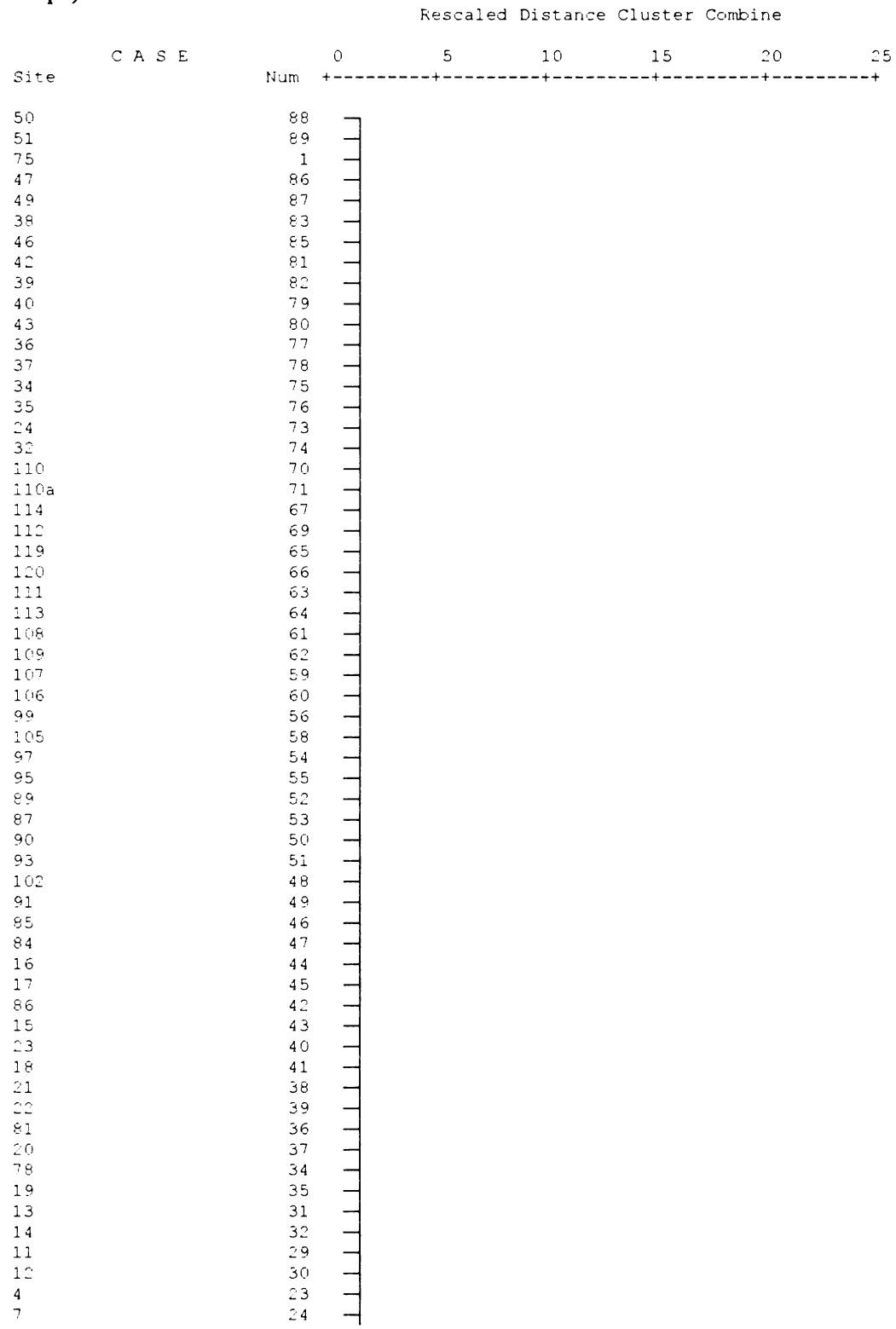
Final Cluster Centers	**Cluster**		
	1	**2**	**3**
conical supports	0	0	0
Circular Cross-section	6	3	0
Simple Twist	0	0	0
Incised twist four	1	1	0
Incised Twist Three	0	0	0
Twisted & Incised	0	0	0
Twisted & Scalloped	0	0	0
Oval Cross-section	1	0	0
unslipped: pattern bur.	0	0	0
stamp incised	0	0	0
incised straight line	0	0	0
incised wavy line	0	0	0
Scalloped	0	0	0

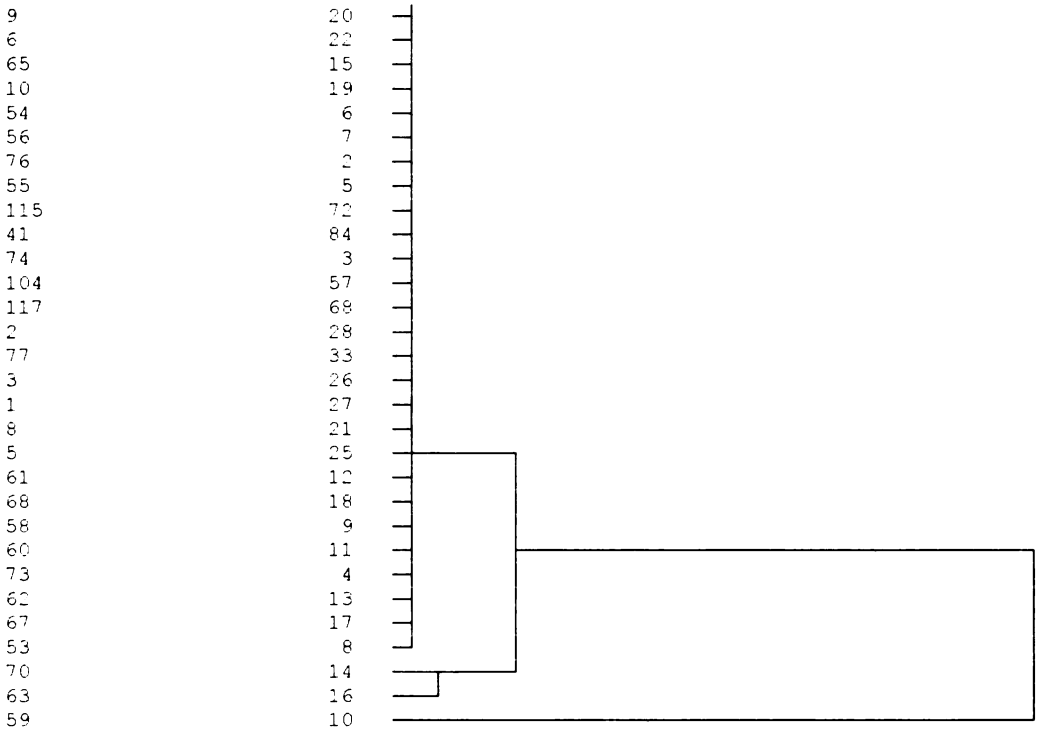
Number of Cases in each Cluster

Cluster		
	1	9
	2	22
	3	56
	Valid	87
	Missing	0

Querenda White Ware: Cluster Analysis
-Hierarchical Cluster Analysis (n=89 sites)

Figure 15 – Querenda White Variables: Dendrogram Using Average Linkage (Between Groups)

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56
76
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115
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74
104
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70
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59
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22
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19
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7
2
5
72
84
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16
10

Table 22 – Querenda White Variables: Cluster Membership - K-Means Cluster Analysis (n=89 sites)

Case #	Sites	Cluster	Distance
1	75	1	0.291
2	76	1	0.291
3	74	1	0.709
4	73	1	0.709
5	55	1	0.291
6	54	1	0.291
7	56	1	0.291
8	53	1	2.709
9	58	1	0.709
10	59	3	0
11	60	1	0.709
12	61	1	0.709
13	62	1	2.709
14	70	2	3.5
15	65	1	0.291
16	63	2	3.5
17	67	1	2.709
18	68	1	0.709
19	10	1	0.291
20	9	1	0.291
21	8	1	0.709
22	6	1	0.291
23	4	1	0.291
24	7	1	0.291
25	5	1	0.709
26	3	1	0.709
27	1	1	0.709
28	2	1	0.709
29	11	1	0.291
30	12	1	0.291
31	13	1	0.291
32	14	1	0.291
33	77	1	0.709
34	78	1	0.291
35	19	1	0.291
36	81	1	0.291
37	20	1	0.291
38	21	1	0.291
39	22	1	0.291
40	23	1	0.291
41	18	1	0.291
42	86	1	0.291
43	15	1	0.291
44	16	1	0.291
45	17	1	0.291
46	85	1	0.291
47	84	1	0.291
48	102	1	0.291
49	91	1	0.291
50	90	1	0.291
51	93	1	0.291
52	89	1	0.291
53	87	1	0.291
54	97	1	0.291
55	95	1	0.291
56	99	1	0.291
57	104	1	0.709
58	105	1	0.291
59	107	1	0.291
60	106	1	0.291
61	108	1	0.291
62	109	1	0.291
63	111	1	0.291
64	113	1	0.291
65	119	1	0.291
66	120	1	0.291
67	114	1	0.291
68	117	1	0.709
69	112	1	0.291
70	110	1	0.291
71	110a	1	0.291
72	115	1	0.709
73	24	1	0.291
74	32	1	0.291
75	34	1	0.291
76	35	1	0.291
77	36	1	0.291
78	37	1	0.291
79	40	1	0.291
80	43	1	0.291
81	42	1	0.291
82	39	1	0.291
83	38	1	0.291
84	41	1	0.709
85	46	1	0.291
86	47	1	0.291
87	49	1	0.291
88	50	1	0.291
89	51	1	0.291

Table 23 – Querenda White Variables: Final Cluster Centers - K-Means Cluster Analysis (n = 89 sites)

Final Cluster Centers

	Cluster		
	1	**2**	**3**
Querenda White	0	12	31

Number of Cases in each Cluster

Cluster	1	86
	2	2
	3	1
	Valid	89
	Missing	0

Table 24 – Querenda White Variables: Cluster Membership - K-Means Cluster Analysis (n=86 sites)

(Tz-59, Tz-63, Tz-70 removed)

Case #	Sites	Cluster	Distance
1	75	1	0
2	76	1	0
3	74	3	0
4	73	3	0
5	55	1	0
6	54	1	0
7	56	1	0
8	53	2	0
9	58	3	0
10	60	3	0
11	61	3	0
12	62	2	0
13	65	1	0
14	67	2	0
15	68	3	0
16	10	1	0
17	9	1	0
18	8	3	0
19	6	1	0
20	4	1	0
21	7	1	0
22	5	3	0
23	3	3	0
24	1	3	0
25	2	3	0
26	11	1	0
27	12	1	0
28	13	1	0
29	14	1	0
30	77	3	0
31	78	1	0
32	19	1	0
33	81	1	0
34	20	1	0
35	21	1	0
36	22	1	0
37	23	1	0
38	18	1	0
39	86	1	0
40	15	1	0
41	16	1	0
42	17	1	0
43	85	1	0

Case #	Site	Cluster	Distance
44	84	1	0
45	102	1	0
46	91	1	0
47	90	1	0
48	93	1	0
49	89	1	0
50	87	1	0
51	97	1	0
52	95	1	0
53	99	1	0
54	104	3	0
55	105	1	0
56	107	1	0
57	106	1	0
58	108	1	0
59	109	1	0
60	111	1	0
61	113	1	0
62	119	1	0
63	120	1	0
64	114	1	0
65	117	3	0
66	112	1	0
67	110	1	0
68	110a	1	0
69	115	3	0
70	24	1	0
71	32	1	0
72	34	1	0
73	35	1	0
74	36	1	0
75	37	1	0
76	40	1	0
77	43	1	0
78	42	1	0
79	39	1	0
80	38	1	0
81	41	3	0
82	46	1	0
83	47	1	0
84	49	1	0
85	50	1	0
86	51	1	0

Table 25 – Querenda White Variables: Final Cluster Centers - K-Means Cluster Analysis (n=86 sites)
(Tz-59, Tz-63, Tz-70 removed)

Number of Cases in each Cluster

Cluster		
	1	67
	2	3
	3	16
	Valid	86
	Missing	0

Final Cluster Centers

	Cluster		
	1	2	3
Querenda White	0	3	1

Figure 16 - Sipiho Gris: Tecuena Group

Figure 17 - Tarerio Cream: Jaracuro simple bowl

Figure 18 - Tariacuri Cafe: La Vinata Group

Figure 19 - Tariacuri Cafe: Cucuhucho (handle)

Figure 20 - Tariacuri Café: Restricted Vessel (spout handle)

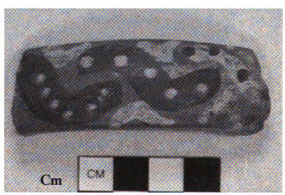


Figure 21 - Tariacuri Café var. Santa Ana

Figure 22 - Tecolote Orange Mini Bowl Fragments

Figure 23 - Yaguarato Coarse var. San Bartolo (brasero)

Figure 24 - Late Urichu Phase: Arocutin Rojo con Negativo

Figure 25 - Late Urichu Phase: Copujo Rojo sobre Crema (small support)

Figure 26 - Oval Cross Section w/ Decoration

Figure 27 - Incised Twist Four

Figure 28 - Circular Cross Section: Red Slip

Figure 29 - Oval Cross Section

Figure 30 – Tzintzuntzan Survey Map: Northwest Portion

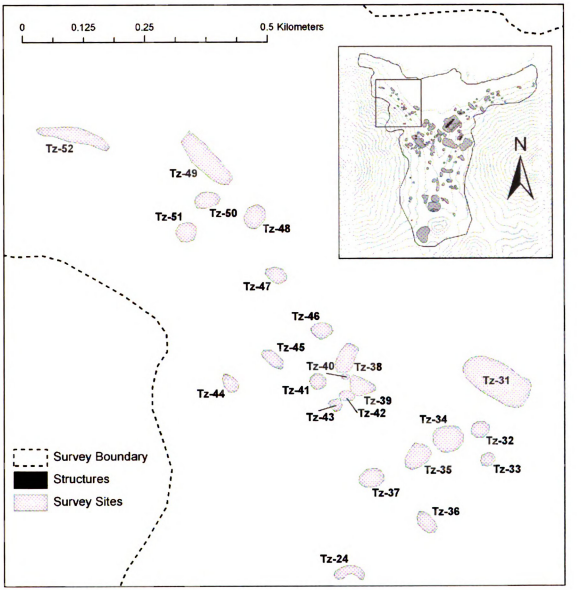


Figure 31 – Tzintzuntzan Survey Map: West Central Portion

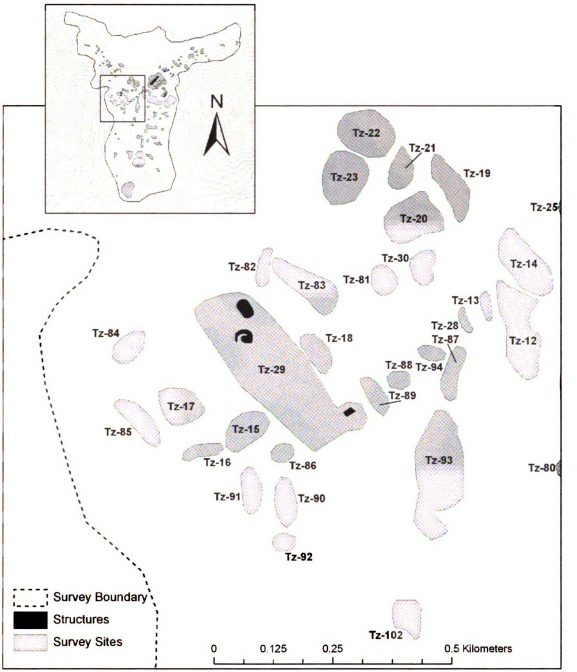


Figure 32 – Tzintzuntzan Survey Map: East Central Portion

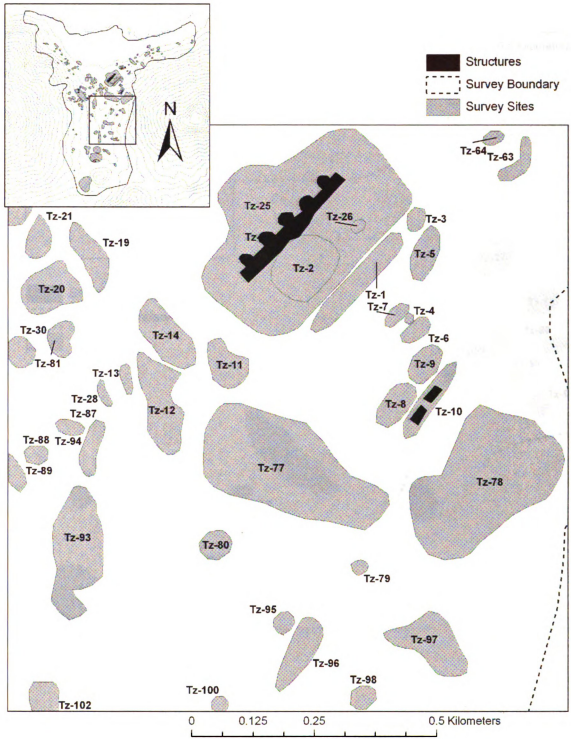


Figure 33 – Tzintzuntzan Survey Map: Lower Northeast Portion

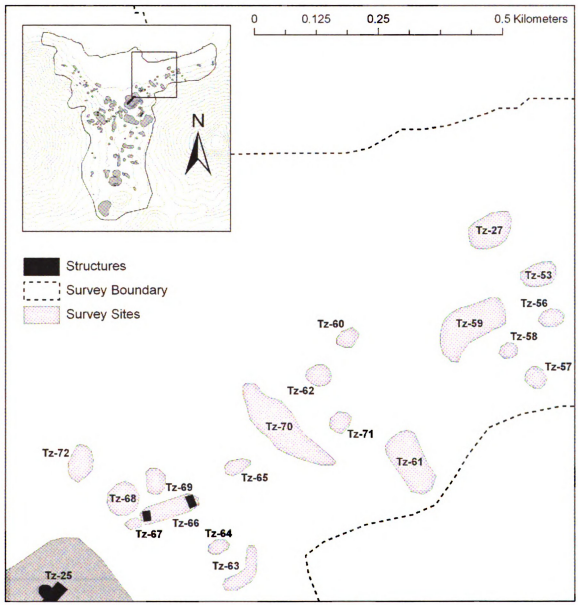


Figure 34 – Tzintzuntzan Survey Map: Upper Northeast Portion

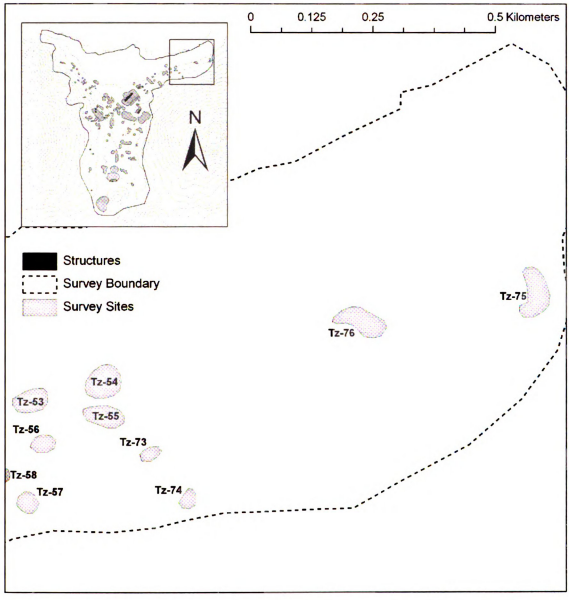
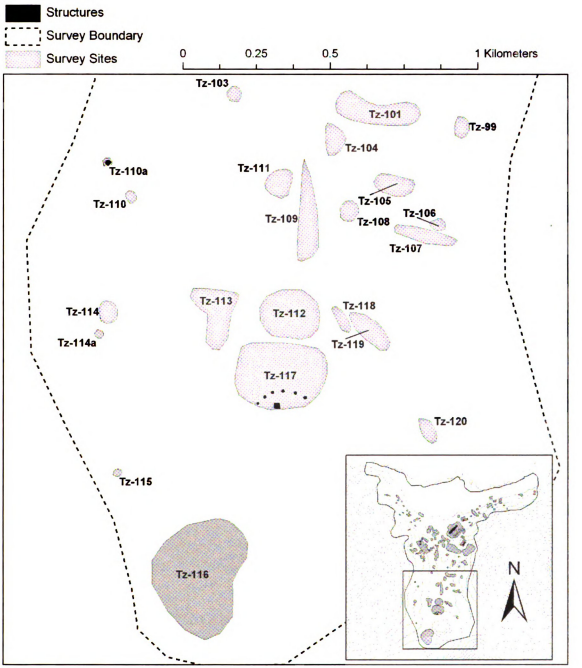


Figure 35 – Tzintzuntzan Survey Map: South Portion



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